

Mortality and Longevity

Group Life COVID-19 Mortality Survey





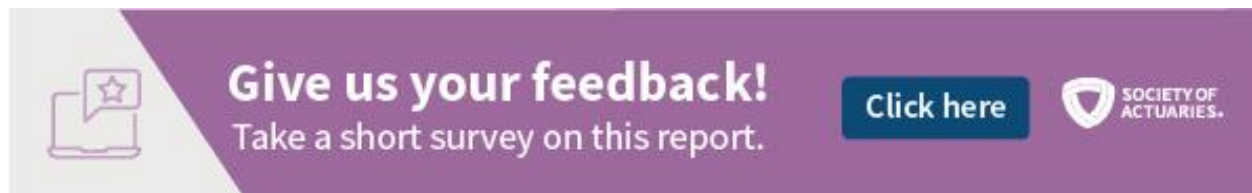
Group Life COVID-19 Mortality Survey

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Section 1: Purpose of the Survey

The purpose of this survey is to gather a high-level view of U.S. Group Term Life Insurance mortality results during the COVID-19 pandemic, as compared to prior period baseline mortality results. This report is an update to the previous [Group Life COVID-19 Mortality Survey](#) first published in December 2020, which included pandemic data from April through August 2020. This update includes Group Life mortality results from April 2020 through March 2021, representing a full 12 months of Group Life mortality experience during the COVID-19 pandemic. COVID-19 is caused by the “novel coronavirus” named “SARS-CoV-2,” which was identified in 2019. As of the writing of this document, complications from COVID-19 have killed over 620,000 people in the United States alone, and over 4.0 million worldwide.

The survey has been conducted by the Group Life Experience Committee (“the Committee”) of the Society of Actuaries and has been structured as a recurring monthly data collection and compilation process from U.S. Group Term Life insurers. The datasets for this report encompass all Group Term Life claims for the calendar years 2017-2021 reported to participating carriers as of March 31, 2021 and include over 1.8 million claims and over \$83 billion in earned premium. The Committee is grateful that 20 of the top 21 U.S. Group Term Life insurers focused on employer groups are participating in this survey, with market share representing roughly 90% of the employer-based Group Term Life industry. Thus, the Committee believes the findings herein are representative of the COVID-19 mortality impact on the U.S. Group Term Life industry as a whole.


Guiding principles for the survey include the following:

- Providing timely information on total high-level Group Life mortality results versus baseline expectations during the pandemic is the most important goal. Thus, the survey is not a seriatim mortality study. Rather, it is a synopsis of monthly Group Life exposures, death counts and amounts.
- It’s critical for this survey to compare current Group Life mortality from all causes of death to the baseline expected all-cause mortality levels. The Committee recognizes there are limitations in the ability to code deaths as COVID-19 related, within both the general population and Group Life exposures. Thus, tracking just Group Life deaths coded with a cause of COVID-19 may not accurately measure the total impact of the pandemic.
- The Committee asked carriers to provide segmentation data when feasible. However, the Committee did not want the additional detailed data request to become so onerous that it materially delayed the survey reporting process or shrunk the number of carriers willing and able to participate. Thus, the survey includes high-level exposure and claims data for all 20 carriers, but much of the segmentation data is based on results for just subsets of carriers.



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Section 2: Overview

2.1 BACKGROUND

Carriers provided a complete set of monthly Group Life exposures dating back to January 2017, along with all Group Life death claims reported in January 2017 or later. The reported death claims also identified the months of death, i.e., incurred months.

Exposures and deaths during the three-year period of 2017-2019 were used to set baseline mortality expectations. The dataset for this report encompasses all Group Life claims reported to participating carriers as of March 31, 2021. Reported claims are easier to measure than incurred claims, but they do not tell the full story about Group Life mortality through March 2021 because the reported claims in a given month include deaths from prior periods. Therefore, claim reporting patterns from prior periods have been analyzed to develop completion factors, which are used to estimate incurred but not yet reported (IBNR) claims for each month. This enabled the Committee to estimate incurred claims for each month up through March 2021. Note that estimated incurred claims for March 2021 and other recent months are still subject to change in the future as more claims are revealed. For example, estimated incurred March 2021 claims in this report are roughly 30% complete, while October 2020 incurrals are roughly 95% complete.

2.2 SCOPE

The following specifications were used to define claims and exposures within the survey:

- Include Group Term Life only. Exclude Group Whole Life; GUL; COLI; 10- or 20-year Group Term, etc.
- Include both list billed and self-administered business.
- Include employee, spouse and child exposures and deaths.
- Include both active and retired lives and claims.
- Include death benefits only; exclude riders, interest payments and claims expenses.
- Include only the life insurance benefit for accidental deaths; exclude any additional AD&D rider amounts.
- Exclude Waiver of Premium disabilities but include deaths from persons on Waiver of Premium status.
- Portability and Conversion exposures and claims may be either included or excluded based on each company's internal reporting procedures.

2.3 SURVEY HIGHLIGHTS

Tables 2.1 through 2.4¹ display high-level incidence results for 2020 and the first quarter of 2021 compared to the 2017-2019 baseline period for each combination of a) incurred/reported basis and b) count/amount basis through March 2021. In these tables, the number of COVID-19 claims has not been adjusted for seasonality, but the ratios to baseline have been adjusted for seasonality.

Table 2.1

COUNT-BASED INCURRED INCIDENCE RESULTS RELATIVE TO 2017-2019 BASELINE PERIOD

Count-Based	1Q20	2Q20	3Q20	4Q20	1Q21	4/20-3/21
Total / Baseline	98.5%	115.2%	114.7%	126.9%	121.9%	119.6%
COVID-19 Claims	1,152	12,862	9,690	22,195	20,248	64,995
<i>COVID / Baseline</i>	<i>1.0%</i>	<i>12.3%</i>	<i>9.5%</i>	<i>20.6%</i>	<i>18.1%</i>	<i>15.1%</i>
<i>Non-COVID / Baseline</i>	<i>97.5%</i>	<i>102.9%</i>	<i>105.2%</i>	<i>106.3%</i>	<i>103.8%</i>	<i>104.5%</i>

Table 2.2

AMOUNT-BASED INCURRED INCIDENCE RESULTS RELATIVE TO 2017-2019 BASELINE PERIOD

Amount-Based	1Q20	2Q20	3Q20	4Q20	1Q21	4/20-3/21
Total / Baseline	102.7%	119.9%	124.7%	132.9%	131.6%	127.3%
COVID-19 Claims	57,699 K	463,995K	397,884K	813,876 K	842,909 K	2,518,664 K
<i>COVID / Baseline</i>	<i>1.4%</i>	<i>12.1%</i>	<i>10.7%</i>	<i>20.7%</i>	<i>20.7%</i>	<i>16.0%</i>
<i>Non-COVID / Baseline</i>	<i>101.3%</i>	<i>107.8%</i>	<i>114.0%</i>	<i>112.2%</i>	<i>110.9%</i>	<i>111.3%</i>

Table 2.3

COUNT-BASED REPORTED INCIDENCE RESULTS RELATIVE TO 2017-2019 BASELINE PERIOD

Count-Based	1Q20	2Q20	3Q20	4Q20	1Q21	4/20-3/21
Total / Baseline	98.7%	110.6%	113.2%	120.7%	124.6%	117.3%
COVID-19 Claims	152	10,309	9,407	14,007	24,840	58,563
<i>COVID / Baseline</i>	<i>0.1%</i>	<i>9.5%</i>	<i>9.2%</i>	<i>14.1%</i>	<i>22.0%</i>	<i>13.7%</i>
<i>Non-COVID / Baseline</i>	<i>98.6%</i>	<i>101.1%</i>	<i>104.0%</i>	<i>106.6%</i>	<i>102.6%</i>	<i>103.6%</i>

Table 2.4

AMOUNT-BASED REPORTED INCIDENCE RESULTS RELATIVE TO 2017-2019 BASELINE PERIOD

Amount-Based	1Q20	2Q20	3Q20	4Q20	1Q21	4/20-3/21
Total / Baseline	99.9%	115.1%	124.4%	131.1%	130.9%	125.3%
COVID-19 Claims	11,837 K	402,734 K	384,319K	553,548 K	980,916 K	2,321,517 K
<i>COVID / Baseline</i>	<i>0.3%</i>	<i>10.2%</i>	<i>10.4%</i>	<i>15.6%</i>	<i>24.1%</i>	<i>15.0%</i>
<i>Non-COVID / Baseline</i>	<i>99.6%</i>	<i>104.9%</i>	<i>114.0%</i>	<i>115.5%</i>	<i>106.8%</i>	<i>110.3%</i>

¹ A small number of COVID-19 claims received were dated prior to 2020. The Committee assumes these dates are data errors. As they were not assigned to a particular date in 2020 or 2021, these claims are excluded from Tables 2.1 – 2.4. They are, however, included in the total COVID claims that appear in Section 7.

Group Life carriers generally started receiving a small number of COVID-19 death claims during the month of March 2020, but April 2020 was the first month in which the Group Life industry saw a material number of reported COVID-19 death claims. This drove April 2020 Group Life reported incidence to be measurably larger than baseline expected reported incidence. Reported incidence has remained materially higher than baseline for the entire 12-month period of April 2020 through March 2021. However, excess reported incidence in May and August 2020 was less extreme than the other ten months, with roughly a 4% increase in reported mortality during those two months.

From an incurred mortality viewpoint, all 12 months from April 2020 through March 2021 showed excess mortality² versus baseline expectations. April, November, December and January each had very high incurred mortality spikes of 26% or more, while the other eight months ranged from a low of 7% excess incurred mortality to a high of 18% excess incurred mortality above baseline.

The 12-month period of April 2020 through March 2021 showed the following Group Life mortality results:

- Estimated reported Group Life claim incidence rates were up 17.3% on a seasonally-adjusted basis compared to 2017-2019 reported claims for the same 12-month timeframes.
- Estimated incurred Group Life incidence rates were 19.6% higher than baseline on a seasonally-adjusted basis. The incurred incidence rates in February and March 2021 are based on fairly incomplete data, so they are subject to change and should not be fully relied upon at this point.

Additional highlights include:

- Approximately 13% of all reported Group Life claims with death dates in April 2020 through March 2021 were determined to have a cause of death of COVID-19.
- The Blue Collar group saw the smallest increase in mortality compared to the 2017-2019 baseline period, ranging between 11% and 27% higher on a quarterly basis. White Collar and Grey Collar mortality have generally ranged from 14% to 31% higher than the baseline period on a quarterly basis. The previous December 2020 report also observed that the Blue Collar group had the smallest excess mortality, but the difference was more pronounced when including only data through August 2020. There is less variance between the groups when considering the full April 2020 through March 2021 period.
- Group Life mortality patterns by region have evolved over time during the COVID-19 pandemic. The following regions had the highest excess mortality in each quarter shown:
 - Q2 2020: Northeast (42.6%)
 - Q3 2020: Southeast (25.3%)
 - Q4 2020: Midwest (33.8%)
 - Q1 2021: Southeast (32.3%)
- Relative to prior years, the Group Life insured population studied within this survey experienced a smaller percentage increase in deaths than the U.S. population as a whole. The percentage of excess deaths in the Group Life survey data was observed to be generally 80% - 110% of the percentage of excess deaths in the U.S. population.

² For the purposes of this report, “excess mortality” refers to the percentage change in incidence rates observed during the pandemic compared to the 2017-2019 baseline period.

Section 3: Survey Methodology and Documentation

3.1 DOCUMENTATION

Participating companies provided both claims and exposure data on a monthly basis. The initial data request can be found in Appendix A. For claims information, the following fields were requested:

- Incurred Month
- Reported Month
- Product Type
- Cause of Death
- Number of Claims
- Total Claim Amount Covered/Paid

For exposure information, the following fields were requested:

- Exposure Month
- Product Type
- Exposed Premium
- Number of Inforce Lives

In addition to the above “core” request, participants were also optionally asked to provide the above information split by state, age/gender grouping, and industry (two-digit SIC code). The lone exception is that Reported Month was not requested for the claims portion of these three more granular cuts of the data.

Below is a summary of the key processing assumptions and decisions for each of these fields.

Claims – Incurred Month

Incurred Months were generally used as provided without adjustment. The primary exception was that data with an Incurred Month after the as-of-date were excluded. For example, for the March 2021 data submissions, claims with an Incurred Month of April 2021 were excluded.

Claims – Reported Month

Claims with a Reported Month prior to the Incurred Month were adjusted by setting the Reported Month equal to the Incurred Month.

Claims – Product Type

Carriers were asked to provide data with one of three Product Types: Employee Basic, Employee Sup/Vol, and Retiree Life. All alternative codes received for the Product Type field were sent as data questions to carriers and ultimately mapped to one of these three principal product types. Notably, dependent claims were mapped to one of the two employee types, depending on the code received.

Claims – Cause of Death

Contributors were asked to identify claims as due to COVID, Accident, All-Other Non-Accident (Illness), or Unknown.

Claims – Number of Claims and Total Claim Amount Covered/Paid

Claims by Reported Date were processed as-is without adjustment. However, on an incurred basis, the claims needed to be adjusted with completion factors as described in subsection 3.2.2 below; otherwise, the incidence rates in recent periods would be understated.

Exposure – Exposure Month and Product Type

Processing for these fields was analogous to the corresponding claims fields.

Exposure – Exposed Premium

The proximity of the survey request to the reporting dates of the data requested presented some challenges in the monthly collection process as recent exposure data may be unavailable. For example, one carrier indicated that their premium information for March 2021 was incomplete; therefore, the average premiums for October through December 2020 were imputed for March 2021 for this carrier.

Exposure – Number of Inforce Lives

Not all carriers provided the Number of Inforce Lives. For these carriers, this field was imputed using the average premium per life (PPL) from carriers that supplied both premiums and lives. A separate PPL was calculated for each year and product type, and the missing Number of Inforce Lives was populated by dividing the provided premium by the PPL appropriate to the year and product type for which the premium was earned. The committee acknowledges that PPL varies by company and that the exposure completion methodology may result in an aggregate incidence rate that differs materially from the actual level of incidence but does not expect that it distorted the trends monitored in this study.

Segment Information – State Code

State codes that did not match a listing of valid U.S. state, U.S. overseas territory, or Canadian province codes were sent as data questions to the contributors. Some records with indeterminate codes after this questioning process were mapped to an “unknown” category.

Segment Information – Age and Gender

Companies provided age information according to the following categories: 0-24, 25-34, 35-44, 45-54, 55-64, 65-74, 75-84, and 85+. These age groupings were then lumped into the following broader groupings: 0-44, 45-64, and 65+. Gender information was collected as male, female and unknown.

Segment Information – Industry

For the Industry field, contributors were asked to provide two-digit SIC codes. Codes that did not match a list of valid two-digit SIC codes were sent as data questions to the contributor for resolution. Some records with indeterminate codes after this questioning process were mapped to an “Unknown” category.

3.2 RESULTS PROCESSING AND REVIEW

3.2.1 DAMPENING OF EXPERIENCE

In the December 2020 iteration of this survey report, it was stated that one carrier constituted the majority of Retiree Life exposure. This necessitated the application of dampening factors to this carrier's exposure and the application of factors greater than one to the other four carriers providing Retiree Life exposures to ensure no carrier's data represented more than 40% of the total. However, the carrier that submitted the largest portion of Retiree Life data has since stopped explicitly providing this product type split. After review of the remaining four carriers' data, it was determined that dampening of experience was no longer needed.

3.2.2 COMPLETION OF CLAIMS

A table of claim counts by Incurred Month and Reported Month was compiled to develop completion factors. Month-to-month completion factors were estimated using the accumulated totals for a particular incurred month in consecutive reported months. It was observed that there was some seasonal variation in the completion factors, so adjustments to the factors for calendar month were incorporated.

The total completion factors were computed by cumulatively applying the month-to-month completion factors to all subsequent months. For example, the total completion factor for a claim in month zero is the factor for month zero to one, times the factor for month one to two, times the factor for month two to three, and so forth. In total, 36 months of completion were used.

Completion factors vary by calendar month. Since the last publication of this report in December 2020, the Committee has incorporated factor variation by reporting speed groups as well. The rate at which the contributing companies' claims complete has been categorized into five groups, with three to five companies in each reporting speed group.

3.2.3 BROADER CLASSIFICATION OF SEGMENT INFORMATION

For credibility and confidentiality reasons, the industry codes and state codes were grouped into broader segments for analysis. State codes were mapped to one of 11 divisions, with the New England division being split into northern and southern portions. The state codes were also mapped to four broader U.S. regions (Northeast, Midwest, Southeast, West), with Canada, overseas territories, and unknown codes grouped into a fifth "Other" region.

The two-digit SIC codes were organized into 23 different groupings and then more broadly into one of four codes by collar color (White, Grey, Blue, Unknown).

A table showing the details of these mappings can be found in Appendix B.

3.2.4 UNKNOWN CLAIM DIAGNOSIS

The Unknown claim diagnosis category is artificially large for December 2020 through March 2021. This is primarily due to the newness of these claims. As claims data has been collected and refreshed each month, it has been observed that the concentration of claims with an unknown Cause of Death decreases as the number of months between the original reporting date and the data collection date increases.

3.2.5 COVID-19 CLAIMS FROM 2019 OR EARLIER

The data show a handful of COVID-19 claims with dates of death in 2019 or earlier. The Committee believes that these are coding errors where incorrect cause of death codes were supplied. These claims remain in the data as submitted without adjustment.

3.2.6 GROUPINGS BY COMPANY SIZE

To review results by company size (see subsection 7.6), contributors were split into three groups based on premium amounts from 2019. The Small group consists of companies with less than \$300 million in 2019 premiums, the Medium group consists of companies with between \$300 million and \$1 billion, and the Large group consists of companies with over \$1 billion. The breakpoints were chosen to ensure that there were at least six companies in each group. The Small group contains six companies, while the Medium and Large groups contain seven companies each.

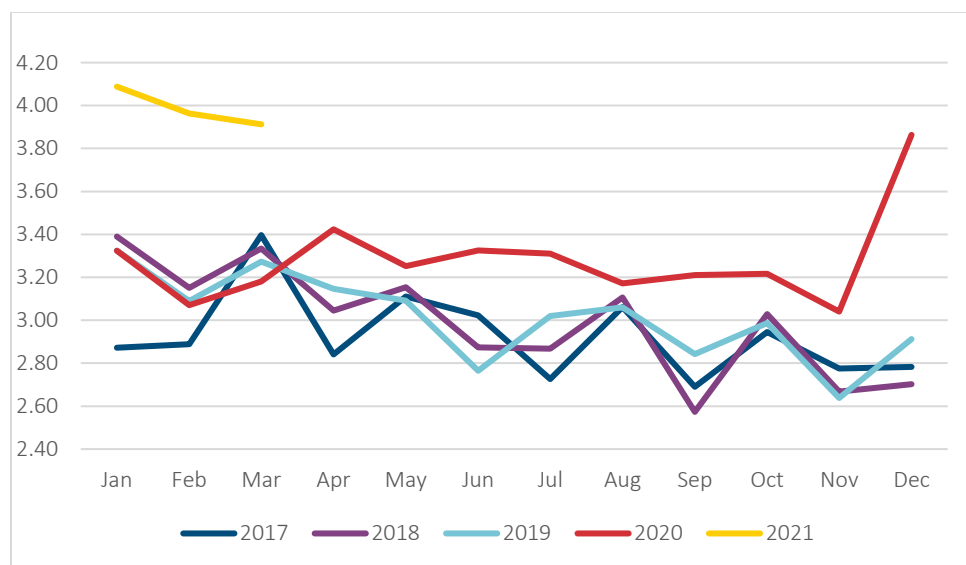
Section 4: Group Life Mortality Results – Reported Death Claims

4.1 REPORTED CLAIM INCIDENCE BY COUNT – ALL CAUSES

Excess reported-basis mortality was observed in every month from April 2020 through March 2021. However, excess reported incidence in May and August 2020 was less extreme than the other ten months, with roughly a 4% increase in reported mortality during those two months.

Reported overall Group Life claim incidence rates by count during April 2020 through March 2021, as shown in Figure 4.1, were up 17.3% compared to 2017-2019 reported claims. Reported claims are easier to measure than incurred, but they do not provide definitive information about experience in the most recent several months since they include deaths from prior periods.

Figure 4.1
AGGREGATE REPORTED CLAIM INCIDENCE PER 1000 BY CALENDAR YEAR AND MONTH



4.2 REPORTED CLAIM INCIDENCE BY COUNT – COVID-19 VERSUS ALL OTHER CAUSES

A total of 58,724 COVID-19 death claims were reported through March 2021. However, the table below shows that COVID-19 claims do not fully explain the increase in reported claim incidence.

Table 4.1

REPORTED EXCESS MORTALITY BY CLAIM COUNT COMPARED TO 2017-2019 BASELINE

Count-Based	1Q20	2Q20	3Q20	4Q20	1Q21	4/20-3/21
Total / Baseline	98.7%	110.6%	113.2%	120.7%	124.6%	117.3%
COVID-19 Claims	152	10,309	9,407	14,007	24,840	58,563
COVID / Baseline	0.1%	9.5%	9.2%	14.1%	22.0%	13.7%
Non-COVID / Baseline	98.6%	101.1%	104.0%	106.6%	102.6%	103.6%

Reported claim details by month are shown below, along with calculated monthly reported incidence rates.

Table 4.2

REPORTED CLAIMS AND INCIDENCE RATES, 2017 THROUGH Q1 2021

Report Date	Raw Submitted Numbers			Calculated Amounts				
	Reported Claims		Premium (000)	Life Years Exposed (000)		Annual Incidence per 1,000	Adjusted for Seasonality	
	Total	COVID		By Month	Yrly Avg		Total	Total/Baseline
3/1/2021	46,173	5,708	1,682,437	11,671	11,802	3.91	3.50	117.4%
2/1/2021	46,778	8,987	1,701,819	11,830	11,802	3.96	3.89	130.6%
1/1/2021	48,246	10,145	1,719,185	11,904	11,802	4.09	3.75	125.9%
12/1/2020	46,204	7,676	1,688,832	11,854	11,959	3.86	4.18	140.2%
11/1/2020	36,362	3,583	1,679,892	11,835	11,959	3.04	3.37	113.1%
10/1/2020	38,468	2,748	1,682,396	11,737	11,959	3.22	3.24	108.9%
9/1/2020	38,395	3,095	1,685,177	11,829	11,959	3.21	3.56	119.4%
8/1/2020	37,933	3,399	1,688,217	11,887	11,959	3.17	3.09	103.7%
7/1/2020	39,592	2,913	1,708,417	11,988	11,959	3.31	3.47	116.5%
6/1/2020	39,764	3,156	1,698,222	11,955	11,959	3.32	3.44	115.3%
5/1/2020	38,902	4,002	1,753,918	12,225	11,959	3.25	3.10	104.1%
4/1/2020	40,953	3,151	1,710,413	11,880	11,959	3.42	3.35	112.4%
3/1/2020	38,033	147	1,714,317	11,979	11,959	3.18	2.85	95.7%
2/1/2020	36,728	2	1,742,559	12,333	11,959	3.07	2.92	98.0%
1/1/2020	39,742	3	1,705,753	12,010	11,959	3.32	3.06	102.6%
2017-19 Baseline	34,653	0	1,602,646	11,642	11,642	2.98	2.98	100.0%
2019 monthly	35,651	0	1,658,929	11,836	11,836	3.01	3.01	101.2%
2018 monthly	34,763	0	1,599,029	11,624	11,624	2.99	2.99	100.3%
2017 monthly	33,545	0	1,549,980	11,465	11,465	2.93	2.93	98.4%

4.3 REPORTED CLAIM INCIDENCE BY AMOUNT – ALL CAUSES

Reported overall Group Life claim incidence rates by amount during April 2020 through March 2021 were up roughly 25% compared to 2017-2019 reported amounts. This increase in incidence rates by amount is notably higher than the corresponding incidence rate increase by count. The Committee estimates that roughly half the difference is due to changes in age and gender mix, and the remainder is likely due to salary and face amount inflation over the four-year period.

4.4 REPORTED CLAIM INCIDENCE BY AMOUNT – COVID-19 VERSUS ALL OTHER CAUSES

Table 4.3

REPORTED EXCESS MORTALITY BY TOTAL CLAIM AMOUNT COMPARED TO 2017-2019 BASELINE

Amount-Based	1Q20	2Q20	3Q20	4Q20	1Q21	4/20-3/21
Total / Baseline	99.9%	115.1%	124.4%	131.1%	130.9%	125.3%
COVID-19 Claims	11,837 K	402,734 K	384,319K	553,548 K	980,916 K	2,321,517 K
<i>COVID / Baseline</i>	<i>0.3%</i>	<i>10.2%</i>	<i>10.4%</i>	<i>15.6%</i>	<i>24.1%</i>	<i>15.0%</i>
<i>Non-COVID / Baseline</i>	<i>99.6%</i>	<i>104.9%</i>	<i>114.0%</i>	<i>115.5%</i>	<i>106.8%</i>	<i>110.3%</i>

Section 5: Completion Factor Development

5.1 BY CLAIM COUNT

Historic Group Life claim reporting patterns by claim count have been studied to develop completion factors, which were then used to translate reported claims through August 2020 by incurral month into estimated ultimate incurred claims for each month. The completion factors for this report are based on the total set of claims by all causes from all 20 participating carriers, with incurred dates of January 2017 or later and reported dates up through September 2020.

Claims were batched together into a claim triangle with incurred month on the horizontal axis and reported month on the vertical axis. Lag is defined as the number of months between when a death occurs and when the claim is reported to a carrier. Thus, a death that was both incurred and reported in August 2020 would have a lag of zero, while a death incurred in June 2020 but reported in August 2020 would have a lag of two, etc. A subset of the claim triangle is displayed below.

Table 5.1
2020 INCURRED CLAIMS BY INCURRED MONTH AND REPORTING LAG

<u>Months of Reporting Lag</u>	<u>Incurred Month</u>							
	<u>Jan-20</u>	<u>Feb-20</u>	<u>Mar-20</u>	<u>Apr-20</u>	<u>May-20</u>	<u>Jun-20</u>	<u>Jul-20</u>	<u>Aug-20</u>
0	11887	10137	10932	13971	11276	10786	13014	12826
1	14647	14412	15443	16559	16158	14850	15686	
2	5822	4961	5713	6916	6109	5517		
3	2159	1867	2656	2785	2249			
4	1350	1242	1283	1386				
5	910	623	732					
6	559	374						
7	438							

Month-to-month completion factors were developed using the accumulated totals for a particular incurred month in consecutive reported months. Seasonal variations were observed during the first two months of lag, so adjustments to the factors for calendar month were incorporated. The total completion factors, as displayed in Table 5.2, were computed by cumulatively applying the month-to-month completion factors to all subsequent months. The data presented in Table 5.1 has not changed since the December 2020 publication. However, the factors in Table 5.2 have been updated since the December 2020 publication. The update occurred by more heavily weighting 2020 completion patterns to reflect more recent completion behavior from the 20 contributing companies.

Table 5.2
ESTIMATED COMPLETION FACTORS BY NUMBER OF MONTHS OF LAG AND CALENDAR MONTH

Lag	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	3.5594	3.7656	3.4405	3.4405	3.4405	3.4405	3.3387	3.1129	3.3387	3.2384	3.5594	4.0150
1	1.4808	1.4313	1.4313	1.4313	1.4313	1.4313	1.3890	1.4313	1.3890	1.4313	1.4808	1.4313
2	1.1752	1.1752	1.1752	1.1752	1.1752	1.1752	1.1752	1.1752	1.1752	1.1752	1.1752	1.1752
3	1.1015	1.1015	1.1015	1.1015	1.1015	1.1015	1.1015	1.1015	1.1015	1.1015	1.1015	1.1015
4	1.0697	1.0697	1.0697	1.0697	1.0697	1.0697	1.0697	1.0697	1.0697	1.0697	1.0697	1.0697
5	1.0530	1.0530	1.0530	1.0530	1.0530	1.0530	1.0530	1.0530	1.0530	1.0530	1.0530	1.0530
6	1.0430	1.0430	1.0430	1.0430	1.0430	1.0430	1.0430	1.0430	1.0430	1.0430	1.0430	1.0430
7	1.0363	1.0363	1.0363	1.0363	1.0363	1.0363	1.0363	1.0363	1.0363	1.0363	1.0363	1.0363
8	1.0314	1.0314	1.0314	1.0314	1.0314	1.0314	1.0314	1.0314	1.0314	1.0314	1.0314	1.0314
9	1.0277	1.0277	1.0277	1.0277	1.0277	1.0277	1.0277	1.0277	1.0277	1.0277	1.0277	1.0277
10	1.0248	1.0248	1.0248	1.0248	1.0248	1.0248	1.0248	1.0248	1.0248	1.0248	1.0248	1.0248
11	1.0221	1.0221	1.0221	1.0221	1.0221	1.0221	1.0221	1.0221	1.0221	1.0221	1.0221	1.0221
12	1.0197	1.0197	1.0197	1.0197	1.0197	1.0197	1.0197	1.0197	1.0197	1.0197	1.0197	1.0197
13	1.0177	1.0177	1.0177	1.0177	1.0177	1.0177	1.0177	1.0177	1.0177	1.0177	1.0177	1.0177
14	1.0162	1.0162	1.0162	1.0162	1.0162	1.0162	1.0162	1.0162	1.0162	1.0162	1.0162	1.0162
15	1.0148	1.0148	1.0148	1.0148	1.0148	1.0148	1.0148	1.0148	1.0148	1.0148	1.0148	1.0148
16	1.0136	1.0136	1.0136	1.0136	1.0136	1.0136	1.0136	1.0136	1.0136	1.0136	1.0136	1.0136
17	1.0126	1.0126	1.0126	1.0126	1.0126	1.0126	1.0126	1.0126	1.0126	1.0126	1.0126	1.0126
18	1.0116	1.0116	1.0116	1.0116	1.0116	1.0116	1.0116	1.0116	1.0116	1.0116	1.0116	1.0116
19	1.0107	1.0107	1.0107	1.0107	1.0107	1.0107	1.0107	1.0107	1.0107	1.0107	1.0107	1.0107
20	1.0098	1.0098	1.0098	1.0098	1.0098	1.0098	1.0098	1.0098	1.0098	1.0098	1.0098	1.0098
21	1.0090	1.0090	1.0090	1.0090	1.0090	1.0090	1.0090	1.0090	1.0090	1.0090	1.0090	1.0090
22	1.0083	1.0083	1.0083	1.0083	1.0083	1.0083	1.0083	1.0083	1.0083	1.0083	1.0083	1.0083
23	1.0076	1.0076	1.0076	1.0076	1.0076	1.0076	1.0076	1.0076	1.0076	1.0076	1.0076	1.0076
24	1.0069	1.0069	1.0069	1.0069	1.0069	1.0069	1.0069	1.0069	1.0069	1.0069	1.0069	1.0069
25	1.0062	1.0062	1.0062	1.0062	1.0062	1.0062	1.0062	1.0062	1.0062	1.0062	1.0062	1.0062
26	1.0056	1.0056	1.0056	1.0056	1.0056	1.0056	1.0056	1.0056	1.0056	1.0056	1.0056	1.0056
27	1.0051	1.0051	1.0051	1.0051	1.0051	1.0051	1.0051	1.0051	1.0051	1.0051	1.0051	1.0051
28	1.0046	1.0046	1.0046	1.0046	1.0046	1.0046	1.0046	1.0046	1.0046	1.0046	1.0046	1.0046
29	1.0042	1.0042	1.0042	1.0042	1.0042	1.0042	1.0042	1.0042	1.0042	1.0042	1.0042	1.0042
30	1.0038	1.0038	1.0038	1.0038	1.0038	1.0038	1.0038	1.0038	1.0038	1.0038	1.0038	1.0038
31	1.0033	1.0033	1.0033	1.0033	1.0033	1.0033	1.0033	1.0033	1.0033	1.0033	1.0033	1.0033
32	1.0030	1.0030	1.0030	1.0030	1.0030	1.0030	1.0030	1.0030	1.0030	1.0030	1.0030	1.0030
33	1.0025	1.0025	1.0025	1.0025	1.0025	1.0025	1.0025	1.0025	1.0025	1.0025	1.0025	1.0025
34	1.0022	1.0022	1.0022	1.0022	1.0022	1.0022	1.0022	1.0022	1.0022	1.0022	1.0022	1.0022
35	1.0006	1.0006	1.0006	1.0006	1.0006	1.0006	1.0006	1.0006	1.0006	1.0006	1.0006	1.0006

5.2 BY FACE AMOUNT

Our analysis has shown that larger face amount claims report faster than lower face amount claims. Thus, over time the average face amount for an incurral month decreases as claims continue to be reported in later months. For example, the average face amount of claims reported in the first month of an incurral period may be \$40,000 but, three years later, it may be \$36,000. This would imply an adjustment factor of 90% is needed to more accurately complete the total claim amounts.

The development of average claim amounts over time was studied from 2017 to 2019 for each month, and a set of factors were developed to adjust the projected claim amounts in future reports. Table 5.3 shows a summarized version of the resulting adjustment factors. These adjustment factors have since been incorporated into the completion factors used within this report.

Table 5.3
AVERAGE CLAIM AMOUNT ADJUSTMENT FACTORS BY REPORTING LAG MONTH (ILLUSTRATIVE)

Reporting Lag Month	Adjustment to Average Size
0	86.0%
1	92.7%
2	95.8%
3	97.2%
10	99.1%
20	99.7%
35	100.0%

5.3 BY CAUSE OF DEATH

It was unknown early on in the pandemic whether COVID-19 claims would be reported more quickly or slowly than other claims. For deaths in March through December of 2020, it appears that COVID-19 claims were being reported slightly slower than the non-COVID-19 set of claims (see Table 5.4 below). However, it is not feasible to vary the actual completion factors for incurred claim development by cause of death because the cause of unreported claims is unknown until they are actually reported.

Table 5.4
REPORTING LAG FOR DEATHS IN MARCH – DECEMBER 2020

Lag Months	COVID	All Other Causes	COVID / All Other Causes
0	2.183	2.149	101.6%
1	1.204	1.190	101.2%
2	1.064	1.067	99.8%
3	1.021	1.029	99.2%
0-3	2.855	2.805	101.8%

5.4 BY COMPANY REPORTING SPEED

The Committee has observed that incurred claim completion rates vary significantly from company to company. Upon analyzing the differences, the 20 contributing companies were grouped into five “reporting speed” groups based on similar reporting patterns. The completion ratios were studied from 2017 through 2020 for these five groups, but more significant weight was placed on data from 2020 as was the case for the base completion factor development. The completion patterns for the five groups were compared to the aggregate completion factors and expressed as adjustments in Table 5.5 below. We view that the differential in completion time is material for the first six reporting months for each incurred period. Further, we did not discern any credible difference in the speed by incurral calendar month, hence only one vector of adjustments is provided for each group. These adjustments provide a more representative picture for the individual company reports and, to a lesser extent, improve the predictive fit of completed claims in total. Thus, the current speed group factors have been updated as compared to Section 9.3 of the December 2020 publication.

Table 5.5
COMPLETION ADJUSTMENT FACTORS BY REPORTING SPEED GROUP

Lag	1	2	3	4	5	Aggregate
0	64.8%	81.6%	111.2%	122.0%	250.0%	100.0%
1	86.1%	94.6%	100.7%	101.4%	125.7%	100.0%
2	94.3%	98.5%	100.5%	100.9%	107.1%	100.0%
3	96.9%	99.3%	100.3%	100.7%	103.7%	100.0%
4	98.0%	99.6%	100.2%	100.5%	102.5%	100.0%
5	98.5%	99.8%	100.1%	100.4%	101.9%	100.0%

Groups 1 and 2 reported claims faster than the aggregate completion factors, evidenced by reducing the magnitude of completion factors for the first six months of reporting. Groups 3 through 5 reported claims slower than the aggregate completion factors.

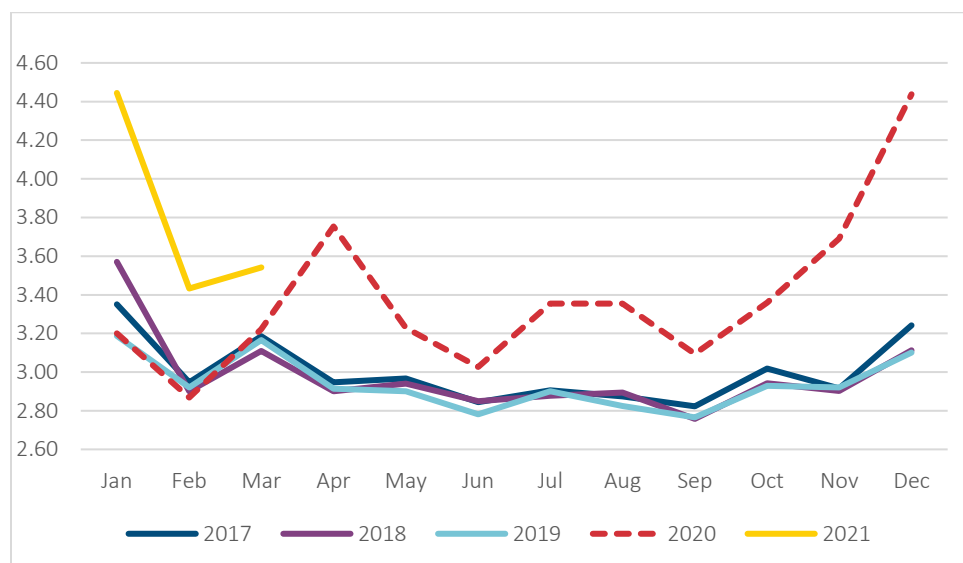
Section 6: Group Life Mortality Results – Estimated Incurred Death Claims

6.1 INCURRED CLAIM INCIDENCE BY COUNT – ALL CAUSES

A completed estimate of incurred incidence rates by count indicates that excess mortality for April 2020 through March 2021 was 19.6% higher than the baseline 2017-2019 incurred incidence on a seasonally-adjusted basis. This includes February and March 2021 incurred incidence rates, which currently indicate lower excess mortality of 17.5% (February) and 12.5% (March), but **the February and March 2021 figures should not be fully relied upon at this point**. Figure 6.1 displays the various monthly estimated incurred incidence rates.

Figure 6.1

AGGREGATE INCURRED³ CLAIM INCIDENCE PER 1000 LIVES BY CALENDAR YEAR AND MONTH



6.2 INCURRED CLAIM INCIDENCE BY COUNT – COVID-19 VERSUS ALL OTHER CAUSES

Table 6.1 below shows that COVID-19 claims do not fully explain the increase in incurred claim incidence on a count basis. COVID-19 claims account for roughly 77% of the excess incurred Group Life mortality during the second quarter of 2020 through the first quarter of 2021, with the other 23% coming from claims that have not been coded with COVID-19 as cause of death.

Table 6.1

INCURRED EXCESS MORTALITY BY CLAIM COUNT COMPARED TO 2017-2019 BASELINE

Count-Based	1Q20	2Q20	3Q20	4Q20	1Q21	4/20-3/21
Total / Baseline	98.5%	115.2%	114.7%	126.9%	121.9%	119.6%
COVID-19 Claims	1,152	12,862	9,690	22,195	20,248	64,995
COVID / Baseline	1.0%	12.3%	9.5%	20.6%	18.1%	15.1%
Non-COVID / Baseline	97.5%	102.9%	105.2%	106.3%	103.8%	104.5%

³ Adjusted for assumed completion.

Incurred claim details by month are shown below, along with calculated monthly incurred incidence rates. Roughly ten COVID-19 claims have reported dates of death in 2019 or prior, which we suspect are due to data errors.

Table 6.2

INCURRED CLAIM COUNTS AND INCIDENCE RATES, 2017 THROUGH Q1 2021

	Raw Submitted Numbers		Calculated Amounts				Adjusted for Seasonality	
	Average Incurred Claim Counts	Average Premium (\$ 000)	Average Life Years Exposed (000)	Average Completed Claim Counts	Annual Incidence per 1,000 (Lives Basis)	Total	Total/Baseline	
<u>Incurral Date</u>	<u>Total</u>	<u>COVID</u>						
3/1/2021	12,242	585	1,682,437	11,671	41,346	3.54	3.35	112.5%
2/1/2021	28,537	3,841	1,701,819	11,830	40,611	3.43	3.49	117.5%
1/1/2021	45,110	10,752	1,719,185	11,904	52,907	4.44	4.03	135.5%
12/1/2020	47,729	11,184	1,688,832	11,854	52,604	4.44	4.20	141.1%
11/1/2020	40,786	6,391	1,679,892	11,835	43,672	3.69	3.76	126.4%
10/1/2020	37,406	2,876	1,682,396	11,737	39,437	3.36	3.36	113.1%
9/1/2020	35,102	2,259	1,685,177	11,829	36,609	3.09	3.31	111.1%
8/1/2020	38,477	3,512	1,688,217	11,887	39,873	3.35	3.48	117.0%
7/1/2020	38,991	3,582	1,708,417	11,988	40,216	3.35	3.45	116.0%
6/1/2020	35,203	1,902	1,698,222	11,955	36,177	3.03	3.19	107.3%
5/1/2020	38,517	3,740	1,753,918	12,225	39,470	3.23	3.27	110.0%
4/1/2020	43,629	6,922	1,710,413	11,880	44,594	3.75	3.82	128.4%
3/1/2020	37,846	1,052	1,714,317	11,979	38,590	3.22	3.05	102.6%
2/1/2020	34,760	18	1,742,559	12,333	35,375	2.87	2.83	95.1%
1/1/2020	37,831	60	1,705,753	12,010	38,443	3.20	2.91	97.9%
2017-19 Baseline	34,479	1	1,602,646	11,642	34,626	2.97	2.97	100.0%
2019 monthly	34,493	1	1,658,929	11,836	34,827	2.94	2.94	99.0%
2018 monthly	34,548	0	1,599,029	11,624	34,636	2.98	2.98	100.1%
2017 monthly	34,397	0	1,549,980	11,465	34,416	3.00	3.00	100.9%

6.3 INCURRED CLAIM INCIDENCE BY AMOUNT – ALL CAUSES

Overall, seasonally-adjusted incurred Group Life claim incidence rates by amount during April 2020 through March 2021 were up 27.3% compared to the 2017-2019 baseline period. This increase in incidence rates by amount is notably higher than the corresponding increase in incidence rates by count. The Committee has estimated that roughly half the difference is due to changes in age and gender mix, and the remainder is likely due to salary and face amount inflation over the experience period.

6.4 INCURRED CLAIM INCIDENCE BY AMOUNT – COVID-19 VERSUS ALL OTHER CAUSES

Similar to Table 6.1, Table 6.3 below shows that COVID-19 claims do not fully explain the increase in incurred claim incidence on an amount basis.

Table 6.3

INCURRED EXCESS MORTALITY BY TOTAL CLAIM AMOUNT COMPARED TO 2017-2019 BASELINE

Amount-Based	1Q20	2Q20	3Q20	4Q20	1Q21	4/20-3/21
Total / Baseline	102.7%	119.9%	124.7%	132.9%	131.6%	127.3%
COVID-19 Claims	57,699 K	463,995K	397,884K	813,876 K	842,909 K	2,518,664 K
COVID / Baseline	1.4%	12.1%	10.7%	20.7%	20.7%	16.0%
Non-COVID / Baseline	101.3%	107.8%	114.0%	112.2%	110.9%	111.3%

Section 7: Estimated Incurred Mortality Results by Segment

Analysis of results by segment will focus on claim count experience for simplicity and credibility. In general, results by claim amount appear to follow the same patterns as results by count.

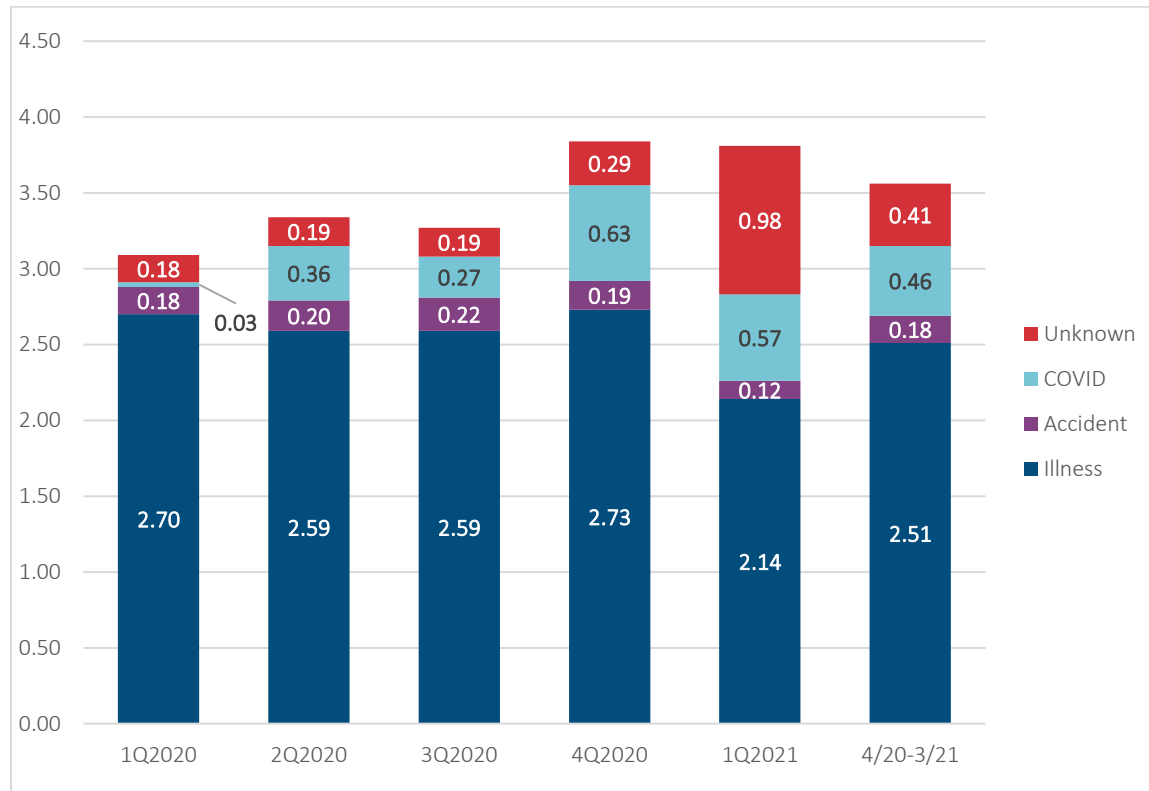
The following notes apply to the data presented in the subsections below:

- Claims and actual-to-expected (A/E) ratios are presented on an incurred basis. The “expected” basis is the 2017-2019 baseline period.
- While most companies were able to provide segment detail, some did not. Results by Company Size reflect all companies. Results for Industry reflect approximately 95% of total company claims, results for Geography reflect approximately 87% of total company claims, and Age / Gender reflect approximately 89% of total company claims. The total claim counts and A/E ratios in each subsection include only the data from companies that produced the breakout being analyzed. For example, the “All” row in the table in subsection 7.2 includes only data from companies that were able to supply claims data by Industry.
- The “% COVID” column in the tables below show the monthly average COVID claims as a percentage of the average total monthly claims from the 2017-2019 baseline period. The “% Non-COVID” column in the Age and Gender tables reflects the same for Non-COVID claims.
- The “% Count” column in the tables below shows the proportion of Baseline claims in each segment. For some segments, there were claims with “Unknown” segmentation value. The Unknowns and their ratios were omitted from subsequent tables, as they tended to account for a small percent of the total.

7.1 CAUSE OF DEATH

Cause of death continues to be difficult to study, as there is a significant delay in assignment of this parameter. In the first quarter of 2021, for example, an incidence rate of 0.98 (approximately 26% of first quarter incidence) is still attributable to Unknowns as of March 31, 2021, which is comprised of both reported claims without diagnosis and unreported claims. Even so, both the fourth quarter of 2020 and the first quarter of 2021 COVID incidence rates are significantly higher than quarters 1-3 of 2020. Accident incidence is generally constant. In early 2020 quarters, the Unknowns appear to have settled at 5% to 6% of total incidence.

Figure 7.1
INCURRED INCIDENCE RATES PER 1000 LIVES BY CAUSE OF DEATH



7.2 INDUSTRY

Over the April 2020 to March 2021 period, the White Collar category maintains a higher A/E ratio than Blue and Grey. The White Collar industry spiked early, with high claims relative to baseline beginning in the second quarter of 2020. The Blue and Grey Collar categories had similar experience to the White Collar category in the fourth quarter of 2020, with all three categories experiencing high A/E ratios. The percentage of claims identified as COVID is fairly consistent across collar segments.

Table 7.1
EXCESS MORTALITY BY INDUSTRY COLLAR

Industry Collar	Q1 2020	Q2 2020	Q3 2020	Q4 2020	Q1 2021	4/20-3/21	% COVID	% Count
Blue	97%	112%	111%	127%	122%	118%	15.8%	39%
Grey	97%	114%	116%	128%	119%	119%	15.4%	18%
White	104%	123%	122%	131%	127%	126%	16.0%	39%
All Collars⁴	98%	115%	115%	127%	123%	120%	15.6%	100%

Table 7.2 shows more detailed industry results for the top ten industry segments by number of COVID claims. Most of these industries were in the top ten for the December 2020 report as well. As we now have more quarters with more complete results, both the A/E ratios for April 2020 through March 2021, as well as the COVID claims as a percentage of baseline claims showed greater consistency across industries than in the previous report. Public Administration continues to be a key driver of high A/E ratios for the White Collar category. Doctors (Healthcare, also White Collar) has the highest COVID claims as a percentage of baseline claims. Auto Manufacturing, Paper and Drug Manufacturing, and Retail Trade all show much higher A/E ratios in the recent two quarters. In the table below, “B”, “W”, and “G” refer to Blue Collar, White Collar, and Grey Collar, respectively.

Table 7.2
EXCESS MORTALITY FOR TOP TEN INDUSTRIES BY NUMBER OF COVID CLAIMS

Industry	Q1 2020	Q2 2020	Q3 2020	Q4 2020	Q1 2021	4/20-3/21	% COVID	% Count	# COVID
W-Public Administration	109%	123%	124%	139%	134%	130%	15.2%	14%	8,936
B-Transport; Comms.; Utilities	99%	114%	112%	127%	112%	116%	15.7%	13%	8,341
B-Manufacturing - Auto, Planes, ...	96%	110%	106%	126%	145%	122%	16.1%	9%	5,933
B-Manufacturing - Heavy; Steel;	96%	108%	104%	124%	105%	110%	14.5%	9%	5,059
W-Doctors Offices	98%	124%	123%	126%	124%	124%	19.3%	6%	4,385
W-Educational Services	100%	117%	122%	126%	129%	124%	15.9%	6%	4,152
G-Manufacturing - Paper; Drugs	92%	105%	111%	125%	119%	115%	14.4%	6%	3,408
G-Wholesale Trade	108%	129%	124%	144%	118%	129%	16.0%	5%	2,998
G-Retail - Trade	89%	107%	106%	115%	126%	113%	15.1%	4%	2,658
W-Insurance; Other Finance	103%	131%	123%	130%	122%	126%	15.5%	3%	2,221
All Segments⁵	98%	115%	115%	127%	123%	120%	15.6%	100%	63,650

It should be noted that the high A/E ratios for Public Administration are driven by experience in the Executive, Legislative, and General Government segment (SIC codes 9100-9199). This segment does not include police and fire and represents over 85% of claims in the broader Public Administration segment.

⁴ Includes only companies that provided Industry splits; see second bullet at the beginning of Section 7.

⁵ Includes only companies that provided Industry splits; see second bullet at the beginning of Section 7.

7.3 GEOGRAPHY

Experience has varied by quarter by broad geographic region. The Northeast and Southeast show the highest overall A/E ratios, as well as the highest percentage of claims identified as COVID. Results appear to be consistent with broad population results in terms of timing of spikes across the country. Standout ratios include the Northeast spike in the second quarter of 2020, increased ratios in the West beginning in the third quarter of 2020, increasing ratios in the Midwest beginning in the fourth quarter of 2020, and high A/E ratios in the Southeast beginning in the third quarter of 2020. The West ratio appears to have dropped in the first quarter of 2021 but results are still developing.

Table 7.3

EXCESS MORTALITY BY GEOGRAPHIC REGION

Region	Q1 2020	Q2 2020	Q3 2020	Q4 2020	Q1 2021	4/20-3/21	% COVID	% Count
Northeast	106%	143%	109%	124%	125%	125%	15.6%	20%
West	101%	110%	123%	127%	112%	118%	14.3%	16%
Midwest	98%	114%	107%	134%	121%	119%	14.0%	29%
Southeast	97%	108%	125%	126%	132%	123%	17.7%	35%
All Regions⁶	100%	117%	116%	128%	125%	122%	15.6%	100%

A closer look at the states with the highest number of COVID claims (Table 7.4) shows results that are not surprising. The second quarter of 2020 saw very high A/E ratios for several states in the Northeast (seen for NY below). States in other regions saw ratios increase beginning in the third quarter of 2020 (TX, CA, FL, GA, TN), while still others didn't see their highest ratios until the fourth quarter of 2020 (IL, OH). Ratios in the two most recent quarters are high across nearly all of the top ten states, though GA and TN are nearly 150%.

Table 7.4

EXCESS MORTALITY FOR TOP TEN STATES BY NUMBER OF COVID CLAIMS

State	Q1 2020	Q2 2020	Q3 2020	Q4 2020	Q1 2021	4/20-3/21	% COVID	% Count	# COVID
TX-Southeast	96%	109%	135%	135%	136%	129%	22.3%	9%	7,115
CA-West	105%	111%	127%	131%	114%	120%	16.5%	6%	3,901
MI-Midwest	103%	129%	104%	131%	127%	123%	14.9%	6%	3,314
FL-Southeast	93%	100%	122%	108%	124%	113%	12.2%	6%	2,799
NY-Northeast	112%	165%	108%	115%	123%	128%	16.3%	4%	2,693
IL-Midwest	96%	115%	107%	135%	120%	119%	13.8%	5%	2,664
GA-Southeast	103%	112%	129%	123%	146%	127%	20.5%	3%	2,622
PA-Northeast	104%	120%	107%	130%	126%	121%	14.5%	5%	2,609
OH-Midwest	92%	104%	105%	126%	118%	113%	13.9%	5%	2,597
TN-Southeast	101%	108%	128%	142%	148%	132%	17.8%	3%	1,765
All States⁷	100%	117%	116%	128%	125%	122%	15.6%	100%	58,146

⁶ Includes only companies that provided Geography splits; see second bullet at the beginning of Section 7.

⁷ Includes only companies that provided Geography splits; see second bullet at the beginning of Section 7.

7.4 AGE AND GENDER

For the Age / Gender segments, excess mortality for April 2020 through March 2021 was split between COVID and non-COVID claims. Each of these represents mortality of that category versus baseline. For example, for 65-99, the 14.8% COVID and 1.2% Non-COVID total 16% excess mortality, which equates to the 116% A/E ratio over April 2020 through March 2021. Generally, it is the 65-99 age band that continues to have lower A/E ratios. However, the bulk of excess mortality for this age group (which includes retirees) is identified as COVID. A/E ratios for April 2020 through March 2021 are higher for both the 0-44 and 45-64 age bands, though for each of these age bands, Non-COVID deaths are a significant component of excess mortality. The 45-64 age band has the highest A/E ratio and the highest excess mortality due to COVID, as well as the highest A/E ratios in the fourth quarter of 2020 and the first quarter of 2021. Also interesting to note is that on a claim amount basis, overall A/E ratios are more aligned across age bands. We suspect this is because the older ages (with lower average amounts and lower A/E ratios) have less weight. Indeed, overall A/E ratios are lowest for the 75+ age bands, while 65-74 results are more similar to ages 45-65.

Table 7.5

EXCESS MORTALITY BY AGE BAND

Age Band	Q1 2020	Q2 2020	Q3 2020	Q4 2020	Q1 2021	4/20-3/21	% COVID	Non-COVID %	% Count
0-44	102%	122%	130%	119%	119%	123%	9.0%	13.6%	8%
45-64	99%	119%	124%	131%	143%	129%	19.0%	10.3%	28%
65-99	98%	113%	109%	127%	116%	116%	14.8%	1.2%	64%
All⁸	99%	115%	115%	127%	123%	120%	15.5%	4.7%	100%

By Gender, A/E ratios have been consistently 5-10% higher for Males, though the COVID versus Non-COVID split is similar for both Males and Females.

Table 7.6

EXCESS MORTALITY BY GENDER

Gender	Q1 2020	Q2 2020	Q3 2020	Q4 2020	Q1 2021	4/20-3/21	% COVID	Non-COVID %	% Count
Female	98%	113%	113%	121%	118%	116%	13.4%	2.9%	33%
Male	99%	116%	114%	129%	124%	121%	16.5%	4.3%	67%
All	98%	115%	114%	126%	122%	119%	15.5%	3.9%	100%

⁸ Includes only companies that provided age splits; see second bullet at the beginning of Section 7.

7.6 COMPANY SIZE

Contributing companies were assigned a size indicator of Large, Medium, or Small per the criteria described in subsection 3.2.6. Results for April 2020 through March 2021 are consistent by company size. Ratios for the Small companies were below those of the other groups in the second quarter of 2020 but have shown similar experience to the Medium and Large groups in subsequent quarters. Results for the first quarter of 2021 indicate that ratios have dropped for Medium size companies, though results are still developing. The % COVID does appear to be somewhat higher for Small companies, though we cannot ascertain whether this is a real difference or simply noise.

Table 7.7

EXCESS MORTALITY BY COMPANY SIZE

Co. Size	Q1 2020	Q2 2020	Q3 2020	Q4 2020	Q1 2021	4/20-3/21	% COVID	% Count
Large	98%	115%	114%	127%	123%	120%	14.9%	79%
Medium	100%	118%	118%	126%	115%	119%	15.3%	16%
Small	94%	108%	117%	129%	123%	119%	18.0%	4%
All	98%	115%	115%	127%	122%	120%	15.1%	100%

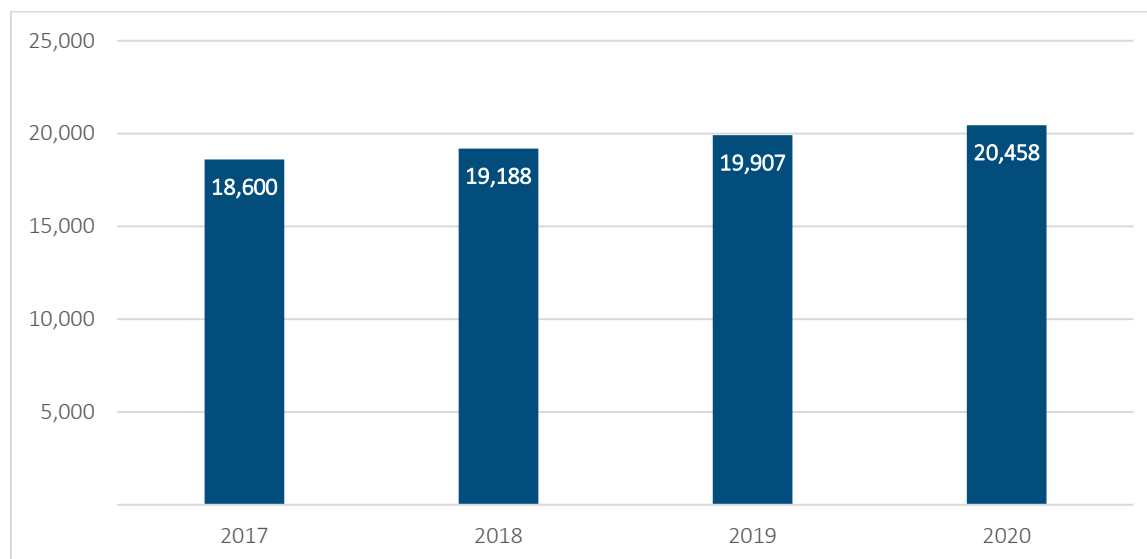
Section 8: Exposure Trends

8.1 PREMIUMS

As part of the data validation process, the Committee analyzed the premium submitted for this study. Consistency in the premium reported during the experience period suggests that the premiums provide a reasonable basis for calculating PPL metrics and estimating lives for carriers that could not provide data for covered lives.

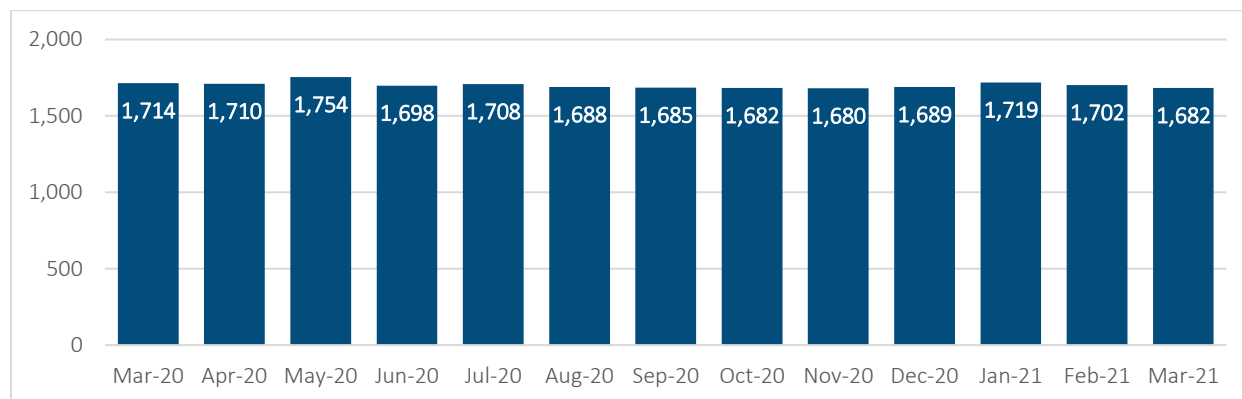
The Committee noticed a slightly increasing trend in the premiums reported for 2017 through 2020, as shown below.

Figure 8.1
REPORTED PREMIUM (\$ MILLIONS) BY YEAR, 2017-2020



The Committee also compared the monthly premium reported from March 2020 through March 2021 to ensure that the monthly premium in 2021 was in line with historical amounts. The levels in 2021 appear consistent with prior periods.

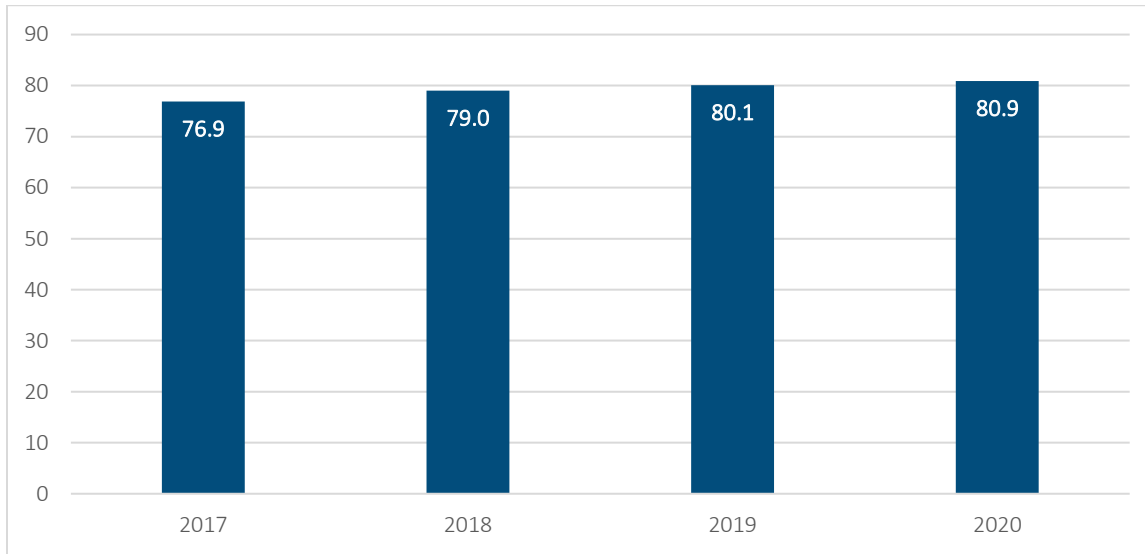
Figure 8.2
REPORTED PREMIUM (\$ MILLIONS) BY MONTH, MARCH 2020 THROUGH MARCH 2021



8.2 LIVES

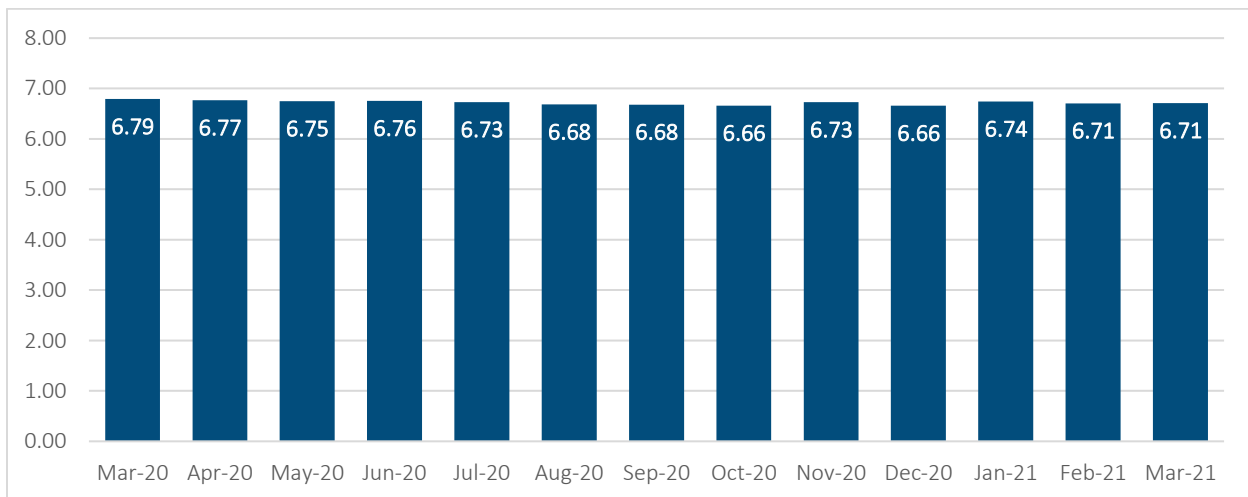
Similarly, the Committee validated the data for covered lives by analyzing life years of exposure (LYE) during the study period. The following chart shows reported LYE from 2017 through 2020. The relationships seem reasonable.

Figure 8.3
LIFE-YEARS OF EXPOSURE (MILLIONS) BY YEAR, 2017-2020



The Committee then compared the monthly LYE reported from March 2020 through March 2021 to ensure the 2021 LYE was in line with historical amounts. This appears to be the case, as shown below.

Figure 8.4
LIFE-YEARS OF EXPOSURE (MILLIONS) BY MONTH, MARCH 2020 THROUGH MARCH 2021



Section 9: Company Variations

9.1 VARIATIONS IN COVID-19 MORTALITY RESULTS

The Survey shows that all participating companies have had elevated Group Life mortality experience during the pandemic. However, the level of excess mortality has not been identical for all carriers. To provide insight into the dispersion of industry experience, Figure 9.1 provides the quartile baseline and pandemic experience, ranked by highest implied excess mortality (by claim count) to lowest. The quartile incidence rates and excess mortality ratios are the weighted average of the five contributing companies' incidence rates contained within each quartile.

Figure 9.1

QUARTERLY SEASONALLY ADJUSTED EXCESS INCURRED MORTALITY (BY COUNT) – COMPANY QUARTILES

Quartile	Baseline	2Q-3Q 2020	4Q 2020	1Q 2021	2Q20 - 1Q21	2Q-3Q20 Ratio	4Q20 Ratio	1Q21 Ratio	2Q20-1Q21 Ratio
Quartile 1	2.370	3.029	3.171	3.041	3.068	127.8%	133.8%	128.3%	129.4%
Quartile 2	2.473	3.041	3.290	3.169	3.134	123.0%	133.0%	128.1%	126.8%
Quartile 3	2.830	3.149	3.575	3.619	3.372	111.3%	126.3%	127.9%	119.1%
Quartile 4	3.565	3.951	4.370	4.020	4.072	110.9%	122.6%	112.8%	114.2%
Total	2.974	3.419	3.775	3.625	3.559	114.9%	126.9%	121.9%	119.6%

9.2 VARIATIONS IN COVID-19 CLAIM CODING PROCEDURES

Participating carriers were asked about the data sources and procedures they use to determine whether a claim should be coded as a COVID-19 cause of death. Eighteen of the 20 carriers in the survey provided details on their claim coding procedures, and the Committee learned the following:

- Seventeen of the 18 respondents include the claim as a COVID-19 death if COVID-19 appears anywhere on the death certificate.
- Eight of the 18 appear to do everything in their power to research all available sources to create an exhaustive tracking of all claims where COVID was a contributing cause. These companies used five or more of the following sources to identify whether a death was caused by COVID-19:
 - Primary cause of death on death certificate
 - Secondary cause of death on death certificate
 - Claim form
 - Communication with employer or beneficiary
 - Obituary
 - Communication with medical examiner or funeral home
- One carrier codes claims with cause of COVID-19 only when COVID-19 is identified as the primary cause of death on the death certificate.
- The other nine participating carriers generally classify deaths as COVID-19 only if it is listed as either primary or secondary cause of death on the death certificate.

9.3 VARIATIONS IN CLAIM REPORTING PATTERNS

Section 5.4 documents that incurred claim completion rates vary significantly from company to company. Upon analyzing the differences, the 20 contributing companies were grouped into five “reporting speed” groups based on similar reporting patterns.

The Committee investigated whether the company reporting speed groupings would be correlated to company size. However, this is not the case. The Large, Medium and Small companies are well dispersed among the five reporting speed categories.

Section 10: Comparisons to U.S. General Population Mortality Results

From April 2020 through March 2021, there were estimated to be 64,995 incurred COVID claims in the Group Life survey data, compared with over 555,000 COVID deaths in the U.S. population during the same time span according to the Centers for Disease Control and Prevention (CDC)⁹. The Committee analyzed the pattern of deaths by month due to COVID in the U.S. population alongside the mortality experience in the Group Life survey. It was observed that, from March 2020 through March 2021, 25,000 COVID deaths in the U.S. per month indicated, on average, approximately an extra 10% in Group Life mortality. However, there has been significant month-to-month variance in this relationship.

Past studies that have compared insured mortality to population mortality have found that mortality among insured lives tends to be lower. In particular, the SOA's 2016 Group Term Life Mortality Study¹⁰ found that, in the key working ages, insured mortality is between 30% and 40% of general population mortality. Because the mortality rates between the two populations tend to differ, the Committee analyzed the relative impact of the COVID-19 pandemic on the Group Life data and the U.S. population by considering excess death percentages, defined as the percentage increase over a baseline expectation for deaths.

The excess deaths in the Group Life data were determined via a comparison to average incidence rates in the Group Life data from the 2017-2019 baseline period, adjusted for seasonality. For the U.S. population, the Committee considered two different expected bases. The first are the expected deaths published by the CDC¹¹, which are developed using Farrington surveillance algorithms and historical data from 2013 to the present¹². For the second method, the Committee estimated expected deaths by computing the average CDC deaths from 2017 through 2019 and adjusting this average for changes in U.S. population size, changes in U.S. population mix by age and sex, and the trend for death rates by age group.

Based on the results from these two methods, the Committee estimates that the excess death percentage in the Group Life data is approximately 80% - 110%¹³ of the U.S. population excess death percentage for April 2020 through March 2021, with the first method informing the lower end of the range and the second method informing the higher end of the range. In the December 2020 report, it was noted that this range was 50% - 70%, which indicates that the gap between the Group Life excess mortality and U.S. population excess mortality has since become smaller.

⁹ <https://www.cdc.gov/nchs/nvss/vsrr/covid19/index.htm>

¹⁰ <https://www.soa.org/resources/experience-studies/2016/2016-group-life-mortality-study/>

¹¹ https://www.cdc.gov/nchs/nvss/vsrr/covid19/excess_deaths.htm

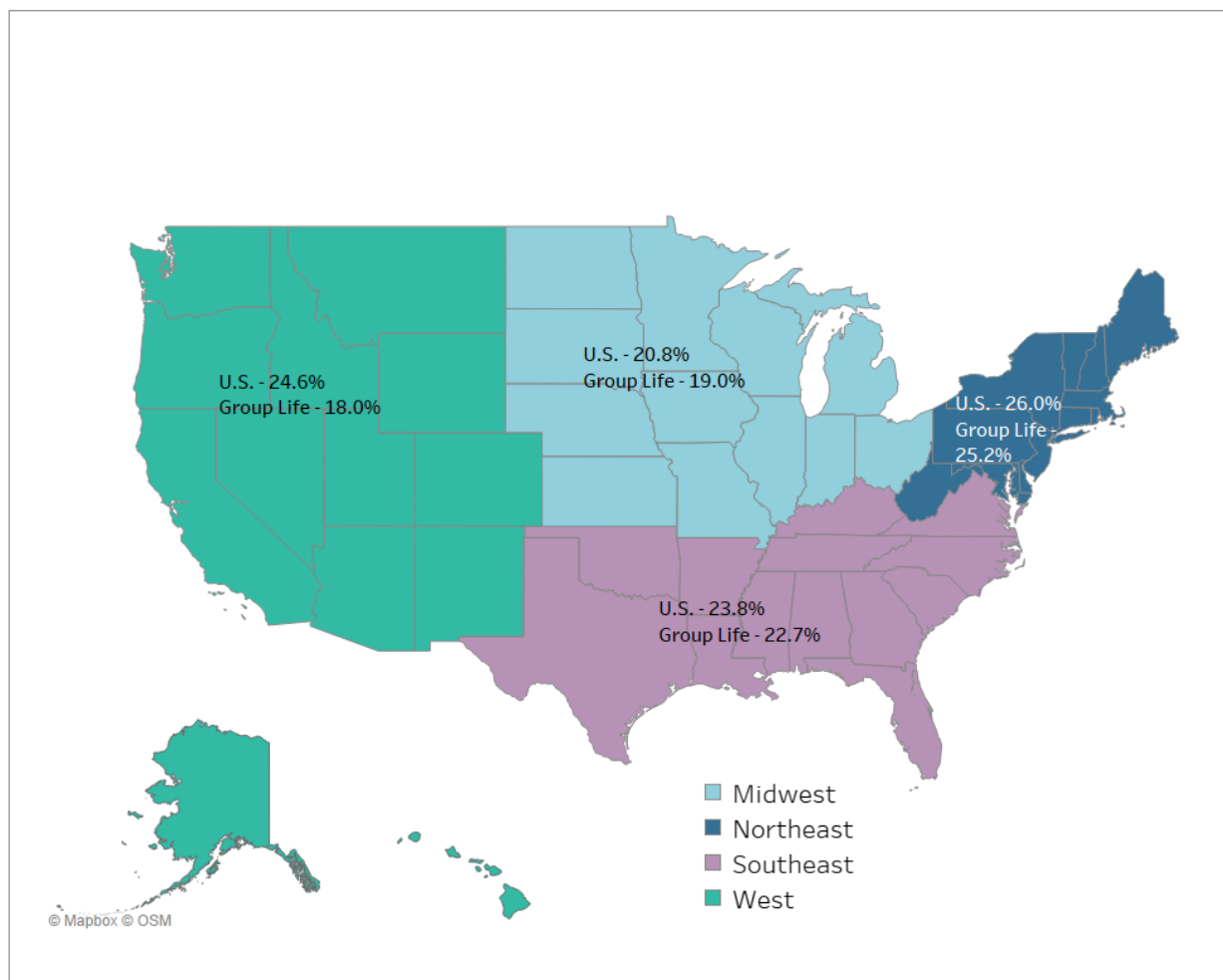
¹² More information can be found in the technical notes at the following website, where the CDC publishes excess deaths:

https://www.cdc.gov/nchs/nvss/vsrr/covid19/excess_deaths.htm#techNotes

¹³ Due to differences in development of expected bases, population differences, differences in seasonality adjustments, and the assumption for IBNR claims, this could not be computed with precision. The particular assumption set underlying Tables 10.1 and 10.2 results in a ratio of 19.7% / 23.6% = 83.2%.

Using the CDC-developed expected basis described above for U.S. population deaths, a comparison of excess death percentages by month and geographic region is possible. Figure 10.1 below shows the excess death percentages from April 2020 through March 2021 for the U.S. population and the Group Life survey data for each of the four U.S. regions.

Figure 10.1
EXCESS DEATH PERCENTAGES, APRIL 2020 THROUGH MARCH 2021



Tables 10.1 and 10.2 display the excess death percentages by month and region for the U.S. population and the Group Life survey data, respectively. In each table, the “Total” row includes a small portion of data (less than 1%) that could not be definitively allocated to a geographic region.

Table 10.1
U.S. POPULATION EXCESS DEATH PERCENTAGE BY MONTH AND GEOGRAPHIC REGION

Region	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2020 – Q1 2021	% of Total COVID Deaths
Midwest	16.5%	13.7%	40.0%	13.4%	20.8%	20.4%
Northeast	55.3%	6.5%	19.9%	21.8%	26.0%	25.2%
Southeast	11.3%	30.3%	25.9%	27.7%	23.8%	34.8%
West	12.0%	24.0%	30.0%	31.4%	24.5%	19.7%
Total	21.5%	20.4%	28.5%	23.8%	23.6%	100.0%

Table 10.2
GROUP LIFE COVID-19 SURVEY EXCESS DEATH PERCENTAGE BY MONTH AND GEOGRAPHIC REGION

Region	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2020 – Q1 2021	% of Total COVID Deaths
Midwest	14.2%	7.2%	33.8%	20.9%	19.0%	25.9%
Northeast	42.6%	8.8%	24.4%	24.9%	25.2%	19.7%
Southeast	7.7%	25.3%	25.6%	32.3%	22.7%	40.1%
West	10.4%	22.5%	27.1%	12.1%	18.0%	14.3%
Total	15.2%	14.7%	26.9%	21.8%	19.6%	100.0%

The above tables indicate that the U.S. population has experienced a higher excess death percentage than what has been seen in the Group Life COVID-19 survey population. However, the difference between the two excess mortality percentages has narrowed since the publication of the December 2020 report:

Table 10.3
SPREAD BETWEEN U.S. POPULATION AND GROUP LIFE EXCESS DEATH PERCENTAGES

Report	Date Range of Data	U.S. Population Excess Death Percentage	Group Life Excess Death Percentage	Difference
December 2020	April 2020 – August 2020	21.9%	12.9%	9.0%
July 2021	April 2020 – March 2021	23.6%	19.7%	3.9%

All four geographic regions show a larger excess death percentage in the U.S. population data than the Group Life survey data for the April 2020 through March 2021 period, though this difference is modest for three of the four regions. The largest difference between the excess death percentages of the U.S. population and the Group Life survey population is found in the West region. Much of this is attributable to the first quarter of 2021 experience, during which the West region had the highest excess mortality in the U.S. population but the lowest excess mortality in the Group Life survey data.

The Committee notes that the age and sex profiles of the Group Life dataset and the U.S. population vary considerably and considered this as a possible cause of the difference in excess death percentage.

Section 11: Reliance and Limitations

In producing this report, the Committee relied upon data furnished by contributing companies and data published by the CDC. The Committee would like to stress that the data presented in this survey is emerging data. Contributing companies may true-up this data over time. The Committee also notes that carriers submitted data in different formats; it is possible that the homogenization of data submissions could introduce some unintended distortion in the survey results. The reader should review the limitations noted throughout the report.

Section 12: List of Participating Companies

The Committee would like to thank the following companies that submitted data and made this COVID-19 mortality survey possible:

Aflac
Anthem
Dearborn National
Guardian
The Hartford
Lincoln Financial Group
MetLife
Mutual of Omaha
New York Life Group Benefit Solutions
OneAmerica
Principal Financial
Reliance Standard
Renaissance
Securian Financial Group
Standard Insurance Group
SunLife Financial Group
Symetra
Unum
USABLE
Voya

Appendix A: 2020 SOA Group Term Life COVID-19 Mortality Survey Data Request

Purpose

This is the data request for a Group Term Life Claim study intended to allow a quick assessment of the impact of the COVID-19 pandemic on the Group Life industry – primarily by measuring the extra mortality occurring during the pandemic as compared to prior periods. This high level study will become a valuable data source for Group Life insurers, since the industry wide COVID-19 claims will be significantly more credible than the claims experience for any one carrier.

Timing

We are requesting the initial data submission be provided by **Friday, June 19th**. We acknowledge that this is a tight turnaround, but due to the rapidly changing environment, time is of the essence. Please let us know ASAP if you have a problem with this date or any element of this request. We plan to act quickly on the data – releasing an initial summary report to participating carriers the week of July 6th.

The initial data request is for data from January 2017 through May 2020. We also plan to update the study monthly throughout the duration of the pandemic. Please consider this when you build your queries for the initial request, so that the monthly updates are easier to produce. We request that updates be submitted by the 3rd Friday of each month. Contributors will receive a detailed summary report of their submitted data with some analysis of all the contributed data after each monthly submission. The SOA will also be releasing summary reports of the aggregated results periodically throughout the duration of the study.

General Comments

Our goal is to measure patterns and trends rather than actual mortality rates. For the data request, this means we are more interested in how things change by month than whether they are 100% accurate or even consistent with other carrier submissions. We understand this data assembly will take some effort, and want to minimize unnecessary data manipulation. To this end, please develop your submission as best you can to align with our request, but more importantly, please ensure it is consistent over subsequent monthly updates.

Claim Data Request

Broadly, we are requesting summarized death claim information for your group life business with limited segmentation. The limited segmentation will support further analysis/validation of observed trends. We hope all carriers will be able to provide the Baseline data below. Please also provide the Segmentation if feasible, but we can include your submission in the study even if these components are not readily available.

1. Baseline – The essential data requested is claim counts by incurred month, reported month, product segment, and limited cause of death. Ideally, claim amounts can also be provided.
 - Product Segment = Basic Life, Supp/Optional/Voluntary Life, and Retiree Life
 - Cause of Death = COVID, Accident, and All Other

2. Segmentation – We are also requesting claim counts and amounts for three separate segments – industry, state, and age/gender. Data for each requested segment would be further split into the product and cause of death categories referenced above.
 - Industry = 2-digit SIC code is ideal
 - State = Based on residence, or work location if residence not available
 - Age/Gender = M/F/U, and 10-year age bands

Claim Data Specifics

Again, as we will be looking at trends and patterns rather than actual mortality, it is most important that your submission be consistent month to month. Nevertheless, the ideal submission should consider the following specific criteria:

- Include only group term life business. Exclude any GUL/GVUL, COLI/BOLI, 10/20-year group term, etc.
- Include both self-administered and list-billed business
- Include employee, spouse, and child claims
- Include or exclude portability and conversion claims – whichever is easier - based on your company reporting.
- Include deaths from persons on waiver of premium; exclude active waivers
- Include only death claims; exclude counts or amounts for various riders, especially living benefit riders or critical illness riders
- Include only the life insurance amount for accidental deaths
- Exclude any interest payments or expenses

Exposure Data Request

As stated, this is not a mortality rate study, and we do not intend to calculate mortality rates. The purpose of exposure data is to help explain and validate any observed trends. As with claims, we are requesting both high-level exposure data, as well as exposure data by segment. However, the most critical information is exposures by month.

1. Baseline – The essential data requested is earned premium by report month and product segment. Optional data would include exposed lives by month.
 - Product Segment = Basic Life, Supp/Optional/Voluntary Life, and Retiree Life
2. Segmentation – We are also requesting exposure data for the segments – industry, state, and age/gender. Data for each requested segment would be further split by product.
 - Industry = 2-digit SIC code is ideal
 - State = Based on residence, or work location if residence not available
 - Age/Gender = M/F/U, and 10-year age bands

Exposure Data Specifics

We recognize that it can be difficult to provide exposed lives data, which is why we have selected earned premium as the primary exposure metric. Exposed lives is certainly a valuable addition, if it is available. As with claims, we stress the importance of consistency month to month, and reiterate that we are interested in the information you can provide with relative ease. Some specific (ideal) considerations include:

- Include only group term life business. Exclude any GUL/GVUL, COLI/BOLI, 10/20-year group term, etc.
- Include or exclude premium for accident riders depending on how they are handled in your system; just be consistent and identify what is included.
- Include both self-administered and list-billed business.
- For exposed lives, we recognize that some data (list billed groups, for example) may be more current and accurate than other data. Please provide your best representation of exposed lives, and identify any particular limitations or special considerations in your submission.

Final Notes on Requested Data

We intend to turn around results rapidly to maximize value on internal decision-making for participating carriers. With that in mind, we have tried to keep the request as simple as possible. We have tried to define exactly what we are requesting, but if your own tracking does not align and the customization is difficult, then please provide what you normally track rather than trying to match our definitions. The period-over-period change will be most

valuable, so consistency is more important than precise definitions. We understand there can be nuances in how carriers count claims and track exposures, but we think the recently observed changes will be valuable. If you have any questions at all about what we are asking, please reach out.

PLEASE NOTE: YOUR DATA SUBMISSIONS SHOULD NOT CONTAIN ANY INDIVIDUAL POLICY LEVEL INFORMATION. PLEASE SEND ONLY THE AGGREGATED SUMMARY INFORMATION REQUESTED.

SOA staff will be receiving and compiling your submissions and the SOA is not able to receive any personal information on your policyholders.

Reports

Our minimal request is for the monthly results without industry, geographic, or demographic segmentation. Please provide the additional segment data as you are able, and we will return cross-industry information consistent with your submission. We do not plan to provide individual carrier-level experience.

We plan to show cross-industry extra mortality by calendar month. We will compare the most recent months to the prior periods, including prior months, and the same month a year ago.

We will not show individual carrier experience, but may comment on the consistencies of changes across carriers.

Technical Notes

The accompanying Excel workbook contains specific templates for the data submission. You can use the Excel templates or submit data in a format of your choosing. The workbook includes an "Outline" tab to guide your submission.

Please return the submission via e-mail to Korrel Crawford at kcrawford@soa.org. If you have concerns about file security, please contact her and she will provide you with an alternate means of submitting data in a more secure fashion.

Appendix B: State and Industry Code Mappings

Table B.1
STATE CODE MAPPINGS

State / Province Name	Abbrev	Division	Region
U.S. Armed Forces – Americas	AA	Division 11: Unknown	Other
Alberta	AB	Division 10: Canada	Other
U.S. Armed Forces – Europe	AE	Division 11: Unknown	Other
Alaska	AK	Division 09: Pacific	West
Alabama	AL	Division 06: East South Central	Southeast
U.S. Armed Forces – Pacific	AP	Division 11: Unknown	Other
Arkansas	AR	Division 07: West South Central	Southeast
American Samoa	AS	Division 09: Pacific	Other
Arizona	AZ	Division 08: Mountain	West
British Columbia	BC	Division 10: Canada	Other
California	CA	Division 09: Pacific	West
Colorado	CO	Division 08: Mountain	West
Connecticut	CT	Division 01A: Southern New England	Northeast
District of Columbia	DC	Division 02: Middle Atlantic	Northeast
Delaware	DE	Division 02: Middle Atlantic	Northeast
Florida	FL	Division 05: South Atlantic	Southeast
Micronesia	FM	Division 09: Pacific	Other
Georgia	GA	Division 05: South Atlantic	Southeast
Guam	GU	Division 09: Pacific	Other
Hawaii	HI	Division 09: Pacific	West
Iowa	IA	Division 04: North Central	Midwest
Idaho	ID	Division 08: Mountain	West
Illinois	IL	Division 03: Great Lakes	Midwest
Indiana	IN	Division 03: Great Lakes	Midwest
Kansas	KS	Division 04: North Central	Midwest
Kentucky	KY	Division 06: East South Central	Southeast
Louisiana	LA	Division 07: West South Central	Southeast
Massachusetts	MA	Division 01A: Southern New England	Northeast
Manitoba	MB	Division 10: Canada	Other
Maryland	MD	Division 02: Middle Atlantic	Northeast
Maine	ME	Division 01B: Northern New England	Northeast
Marshall Islands	MH	Division 09: Pacific	Other
Michigan	MI	Division 03: Great Lakes	Midwest
Minnesota	MN	Division 04: North Central	Midwest
Missouri	MO	Division 04: North Central	Midwest
Northern Mariana Islands	MP	Division 09: Pacific	Other
Mississippi	MS	Division 06: East South Central	Southeast
Montana	MT	Division 08: Mountain	West

New Brunswick	NB	Division 10: Canada	Other
North Carolina	NC	Division 05: South Atlantic	Southeast
North Dakota	ND	Division 04: North Central	Midwest
Nebraska	NE	Division 04: North Central	Midwest
New Hampshire	NH	Division 01B: Northern New England	Northeast
New Jersey	NJ	Division 02: Middle Atlantic	Northeast
Newfoundland and Labrador	NL	Division 10: Canada	Other
New Mexico	NM	Division 08: Mountain	West
Nova Scotia	NS	Division 10: Canada	Other
Nunavut	NU	Division 10: Canada	Other
Nevada	NV	Division 08: Mountain	West
Northwest Territories	NW	Division 10: Canada	Other
New York	NY	Division 02: Middle Atlantic	Northeast
Ohio	OH	Division 03: Great Lakes	Midwest
Oklahoma	OK	Division 07: West South Central	Southeast
Ontario	ON	Division 10: Canada	Other
Oregon	OR	Division 09: Pacific	West
Other	Other	Division 11: Unknown	Other
Pennsylvania	PA	Division 02: Middle Atlantic	Northeast
Prince Edward Island	PE	Division 10: Canada	Other
Puerto Rico	PR	Division 05: South Atlantic	Other
Palau	PW	Division 09: Pacific	Other
Quebec	QC	Division 10: Canada	Other
Rhode Island	RI	Division 01A: Southern New England	Northeast
South Carolina	SC	Division 05: South Atlantic	Southeast
South Dakota	SD	Division 04: North Central	Midwest
Saskatchewan	SK	Division 10: Canada	Other
Tennessee	TN	Division 06: East South Central	Southeast
Texas	TX	Division 07: West South Central	Southeast
Unknown	UN	Division 11: Unknown	Other
Unknown	Unknown	Division 11: Unknown	Other
Utah	UT	Division 08: Mountain	West
Virginia	VA	Division 05: South Atlantic	Southeast
Virgin Islands	VI	Division 05: South Atlantic	Other
Vermont	VT	Division 01B: Northern New England	Northeast
Washington	WA	Division 09: Pacific	West
Wisconsin	WI	Division 03: Great Lakes	Midwest
West Virginia	WV	Division 02: Middle Atlantic	Northeast
Wyoming	WY	Division 08: Mountain	West
Yukon	YK	Division 10: Canada	Other

Table B.2
INDUSTRY CODE MAPPINGS

2-Digit SIC Code	Industry Group	Collar Color
00	Unknown/Invalid	Unknown
01	Agricultural; Forestry; Fishing	Blue
02	Agricultural; Forestry; Fishing	Blue
03	Agricultural; Forestry; Fishing	Blue
04	Agricultural; Forestry; Fishing	Blue
05	Agricultural; Forestry; Fishing	Blue
07	Agricultural; Forestry; Fishing	Blue
08	Agricultural; Forestry; Fishing	Blue
09	Agricultural; Forestry; Fishing	Blue
10	Mining	Blue
11	Mining	Blue
12	Mining	Blue
13	Mining	Blue
14	Mining	Blue
15	Construction	Blue
16	Construction	Blue
17	Construction	Blue
18	Construction	Blue
19	Construction	Blue
20	Manufacturing - Food	Blue
21	Manufacturing - Food	Blue
22	Manufacturing - Clothes; Textile; Wood	Blue
23	Manufacturing - Clothes; Textile; Wood	Blue
24	Manufacturing - Clothes; Textile; Wood	Blue
25	Manufacturing - Clothes; Textile; Wood	Blue
26	Manufacturing - Clothes; Textile; Wood	Blue
27	Manufacturing - Paper; Drugs	Grey
28	Manufacturing - Paper; Drugs	Grey
29	Manufacturing - Paper; Drugs	Grey
30	Manufacturing - Paper; Drugs	Grey
31	Manufacturing - Paper; Drugs	Grey
32	Manufacturing - Paper; Drugs	Grey
33	Manufacturing - Heavy; Steel;	Blue
34	Manufacturing - Heavy; Steel;	Blue
35	Manufacturing - Heavy; Steel;	Blue
36	Manufacturing - Heavy; Steel;	Blue
37	Manufacturing - Auto, Airplanes, Precision Equipment	Blue
38	Manufacturing - Auto, Airplanes, Precision Equipment	Blue
39	Manufacturing - Auto, Airplanes, Precision Equipment	Blue
40	Transport; Communication; Utilities	Blue

41	Transport; Communication; Utilities	Blue
42	Transport; Communication; Utilities	Blue
43	Transport; Communication; Utilities	Blue
44	Transport; Communication; Utilities	Blue
45	Transport; Communication; Utilities	Blue
46	Transport; Communication; Utilities	Blue
47	Transport; Communication; Utilities	Blue
48	Transport; Communication; Utilities	Blue
49	Transport; Communication; Utilities	Blue
50	Wholesale Trade	Grey
51	Wholesale Trade	Grey
52	Retail - Trade	Grey
53	Retail - Trade	Grey
54	Retail - Trade	Grey
55	Retail - Trade	Grey
56	Retail - Trade	Grey
57	Retail - Trade	Grey
58	Retail - Trade	Grey
59	Retail - Trade	Grey
60	Banks and Securities	White
61	Banks and Securities	White
62	Banks and Securities	White
63	Insurance; Other Finance	White
64	Insurance; Other Finance	White
65	Insurance; Other Finance	White
66	Insurance; Other Finance	White
67	Insurance; Other Finance	White
68	Insurance; Other Finance	White
69	Insurance; Other Finance	White
70	Hotels/Personal Services	Grey
71	Hotels/Personal Services	Grey
72	Hotels/Personal Services	Grey
73	Misc Service/Data Processing	Grey
74	Misc Service/Data Processing	Grey
75	Misc Service/Data Processing	Grey
76	Misc Service/Data Processing	Grey
78	Misc Service/Data Processing	Grey
79	Misc Service/Data Processing	Grey
80	Doctors' Offices	White
81	Legal Services	White
82	Educational Services	White
83	Social Services	White
84	Museums and Membership Orgs	White

85	Museums and Membership Orgs	White
86	Museums and Membership Orgs	White
87	Engineering, Architecture, Business Consulting	White
88	Engineering, Architecture, Business Consulting	White
89	Engineering, Architecture, Business Consulting	White
90	Public Administration	White
91	Public Administration	White
92	Public Administration	White
93	Public Administration	White
94	Public Administration	White
95	Public Administration	White
96	Public Administration	White
97	Public Administration	White
99	Unknown/Invalid	Unknown
Unknown	Unknown/Invalid	Unknown



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With roots dating back to 1889, the [Society of Actuaries](#) (SOA) is the world's largest actuarial professional organization with more than 31,000 members. Through research and education, the SOA's mission is to advance actuarial knowledge and to enhance the ability of actuaries to provide expert advice and relevant solutions for financial, business and societal challenges. The SOA's vision is for actuaries to be the leading professionals in the measurement and management of risk.

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 nonactuaries 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.

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