SOA Research Institute

Group Life COVID-19 Mortality Survey Report

Mortality and Longevity

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Group Life COVID-19 Mortality Survey Report

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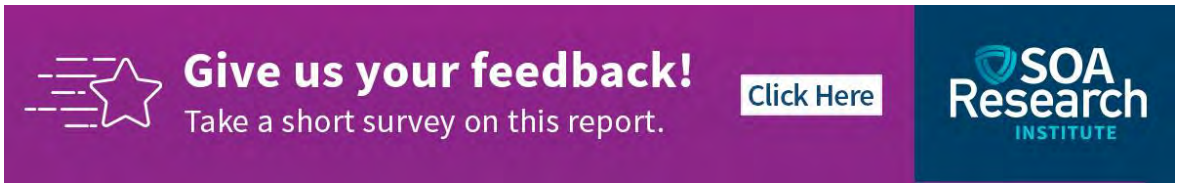

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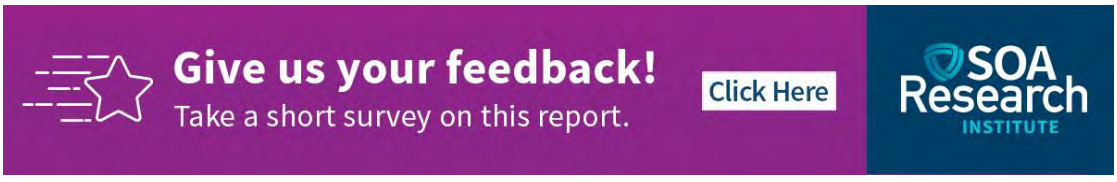
Section 1: Purpose of the Survey

The purpose of this survey was 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 published in July 2021, which included pandemic data from April 2020 through March 2021. This update includes Group Life mortality results from April 2020 through September 2021 (referred to in this report as the "pandemic period"), representing 18 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 875,000 people in the United States alone, and over 5.5 million worldwide.

The survey was 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 September 30, 2021 and include over 2.0 million claims and over $93 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. Also, the survey seeks to analyze whether the pandemic has had indirect impacts on population mortality, beyond deaths associated directly with the COVID-19 virus. 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.



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 September 30, 2021. Reported claims are easier to measure than incurred claims, but they do not tell the full story about Group Life mortality through September 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 September 2021.

As in prior reports, the most recent one-to-two incurral months should not be fully relied upon due to the maturity of the completion of reported claims, with the completion factors for the most recent two months falling in the 30-35% and 70-75% ranges, respectively. The Committee has observed significant reporting lag volatility over the course of the study, resulting in volatility of incurred incidence development over time, especially in the most recent incurred months.

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 2.4[1] display high-level incidence results for 2020 and the first three quarters of 2021 compared to the 2017-2019 baseline period for each combination of a) incurred/reported basis and b) count/amount basis through September 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.

Note that additional data reported in October 2021 indicates that the 3Q21 excess mortality will likely complete downward from the 37.7% shown below using September data. The fully complete 3Q21 excess mortality is expected to remain above 30%, which will continue to be the highest quarterly Group Life mortality spike observed thus far in the pandemic.

Table 2.1
COUNT-BASED INCURRED INCIDENCE RESULTS RELATIVE TO 2017-2019 BASELINE PERIOD

Count-Based	2Q20	3Q20	4Q20	1Q21	2Q21	3Q21	4/20-9/21
Total / Baseline	115.4%	115.1%	128.1%	122.0%	106.9%	137.7%	120.8%
COVID-19 Claims	12,972	9,820	23,555	24,441	6,868	18,623	96,278
COVID / Baseline	*12.4%*	*9.6%*	*21.7%*	*21.8%*	*6.6%*	*18.7%*	*15.1%*
Non-COVID / Baseline	*103.0%*	*105.5%*	*106.4%*	*100.2%*	*100.3%*	*119.0%*	*105.7%*

Table 2.2
AMOUNT-BASED INCURRED INCIDENCE RESULTS RELATIVE TO 2017-2019 BASELINE PERIOD

Amount-Based	2Q20	3Q20	4Q20	1Q21	2Q21	3Q21	4/20-9/21
Total / Baseline	119.8%	125.1%	133.1%	133.3%	122.1%	166.0%	133.1%
COVID-19 Claims	467.4 M	403.9 M	845.9 M	1,015.4 M	369.6 M	1,106.9 M	4,209.2 M
COVID / Baseline	*12.1%*	*10.8%*	*21.3%*	*24.7%*	*9.7%*	*30.2%*	*18.1%*
Non-COVID / Baseline	*107.7%*	*114.3%*	*111.8%*	*108.6%*	*112.4%*	*135.8%*	*115.0%*

Table 2.3
COUNT-BASED REPORTED INCIDENCE RESULTS RELATIVE TO 2017-2019 BASELINE PERIOD

Count-Based	2Q20	3Q20	4Q20	1Q21	2Q21	3Q21	4/20-9/21
Total / Baseline	110.8%	114.0%	121.5%	129.0%	110.4%	120.1%	117.6%
COVID-19 Claims	10,366	9,519	14,464	29,228	10,973	11,914	86,464
COVID / Baseline	*9.5%*	*9.3%*	*14.5%*	*25.8%*	*10.2%*	*11.8%*	*13.5%*
Non-COVID / Baseline	*101.3%*	*104.7%*	*107.0%*	*103.2%*	*100.2%*	*108.3%*	*104.1%*

[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 5.

Table 2.4
AMOUNT-BASED REPORTED INCIDENCE RESULTS RELATIVE TO 2017-2019 BASELINE PERIOD

Amount-Based	2Q20	3Q20	4Q20	1Q21	2Q21	3Q21	4/20-9/21
Total / Baseline	114.9%	125.7%	131.5%	136.9%	122.8%	143.4%	129.1%
COVID-19 Claims	405.3 M	388.6 M	570.1 M	1,153.2 M	493.8 M	728.1 M	3,739.1 M
COVID / Baseline	*10.2%*	*10.4%*	*15.9%*	*27.9%*	*12.5%*	*20.0%*	*16.1%*
Non-COVID / Baseline	*104.7%*	*115.3%*	*115.6%*	*109.0%*	*110.3%*	*123.4%*	*113.0%*

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 in almost all months during the pandemic period. The lone exception was May 2021, during which reported incidence was approximately 1% lower than baseline.

It is important to note that incurred estimates of August and September 2021 lack credibility due to the low level of completion of the data used at the time of this analysis. Group Life claim completion has been especially volatile during the pandemic waves, driven by both the ultimate incurred levels fluctuating from month to month, and by company specific claim processing speeds fluctuating up and down due to increases/decreases in staffing levels and build up/down of claim backlogs.

From an incurred mortality viewpoint, all 18 months from April 2020 through September 2021 showed excess mortality[2] versus baseline expectations. November 2020, December 2020, August 2021, and September 2021 each had very high incurred mortality spikes of 40% or more, while the other eight months ranged from a low of 6% excess incurred mortality to a high of 29% excess incurred mortality above baseline.

The 18-month period of April 2020 through September 2021 showed the following Group Life mortality results:

- Estimated reported Group Life claim incidence rates were up 17.6% on a seasonally-adjusted basis compared to 2017-2019 reported claims.
- Estimated incurred Group Life incidence rates were 20.8% higher than baseline on a seasonally-adjusted basis. As noted above, the incurred incidence rates in August and September 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 12% of all reported Group Life claims with death dates in the pandemic period were determined to have a cause of death of COVID-19.
- Blue-collar and Gray-collar groups have the lowest A/Es relative to baseline over the "pandemic period" starting in April 2020 at around 18%, with quarterly A/Es ranging between 3% and 38%. Over the course of the pandemic, differences between these two industry groups' excess mortality have disappeared in total, but show quarterly variability in relation to one another. The White-collar group continues to have the

[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.

highest mortality A/E relative to baseline at 24% during the pandemic period, though the differences between collar groups in 2021 are less significant than they were in 2020.

- Group Life mortality patterns by region have changed over time during the COVID-19 pandemic. For each of the first three quarters in 2021, the Southeast region has exhibited the highest excess mortality. The following regions had the highest excess mortality in each quarter shown:
  - Q2 2020: Northeast (43%)
  - Q3 2020: Southeast (27%)
  - Q4 2020: Midwest (33%)
  - Q1 2021: Southeast (32%)
  - Q2 2021: Southeast (12%)
  - Q3 2021: Southeast (68%)
- Relative to prior years, the Group Life insured population studied within this survey experienced a greater 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 105% - 125% of the percentage of excess deaths in the U.S. population. Two contributing factors to this observation are a shift in excess mortality in the U.S. population toward younger adult ages during 2021 and particularly adverse Group Life experience for insureds under age 65 during the third quarter of 2021[3]. This is explained in more detail in subsection 8.1.
- Early quarters of the pandemic period (Q2 2020 and Q3 2020) showed the Group Life insured population studied within this survey to have experienced a lower percentage of excess deaths than the U.S. population as a whole. Beginning in the fourth quarter of 2020, this relationship has flipped, with subsequent quarters indicating higher excess mortality for the Group Life insured population by a percentage difference ranging from 2% to 14% (additive) by quarter. Note that additional data reported in October 2021 indicates that the third quarter excess mortality will likely complete downward from the 38% shown below using September data. The U.S. population excess mortality shown below is based on more complete data through December, so this update to the Group Life data will likely reduce the difference in excess mortality between the two populations.

Table 2.5
GROUP LIFE AND U.S. POPULATION EXCESS MORTALITY PERCENTAGES BY QUARTER

Age	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021	Q3 2021
Group Life	15%	15%	28%	22%	7%	38%
U.S. Population	20%	16%	21%	17%	5%	25%
Difference	-5%	-1%	7%	5%	2%	13%

- In the third quarter of 2021, there was a moderate negative correlation between vaccination rate and excess mortality by state. Other factors potentially influencing this relationship are climate, seasonality, preventative measures (e.g., social distancing and masking), and deaths from causes other than COVID-19. This is explained in further detail in subsection 8.3.

[3] Due to variability in claim completion patterns and the maturity of the most recent quarter's incurred claim experience, these observations may change over time.

Section 3: Group Life Mortality Results – Reported Death Claims

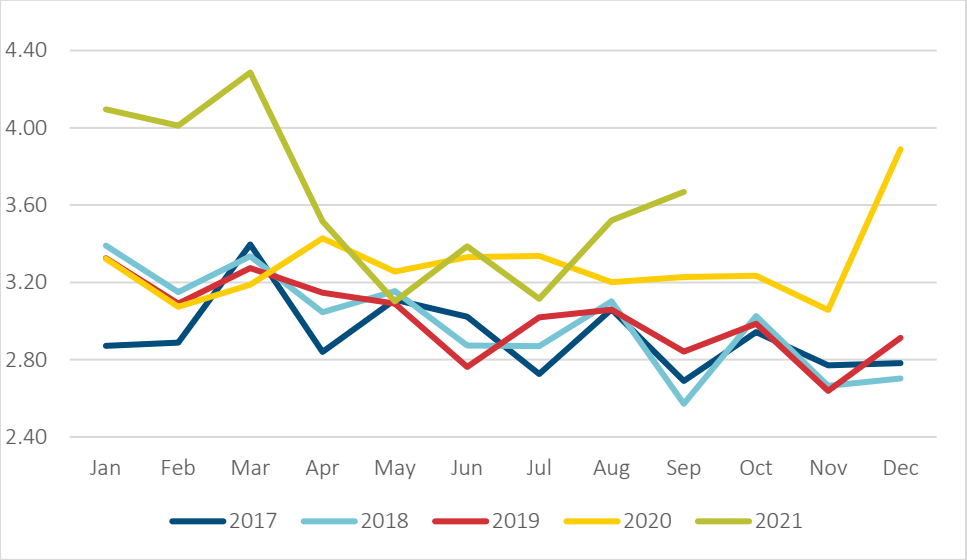
3.1 REPORTED CLAIM INCIDENCE BY COUNT – ALL CAUSES

Excess reported-basis mortality was observed in almost every month of the pandemic period, with May 2021 being the lone month where reported incidence was consistent or less than the corresponding baseline months.

Reported overall Group Life claim incidence rates during the pandemic period, as shown in Figure 3.1, are up roughly 18% compared to 2017-2019 reported claims. Reported claims are easier to measure than incurred, as no estimation of completeness is required. However, reported claims do not tell the true economic impact of what is happening in the claim experience of a particular reported period, since those reported claims include deaths associated with prior periods, which may or may not have been accurately expected and accrued for in prior period claim liabilities.

Figure 3.1

AGGREGATE REPORTED CLAIM INCIDENCE PER 1000 BY CALENDAR YEAR AND MONTH



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

A total of 86,464 COVID-19 death claims were reported during the pandemic period. Roughly 75% of the COVID-19 claims were for Basic Group Life coverage and roughly 25% for Supplemental/Voluntary coverage, with both figures including active employees and retirees. Note that insureds having both Basic coverage and Supplemental/Voluntary coverage have their exposures and claim counts included in both product lines. Thus, some deaths are counted as both Basic and Supplemental/Voluntary deaths, so the total number of Group Life insureds with COVID-19 deaths is less than 86,464.

The table below shows the total death claim incidence level (mortality rate) for each quarter during the pandemic relative to the baseline period metric. The table also shows a relativity for COVID-19 claims and non-COVID claims. As the table illustrates, COVID-19 claims do not fully explain the increase in reported claim incidence over the baseline period.

Table 3.1

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

Count-Based	2Q20	3Q20	4Q20	1Q21	2Q21	3Q21	4/20-9/21
Total / Baseline	110.8%	114.0%	121.5%	129.0%	110.4%	120.1%	**117.6%**
COVID-19 Claims	10,366	9,519	14,464	29,228	10,973	11,914	**86,464**
COVID / Baseline	*9.5%*	*9.3%*	*14.5%*	*25.8%*	*10.2%*	*11.8%*	***13.5%***
Non-COVID / Baseline	*101.3%*	*104.7%*	*107.0%*	*103.2%*	*100.2%*	*108.3%*	***104.1%***

Reported claim details by month are shown below, along with calculated monthly reported incidence rates. Note that a small number of COVID-19 claims have reported dates of death in 2019 or prior, which we suspect are due to data errors.

Table 3.2
REPORTED CLAIMS AND INCIDENCE RATES, 2017 THROUGH Q3 2021

	Raw Submitted Numbers			Calculated Amounts				
	Reported Claims		Premium (000)	Life Years Exposed (000)		Annual Incidence per 1,000	Adjusted for Seasonality	
Report Date	Total	COVID		By Month	Yrly Avg		Total	Total/Baseline
9/1/21	43,325	5,843	1,711,188	11,733	11,813	3.67	4.05	136.0%
8/1/21	41,588	4,279	1,684,221	11,616	11,813	3.52	3.42	114.8%
7/1/21	36,799	1,792	1,726,233	11,744	11,813	3.12	3.25	109.3%
6/1/21	40,012	2,667	1,737,026	11,858	11,813	3.39	3.49	117.2%
5/1/21	36,642	3,451	1,747,031	11,893	11,813	3.10	2.95	99.0%
4/1/21	41,525	4,855	1,750,805	11,923	11,813	3.52	3.43	115.1%
3/1/21	50,631	8,096	1,742,536	11,867	11,813	4.29	3.83	128.6%
2/1/21	47,379	10,238	1,735,968	11,863	11,813	4.01	3.94	132.2%
1/1/21	48,384	10,894	1,731,224	11,823	11,813	4.10	3.76	126.1%
12/1/20	46,554	8,001	1,700,627	11,929	11,970	3.89	4.20	141.2%
11/1/20	36,596	3,655	1,680,476	11,834	11,970	3.06	3.39	113.7%
10/1/20	38,712	2,808	1,682,401	11,738	11,970	3.23	3.26	109.5%
9/1/20	38,634	3,148	1,685,592	11,831	11,970	3.23	3.57	120.0%
8/1/20	38,309	3,436	1,688,452	11,893	11,970	3.20	3.12	104.7%
7/1/20	39,937	2,935	1,708,404	11,989	11,970	3.34	3.50	117.4%
6/1/20	39,868	3,180	1,698,088	11,957	11,970	3.33	3.44	115.6%
5/1/20	38,963	4,024	1,753,961	12,234	11,970	3.26	3.10	104.2%
4/1/20	41,040	3,162	1,710,373	11,888	11,970	3.43	3.35	112.5%
3/1/20	38,150	153	1,714,270	11,986	11,970	3.19	2.86	95.9%
2/1/20	36,791	3	1,742,455	12,340	11,970	3.07	2.92	98.1%
1/1/20	39,760	3	1,705,753	12,020	11,970	3.32	3.05	102.6%
2017-2019 Baseline	**34,655**	**0**	**1,602,918**	**11,644**	**11,644**	**2.98**	**2.98**	**100.0%**
2019 Monthly	35,651	0	1,658,732	11,836	11,836	3.01	3.02	101.2%
2018 Monthly	34,767	1	1,599,475	11,626	11,626	2.99	2.99	100.3%
2017 Monthly	33,547	1	1,550,546	11,469	11,469	2.92	2.93	98.4%

3.3 REPORTED CLAIM INCIDENCE BY AMOUNT – ALL CAUSES

Reported overall Group Life claim incidence rates by amount during the pandemic period were up roughly 29% 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.

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

Table 3.3
REPORTED EXCESS MORTALITY BY TOTAL CLAIM AMOUNT COMPARED TO 2017-2019 BASELINE

Amount-Based	2Q20	3Q20	4Q20	1Q21	2Q21	3Q21	4/20-9/21
Total / Baseline	114.9%	125.7%	131.5%	136.9%	122.8%	143.4%	**129.1%**
COVID-19 Claims	405.3 M	388.6 M	570.1 M	1,153.2 M	493.8 M	728.1 M	**3,739.1 M**
COVID / Baseline	*10.2%*	*10.4%*	*15.9%*	*27.9%*	*12.5%*	*20.0%*	***16.1%***
Non-COVID / Baseline	*104.7%*	*115.3%*	*115.6%*	*109.0%*	*110.3%*	*123.4%*	***113.0%***

Section 4: Group Life Mortality Results – Estimated Incurred Death Claims

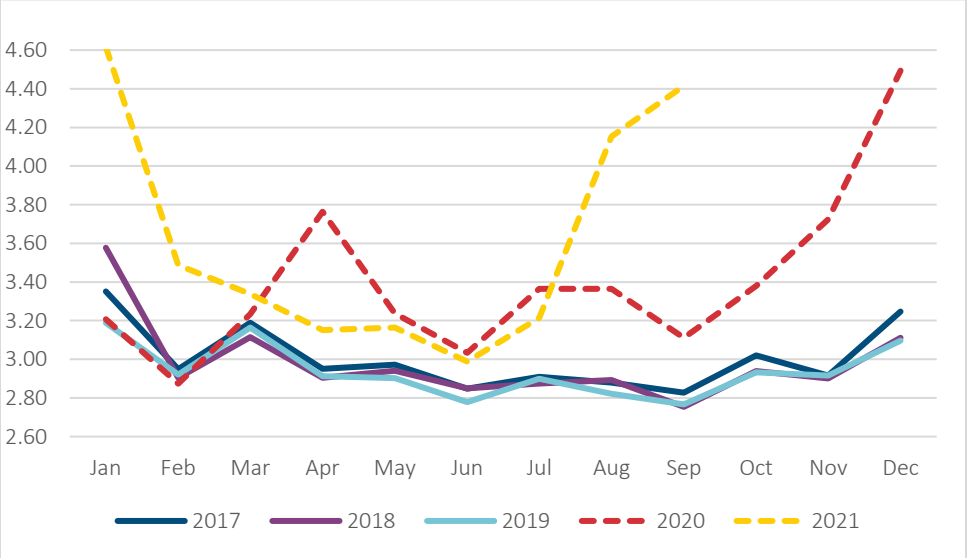
4.1 INCURRED CLAIM INCIDENCE BY COUNT – ALL CAUSES

A completed estimate of incurred incidence rates by count indicates that excess mortality for the pandemic period was 20.8% higher than the baseline 2017-2019 incurred incidence on a seasonally-adjusted basis. This includes August and September 2021 incurred incidence rates, which currently indicate very high excess mortality of 44.5% (August) and 58.0% (September); however, given the limited maturity of **the August and September 2021 incurred months from a completion perspective, these figures should not be deemed fully credible as of the publication of this report.** Figure 4.1 displays the various monthly estimated incurred incidence rates.

The initial estimates of the third quarter 2021 incurred incidence rates indicate that excess mortality is 37.7% higher than baseline on a seasonally-adjusted basis, implying the highest quarter of excess mortality observed over the past six quarters. Note that additional data reported in October 2021 indicate that the 3Q21 excess mortality will likely complete downward from the 37.7% shown below using September data. The fully complete 3Q21 excess mortality is expected to remain above 30%, which will continue to be the highest quarterly Group Life mortality spike observed thus far in the pandemic.

Figure 4.1

AGGREGATE INCURRED[4] CLAIM INCIDENCE PER 1000 BY CALENDAR YEAR AND MONTH



[4] Adjusted for assumed completion.

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

Similar to reported claim metrics, Table 4.1 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 73% of the excess incurred Group Life mortality during the second quarter of 2020 through the first quarter of 2021, with the other 27% coming from claims that have not been coded with COVID-19 as cause of death.

Table 4.1
INCURRED EXCESS MORTALITY BY CLAIM COUNT COMPARED TO 2017-2019 BASELINE

Count-Based	2Q20	3Q20	4Q20	1Q21	2Q21	3Q21	4/20-9/21
Total / Baseline	115.4%	115.1%	128.1%	122.0%	106.9%	137.7%	**120.8%**
COVID-19 Claims	12,972	9,820	23,555	24,441	6,868	18,623	**96,278**
COVID / Baseline	*12.4%*	*9.6%*	*21.7%*	*21.8%*	*6.6%*	*18.7%*	***15.1%***
Non-COVID / Baseline	*103.0%*	*105.5%*	*106.4%*	*100.2%*	*100.3%*	*119.0%*	***105.7%***

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

Table 4.2
INCURRED CLAIM COUNTS AND INCIDENCE RATES, 2017 THROUGH Q3 2021

	Raw Submitted Numbers			Calculated Amounts				
	Average Incurred Claim Counts		Average Premium ($ 000)	Average Life Years Exposed (000)	Average Completed Claim Counts	Annual Incidence per 1,000 (Lives Basis)	Adjusted for Seasonality	
Incurral Date	Total	COVID					Total	Total/Baseline
9/1/21	15,989	2,159	1,711,188	11,733	51,804	4.42	4.70	158.0%
8/1/21	33,796	6,140	1,684,221	11,616	48,246	4.15	4.30	144.5%
7/1/21	32,129	1,654	1,726,233	11,744	37,742	3.21	3.29	110.7%
6/1/21	32,147	1,212	1,737,026	11,858	35,435	2.99	3.14	105.6%
5/1/21	35,139	2,319	1,747,031	11,893	37,627	3.16	3.20	107.5%
4/1/21	35,649	2,890	1,750,805	11,923	37,578	3.15	3.20	107.5%
3/1/21	37,973	3,167	1,742,536	11,867	39,605	3.34	3.15	105.9%
2/1/21	39,920	6,485	1,735,968	11,863	41,368	3.49	3.55	119.3%
1/1/21	52,904	13,978	1,731,224	11,823	54,567	4.62	4.19	140.7%
12/1/20	52,161	12,942	1,700,627	11,929	53,605	4.49	4.25	142.9%
11/1/20	43,004	6,975	1,680,476	11,834	44,069	3.72	3.79	127.5%
10/1/20	38,804	3,040	1,682,401	11,738	39,662	3.38	3.38	113.7%
9/1/20	36,103	2,351	1,685,592	11,831	36,813	3.11	3.32	111.7%
8/1/20	39,322	3,631	1,688,452	11,893	40,018	3.36	3.49	117.4%
7/1/20	39,691	3,668	1,708,404	11,989	40,333	3.36	3.46	116.2%
6/1/20	35,745	1,939	1,698,088	11,957	36,273	3.03	3.20	107.5%
5/1/20	39,062	3,821	1,753,961	12,234	39,595	3.24	3.28	110.2%
4/1/20	44,188	7,043	1,710,373	11,888	44,744	3.76	3.83	128.7%
3/1/20	38,318	1,068	1,714,270	11,986	38,761	3.23	3.06	102.9%
2/1/20	35,088	19	1,742,455	12,340	35,463	2.87	2.83	95.2%
1/1/20	38,168	61	1,705,753	12,020	38,543	3.21	2.92	98.0%
2017-2019 Baseline	**34,564**	**1**	**1,602,918**	**11,644**	**34,645**	**2.98**	**2.98**	**100.0%**
2019 Monthly	34,626	1	1,658,732	11,836	34,821	2.94	2.94	98.9%
2018 Monthly	34,620	1	1,599,475	11,626	34,650	2.98	2.98	100.1%
2017 Monthly	34,444	1	1,550,546	11,469	34,463	3.00	3.00	101.0%

4.3 INCURRED CLAIM INCIDENCE BY AMOUNT – ALL CAUSES

Overall, seasonally-adjusted incurred Group Life claim incidence rates by amount during the pandemic period were up 33.1% 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 sex mix, and the remainder is likely due to salary and face amount inflation over the experience period.

Note that the excess incurred mortality by amount during Q3 2021 is more inflated than typical as compared to excess incurred mortality by count. This, in general, is a function of elevated mortality occurring in subsets of the group life population with greater coverage amounts. For example, as indicated in subsection 5.4, excess mortality on a count basis has been significantly higher for ages under 65, where coverage amounts are a function of salary, versus age groups over 65, where retiree life coverages tend to have smaller flat face amounts. This Q3 2021 relationship between count- and amount-based excess mortality is subject to change as the data becomes more complete, and it should not be viewed as fully credible.

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

Similar to Table 4.1, Table 4.3 below shows that COVID-19 claims do not fully explain the increase in incurred claim incidence on an amount basis.

Table 4.3
INCURRED EXCESS MORTALITY BY TOTAL CLAIM AMOUNT COMPARED TO 2017-2019 BASELINE

Amount-Based	2Q20	3Q20	4Q20	1Q21	2Q21	3Q21	4/20-9/21
Total / Baseline	119.8%	125.1%	133.1%	133.3%	122.1%	166.0%	**133.1%**
COVID-19 Claims	467.4 M	403.9 M	845.9 M	1,015.4 M	369.6 M	1,106.9 M	**4,209.2 M**
COVID / Baseline	*12.1%*	*10.8%*	*21.3%*	*24.7%*	*9.7%*	*30.2%*	***18.1%***
Non-COVID / Baseline	*107.7%*	*114.3%*	*111.8%*	*108.6%*	*112.4%*	*135.8%*	***115.0%***

Section 5: 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.

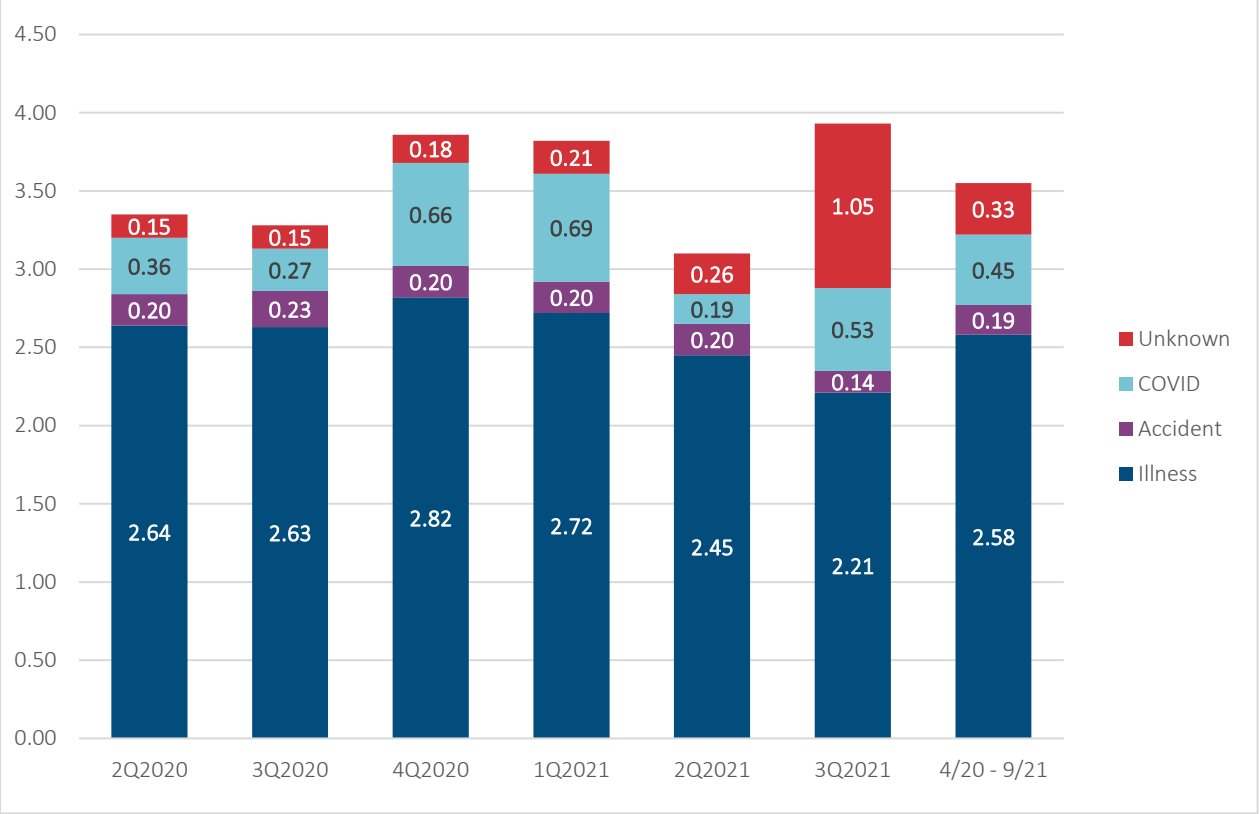
The following notes apply to the data presented in the subsections below:

- 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 and Geography reflect approximately 97% of total company claims, while results by Age / Sex reflect approximately 86% 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 Segments" row in the table in subsection 5.2 includes only data from companies that were able to supply claims data by Industry.
- The "% COVID" columns in the tables below show the monthly average COVID claims during the pandemic period as a percentage of the average total monthly claims from the 2017-2019 baseline period. The "% Non-COVID" column in the Age and Sex tables reflects the same for non-COVID claims.
- The "% Count" columns in the tables below show 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.

5.1 CAUSE OF DEATH

Cause of death continues to be difficult to study, as there is a significant delay in assignment of this parameter during the course of the claim adjudication cycle. In the third quarter of 2021, for example, an incidence rate of 1.05 (approximately 27% of third quarter incidence) is still attributable to claims with Unknown causes of death as of September 30, 2021, which is comprised of both reported claims without diagnosis and unreported claims. While it appears the mortality rate due to COVID for second quarter 2021 will remain lower than previous quarters, even after Unknowns are allocated, the COVID mortality for third quarter 2021 is already approaching that of the highest quarters (Q4 2020 and Q1 2021). Accident incidence continues to be fairly constant. In 2020 and early 2021, the Unknowns appear to have settled at 5% to 6% of total incidence.

Figure 5.1
INCURRED INCIDENCE RATES PER 1000 LIVES BY CAUSE OF DEATH



5.2 INDUSTRY

Over the pandemic period, the White Collar category has remained at a higher A/E ratio than Blue and Grey collar industries. The White Collar industry spiked early in the pandemic, 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. All three categories saw declining excess mortality in early 2021, particularly in second quarter 2021, followed by a sharp increase in A/E ratios in third quarter 2021. The percentage of claims identified as COVID is fairly consistent across collar segments.

Table 5.1
EXCESS MORTALITY BY INDUSTRY COLLAR

Industry Collar	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021	Q3 2021	4/20-9/21	% COVID	% Count
Blue	111%	110%	127%	122%	107%	134%	119%	15.3%	40%
Grey	112%	114%	127%	116%	103%	138%	118%	16.1%	19%
White	122%	121%	130%	124%	108%	139%	124%	15.3%	40%
All Collars[5]	**116%**	**115%**	**128%**	**122%**	**107%**	**138%**	**121%**	**15.4%**	**100%**

Table 5.2 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 July 2021 report as well. As we now have more quarters with more complete results, both the A/E ratios for April 2020 through September 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), Retail Trade (Grey Collar), and Misc. Services (Grey Collar) have the highest COVID claims as a percentage of baseline claims. Heavy Steel Manufacturing (Blue Collar) has a much lower A/E ratio than the other top 10 industries. In the table below, "B," "W," and "G" refer to Blue Collar, White Collar, and Grey Collar, respectively.

Table 5.2
EXCESS MORTALITY FOR TOP TEN INDUSTRIES BY NUMBER OF COVID CLAIMS

Industry	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021	Q3 2021	4/20-9/21	% COVID	% Count	# COVID
W-Public Administration	121%	123%	137%	126%	111%	152%	128%	14.5%	14%	12,850
B-Transport; Communication; Utilities	113%	112%	128%	121%	105%	139%	120%	15.6%	13%	12,497
B-Manufacturing - Auto, Airplanes	109%	104%	123%	127%	117%	144%	121%	14.8%	9%	8,244
B-Manufacturing - Heavy; Steel	107%	103%	125%	112%	97%	108%	109%	13.6%	9%	7,231
W-Doctors Offices	123%	122%	125%	119%	104%	136%	122%	17.5%	6%	6,050
W-Educational Services	116%	121%	127%	124%	108%	134%	122%	15.2%	6%	6,013
G-Manufacturing - Paper; Drugs	103%	109%	126%	122%	105%	126%	115%	14.1%	6%	5,145
G-Retail - Trade	106%	105%	114%	118%	103%	155%	117%	17.6%	4%	4,720
G-Wholesale Trade	128%	123%	141%	104%	98%	133%	121%	15.8%	5%	4,494
G-Misc Service/Data Processing	110%	114%	120%	118%	107%	143%	119%	17.0%	3%	3,345
All Segments[6]	**116%**	**115%**	**128%**	**122%**	**107%**	**138%**	**121%**	**15.4%**	**100%**	**94,589**

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

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 (Standard Industry Classification [SIC] codes 9100-9199). This segment does not include police and fire and represents over 85% of claims in the broader Public Administration segment.

5.3 GEOGRAPHY

Experience has varied by quarter by broad geographic region. For the April 2020 through September 2021 period, the Southeast Region shows the highest overall A/E ratio, as well as the highest percentage of claims identified as COVID. The Southeast also has a significantly higher A/E ratio in third quarter 2021 than other regions. This spike is consistent for most states within the Southeast Region. Other results of note include the Northeast spike in the second quarter of 2020, increased ratios in the West beginning in the third quarter of 2020, and a spike in the Midwest in fourth quarter 2020. All regions showed a significant decrease in ratios in second quarter 2021 though, except for the Northeast Region, they all increased again in third quarter 2021. Results appear to be consistent with broad population results in terms of timing of regional spikes across the country.

Table 5.3
EXCESS MORTALITY BY GEOGRAPHIC REGION

Region	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021	Q3 2021	4/20-9/21	% COVID	% Count
Northeast	143%	105%	124%	122%	106%	109%	118%	13.3%	20%
West	108%	121%	129%	129%	102%	116%	117%	14.6%	16%
Midwest	114%	107%	133%	108%	106%	127%	116%	12.9%	28%
Southeast	108%	127%	129%	132%	112%	168%	129%	19.7%	35%
All Regions[7]	**116%**	**115%**	**128%**	**122%**	**107%**	**138%**	**121%**	**15.5%**	**100%**

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

A closer look at the states with the highest number of COVID claims (Table 5.4) shows results that are not surprising, given the regional results in Table 5.3. 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, FL, CA, GA, TN), while still others didn't see a significant spike until the fourth quarter of 2020 (MI, IL, OH, PA). Most states saw a decrease in A/E ratios in second quarter 2021, and most saw a return to high ratios in third quarter 2021 (except NY and CA). Several Southeast states (FL, GA, TN, TX) show extreme spikes in third quarter 2021. Two of these states (TX, GA) show COVID rates as a percentage of baseline near 23% - well above average.

Table 5.4
EXCESS MORTALITY FOR TOP TEN STATES BY NUMBER OF COVID CLAIMS

State	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021	Q3 2021	4/20-9/21	% COVID	% Count	# COVID
TX-Southeast	107%	134%	135%	137%	105%	153%	128%	22.7%	8%	11,609
FL-Southeast	105%	129%	117%	126%	116%	196%	132%	18.6%	6%	7,069
CA-West	107%	124%	134%	146%	98%	108%	120%	17.0%	6%	6,680
MI-Midwest	129%	103%	130%	109%	117%	128%	119%	13.8%	6%	4,895
GA-Southeast	118%	135%	130%	145%	118%	195%	140%	22.9%	3%	4,846
IL-Midwest	114%	107%	134%	108%	104%	125%	115%	12.6%	5%	3,930
OH-Midwest	104%	105%	129%	110%	101%	123%	112%	12.7%	5%	3,855
PA-Northeast	119%	107%	131%	121%	108%	117%	117%	12.3%	5%	3,757
NY-Northeast	163%	108%	118%	129%	102%	103%	121%	13.1%	5%	3,628
TN-Southeast	103%	124%	136%	133%	121%	170%	131%	19.2%	3%	3,103
All States[8]	**116%**	**115%**	**128%**	**122%**	**107%**	**138%**	**121%**	**15.5%**	**100%**	**95,203**

[8] Includes only companies that provided Geography splits; see second bullet at the beginning of Section 5.

5.4 AGE AND SEX

For the Age / Sex segments, excess mortality for the pandemic period was split between COVID and non-COVID claims. For example, for 45-64, the 21.9% COVID and 12.2% Non-COVID total 34% excess mortality, which equates to the 134% A/E ratio over April 2020 through September 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 September 2021 were higher for both the 0-44 and 45-64 age bands. However, a much greater proportion of excess mortality was identified as COVID for the 45-64 age band. Excess mortality for both the 0-44 and 45-64 age bands shows a significant spike in third quarter 2021, while ratios for 65-99 remain lower.

Table 5.5
EXCESS MORTALITY BY AGE BAND

Age	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021	Q3 2021	4/20-9/21	% COVID	% Non-COVID	% Count
0-44	124%	134%	123%	121%	130%	189%	137%	14.0%	22.9%	8%
45-64	119%	124%	130%	131%	118%	183%	134%	21.9%	12.2%	28%
65+	113%	109%	128%	119%	100%	113%	114%	13.0%	0.7%	64%
All[9]	**116%**	**115%**	**128%**	**122%**	**107%**	**139%**	**121%**	**15.6%**	**5.7%**	**100%**

Greater age band detail provides further insight on excess mortality by age, illustrating the recent spike in A/E ratios within the 25-64 age bands.

Table 5.6
EXCESS MORTALITY BY DETAILED AGE BAND

Age	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021	Q3 2021	4/20-9/21	% COVID	% Non-COVID	% Count
0-24	119%	127%	108%	102%	121%	129%	118%	2.7%	15.2%	2%
25-34	129%	135%	124%	120%	131%	181%	136%	11.4%	25.1%	2%
35-44	124%	136%	129%	129%	132%	217%	144%	19.8%	24.7%	4%
45-54	123%	127%	130%	133%	121%	208%	140%	23.8%	16.5%	10%
55-64	117%	123%	130%	129%	116%	170%	131%	21.0%	10.0%	18%
65-74	116%	115%	133%	130%	108%	133%	122%	16.8%	5.6%	17%
75-84	113%	113%	132%	122%	105%	116%	117%	13.3%	3.7%	20%
85+	111%	102%	123%	110%	90%	98%	106%	10.4%	-4.6%	27%
All[10]	**116%**	**115%**	**128%**	**122%**	**107%**	**139%**	**121%**	**15.6%**	**5.7%**	**100%**

The overall A/E ratios are similar by amount and count for age bands below 65. For age bands over 65, A/E ratios tend to be higher by amount than count by approximately 10%.

[9] Includes only companies that provided age splits; see second bullet at the beginning of Section 5.
[10] Includes only companies that provided age splits; see second bullet at the beginning of Section 5.

By Sex, A/E ratios have been higher in aggregate for Males, as is the excess mortality due to claims identified as COVID. While not shown, A/E ratios for males within the 35-64 age bands run approximately 10% higher than female ratios, whereas ratios tend to be similar by Sex for other age bands.

Table 5.7
EXCESS MORTALITY BY SEX

Sex	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021	Q3 2021	4/20-9/21	% COVID	% Non-COVID	% Count
Female	113%	114%	123%	119%	105%	134%	118%	13.5%	4.5%	32%
Male	116%	115%	130%	123%	107%	140%	122%	16.5%	5.5%	66%
All[11]	**116%**	**115%**	**128%**	**122%**	**107%**	**139%**	**121%**	**15.6%**	**5.8%**	**100%**

[11] Includes only companies that provided sex splits; see second bullet at the beginning of Section 5.

5.5 COMPANY SIZE

Contributing companies were assigned a size indicator of Large, Medium, or Small per the criteria described in Appendix C.2.5. Results for April 2020 through September 2021 indicate higher excess mortality (and higher % claims identified as COVID) by decreasing company size, although the results by Company Size were generally of the same magnitude and were all consistent in pattern from quarter-to-quarter. Ratios for Large Companies tended to be lower than other companies across all quarters. All company size categories saw a drop in A/E ratios in second quarter 2021, followed by a steep increase in third quarter 2021.

Table 5.8
EXCESS MORTALITY BY COMPANY SIZE

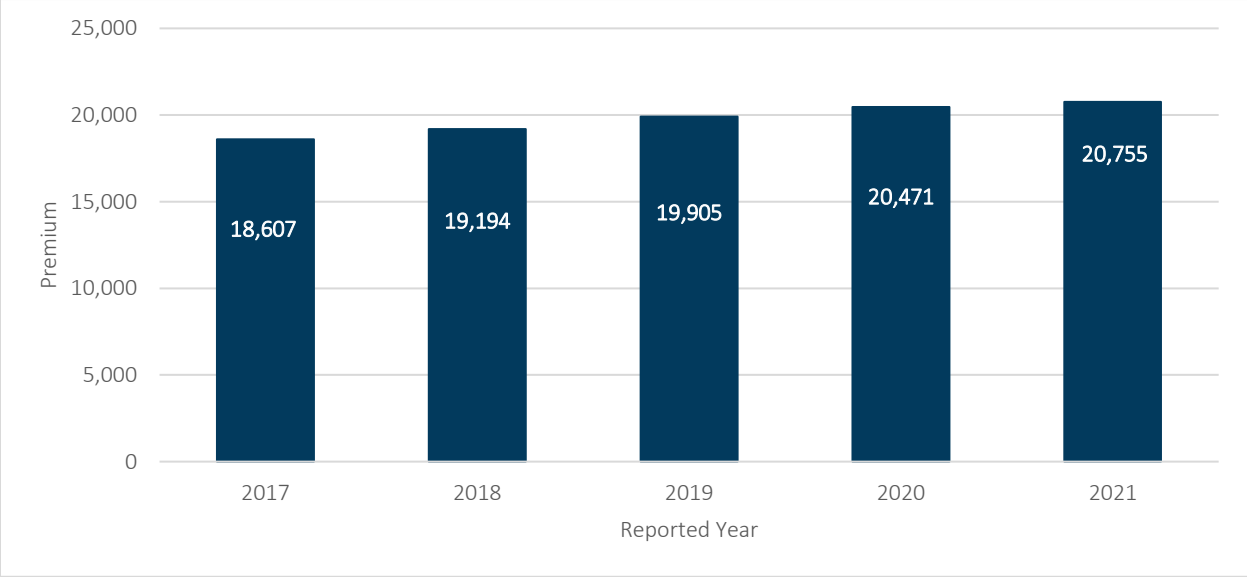
Co Size	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021	Q3 2021	4/20-9/21	% COVID	% Count
Large	114%	113%	127%	122%	107%	137%	120%	15.0%	79%
Medium	121%	122%	132%	120%	107%	139%	123%	17.0%	16%
Small	114%	123%	136%	130%	110%	143%	126%	18.3%	4%
All	**115%**	**115%**	**128%**	**122%**	**107%**	**138%**	**121%**	**15.4%**	**100%**

Section 6: Exposure Trends

6.1 PREMIUMS

As part of the data validation process, the Committee analyzed the premiums submitted for the study to determine if the premium exposure was stable or exhibited volatility during the experience period. Figure 6.1 indicates that there is a steady, gradual increase in premium exposure year by year from 2017 through 3Q 2021, as expected when wage inflation is considered. Note that 2021 premium in Figure 6.1 was annualized based on the monthly premiums from January through September of 2021. The stable trend in premiums by year helps validate the premium data, which was used for calculating premium per life (PPL) metrics and estimating covered lives when carriers could not provide this information.

Figure 6.1
REPORTED PREMIUM ($ MILLIONS) BY YEAR, 2017- 2021[12]



[12] 2021 Premium in Figure 6.1 was annualized based on the monthly premiums reported from January through September of 2021.

The Committee also compared the monthly premiums reported from the recent period of September 2020 through September 2021 to determine whether the monthly premiums in 2021 were in line with those from 2020 or if they exhibited different patterns. The monthly premiums in 2021 appear to be relatively consistent with the monthly premiums in 2020, as shown in Table 6.1 below.

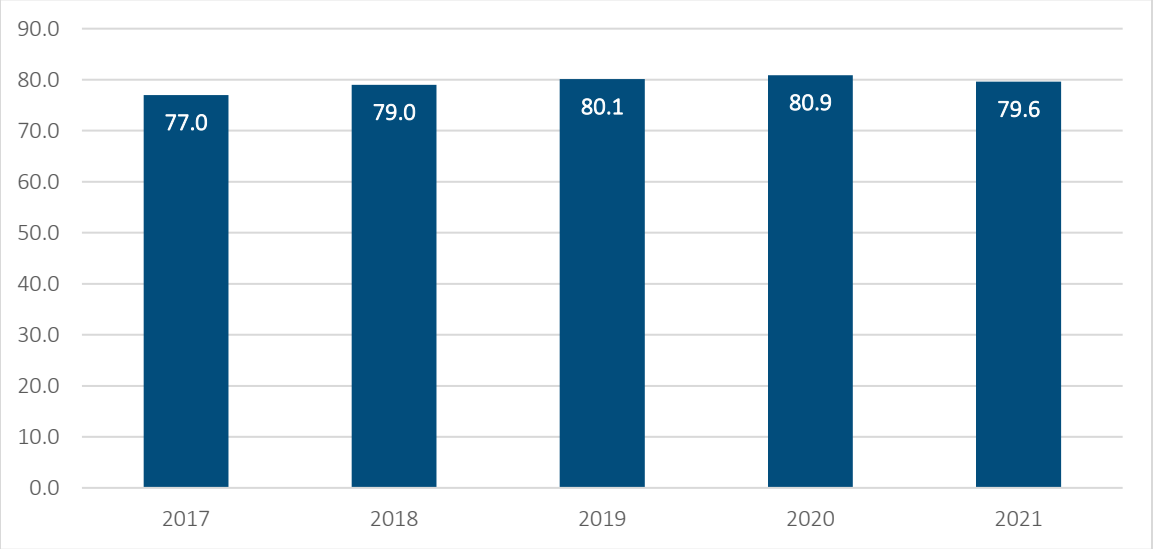
Table 6.1
REPORTED PREMIUM ($ MILLIONS) BY MONTH THROUGH SEPTEMBER 2021

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2021	1,731	1,736	1,743	1,751	1,747	1,737	1,726	1,684	1,711			
2020	1,706	1,742	1,714	1,710	1,754	1,698	1,708	1,688	1,686	1,682	1,680	1,701
Diff.	**1.5%**	**-0.4%**	**1.6%**	**2.4%**	**0.4%**	**2.3%**	**1.0%**	**-0.3%**	**1.5%**			

6.2 LIVES

The Committee validated the data for covered lives by analyzing trends in life-years of exposure (LYE) during the study period. The following chart shows reported LYE from 2017 through 2021, where the 2021 LYE was annualized based on nine months of exposure from January through September of 2021. The trend in LYE by year was relatively stable during the study period, as shown below.

Figure 6.2
LIFE-YEARS OF EXPOSURE (MILLIONS) BY YEAR, 2017- 2021[13]



[13] The 2021 LYE in Figure 6.2 was annualized based on experience from January through September of 2021.

The Committee then compared the monthly LYE reported from September 2020 through September 2021 to determine if the 2021 LYE was in line with historical exposures. This appears to be the case, as shown below.

Table 6.2
LIFE-YEARS OF EXPOSURE (MILLIONS) BY MONTH THROUGH SEPTEMBER 2021

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2021	6.70	6.67	6.66	6.66	6.65	6.64	6.59	6.57	6.57			
2020	6.87	6.82	6.80	6.77	6.76	6.76	6.73	6.69	6.68	6.66	6.72	6.67
Diff.	**-2.4%**	**-2.1%**	**-2.0%**	**-1.6%**	**-1.5%**	**-1.7%**	**-2.1%**	**-1.7%**	**-1.7%**			

A closer look at the exposures by Product Type (Employee Basic, Employee Sup/Vol, and Retiree Life) reveals that the increase in premium from 2020 to 2021 was driven by Employee Sup/Vol premium, which increased by approximately 3% between 2020 and 2021, whereas Employee Basic and Retiree Life premiums remained relatively flat, as shown below.

Table 6.3
REPORTED PREMIUM BY PRODUCT TYPE AND YEAR

Product Type	2017	2018	2019	2020	2021
Employee Basic	$9,791	$10,053	$10,320	$10,450	$10,451
Employee Sup/Vol	$8,739	$9,045	$9,485	$9,919	$10,200
Retiree Life	$77	$95	$99	$102	$103
Total	**$18,607**	**$19,194**	**$19,905**	**$20,471**	**$20,755**

However, Employee Sup/Vol LYE was level between 2020 and 2021, suggesting that the increase in Employee Sup/Vol premium was not due to an increase in covered lives, but instead may be attributed to employees increasing their supplemental benefit amounts in 2021 in light of the ongoing pandemic.

Section 7: Company Variations

7.1 VARIATIONS IN COVID-19 MORTALITY RESULTS

The Survey showed that all participating companies had elevated Group Life mortality experience during the pandemic. However, the level of excess mortality varied between carriers. To provide insight into the dispersion of industry experience, Table 7.1 provides the quartile baseline and pandemic experience, ranked by highest implied excess mortality percentage (by claim count) to lowest over the full pandemic period. The quartile incidence rates and excess mortality ratios are the weighted average of the five contributing companies' incidence rates contained within each quartile.

Table 7.1
QUARTERLY SEASONALLY-ADJUSTED EXCESS INCURRED MORTALITY (BY COUNT) – COMPANY QUARTILES

Quartile	Base Line	2Q–4Q20	1Q 2021	2Q 2021	3Q 2021	1Q – 3Q21	2Q-4Q20 Ratio	1Q21 Ratio	2Q21 Ratio	3Q21 Ratio	1Q-3Q21 Ratio
1	2.415	3.168	3.238	2.800	3.578	3.206	131.2%	134.1%	115.9%	148.1%	132.7%
2	2.043	2.553	2.523	2.236	2.941	2.565	125.0%	123.5%	109.5%	144.0%	125.5%
3	3.410	4.017	4.135	3.606	4.663	4.131	117.8%	121.3%	105.8%	136.8%	121.2%
4	4.095	4.591	4.644	4.055	5.096	4.595	112.1%	113.4%	99.0%	124.5%	112.2%
Total	**2.975**	**3.556**	**3.628**	**3.180**	**4.098**	**3.633**	**119.5%**	**122.0%**	**106.9%**	**137.7%**	**122.1%**

7.2 VARIATIONS IN COVID-19 CLAIM CODING PROCEDURES

Participating carriers were asked about the data sources and procedures they used 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 included the claim as a COVID-19 death if COVID-19 appeared anywhere on the death certificate.
- Eight of the 18 appeared 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 coded claims with cause of COVID-19 only when COVID-19 was identified as the primary cause of death on the death certificate.
- The other nine participating carriers generally classified deaths as COVID-19 only if it was listed as either primary or secondary cause of death on the death certificate.

7.3 VARIATIONS IN CLAIM REPORTING PATTERNS

Appendix D.4 documents that incurred claim completion rates varied 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 8: Comparisons to U.S. General Population Mortality Results

8.1 AGGREGATE EXCESS MORTALITY COMPARSIONS

From April 2020 through September 2021, there were estimated to be 96,278 incurred COVID claims in the Group Life survey data, compared with over 717,000 COVID deaths in the U.S. population during the same time span according to the Centers for Disease Control and Prevention (CDC)[14]. 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 September 2021, 25,000 COVID deaths in the U.S. per month indicated, on average, approximately an extra 10%-15% 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 Study[15] found that, in the key working ages, insured mortality is between 30% and 40% of general population mortality. This is often considered to be a function of the fact that an employee generally is in good health in order to be actively at work, often has access to healthcare, and tends to have a higher level of income (which is correlated with better health). 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 in mortality rate over a baseline expectation.

The excess deaths in the Group Life data were determined via a comparison to average death 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 expectation bases. The first basis was expected deaths published by the CDC[16], which were developed using Farrington surveillance algorithms and historical data[17] ("CDC method"). 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 the U.S. population demographic mix by age and sex, and the trend for death rates by age group ("Committee method").

Based on the results from these two methods, the Committee estimates that the excess death percentage in the Group Life data is approximately 105% - 125%[18] of the U.S. population excess death percentage for the pandemic period, with the first method informing the lower end of the range and the second method informing the higher end of the range. In the July 2021 report, it was noted that this range was 80% - 105%. This progression indicates that mortality experience within the Group Life population has deteriorated on an absolute level since the last report, and that the Group Life population mortality now has become more adverse than the U.S. population mortality when measured over the pandemic period. Table 8.1 shows the evolution of this comparison by quarter using the Committee method for Group Life results.

[14] https://www.cdc.gov/nchs/nvss/vsrr/covid19/index.htm
[15] https://www.soa.org/resources/experience-studies/2016/2016-group-life-mortality-study/
[16] https://www.cdc.gov/nchs/nvss/vsrr/covid19/excess_deaths.htm
[17] 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
[18] 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 8.1 and 8.2 results in a ratio of 20.9% / 18.6% = 112.0%.

Table 8.1
GROUP LIFE AND U.S. POPULATION EXCESS MORTALITY PERCENTAGES BY QUARTER

Age	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021	Q3 2021
Group Life	15%	15%	28%	22%	7%	38%
U.S. Population	20%	16%	21%	17%	5%	25%
Difference	-5%	-1%	7%	5%	2%	13%

In order to fully explore the differences in excess mortality, it is important to first understand the relative demographics of the two populations. As might generally be expected, the U.S. population data is much more evenly dispersed across the age categories, while a smaller portion of the Group Life survey data exposure is for children and retirees. It is also important to consider that mortality rates increase materially as age increases. Table 8.2 compares the age distribution of expected deaths between the Group Life survey data and the U.S. population, taking into consideration the same expected mortality applied to the two different demographics. Again, given the differences in demographics, a significantly higher proportion of deaths would be expected to occur in the working age population for the Group Life exposure.

Table 8.2
DISTRIBUTION OF EXPECTED DEATHS BY AGE GROUP

Age	Group Life Survey Data[19]	U.S. Population[20]
0–44	8%	7%
45–64	28%	18%
65+	64%	75%
All	**100%**	**100%**

[19] Percentages represent allocation of deaths in the 2017-2019 baseline period
[20] Percentages represent expected deaths based on estimates using the Committee method.

However, the demographic differences constitute only a partial explanation. A comparison of the excess mortality between the Group Life survey data and the U.S. population data by age group indicates that the Group Life population has experienced significantly higher excess mortality within the under-65 age groups. Table 8.3 shows the difference in excess mortality percentages between the Group Life and U.S. populations across the pandemic. The third quarter 2021 percentages are much higher in the Group Life population for the under-65 age groups. The 4/20 – 6/21 column indicates that before the third quarter of 2021, both populations had relatively similar total excess mortality by age group.

Table 8.3

GROUP LIFE EXCESS DEATH PERCENTAGES MINUS U.S. POPULATION EXCESS DEATH PERCENTAGES

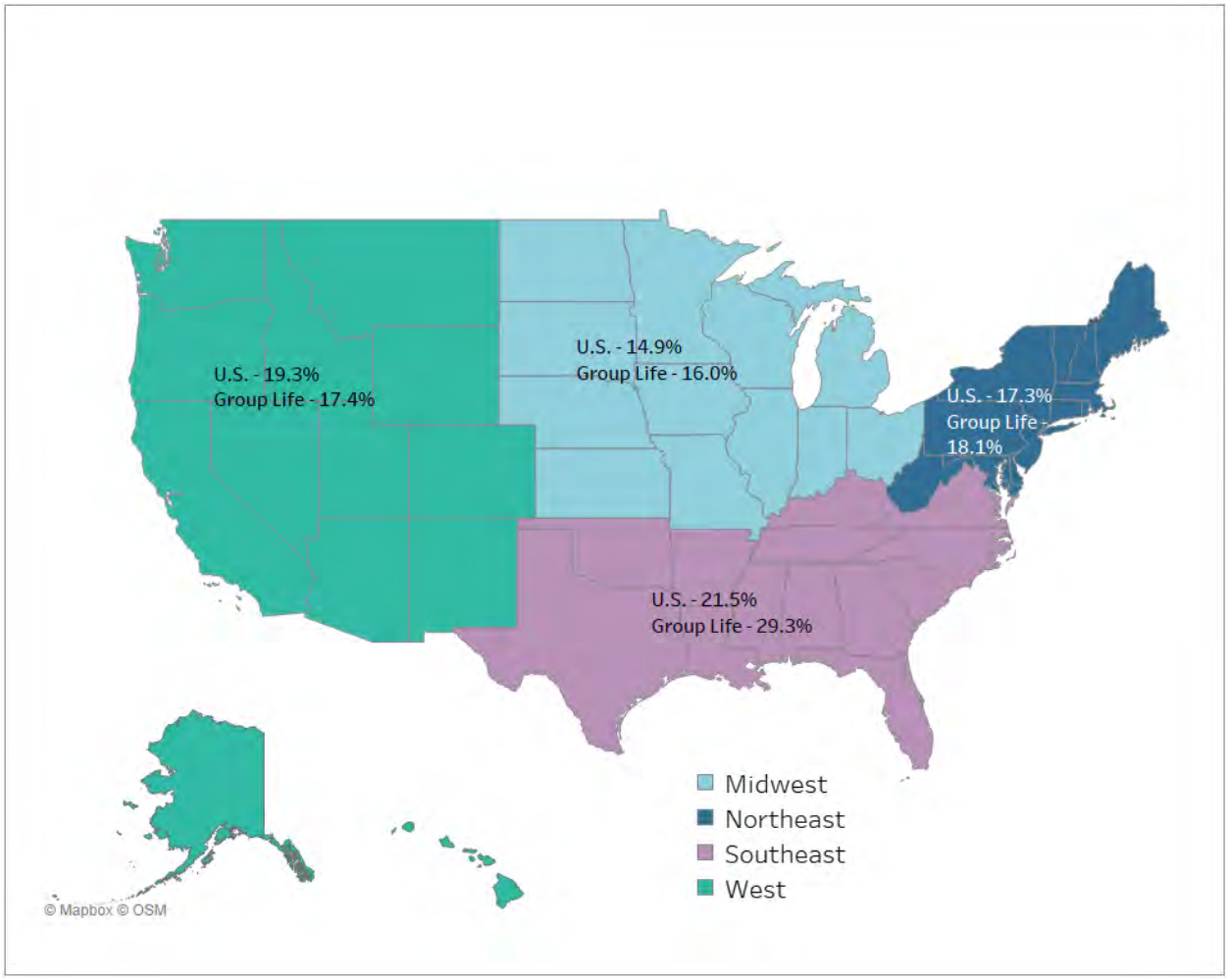
Age	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021	Q3 2021	4/20-9/21	4/20-6/21
0–44	1%	9%	-4%	-5%	2%	41%	8%	1%
45–64	-2%	4%	4%	8%	3%	41%	10%	3%
65+	-6%	-5%	9%	4%	-1%	-6%	-1%	-1%
All	-5%	-1%	7%	5%	2%	13%	3%	1%

Due to variability in claim completion patterns, and the maturity of the most recent quarter's incurred claim experience, these observations may change over time.

8.2 EXCESS MORTALITY COMPARISON BY GEOGRAPHIC REGION

The CDC method described above for U.S. population expected deaths enables a comparison of excess death percentages by month and geographic region. Figure 8.1 below shows the excess death percentages from April 2020 through September 2021 for the U.S. population and the Group Life survey data for each of the four U.S. regions.

Figure 8.1
EXCESS DEATH PERCENTAGES, APRIL 2020 THROUGH SEPTEMBER 2021



Tables 8.4 and 8.5 display the excess death percentages by quarter 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 8.4
U.S. POPULATION EXCESS DEATH PERCENTAGE BY MONTH AND GEOGRAPHIC REGION[21]

Region	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q2 2020 – Q1 2021	% of Total COVID Deaths
Midwest	15.3%	10.0%	34.9%	10.9%	4.6%	13.4%	14.9%	19.3%
Northeast	52.5%	3.7%	17.1%	18.0%	3.7%	7.9%	17.3%	22.2%
Southeast	9.3%	27.3%	24.2%	25.9%	7.4%	35.3%	21.5%	39.6%
West	8.8%	19.6%	26.8%	30.1%	5.6%	24.3%	19.3%	18.9%
Total	**19.2%**	**17.0%**	**25.5%**	**21.6%**	**5.7%**	**22.5%**	**18.6%**	**100.0%**

Table 8.5
GROUP LIFE COVID-19 SURVEY EXCESS DEATH PERCENTAGE BY MONTH AND GEOGRAPHIC REGION

Region	Q2 2020	Q3 2020	Q4 2020	Q1 2021	Q2 2021	Q3 2021	Q2 2020 – Q1 2021	% of Total COVID Deaths
Midwest	13.5%	7.4%	33.3%	8.5%	6.0%	27.2%	16.0%	23.5%
Northeast	43.3%	5.4%	23.5%	21.9%	5.6%	8.7%	18.1%	17.1%
Southeast	8.1%	27.1%	28.7%	32.3%	11.6%	68.0%	29.3%	44.8%
West	7.6%	20.8%	28.7%	28.8%	2.2%	16.0%	17.4%	14.6%
Total	**15.5%**	**15.1%**	**28.0%**	**22.0%**	**6.9%**	**37.7%**	**20.9%**	**100.0%**

For the April 2020 through September 2021 period, the West region shows lower excess mortality in the Group Life survey data compared to the U.S. population, but the opposite is true for the other three regions. The largest difference between the excess death percentages of the U.S. population and the Group Life survey population is found in the Southeast region, where the Group Life excess mortality percentage is (arithmetically) 7.8% higher. Much of this is attributable to the third quarter of 2021 experience, during which the Southeast region experienced 68.0% excess mortality in the Group Life data, compared to 35.3% in the U.S. population data.

8.3 EXCESS MORTALITY COMPARISON BY VACCINATION UPTAKE

The Committee researched vaccination uptake statistics as of June 30, 2021 by state using data furnished by Our World in Data[22]. Using this information, the Committee analyzed excess mortality percentages by statewide vaccination rates[23] in the Group Life population and the U.S. population (using the CDC method for expected deaths) for the third quarter of 2021. The scatterplots in Figures 8.2 and 8.3 show the correlation between these two measures.

[21] Note that since the July 2021 iteration of this report, the CDC has made a change to their methodology of estimating excess deaths to use six years of prior historical data rather than four. This change resulted in an increase in the weekly expected number of deaths by an average of 2% throughout the pandemic, which, in turn, decreased the estimates of total excess deaths. Further details can be found at: https://www.cdc.gov/nchs/nvss/vsrr/covid19/excess_deaths.htm.

[22] https://github.com/owid/covid-19-data/blob/master/public/data/vaccinations/us_state_vaccinations.csv

[23] Although COVID-19 vaccines were only approved for ages 12 and up as of June 30, 2021, the denominators for the vaccination rates shown in this subsection are total state populations including all ages.

Figure 8.2[24]
U.S. POPULATION EXCESS MORTALITY BY STATEWIDE VACCINATION RATE, JULY THROUGH SEPTEMBER 2021

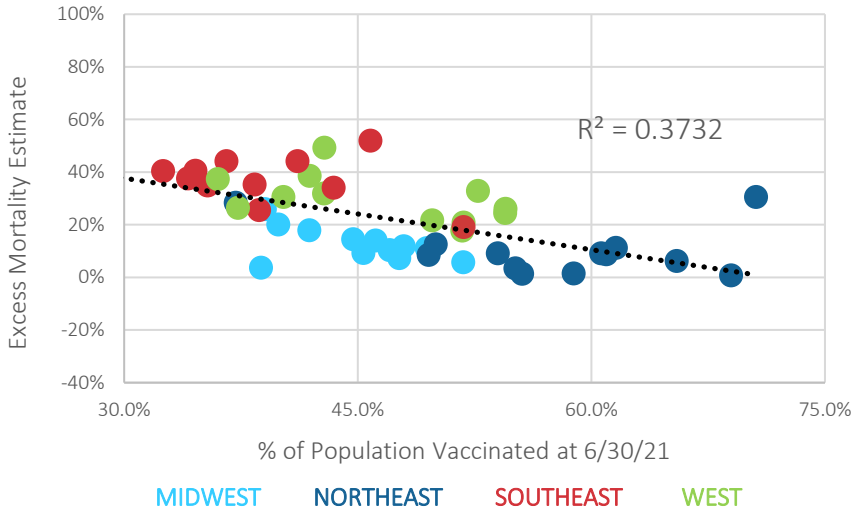
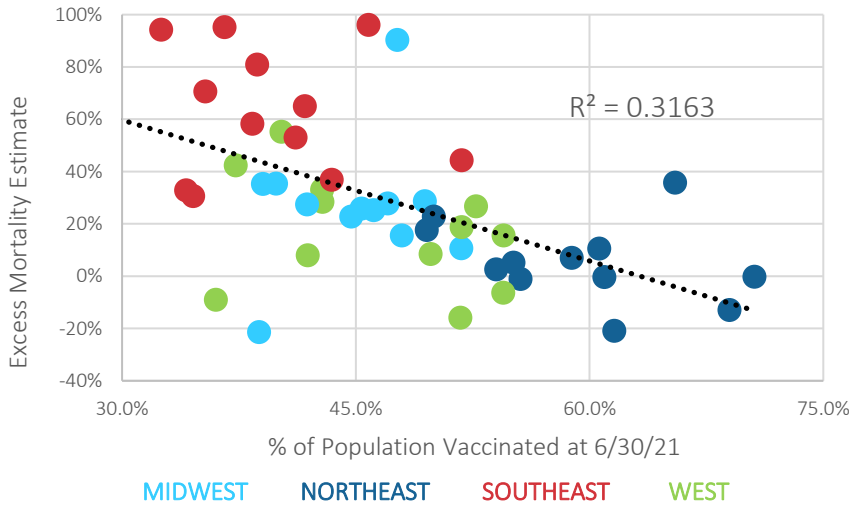


Figure 8.3[25]
GROUP LIFE EXCESS MORTALITY BY STATEWIDE VACCINATION RATE, JULY THROUGH SEPTEMBER 2021



Comparing state-level excess mortality percentage estimates to estimated COVID-19 vaccinated percentages shows a moderate negative correlation for both the U.S. population and the Group Life data. Therefore, other variables in addition to COVID-19 vaccination rates are certainly relevant to explaining the excess mortality observed in the

[24] North Carolina and West Virginia data were not available and are not included in the scatterplot.
[25] West Virginia and Wyoming data were not available and are not included in the scatterplot.

United States. The color-coded geographic regions in Figures 8.2 and 8.3 show noticeable clustering of excess mortality results regardless of vaccination percentage, especially in the U.S. CDC data.

Climate and seasonality are possible contributing factors to this observation, as weather patterns in broad geographic regions may contribute to similar behavior patterns and levels of viral transmission for states within the same region. There may also be state-level differences in preventative measures (e.g., social distancing and masking) that produce different transmission and death rates. Finally, it should be noted that COVID-19 deaths do not explain all of the excess mortality observed in either dataset presented here, and mortality patterns for other causes of death also influence the patterns shown above.

Section 9: 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 10: 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/sex. 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/Sex = 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/sex. 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/Sex = 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

Appendix C: Survey Methodology and Documentation

C.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/sex 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 September 2021 data submissions, claims with an Incurred Month of October 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 C.2.1 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 September 2021 was incomplete; therefore, the average premiums for April through July 2021 were imputed for September 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 Sex

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+. Sex 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.

C.2 RESULTS PROCESSING AND REVIEW

C.2.1 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, reflecting the seasonal nature of claim reporting and claim processing speeds. The Committee has also incorporated factor variation by reporting speed groups. The rate at which the contributing companies' claims complete has been analyzed and categorized into five groups, with three to five companies in each reporting speed group.

C.2.2 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.

C.2.3 UNKNOWN CLAIM DIAGNOSIS

The Unknown claim diagnosis category is artificially large for June 2021 through September 2021. This is primarily due to the newness of these claims and a reflection of the claim adjudication lifecycle. It is not uncommon for there to be an additional time lag between the claim reporting date and the point in the claim adjudication process when the cause of death is known, allowing for the claim to be categorized. 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.

C.2.4 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.

C.2.5 GROUPINGS BY COMPANY SIZE

To review results by company size (see subsection 5.5), contributors were split into three groups based on annualized 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.

Appendix D: Completion Factor Development

D.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. Since that time, completion factors have been reviewed periodically and there have been no changes made to them.

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 D.1
2020 INCURRED CLAIMS BY INCURRED MONTH AND REPORTING LAG

	Incurred Month							
Months of Reporting Lag	Jan-20	Feb-20	Mar-20	Apr-20	May-20	Jun-20	Jul-20	Aug-20
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 D.2, were computed by cumulatively applying the month-to-month completion factors to all subsequent months. The data presented in both Tables D.1 and D.2 have not been changed since the July 2021 publication of this report.

Table D.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

D.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 D.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 D.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%

D.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. Assignment of the cause of death is typically later in the claim adjudication cycle then reporting of the claim, so COVID claims in general were expected to complete a bit more slowly than average claims due to the need to complete that step in the adjudication cycle. For deaths in June 2020 through February of 2021, it appears that COVID-19 claims were being reported at roughly the same rate as the non-COVID-19 set of claims (see Table D.4 below).

Table D.4
CHAIN-LINK FACTORS FOR DEATHS IN JUNE 2020 – FEBRUARY 2021

Lag Months	COVID	All Other Causes	COVID / All Other Causes
0	2.188	2.202	99.3%
1	1.203	1.198	100.4%
2	1.062	1.068	99.4%
3	1.031	1.034	99.7%
0-3	2.888	2.916	99.1%

D.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 D.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 subsection 9.3 of the December 2020 publication.

Table D.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.

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