2017 Credit Life Mortality Study

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	Society of Actuaries

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Section 1: Purpose of the Study and Summary Results

This study and report have the following primary purposes:

1. Compare recent mortality experience to the NAIC mortality reserve standard for credit life and credit-related life insurance contracts.

2. Provide a comparison of recent mortality experience to previous studies of credit life insurance.

3. Provide the actuary with relevant insights into the current experience and industry changes, which have impacts on this experience.

Any comparison of mortality trends should be considered carefully and evaluated with attention to all underlying factors. Results observed may reflect impacts of variables not included in the current analysis. An actuary using this report should make his/her own determination concerning the applicability of this information to his/her individual purpose and use.

The 2017 credit life mortality study covers a five-calendar year period, years 2011 - 2015. Death claims incurred during this five-year period and paid by the data collection date were included. The data was primarily collected during the summer and fall of 2017, which would allow a minimum of 18 months following date of death for a claim to be paid. The study was limited to single premium credit life insurance.

Companies that submitted data to the study comprise over 89% of the 2017 credit life net written premium in the United States. The study included a cross section of all major distribution systems, including automobile dealer, retail, bank, credit union, and finance company-produced business.

The expected mortality table was the 2001 Commissioners Standard Ordinary Ultimate Male Age Last Birthday Mortality Table (2001 CSO), which is the current valuation standard for credit life insurance for the majority of states. The overall result of the study is that the Actual-to-Expected (A/E) Ratio was 69.76% when measured by amount of insurance and 81.10% by number of contracts.

Section 2: Description of the Data

Companies were given the option of submitting data that was combined for all business, or separately based on the administrating company or for acquired blocks of business. For those companies that submitted multiple data files, no effort was made to combine them into a single dataset. Some of the business segments are small and/or in a runoff status, so the reader is cautioned to keep this in mind when interpreting the individual company results presented herein. For convenience in this report, we have referred to each block of business where data was reported separately as a "company."

All 24 companies which contributed data were used in the study. A very small amount of the data was excluded due to missing information. The list of the contributors is shown in Appendix A.

The claim and inforce data for each company was compiled in Microsoft Access database tables. A Visual Basic .NET program calculated the exposures and compiled the claims for each company. The resulting exposures and claims by face amount and certificate count were exported to an Excel spreadsheet for further processing.

Section 3: Adjustment of the Data

Similar to the last study, several adjustments were required to adjust for various anomalies in the raw data. These fall into three general categories. The first is where invalid ages were associated with individual certificates. In the second, it was obvious that some business was processed using "default ages" because there was a large "spike" in the raw exposure data. In the third, certain companies exhibited extreme age-to-age fluctuations in exposure. The adjustments to compensate for these are discussed below.

3.1 INVALID AGE ADJUSTMENT

It was assumed that all inforce and claims data for both number and amount had incorrect ages if the recorded age was less than 16 or greater than 74. We calculated an Exposure Data Adjustment, the total of which was equal to the sum of the raw exposure data for these "incorrect ages".

The Exposure Data Adjustment was allocated to the other ages based on the raw exposure data age distribution for these valid ages.

3.2 DEFAULT AGE ADJUSTMENT

For inforce data for both number and amount, many companies assign a default age when applications are submitted without an age or date of birth rather than reject the application. These companies will select and assign a default age that, on average, will result in a reserve value that will match the average reserve value for their business. It was noted that the frequency of the default age adjustment was much lower than in previous studies.

To smooth out the exposure data by company, the Karup-King formula was used. Thus, for specified ages, the raw exposure data was replaced by the smoothed exposure data. An example of the process used to smooth the exposures is illustrated in the first chart in Appendix B.

3.3 EXTREME AGE-TO-AGE FLUCTUATIONS

For some companies, extreme age-to-age fluctuations occurred in inforce data by both number and amount due to the small amount of exposure data.

To smooth out the exposure data by company, the Karup-King formula was used. In this case, the raw exposure data was replaced by the smoothed exposure data. An illustration of the process used to smooth the exposures is shown in the second chart in Appendix B.

As a final step, it was verified that the final total exposure was equal to the total exposure calculated before application of the adjustment process.

Section 4: All Companies Combined Results

Mortality rates were computed by both amount and number of claims. The results are shown in the two tables in Appendix C by five-year age brackets for all companies combined. The expected mortality table was the 2001 Commissioners Standard Ordinary Ultimate Male Age Last Birthday Mortality Table (2001 CSO), which is the current valuation standard for credit life insurance for the majority of states. The last column shows the Actual-to-Expected Claim ratios. Overall, the Actual-to-Expected (A/E) Ratio was 69.76% by amount and 81.10% by number. No dramatic differences in the various age segments were noted, with the lowest age bracket ratio being 59.64% and the highest being 94.64%. This consistency validates the use of the 2001 table as an appropriate expected mortality basis.

Section 5: Results by Individual Company

Appendix D shows actual mortality rates by central age for the individual companies in the study, and Appendix E shows a listing of summary results. A letter was assigned to each company in order to keep their specific data confidential.

Excluding the two companies with zero claims, 20 of the 22 companies had an actual-to-expected mortality ratio of 100% or less by amount, and 21 out of 22 had a ratio of 100% or less by number. This means that (excluding the two companies with zero claims) 91% (20/22) of the companies had actual mortality less than the "2001 CSO" by amount, and 95% (21/22) by number.

It is important to note that, of the companies which had more than 1,000 claims incurred during the five-year study period, 13 of the 14 had A/E ratios of less than 100% by number of claims, and the same 13 out of 14 had A/E ratios of less than 100% by amount of claims.

Section 6: Comparison to the Prior Studies

Item	2017 Study	2009 Study	2002 Study
Exposure Period	2011-2015	2003 – 2006	1998 - 1999
Data Collection Date	Fall 2017	Summer/Fall 2008	Summer 2001
# Companies Contributing Data	24	48	29
# Companies Used In the Study	24	41	27
# Companies Without Zero Claims	22	35	26
All Companies Total "A/E"			
By Amount	69.76%	63.68%	76.05%
By Number	81.10%	63.41%	80.09%
# Companies Where "A/E" < 100% *			
By Amount	22	26	21
By Number	23	31	20
% Companies Where "A/E" < 100% *			
By Amount	91%	74%	81%
By Number	95%	89%	77%
Average Claim Amount	$4,250	$9,556	$7,452
Average Inforce Exposure	$4,674	$8,568	$7,361
# Companies With Less Than 100 Claims	5	20	4

*Companies with zero claims were excluded from both numerator and denominator.

The Actual-to-Expected results show a significant increase from the 2009 study, and comparable results to the 2002 study. By amount, the A/E decreased from 76.05% to 63.68% (2002 to 2009), and increased from 63.68% to 69.76% (2009 to 2017). No reason for this fluctuation is immediately evident; however, there are several changes to the overall composition of the data that are worth noting.

The Average Claim Amount and Average Inforce Exposure decreased sharply from the 2009 study. Several members of the Committee believe this relates to the mix of business by

producer-type shifting, with a decreasing exposure to banks and automobile dealers, and increasing exposure to finance companies. While we investigated the ability to stratify the mortality study by initial face amount, the information available did not allow for a sufficiently complete study.

It is clear to the Committee that the companies that contributed data have shifted. While all studies include a large share of the business being written, several carriers who contributed significantly to the 2002 study have changed or reduced their writings. Several significant carriers have recently ceased writing entirely or merged.

With regard to the higher mortality ratios by number versus amount, the Committee members believe this is due to the reduced percentage of underwritten business as a result of the decreased exposure to bank and auto dealer business. Members noted that a number of states only allow health questions to be asked when the initial loan amount exceeds $15,000 - or even $25,000 in one state - so it makes sense that the current study contains less underwritten business.

Much of the longer-term single-premium coverages that insured real-estate secured loans have all but run out, having been replaced by closed-end monthly premium plans. Monthly premium plans are not included in any of the three studies.

It would be instructive to separate the business by source of production (e.g. bank, credit union, etc.). However, the confidentiality of the data would be difficult to protect, especially in business segments that are dominated by a few major writers. The data request included a field for source of business, but most multi-source writers do not separate their business by producer type, so this field was frequently left blank or "unknown."

Section 7: Members of the Credit Insurance Experience Committee

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Appendix A: 2017 Mortality Study Participating Companies

	Company Name	Company Group
1	Company/Block 1	Assurant
2	Company/Block 2	
3	Company/Block 1	American National
4	Company/Block 1	Central States
5	Company/Block 1	CMFG
6	Company/Block 1	Fortegra Financial
7	Company/Block 2	
8	Company/Block 3	
9	Company/Block 4	
10	Company/Block 5	
11	Company/Block 6	
12	Company/Block 7	
13	Company/Block 8	
14	Company/Block 9	
15	Company/Block 1	One Main
16	Company/Block 2	
17	Company/Block 3	
18	Company/Block 4	
19	Company/Block 5	
20	Company/Block 1	Plateau
21	Company/Block 2	
22	Company/Block 3	
23	Company/Block 1	Securian
24	Company/Block 2	

Appendix B: Karup-King Four-Point Interpolation Formula

The Karup-King formula was applied as follows:

Each quinquennial age ending in 2 or 7 was set equal to the average of the surrounding five ages and treated as successive values of F(x). These central ages were interpolated to intervening individual ages using the formula below:

Default Ages – Chart 1

A graphical example of one of the companies' data appears below. The default ages are apparent by the "spike" shown at ages 41 and 42. A new line was drawn that was equal to the original line at all points, except these default points, and the Karup-King line at these points.

Extreme Age-To-Age Fluctuations – Chart 2

A graphical example of one of the companies' data appears below. The data fluctuations are apparent by the multiple spikes shown between the ages of 42 through 61. A new line was drawn that was equal to the original line at all points, except these default points, and the Karup-King line at these points.

Karup-King Formula

$$F(x+s) = s * F(x+1) - (1/2) * (s \wedge 2) * (1-s) * (2CD) F(x+1)$$

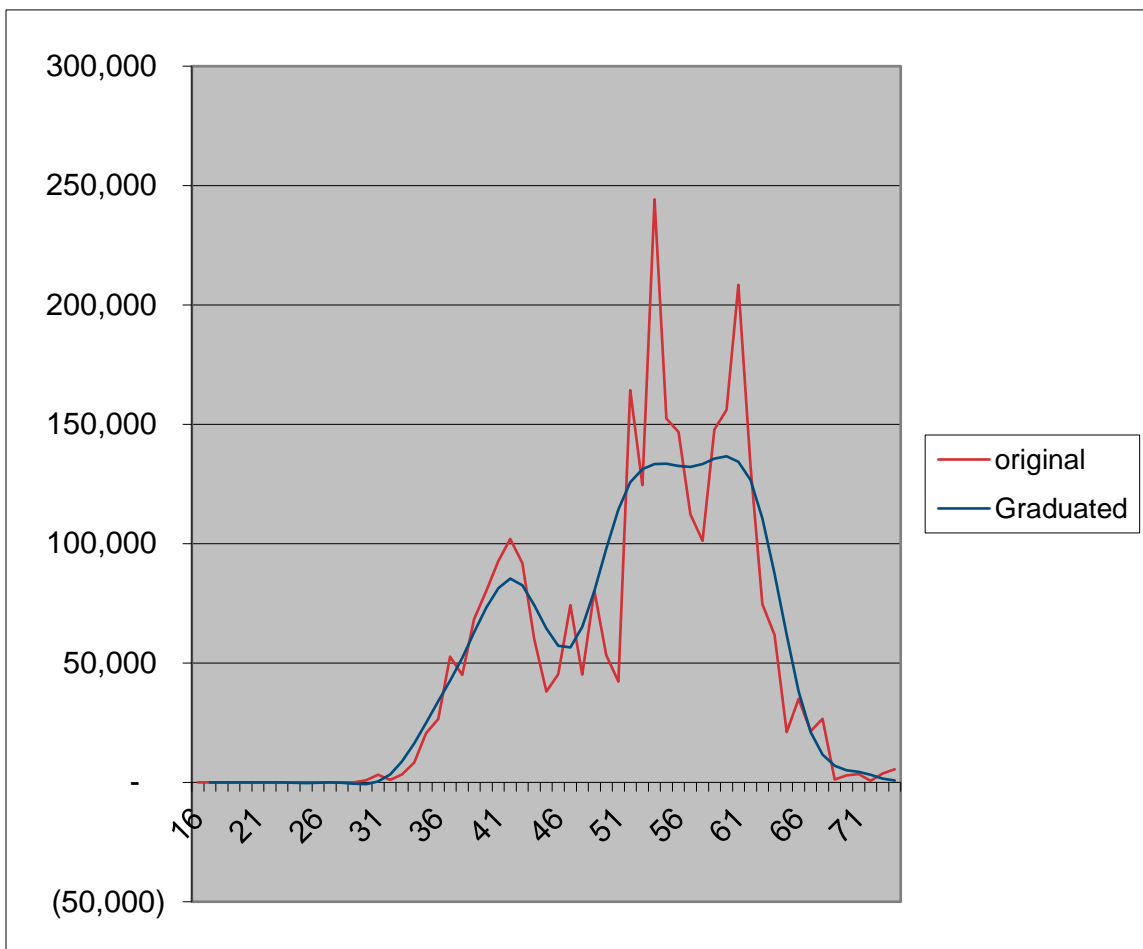$$+ (1-s) F(x) - (1/2) * ((1-s) \wedge 2) * (s) * (2CD) F(x)$$

$$\text{Where: } (2CD) x = (x+1) - 2 * (x) + (x-1)$$

In Lagrange Form:
$$F(x+s) = F(x-1) * (-s^3/2 + s^2 - s/2)$$
$$+ F(x) * (1.5s^3 - 2.5s^2 + 1)$$
$$+ F(x+1) * (-1.5s^3 + 2s^2 + s/2)$$
$$+ F(x+2) * (.5s^3 - .5s^2)$$

Chart 1
DEFAULT AGES
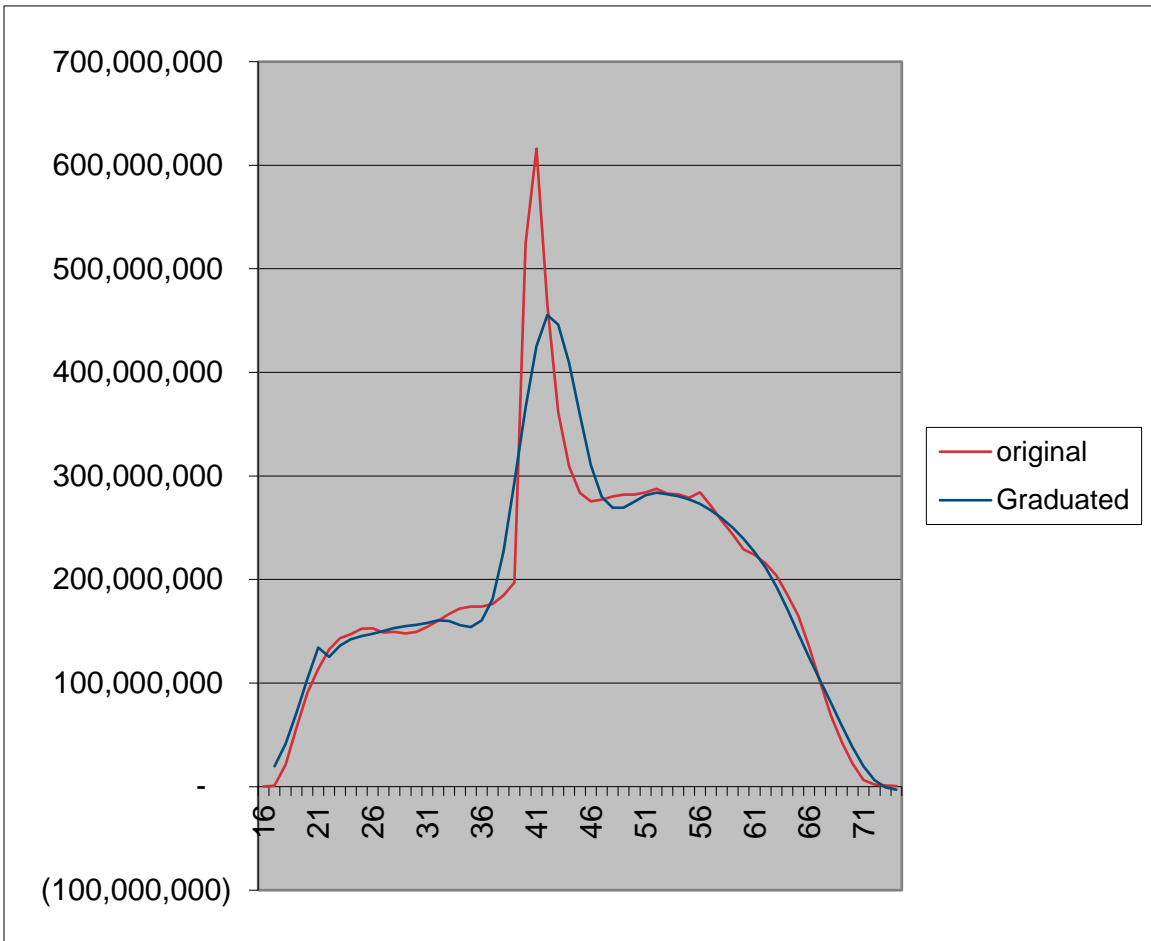
Chart 2
EXTREME AGE-TO-AGE FLUCTUATION

Appendix C

Appendix C

Table 1 by Amount

Age Range	Central Age	Grouped Exposures	Grouped Claims	Mortality Rate	Expected Mortality Rate	Expected Claims	Actual to Expected
		All Cos Grouped Exposures			[2001 CSO]	(GE+GC/2)x EMR	(GC / EC)
16 - 24	22	4,942,251,532	3,959,008	0.801	0.970	4,795,904	82.55%
25 - 29	27	8,028,241,325	5,686,267	0.708	1.142	9,171,498	62.00%
30 - 34	32	10,317,541,184	8,362,107	0.810	1.152	11,890,624	70.33%
35 - 39	37	11,685,562,976	12,526,983	1.072	1.404	16,415,324	76.31%
40 - 44	42	14,602,485,748	20,904,005	1.432	2.086	30,482,588	68.58%
45 - 49	47	16,759,120,253	37,240,203	2.222	3.222	54,057,879	68.89%
50 - 54	52	18,158,788,298	67,293,923	3.706	4.782	86,996,225	77.35%
55 - 59	57	17,898,794,460	105,147,876	5.875	7.956	142,821,087	73.62%
60 - 64	62	16,047,303,686	142,933,641	8.907	13.096	211,091,419	67.71%
65 - 69	67	7,804,223,349	108,834,741	13.946	21.062	165,518,691	65.75%
70 - 74	72	987,267,865	21,722,687	22.003	33.174	33,111,938	65.60%
	Total	127,231,580,677	534,611,442	4.202	6.023	766,353,179	69.76%

Table 2 by Number

Age Range	Central Age	Grouped Exposures	Grouped Claims	Mortality Rate	Expected Mortality Rate	Expected Claims	Actual to Expected
		All Cos Grouped Exposures			[2001 CSO]	(GE+GC/2)x EMR	(GC / EC)
16 - 24	22	1,469,587	988	0.673	0.970	1,426	69.31%
25 - 29	27	2,070,082	1,410	0.681	1.142	2,365	59.64%
30 - 34	32	2,513,970	2,240	0.891	1.152	2,897	77.31%
35 - 39	37	2,711,181	3,235	1.193	1.404	3,809	84.94%
40 - 44	42	3,168,136	5,297	1.672	2.086	6,614	80.08%
45 - 49	47	3,472,890	9,529	2.744	3.222	11,205	85.05%
50 - 54	52	3,594,456	16,304	4.536	4.782	17,228	94.64%
55 - 59	57	3,390,737	24,147	7.121	7.956	27,073	89.19%
60 - 64	62	2,919,886	31,072	10.642	13.096	38,442	80.83%
65 - 69	67	1,626,445	25,360	15.593	21.062	34,523	73.46%
70 - 74	72	283,992	6,212	21.872	33.174	9,524	65.22%
	Total	27,221,364	125,795	4.621	5.698	155,106	81.10%

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Actual Mortality Rates per $1,000 by Company

Company A By Amount Age	Mortality Rate Per 1000	Company B By Amount Age	Mortality Rate Per 1000	Company C By Amount Age	Mortality Rate Per 1000	Company D By Amount Age	Mortality Rate Per 1000	Company E By Amount Age	Mortality Rate Per 1000	Company F By Amount Age	Mortality Rate Per 1000
22	0.66	22	0.83	22	0.29	22	0.73	22	0.76	22	0.00
27	0.72	27	0.73	27	0.22	27	1.00	27	1.19	27	0.00
32	0.72	32	0.56	32	0.51	32	1.26	32	1.36	32	0.00
37	1.19	37	0.80	37	0.47	37	1.35	37	0.95	37	0.00
42	1.53	42	0.82	42	1.13	42	1.48	42	1.95	42	0.00
47	2.81	47	1.51	47	1.50	47	2.69	47	1.76	47	0.00
52	4.37	52	2.39	52	2.47	52	4.61	52	3.02	52	0.00
57	7.37	57	4.72	57	4.12	57	6.65	57	5.75	57	0.00
62	10.73	62	6.51	62	5.20	62	11.32	62	7.04	62	0.00
67	18.83	67	10.06	67	9.83	67	15.80	67	10.15	67	0.00
72	25.25	72	16.65	72	8.26	72	20.94	72	8.73	72	0.00

By Number Age	Mortality Rate Per 1000	By Number Age	Mortality Rate Per 1000	By Number Age	Mortality Rate Per 1000	By Number Age	Mortality Rate Per 1000	By Number Age	Mortality Rate Per 1000	By Number Age	Mortality Rate Per 1000
22	0.59	22	0.58	22	0.40	22	0.54	22	0.92	22	0.00
27	0.66	27	0.61	27	0.31	27	1.01	27	0.84	27	0.00
32	0.85	32	0.57	32	0.48	32	1.18	32	1.43	32	0.00
37	1.19	37	0.96	37	0.58	37	1.88	37	1.00	37	0.00
42	1.72	42	1.02	42	1.16	42	1.99	42	1.43	42	0.00
47	3.02	47	1.76	47	1.46	47	3.65	47	2.23	47	0.00
52	5.05	52	2.70	52	3.16	52	5.90	52	3.86	52	0.00
57	8.09	57	4.73	57	4.80	57	8.98	57	6.44	57	0.00
62	11.60	62	7.11	62	6.44	62	12.70	62	8.22	62	0.00
67	17.07	67	10.45	67	10.47	67	17.41	67	12.42	67	0.00
72	23.01	72	15.40	72	11.15	72	21.77	72	11.42	72	0.00

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Actual Mortality Rates per $1,000 by Company

By Amount

Company G		Company H		Company I		Company J		Company K		Company L	
Age	Mortality Rate Per 1000	Age	Mortality Rate Per 1000	Age	Mortality Rate Per 1000	Age	Mortality Rate Per 1000	Age	Mortality Rate Per 1000	Age	Mortality Rate Per 1000
22	0.78	22	0.80	22	0.00	22	0.59	22	0.00	22	0.54
27	1.11	27	0.69	27	0.00	27	0.45	27	0.00	27	0.16
32	0.97	32	0.80	32	0.00	32	1.11	32	2.00	32	0.38
37	1.29	37	1.15	37	0.00	37	1.23	37	2.46	37	0.47
42	0.57	42	1.52	42	0.00	42	1.76	42	7.08	42	0.70
47	3.21	47	2.37	47	0.00	47	3.76	47	1.18	47	1.36
52	3.52	52	4.26	52	0.00	52	5.80	52	5.88	52	1.47
57	6.00	57	7.11	57	0.00	57	8.89	57	12.49	57	2.45
62	8.23	62	10.90	62	0.00	62	11.80	62	18.16	62	4.08
67	15.27	67	15.58	67	0.00	67	21.91	67	17.50	67	5.58
72	0.00	72	20.09	72	0.00	72	32.50	72	26.52	72	9.80

By Number

Company G		Company H		Company I		Company J		Company K		Company L	
Age	Mortality Rate Per 1000	Age	Mortality Rate Per 1000	Age	Mortality Rate Per 1000	Age	Mortality Rate Per 1000	Age	Mortality Rate Per 1000	Age	Mortality Rate Per 1000
22	0.68	22	0.73	22	0.00	22	0.71	22	0.00	22	0.87
27	0.73	27	0.73	27	0.00	27	0.78	27	0.00	27	0.29
32	1.39	32	1.05	32	0.00	32	1.42	32	1.46	32	0.82
37	1.64	37	1.44	37	0.00	37	1.70	37	1.82	37	0.41
42	1.00	42	2.02	42	0.00	42	2.59	42	5.31	42	0.58
47	2.65	47	3.41	47	0.00	47	4.83	47	2.27	47	1.25
52	5.19	52	5.63	52	0.00	52	7.23	52	4.48	52	1.66
57	6.05	57	8.92	57	0.00	57	10.87	57	6.47	57	2.93
62	14.96	62	12.93	62	0.00	62	15.41	62	12.26	62	4.91
67	21.59	67	18.23	67	0.00	67	23.98	67	15.78	67	6.28
72	0.00	72	22.85	72	0.00	72	28.55	72	27.39	72	9.97

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Actual Mortality Rates per $1,000 by Company

By Amount

	Company M	Company N	Company O	Company P	Company Q	Company R
Age	Mortality Rate Per 1000	Mortality Rate Per 1000	Mortality Rate Per 1000	Mortality Rate Per 1000	Mortality Rate Per 1000	Mortality Rate Per 1000
22	0.95	0.61	1.21	0.73	0.61	1.09
27	0.89	0.92	1.02	0.52	0.50	0.82
32	1.05	1.20	1.00	0.57	0.65	1.02
37	1.24	1.02	1.60	0.79	0.86	1.32
42	1.76	1.62	1.74	1.00	1.27	1.73
47	2.82	2.59	2.35	1.56	1.94	2.58
52	5.16	4.31	4.33	2.16	3.51	4.25
57	7.43	6.45	6.25	3.34	5.35	7.45
62	8.71	8.73	8.62	4.69	8.93	12.54
67	13.05	12.47	11.98	7.29	15.80	19.21
72	10.09	20.01	18.66	6.78	23.96	30.73

By Number

	Company M	Company N	Company O	Company P	Company Q	Company R
Age	Mortality Rate Per 1000	Mortality Rate Per 1000	Mortality Rate Per 1000	Mortality Rate	Mortality Rate	Mortality Rate
22	1.14	0.73	1.03	0.50	0.55	0.97
27	1.00	0.76	0.90	0.54	0.47	0.76
32	0.92	1.13	0.82	0.58	0.69	0.94
37	1.93	1.17	1.37	0.86	0.87	1.26
42	2.15	1.92	1.56	1.27	1.32	1.74
47	3.31	3.18	2.23	2.05	2.03	2.64
52	6.11	5.36	3.89	3.18	3.76	4.41
57	8.03	7.81	5.67	4.70	5.99	7.60
62	12.88	11.21	8.56	6.73	9.92	12.63
67	15.37	15.39	12.03	9.51	16.45	19.38
72	15.09	21.06	17.57	8.22	23.66	30.57

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Actual Mortality Rates per $1,000 by Company

Company S By Amount		Company T By Amount		Company U By Amount		Company V By Amount		Company W By Amount		Company X By Amount	
Age	Mortality Rate Per 1000	Age	Mortality Rate Per 1000	Age	Mortality Rate Per 1000	Age	Mortality Rate Per 1000	Age	Mortality Rate Per 1000	Age	Mortality Rate Per 1000
22	0.00	22	0.00	22	0.00	22	0.73	22	0.00	22	0.36
27	0.75	27	0.33	27	0.00	27	0.71	27	0.00	27	0.39
32	0.00	32	0.99	32	0.00	32	0.88	32	0.00	32	0.83
37	0.19	37	0.84	37	0.00	37	1.04	37	2.14	37	0.28
42	0.19	42	0.79	42	0.00	42	1.26	42	2.80	42	1.46
47	2.23	47	1.14	47	0.00	47	2.26	47	0.50	47	2.02
52	1.82	52	3.13	52	0.00	52	3.55	52	1.50	52	2.93
57	4.81	57	4.85	57	4.92	57	5.77	57	5.31	57	4.45
62	7.41	62	9.15	62	8.14	62	9.01	62	12.24	62	7.11
67	14.36	67	16.63	67	12.75	67	14.11	67	15.81	67	14.04
72	0.00	72	0.00	72	0.00	72	14.29	72	0.00	72	17.08

Company S By Number		Company T By Number		Company U By Number		Company V By Number		Company W By Number		Company X By Number	
Age	Mortality Rate	Age	Mortality Rate	Age	Mortality Rate	Age	Mortality Rate	Age	Mortality Rate	Age	Mortality Rate
22	0.00	22	0.00	22	0.00	22	0.64	22	0.00	22	0.49
27	0.62	27	0.86	27	0.00	27	0.66	27	0.00	27	0.38
32	0.00	32	1.08	32	0.00	32	0.88	32	0.00	32	0.74
37	0.36	37	0.88	37	0.00	37	1.10	37	0.65	37	0.43
42	0.50	42	0.81	42	0.00	42	1.38	42	0.52	42	1.12
47	1.83	47	1.73	47	0.00	47	2.32	47	1.28	47	1.65
52	2.18	52	3.32	52	0.00	52	4.10	52	1.90	52	2.66
57	5.25	57	5.47	57	5.97	57	6.60	57	4.13	57	4.39
62	7.78	62	9.62	62	11.90	62	10.53	62	8.88	62	6.59
67	15.34	67	16.32	67	12.35	67	16.45	67	10.56	67	11.17
72	0.00	72	0.00	72	0.00	72	11.20	72	0.00	72	16.62

Appendix E – Table 1

2018 Mortality Study - Summary Results By Company

Company	% Of Tot	Exposure Amts	Actual Claim Amts	Expected Claim Amts	Actual / Expected
		BY AMOUNT - RANKED BY MORTALITY RATIO			
I	0.0%	405,238	-	2,563	0.00%
F	0.0%	989,173	-	7,177	0.00%
L	1.0%	1,249,804,403	2,447,124	7,930,780	30.86%
P	11.3%	14,424,006,652	30,818,934	75,819,135	40.65%
U	0.0%	3,911,440	8,639	21,243	40.67%
C	1.2%	1,537,388,653	4,568,949	10,176,872	44.90%
B	3.8%	4,860,168,517	18,433,099	36,636,059	50.31%
S	0.2%	214,312,370	807,724	1,452,948	55.59%
X	2.3%	2,874,443,363	10,461,383	17,983,028	58.17%
E	0.9%	1,181,222,595	3,572,905	5,735,446	62.30%
T	0.3%	330,426,909	1,411,618	2,176,021	64.87%
W	0.0%	53,481,258	191,876	284,805	67.37%
Q	20.9%	26,642,974,435	123,631,148	180,063,699	68.66%
V	4.8%	6,135,634,153	20,934,550	30,154,480	69.42%
O	12.9%	16,373,054,483	77,859,801	112,100,030	69.46%
G	0.2%	216,429,195	914,463	1,294,988	70.62%
N	4.1%	5,256,262,641	19,953,578	27,145,909	73.50%
H	11.4%	14,505,675,118	67,473,268	85,477,293	78.94%
M	1.8%	2,249,057,273	9,681,431	12,255,990	78.99%
D	1.4%	1,756,721,202	8,065,706	9,715,252	83.02%
A	9.9%	12,541,882,654	51,850,639	61,159,180	84.78%
R	10.5%	13,333,478,986	73,790,380	81,169,334	90.91%
J	1.1%	1,462,685,909	7,582,894	7,473,124	101.47%
K	0.0%	27,164,056	151,329	117,821	128.44%
Summary	100.0%	127,231,580,677	534,611,442	766,353,179	69.76%

Appendix E – Table 2

2018 Mortality Study - Summary Results By Company

Company	% Of Tot	Exposure #	Actual Claim #	Expected Claim #	Actual / Expected
		BY NUMBER - RANKED BY EXPOSURE			
H	20.7%	5,642,850	31,348	32,479	96.52%
A	16.9%	4,604,063	20,236	22,885	88.43%
Q	11.9%	3,228,585	16,119	21,798	73.95%
P	10.8%	2,926,939	8,093	15,108	53.57%
R	10.4%	2,840,848	15,478	16,875	91.72%
V	4.9%	1,344,404	4,962	6,362	77.99%
N	4.9%	1,337,183	6,252	7,127	87.72%
O	4.8%	1,317,408	5,866	8,927	65.71%
B	3.6%	991,229	3,881	7,351	52.79%
D	2.7%	740,046	3,927	4,024	97.60%
J	2.3%	620,905	3,804	3,084	123.35%
E	1.6%	440,038	1,589	2,289	69.41%
X	1.6%	436,252	1,345	2,581	52.11%
M	1.0%	277,968	1,367	1,401	97.61%
C	0.8%	220,617	681	1,331	51.15%
L	0.3%	93,407	200	560	35.72%
T	0.2%	56,753	246	354	69.48%
S	0.1%	38,672	154	260	59.27%
G	0.1%	32,092	144	152	94.59%
W	0.1%	16,133	43	86	49.93%
K	0.0%	12,407	54	57	94.20%
U	0.0%	2,143	6	12	51.27%
I	0.0%	317	-	2	0.00%
F	0.0%	105	-	1	0.00%
Summary	100.0%	27,221,364	125,795	155,106	81.10%

Appendix F – Data Collection Letter and Record Layout

SOCIETY OF ACTUARIES

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SOA.ORG

Date: August 2, 2017

From: Credit Insurance Experience Committee
Christopher H. Hause, FSA, MAAA, Committee Chairman

cc: Cynthia MacDonald
Senior Experience Studies Actuary, SOA

Re: 2011-15 Credit Life Mortality Study

In response to the Principles-Based Reserves regulation, it is important that the credit insurance industry collect and maintain current mortality experience for reserving, pricing and experience analysis. To that end, we have been tasked to calculate updated Actual-to-Expected Claim Costs using recent Credit Life Insurance Industry loss experience and the 2001 CSO Male Composite Ultimate Table for Actual and Expected Claim Costs, respectively. We are asking for your participation by submitting experience for direct written Single Premium Credit Life Insurance in force during 2011 through 2015. The specifications for the data call are attached. Please note that we need an extract from your certificate file for every certificate that was in force at some point during 2011 through 2015. This will include all certificates issued prior to 2011, still active on January 1, 2011, as well as all certificates issued during 2011 through 2015. We will also need an extract from your claim file for all deaths incurred for these certificates.

Hause Actuarial Solutions, Inc. has contracted to perform the data collection and can be contacted if you have any questions. They have agreed that this data will only be used for the purpose of this study, and that the identity of the company will not be associated with its experience after it has been collected, thereby preserving confidentiality.

In order to be included in the study the data must be received by November 30, 2017.

This data request is limited to Single Premium Credit Life Insurance, but we also want to determine the amount of detail data Companies have on Closed-End Monthly Outstanding Balance (CE MOB) and/or Open-End MOB (OE MOB) Credit Life Insurance so that we can decide whether or not we could perform a similar study on MOB business in the next year or two. As a result, we have posed a few questions in Appendix A of the Data Request regarding your Company's availability of detail data on CE MOB and OE MOB Credit Life Insurance.

If you are not the appropriate person to receive this data call, we ask that you forward it to the responsible party. We encourage you to participate in this study to allow for the validation of the continued use of the 2001 CSO mortality valuation standard for Credit Life Insurance. The Credit Insurance Experience Committee thanks you in advance for your participation.

Credit Mortality Data Request
In force and Terminated Business
Claim Data

Company Name _____

Company's 2016 Credit Life Single Premium Direct Writings _____

Percentage of Direct Business for Which Data is Provided _____

Contact: Name: _____
                  Address: _____
                                _____
                  Phone: _____
                  Fax: _____

Questions can be directed to:

                        Christopher Hause, FSA, MAAA
                        Hause Actuarial Solutions, Inc.
                        Phone (913) 685-2200
                        Fax (913) 685-2205
                        E-Mail: chrish@hauseactuarial.com

MOB Data

Does your Company write any **CE MOB** Credit Life Business? _____
If yes, what is the estimated annual premium production? _____
If yes, what percentage of the total **CE MOB** block is processed using detail data (as opposed to batch or bulk processing)? _____

Does your Company write any **OE MOB** Credit Life Business? _____
If yes, what is the estimated annual premium production? _____
If yes, what percentage of the total **OE MOB** block is processed using detail data (as opposed to batch or bulk processing)? _____

In force File Description

The in force file should contain all certificates that were in force at any time during the study period. Policies not in force at the end of the study period should be included. We will calculate exposures for each certificate, based on the type of coverage and face amount at the beginning and end of each month the certificate was in force. We must have a valid issue age or date of birth so that exposures can be properly allocated to the correct attained age.

The data should be in ASCII text, comma delimited format. If dollars and cents are represented, the decimal point must be inserted in the field where appropriate. Date formats should be delimited by forward slashes.

In force File

#	Name of Field	Field Type	Field Options or Description	Default/Not Available Value
1	Issuing Company Name	Alphanumeric	Full Name of Direct Carrier	NA
2	Group Policy Number	Alphanumeric	Identifier for Group	NA
3	Individual Certificate Number	Alphanumeric	Unique Certificate Number within the Group	NA
4	Primary Insured Date of Birth	Date (MM/DD/CCYY)	Either this field or the following must be supplied, or exposure will not be recorded.	Blank
5	Primary Insured Age Last Birthday at Issue	Numeric	Either this field or the previous must be supplied, or exposure will not be recorded. Will override date field.	99
6	Primary Insured Gender	Alpha	M = Male\nF = Female\nU = Unknown	U
7	Secondary Insured Date of Birth	Date (MM/DD/CCYY)	Either this field or the following must be supplied, or exposure will not be recorded.	Blank
8	Secondary Insured Age Last Birthday at Issue	Numeric	Either this field or the previous must be supplied, or exposure will not be recorded. Will override date field.	Primary Insured Age
9	Secondary Insured Gender	Alpha	M = Male\nF = Female\nU = Unknown	U
10	Coverage Type	Alpha	GD = Gross Decreasing\nND = Net Decreasing\nGL = Level\nTN = Truncated Net\nO = Other, (please explain in transmittal)	GD
11	Single/Joint Indicator	Alpha	S = Single\nJ = Joint	S
12	Effective Date	Date (MM/DD/CCYY)	Required field	01/01/2000
13	Term of Coverage in Months	Numeric	Required field	0
14	Initial Face Amount	Numeric	Required field	0
15	Face Amount Limitation Indicator	Alpha	M = Max. Exposure\nR = Ratio to Loan\nN = Not Used	N
16	Face Amount Limitation	Numeric	Maximum face Amount	0
17	Principal Amount of Loan	Numeric	Includes financed credit premiums	0
18	Gross Loan Amount	Numeric	Total of Payments	0
19	Term of Loan in Months	Numeric	Used for truncated coverage. We will use coverage term if 0.	0
20	APR of Loan	Numeric	Used for Net Pay coverage. Default will be 10%, if 0 is entered.	10
21	Cancellation Date	Date (MM/DD/CCYY)	Date of cancellation, blank if still in force.	Blank
22	Reason for Cancellation	Alpha	D = Death\nE = Expiration of Term\nO = Other	O
23	Underwritten Indicator	Alpha	N = Not Underwritten\nU = Underwritten	N
24	Type of Lender	Alpha	A = Auto Dealer\nB = Bank\nC = Credit Union\nD = Other Dealer\nF = Finance Company\nO = Other not Specified\nU = Unknown	U
25	State of Issue	Alpha	Two Letter Postal Abbreviation	NA

Claim File Description

The data should be in ASCII text, comma delimited format. If dollars and cents are represented, the decimal point must be inserted in the field where appropriate. Date formats should be delimited by forward slashes. We must have at least one valid age or date of birth, so claims can be properly allocated to the correct attained age.

#	Name of Field	Field Type	Field Options or Description	Default/Not Available Value
1	Issuing Company Name	Alphanumeric	Full Name of Direct Carrier	NA
2	Group Policy Number	Alphanumeric	Identifier for Group	NA
3	Individual Certificate Number	Alphanumeric	Unique Certificate Number within the Group	NA
4	Claim Number	Alphanumeric	Unique Claim Number	NA
5	Primary Insured Date of Birth	Date (MM/DD/CCYY)	Either this field or the following must be supplied, or claim will not be recorded.	Blank
6	Primary Insured Age Last Birthday at Death	Numeric	Either this field or the previous must be supplied, or claim will not be recorded. Will override date field.	99
7	Primary Insured Gender	Alpha	M = Male F = Female U = Unknown	U
8	Claimant Date of Birth	Date (MM/DD/CCYY)	Either this field or the following must be supplied, or Primary Insured date will be used.	Blank
9	Claimant Age Last Birthday at Death	Numeric	Either this field or the previous must be supplied, or Primary Insured age at Death will be used. Will override corresponding date field.	Primary Insured Age
10	Claimant Gender	Alpha	M = Male F = Female U = Unknown	U
11	Coverage Type	Alpha	GD = Gross Decreasing ND = Net Decreasing GL = Level TN = Truncated Net O = Other, (please explain in transmittal)	GD
12	Single/Joint Indicator	Alpha	S = Single J = Joint	S
13	Date of Death	Date (MM/DD/CCYY)	Required field	01/01/2000
14	Claim Amount	Numeric	Required field	0
15	Underwritten Indicator	Alpha	N = Not Underwritten U = Underwritten	N
16	Type of Lender	Alpha	A = Auto Dealer B = Bank C = Credit Union D = Other Dealer F = Finance Company O = Other not Specified U = Unknown	U
17	State of Issue	Alpha	Two Letter Postal Abbreviation	NA

Appendix G – Data Collection and Processing Documentation

Collection of Data
Data was collected in the form of text files, in the format in which it was received. It was converted to a standard format, then imported into an Access database. Where necessary, some files were combined, split, converted, or ignored completely. Record counts were verified against the original data.

Processing of Exposures & Claims - The participating companies submitted Inforce and Claim files. The data processed was either grouped together or split per the companies' request.

Data Collection and Processing Methods
The program used was a Visual Basic .NET application that extracted and stored the data in an Access Database, which included six tables.

The total number of Claims records and total number of Inforce records used for input for each company were recorded and stored on a spreadsheet. The total number of Claims and total number of Inforce records used for input were then compared to the total number of Claims and total number of Inforce records that were processed, insuring that all records were accounted for.

There are 25 fields in the Inforce File and 17 fields in the Claim File. If a required field in a record is not filled out, the record is written out to a bad record file. The process stopped if the number of bad records for either the Inforce file or the Claim file exceeded 1,000. The client was contacted and sent the bad records, so they could supply the missing information. After the client supplied the missing data, the entire process was rerun until all bad records were eliminated. If a record did not affect the study, such as in a case where the claim amount was zero, the record was ignored. A default value was used for fields that were blank but not required.

The six tables and their purpose are shown below:
1) Claim file table - used for importing the claims records.
2) Claim file bad record table - used for storing records that did not have all of the required fields. The records were reviewed once the program completed. The client was contacted if a bad record affected the results of the study.
3) Claim Summary - A summary of all of the claims records processed. This data was imported into an excel spreadsheet for further calculations.
4) Inforce file table - used for importing the inforce records.
5) Inforce file bad record table - used for storing records that did not have all of the required fields. The records were reviewed once the program completed. The client was contacted if a bad record affected the results of the study.

6) Inforce Summary - A summary of all of the inforce records processed. This data was imported into an excel spreadsheet for further calculations.

Formulas Used

The formulas were based on the required fields in the Claims and Inforce tables. The listings below show all of the fields for both the Claims and Inforce tables. If the field is required, the appropriate action is listed next to the field description if the field was left blank on a given record:

Claim File Fields and Criteria

1) Claim Company - Default is "NA"
2) Claim Group Policy Number - Default is "NA"
3) Claim Individual Certificate Number - Default is "NA"
4) Claim Number - Default is "NA"
5) Claim Primary Insured's Date of Birth - If blank, use Primary Insured's Age
6) Claim Primary Insured's Age - If blank, calculate from Primary Insured's Date of Birth
7) Claim Primary Insured's Gender - Default is "U"
8) Claim Insured's Date of Birth - If blank, use Claim Insured's Age
9) Claim Insured's Last Birthday - If blank, calculate from Claim Insured's Date of Birth
     If both Claim Primary Insured's Date of Birth and Claim Primary Insured's Age are blank,
     use Claim Insured's Age or calculate the age from Claim Insured's Date of Birth. If all
     fields are blank, write out a bad record
10) Claim Insured's Gender - If blank, default is "U"
11) Claim Coverage Type - If blank, write out a bad record
12) Claim Single/Joint Indicator - If blank, default is "S"
13) Claim Date of Death - If blank, write out a bad record
14) Claim - If blank, default is 0
15) Claim Underwritten Indicator - If blank, default is "N"
16) Claim Type of Lender - If blank, default is "U"
17) Claim State - If blank, default is "NA"

Inforce File Fields and Criteria

1) Company - Default is "NA"
2) Group Policy Number - Default is "NA"
3) Individual Certificate Number - Default "NA"
4) Primary Insured's Date of birth - If blank, use Primary Insured's Last Birthday
5) Primary Insured's Last Birthday - If blank, calculate from Primary Insured's Date of Birth
     If both Primary Insured's Date of Birth and Primary Insured's Last Birthday are blank,
     write out a bad record
6) Primary Insured's Gender - If blank, default is "U"
7) Insured's Date of birth - If blank, use Secondary Insured's Last Birthday
8) Sec Insured's Last Birthday - If blank, calculate from Secondary Insured's Date of Birth
     If both Secondary Insured's Date of Birth and Secondary Insured's Last Birthday are blank,
     write out a bad record.
9) Secondary Insured's Gender - If blank, default is "U"
10) Coverage Type - If blank, write a bad record. Required field.
11) Single/Joint Indicator - If blank, default is "S"
12) Effective Date - If blank, write a bad record. Required field.
13) Term Coverage in Months - If blank or zero, write a bad record. Required field.
14) Initial Face - If blank or zero, write a bad record. Required field.
15) Face Amount Limitation Indicator - If blank, default is "N"

16) Face Amount Limitation - If blank, default is 0
17) Principal Amount of Loan - If blank, default is 0
18) Gross Loan Amount - If blank, default is 0
19) Term of Loan in Months - If blank, default to 0 and write a bad record. Required field.
20) APR of Loan - Used for Net Pay Calculations. If blank, default is 10%
     If APR of Loan = 0 set APR of Loan to 10% as default value
     If APR of Loan > 1 then APR of Loan = APR of Loan / 100 to convert whole numbers to decimals
21) Cancellation Date - If blank, default is 0
22) Reason for Cancellation - If blank, default is "O"
23) Underwritten Indicator - If blank, default is "N"
24) Type of Lender - If blank, default is "U"
25) State - If blank, default is "NA"

Calculation of Exposures

The formulas for the current months' exposure for the various coverage types are listed here. The exposure was measured at the beginning and end of each calendar month that the insurance was inforce at 1/24 of the face amount inforce as of that date. The face amount at any date was subject to the maximum exposure indicated by the company.

Gross Decreasing Term Coverage

Initial Face Amount * (1 – (Elapsed Months/Term of Coverage))

Level Term Coverage

Initial Face Amount

Net Payoff

Initial Face Amount * a(Term of Coverage – Elapsed Months) / a(Term of Coverage)
Where a() is an annuity immediate factor at the Annual Percentage Rate of the underlying loan

Truncated Net Payoff

Initial Face Amount * a(Term of Loan – Elapsed Months) / a(Term of Loan)
Where a() is an annuity immediate factor at the Annual Percentage Rate of the underlying loan

The total exposure by amount and by number was accumulated for each type of coverage. If the policy indicated joint coverage, the exposure routine was run again on the second insured. For any information missing from the second insured information, the first insured information was used.

The start date is 1/1/2011. The end date is 12/31/2015.

Loop through the dates, 1/1/2011, 1/31/2011, 2/1/2011 all the way until 12/31/2015.

While the Evaluation Date is less than or equal to the End Date, do the following:

    First check to see if the certificate has been issued. If Effective Date is less than or equal to Evaluation Date, go to the next date, if this is the last date, go to next certificate.

    If the evaluation date is after the termination date, end this certificate and go to next certificate.

    Calculate the exposure and calculate the age last birthday for the exposure if the certificate is included in the study.

    If the Primary Insured's Last Birthday is not given, calculate the Primary Insured's Last Birthday from the date of birth.

    Set the calculated Primary Insured's Last Birthday to the Attained Age.

    If the Primary Insured's Last Birthday is less than 0, set the Primary Insured's Last Birthday equal to 0.

    Get the Attained Age by adding the Primary Insured's Last Birthday to the number of whole years that have elapsed from the Effective Date to the Evaluation Date.

    If the Attained Age is greater than 100, set the Attained Age equal to 100.

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