Mortality Study

Canadian Standard Ordinary Life Experience 2015–2016 Using 86–92 and 97-04 Tables

Research Council – Experience Research Committee

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Mortality under Canadian Standard Ordinary Insurance Issues Studied Between the 2015 and 2016 Policy Anniversaries Using the CIA 97-04 and CIA 86-92 Tables

Executive Summary

This is the 67th annual report of the intercompany mortality experience for Canadian standard ordinary life insurance policies. The study covers the one year period between policy anniversaries in 2015 and 2016 on an age-nearest-birthday basis. The study has been approved by the CIA Research Executive Committee.

This report presents the high level findings of the 2015–2016 mortality study based on the CIA 86-92 and CIA 97-04 expected bases. The tables listed below are appended in Excel format and provide additional details of the study results. There are indices at the top of each file with links to the individual tables. Note that the table numbers do not match previous years for tables A3, A4, and A5. These were numbered 8, 9, and 10 in previous reports.

TABLE INDICES FOR 2015–2016 STUDY RESULTS	
Table A1	Total experience by groups of durations and ages, select and ultimate
Table A2	Table 1 further classified by gender
Table A3	Total experience by smoking status, gender, and face amount band
Table A4	Total experience by plan of insurance
Table A5	Total experience by smoking status, gender, band and preferred status
	Tables A1, A2, A3 based on 5-year aggregate data (policy years 2011–2012 through 2015–2016)
	Tables A1, A2, A3 by face amount band

In addition, the data are available in a [comma-delimited text file](#) that can be downloaded from the CIA website. Note that this file is for the one-year study period 2015–2016. A description of the fields is included in the appendix to this report.

Previous-year data files are also available on the CIA website in the same format. The user may combine the 2015–2016 data with data files from previous study years to generate a multi-year study.

This year, we combined the CIA 86-92 and CIA 97-04 reports into one, since much of the commentary is the same.

1. Methodology

Data are collected in a seriatim format. Exposures are calculated using the actuarial exposure method, in which a full year of exposure is credited in the year of death. For attained ages less than 16, the expected mortality rates are based on the aggregate CIA tables. For data submitted without classification by gender, the male table is used. For data submitted without classification by smoker status, the aggregate table is used.

The CIA 97-04 and CIA 86–92 tables do not contain mortality rates for issue ages above 80. For the purposes of this study, we have set the expected mortality at these ages to the rate for the previous issue age, shifted by one duration. For example, the expected mortality rate for issue age 81 at duration 1 is set equal to the mortality rate for issue age 80 at duration 2.

The following data were excluded from the study: substandard lives, joint lives, conversions, simplified issue, and guarantee issue policies.

Policies in the post renewal term period are included. Note that you may exclude the post renewal policies using the plan and duration filters in the downloadable data files.

Since the 2005–2006 policy anniversary study, contributing companies have been asked to provide a preferred basis indicator (yes, no) to indicate whether the life underwent preferred underwriting or not. Where the preferred indicator is yes, the companies also specified the underwriting class—Preferred (better than Standard) or Standard (residual). The smoker status (smoker, non-smoker, or cigar-smoker) was also provided.

We asked the contributing companies to separately identify converted policies and to provide a date of conversion (which should be different than the original policy issue date). Not all companies were able to provide the required data; as such, the decision was made to exclude all known converted policies from the study. However, at least one company was not able to separately identify converted policies from non-converted policies, so this group of policies with unknown conversion status is still included in the study.

We have attempted to isolate conversions since the 2012–2013 study and the process has improved with successive studies. This is the first year where known conversions have been excluded. Prior study years would have some conversions in the study data. Conversions account for 6.6% of total exposures in 2015–2016, ranging from 0% to 14.6% by company.

2. History of Data Changes

This is a new section added this year to separately identify changes made in the underlying data or the data collection over the past five years.

a. In the 2014–2015 study, we added two termination type codes: "in-force on waiver" and "in-force with waiver unknown" and for the first time dropped Simplified Issue policies.

b. In the 2014–2015 and 2013–2014 studies, we did not include conversions with issue dates equal to the conversion dates.

c. In the 2013–2014 study, we asked each contributing company whether lapse terminations are reported at the beginning or the end of the grace period. More than half of the contributing companies set the effective date of lapse to the beginning of the grace period. No adjustments were made to the termination dates.

d. Starting in 2012–2013, we stopped presenting results by "Evidence", i.e., medical, nonmedical, and paramedical, as too few companies contributed data for this field and because of inconsistencies in classification approaches among companies.

e. Starting in 2011–2012, we added more detailed options to the "type of insurance" field. The number of product type options increased from eight to 19.

3. Participating Companies

The 2015–2016 study is based on data from the same eight contributing companies as the previous year. The contribution percentages in table 1 below are based on face amount exposures. Percentages may not add up to 100% due to rounding.

TABLE 1: PARTICIPATING COMPANIES 2014–2015 AND 2015–2016 STUDIES		
Company	Contribution %	
	2014–2015	2015–2016
Desjardins/Laurentian	3.3%	3.4%
Equitable	4.3%	4.5%
Great-West Life	24.4%	24.4%
Industrial Alliance	11.8%	12.0%
ivari	9.9%	10.2%
Manulife	23.7%	22.6%
RBC Insurance	6.2%	6.1%
Sun Life	16.5%	16.8%
Total Exposures	100.0%	100.0%

4. Deviation of Results

Throughout the report, we include the standard deviation (S.D.) for each of the mortality results. The SD is an estimate of the standard deviation of the ratios of actual-to-expected (A/E) mortality based on the number of deaths. The S.D. measures the degree of confidence in the mortality ratios. The formula used to calculate an S.D. is

$$S.D. = \frac{(actual\ number\ of\ deaths)^{1/2}}{expected\ number\ of\ deaths}$$

There is considerable variation in the A/E results by age, sex, and issue age. For this reason, summaries of A/E for other variables are most useful for fixed segments by age, sex, and issue age.

In table 2 we show the percentage departure. This represents the absolute relative deviation of the company-specific A/E by amount from the overall A/E by amount (first row of table 5a). The absolute relative deviation is calculated as

$$abs[(Company\ A/E)\ /\ (Overall\ A/E) - 1]$$

The median relative percentage departure is 5.0 % using the 97-04 rates (4.8% using 86-92). The results in table 2 apply to results on the CIA 97-04 and CIA 86-92 tables.

TABLE 2: COMPANY EXPERIENCE – RATIO VARIABILITY			
Percentage Departure	**Number of Companies**	**Actual Claims**	**Percentage of Claims**
5% or less	5	$2,062,092,031	66.6%
Over 5%	3	$1,032,016,972	33.4%
Total	8	$3,094,109,003	100.0%

5. Study Data Overview

Tables 3(a–d) compare the total exposures, death claims, average claim, and average exposure in the 2015–2016 study with previous policy year studies.

TABLE 3a: TOTAL EXPOSURES BY POLICY YEAR 2010–2011 TO 2015–2016					
Exposures	**2011–2012**	**2012–2013**	**2013–2014**	**2014–2015**	**2015–2016**
By Number	8,779,040	8,917,330	8,104,149	8,509,835	8,855,856
By Amount (millions)	1,270,814	1,384,280	1,301,344	1,512,191	1,565,428

TABLE 3b: DEATH CLAIMS BY POLICY YEAR 2010–2011 TO 2015–2016					
Death Claims	**2011–2012**	**2012–2013**	**2013–2014**	**2014–2015**	**2015–2016**
By Number	63,269	65,611	64,722	68,583	67,501
By Amount ('000)	2,427,673	2,566,749	2,560,849	3,090,612	3,094,109

TABLE 3c: AVERAGE CLAIMS BY POLICY YEAR 2010–2011 TO 2015–2016					
Average Claim	**2011–2012**	**2012–2013**	**2013–2014**	**2014–2015**	**2015–2016**
By Amount	38,371	39,121	39,567	45,064	45,838

TABLE 3d: AVERAGE EXPOSURES (SUM ASSURED) BY POLICY YEAR 2010–2011 TO 2015–2016					
Average Exposures	**2011–2012**	**2012–2013**	**2013–2014**	**2014–2015**	**2015–2016**
Males	163,491	174,962	180,663	199,878	198,238
Females	123,431	133,040	138,159	153,142	153,205
Combined	144,755	155,235	160,578	177,699	176,768

6. Study Results

Tables 4(a–f) present the study results by the following segments: duration, gender and smoker status, preferred status, issue age, band, and product. Additional data splits are available in the appended tables and even more refinements are possible using the data downloaded from the CIA website. Actual-to-expected ratios are shown by policy count (#) and sum assured ($).

Note that unless otherwise stated, the results include all durations, select and ultimate.

Table 4a. Duration

The 2015–2016 study results by duration are summarized in table 4a based on the CIA 97-04 and 86-92 tables. The results are shown separately for the select and ultimate period.

TABLE 4a: CIA 2015–2016 STUDY RESULTS BY DURATION									
	CIA 97-04			CIA 86-92			ACTUAL DEATHS		EXPOSURES	
	A/E #	S.D.	A/E $	A/E #	S.D.	A/E $	#	$ ('000)	#	$ (millions)
SELECT PERIOD										
1–2	71.8	4.0	52.5	55.4	3.1	39.3	317	77,109	716,834	285,438
3–5	71.8	2.6	77.0	57.9	2.1	58.9	789	255,606	971,701	360,868
6–10	68.2	1.6	62.2	51.8	1.2	45.3	1,790	414,662	1,368,662	427,126
11–15	77.4	1.5	66.2	55.4	1.1	46.3	2,563	324,817	913,002	168,919
Total	73.0	1.0	65.5	54.5	0.7	47.7	5,459	1,072,194	3,970,200	1,242,351
ULTIMATE PERIOD										
16–20	76.6	1.1	64.5	54.2	0.8	44.8	4,619	392,356	969,164	115,432
21–25	84.7	0.9	71.7	61.6	0.7	51.2	8,282	541,801	1,022,608	93,449
26+	82.0	0.4	76.9	63.7	0.3	56.9	49,141	1,087,758	2,893,884	114,196
Total	81.9	0.3	72.8	62.6	0.3	52.6	62,042	2,021,915	4,885,656	323,077
GRAND TOTAL	81.1	0.3	70.1	61.8	0.2	50.8	67,501	3,094,109	8,855,856	1,565,428

TABLE 4b. Gender and Smoker Status

The 2015–2016 study results by gender and smoker status are summarized in table 4b based on the CIA 97-04 and 86-92 tables. The results for unknown smoker status are shown separately. Non-smokers, smokers, and unknown smoker status are denoted as NS, SM, and UNK, respectively.

	CIA 97-04			CIA 86-92			ACTUAL DEATHS		EXPOSURES	
TABLE 4b: CIA 2015–2016 STUDY RESULTS BY GENDER AND SMOKER STATUS										
	A/E #	S.D.	A/E $	A/E #	S.D.	A/E $	#	$ ('000)	#	$ (millions)
M NS	74.9	0.7	67.6	53.0	0.5	47.0	11,688	1,462,374	2,658,981	776,492
M SM	83.8	1.2	72.4	58.1	0.8	51.1	5,249	309,011	679,798	91,631
M UNK	80.0	0.5	77.3	62.8	0.4	58.5	24,682	396,530	1,294,848	50,440
M	78.9	0.4	69.8	59.1	0.3	49.3	41,619	2,167,915	4,633,627	918,562
F NS	78.8	0.8	65.8	58.8	0.6	49.5	9,191	653,651	2,642,009	554,712
F SM	102.1	1.6	86.3	81.7	1.3	72.4	4,041	158,509	603,828	53,246
F UNK	85.0	0.8	85.1	69.6	0.6	71.2	12,650	114,034	976,392	38,907
F	84.9	0.5	70.7	66.8	0.4	54.5	25,882	926,194	4,222,229	646,865
NS	76.6	0.5	67.0	55.4	0.4	47.8	20,879	2,116,024	5,300,991	1,331,204
SM	90.9	0.9	76.6	66.5	0.7	56.7	9,290	467,521	1,283,625	144,877
TOTAL	81.1	0.3	70.1	61.8	0.2	50.8	67,501	3,094,109	8,855,856	1,565,428

TABLE 4c. Preferred vs. Standard Underwriting

The 2015–2016 study results by type of underwriting are summarized in table 4c based on the CIA 97-04 and 86-92 tables. There are two possible classes for preferred underwriting: preferred and standard, further split into non-smoker and smoker classes. Non-preferred underwriting is also referred to as standard underwriting. Only non-smoker and smoker classes are available. At the bottom of the table we include totals by type of underwriting: preferred underwriting (PREF UW), which includes four classes, and non-preferred underwriting (NON-PREF UW) which includes two classes.

TABLE 4c: CIA 2015–2016 STUDY RESULTS BY UNDERWRITING TYPE AND UNDERWRITING CLASS										
	CIA 97-04			CIA 86-92			ACTUAL DEATHS		EXPOSURES	
	A/E #	S.D.	A/E $	A/E #	S.D.	A/E %	#	$ ('000)	#	$ (millions)
PREF M NS	58.1	2.6	61.3	40.3	1.8	42.5	508	247,445	562,640	313,478
STD M NS	69.2	2.5	62.1	48.8	1.8	43.5	752	180,408	534,430	208,974
NON-PREF M NS	76.4	0.7	70.4	54.1	0.5	48.9	10,428	1,034,520	1,561,911	254,040
PREF M SM	67.0	6.4	73.6	51.6	4.9	57.5	110	42,377	58,804	25,433
STD M SM	68.8	4.2	58.2	53.1	3.2	45.5	274	37,238	113,587	26,933
NON-PREF M SM	85.3	1.2	75.2	58.6	0.8	51.1	4,865	229,396	507,407	39,265
PREF F NS	60.5	3.4	60.9	46.3	2.6	45.8	315	109,284	528,282	231,488
STD F NS	77.0	3.0	73.1	58.9	2.3	56.4	646	89,150	530,620	136,270
NON-PREF F NS	79.9	0.9	65.9	59.4	0.7	49.4	8,230	455,217	1,583,108	186,954
PREF F SM	56.3	8.6	68.0	50.6	7.7	59.7	43	13,601	34,333	11,337
STD F SM	83.3	5.8	66.3	75.8	5.3	59.6	208	16,897	87,064	13,328
NON-PREF F SM	104.3	1.7	92.6	82.7	1.3	76.3	3,790	128,011	482,431	28,582
TOTAL PREF UW	68.0	1.3	63.3	50.4	0.9	46.0	2,873	737,351	2,572,328	977,822
TOTAL NON-PREF UW	81.8	0.3	72.5	62.4	0.2	52.5	64,628	2,356,758	6,283,528	587,606
GRAND TOTAL	81.1	0.3	70.1	61.8	0.2	50.8	67,501	3,094,109	8,855,856	1,565,428

TABLE 4d. Issue Age

The 2015–2016 study results by issue age are summarized in table 4d based on the CIA 97-04 and 86-92 tables. Results are shown by 10-year issue age groupings. These results are for the select period only. Results by issue age for the ultimate period are available in the downloadable study data.

TABLE 4d: CIA 2015–2016 STUDY RESULTS BY ISSUE AGE										
	CIA 97-04			CIA 86-92			ACTUAL DEATHS		EXPOSURES	
	A/E #	S.D.	A/E $	A/E #	S.D.	A/E $	#	$ ('000)	#	$ (millions)
0–4	75.1	14.0	62.6	44.2	8.2	36.0	29	2,134	278,926	25,101
5–14	84.5	13.4	75.3	54.1	8.5	48.2	40	4,165	185,112	23,160
15–24	78.8	7.8	68.4	54.5	5.4	48.0	103	15,873	323,088	60,698
25–34	70.2	3.7	65.9	49.8	2.6	47.3	360	110,412	988,451	350,823
35–44	74.5	2.6	68.3	51.5	1.8	47.3	809	258,049	1,068,362	449,829
45–54	72.9	2.0	72.6	54.5	1.5	51.8	1,383	347,874	737,604	252,018
55–64	67.3	1.8	58.2	54.0	1.4	46.1	1,424	205,744	306,001	68,862
65–74	82.1	2.5	62.2	59.0	1.8	45.1	1,046	98,377	75,803	10,570
75–89	70.6	4.4	43.6	58.1	3.6	35.6	261	29,436	6,837	1,287
90+	108.9	54.4	103.5	109.2	54.6	104.6	4	131	16	500
Total	73.0	1.0	65.5	54.5	0.7	47.7	5,459	1,072,194	3,970,200	1,242,351

TABLE 4e. Face Amount Band

The 2015–2016 study results by face amount band are summarized in table 4e based on the CIA 97-04 and 86-92 tables.

TABLE 4e: CIA 2015–2016 STUDY RESULTS BY FACE AMOUNT BAND									
	CIA 97-04			CIA 86-92			ACTUAL DEATHS		EXPOSURES	
	A/E #	S.D.	A/E $	A/E #	S.D.	A/E $	#	$ ('000)	#	$ (millions)
< $10,000	81.2	0.5	89.1	64.9	0.4	70.5	27,449	132,636	996,708	6,292
$10k–$49,999	86.6	0.5	83.6	64.9	0.4	62.2	26,965	599,878	2,607,479	74,963
$50k–$99,999	76.7	1.0	75.7	55.7	0.7	55.0	5,702	369,077	1,331,358	86,972
$100k–$249,999	70.7	1.0	71.7	50.7	0.7	51.5	5,297	732,527	2,101,119	305,945
$250k–$499,999	63.8	1.8	66.3	45.7	1.3	47.5	1,226	405,973	970,357	318,349
$500k–$999,999	63.7	2.6	67.1	45.5	1.9	47.9	597	375,675	595,496	360,121
$1,000,000 +	54.0	3.3	55.3	38.7	2.4	39.7	265	478,343	253,340	412,786
TOTAL	81.1	0.3	70.1	61.8	0.2	50.8	67,501	3,094,109	8,855,856	1,565,428
Total $100k+	68.1	0.8	65.1	48.8	0.6	46.7	7,385	1,992,518	3,920,311	1,397,201

TABLE 4f. Policy Type

The 2015–2016 study results by policy type are summarized in table 4f based on the 97-04 and 86-92 tables. WL includes participating and non-participating whole life plans. T10 and T20 are renewable level term plans for 10 and 20 years, respectively. UL-YRT is universal life with YRT cost of insurance charges. UL-LCOI is universal life with level cost of insurance charges.

TABLE 4f: CIA 2015–2016 STUDY RESULTS BY POLICY TYPE									
	CIA 97-04			CIA 86-92			ACTUAL DEATHS		EXPOSURES	
	A/E #	S.D.	A/E $	A/E #	S.D.	A/E $	#	$ ('000)	#	$ (millions)
WL	82.7	0.4	77.3	63.9	0.3	56.8	50,284	1,202,652	4,089,028	269,764
T10	73.2	1.8	66.4	54.2	1.3	48.3	1,622	424,802	1,013,905	417,545
T20	59.2	2.1	51.7	42.3	1.5	36.3	773	194,826	944,302	374,710
UL-YRT	84.0	2.3	69.5	59.9	1.6	49.2	1,376	146,330	499,551	90,812
UL-LCOI	71.7	1.2	57.1	51.7	0.9	40.7	3,367	406,052	1,164,799	179,115
T100	77.1	1.2	66.6	57.1	0.9	49.3	4,345	346,694	392,521	40,492
Other	82.9	1.1	93.3	62.2	0.8	66.6	5,734	372,753	751,749	192,989
Total	81.1	0.3	70.1	61.8	0.2	50.8	67,501	3,094,109	8,855,856	1,565,428

7. One-Year Policy Year Study Results

This section provides a summary of the individual policy year results over the period 2011–2012 to 2015–2016. Results are provided separately for select, ultimate, and select and ultimate periods combined. Table 5a shows results based on the CIA 97-04 table. Table 5b shows results based on the CIA 86-92 table.

TABLE 5a: A/E RATIOS BY AMOUNT FOR ONE YEAR STUDY PERIODS 2011–2012 to 2015–2016					
CIA 97-04	**2011–2012**	**2012–2013**	**2013–2014**	**2014–2015**	**2015–2016**
SELECT & ULTIMATE					
Male & Female	75.9	73.0	71.3	73.8	70.1
Male	75.6	71.3	70.8	71.9	69.8
Female	76.4	77.4	72.5	78.2	70.7
Male NS	73.8	66.8	67.3	69.4	67.6
Male SM	76.8	77.1	73.2	70.8	72.4
Male UNK	80.0	80.6	78.9	80.9	77.3
Female NS	72.9	74.7	67.7	73.9	65.8
Female SM	86.8	86.5	84.7	95.2	86.3
Female UNK	81.8	81.1	82.8	83.4	85.1
SELECT					
Male & Female	69.9	66.5	65.8	67.8	65.5
Male	69.8	64.4	66.7	68.0	66.6
Female	70.1	71.0	63.9	67.5	63.3
Male NS	71.5	64.4	68.1	67.2	66.8
Male SM	65.8	66.4	62.5	63.4	65.9
Male UNK	62.3	60.5	61.8	83.4	52.4
Female NS	70.0	71.8	62.3	65.6	61.3
Female SM	72.0	71.3	69.6	80.7	76.4
Female UNK	66.6	60.7	71.0	65.5	70.2
ULTIMATE					
Male & Female	80.2	77.7	74.6	77.5	72.8
Male	79.5	75.8	73.0	74.2	71.6
Female	82.3	83.1	79.0	86.2	75.8
Male NS	76.0	68.9	66.7	71.1	68.1
Male SM	85.9	85.2	80.2	75.6	76.6
Male UNK	82.9	84.3	81.5	80.5	77.5
Female NS	76.5	78.0	72.9	81.5	69.8
Female SM	99.3	98.3	94.8	104.7	92.3
Female UNK	85.3	86.1	85.2	87.6	85.4

TABLE 5b: A/E RATIOS BY AMOUNT FOR ONE YEAR STUDY PERIODS 2011–2012 to 2015–2016					
CIA 86-92	**2011–2012**	**2012–2013**	**2013–2014**	**2014–2015**	**2015–2016**
SELECT & ULTIMATE					
Male & Female	54.2	52.3	51.3	53.1	50.8
Male	52.8	49.9	49.7	50.6	49.3
Female	58.1	59.0	55.5	60.0	54.5
Male NS	50.7	46.1	46.6	48.1	47.0
Male SM	53.9	54.2	51.5	49.8	51.1
Male UNK	58.2	58.7	57.8	59.5	58.5
Female NS	54.1	55.6	50.5	55.4	49.5
Female SM	72.1	72.2	70.8	79.8	72.4
Female UNK	63.7	63.2	65.7	66.2	71.2
SELECT					
Male & Female	50.4	47.9	47.6	49.0	47.7
Male	49.2	45.3	47.1	47.8	47.2
Female	53.1	53.8	48.7	51.7	49.0
Male NS	49.8	44.9	47.6	46.8	46.6
Male SM	50.4	51.1	48.5	49.0	51.2
Male UNK	41.4	40.0	40.7	54.9	31.5
Female NS	52.6	54.0	47.1	49.8	46.6
Female SM	62.8	62.8	61.7	71.8	68.3
Female UNK	41.9	38.1	45.5	42.4	44.6
ULTIMATE					
Male & Female	57.0	55.4	53.5	55.7	52.6
Male	55.2	52.8	51.1	52.1	50.5
Female	62.7	63.5	60.7	66.3	58.3
Male NS	51.6	47.1	45.8	49.1	47.3
Male SM	56.4	56.2	53.2	50.2	51.0
Male UNK	61.3	62.7	60.7	60.4	58.8
Female NS	55.8	57.3	53.7	60.5	52.1
Female SM	79.3	78.8	76.3	84.5	74.6
Female UNK	70.2	71.3	71.0	73.4	71.9

8. Five-Year Policy Year Study Results

This section provides a summary of the five-year policy results over the period 2007–2016. Results are provided separately for select, ultimate, and select and ultimate periods combined. Table 6a shows results on the CIA 97-04 basis and table 6b shows results on the CIA 86-92 basis. The label 2007–2012 indicates policy years 2007–2008 through 2011–2012, and similar labelling applies for the other five-year study results.

TABLE 6a: A/E RATIOS BY AMOUNT FOR FIVE-YEAR STUDY PERIODS					
CIA 97-04	2007–2012	2008–2013	2009–2014	2010–2015	2011–2016
SELECT & ULTIMATE					
Male & Female	79.8	77.6	74.8	74.2	72.7
Male	79.3	76.9	74.1	73.1	71.7
Female	81.1	79.5	76.6	76.8	74.9
Male NS	76.4	73.8	70.8	70.0	68.8
Male SM	83.3	81.7	78.3	75.3	73.9
Male UNK	84.8	82.6	80.8	80.7	79.6
Female NS	76.9	75.9	72.5	72.7	70.7
Female SM	90.4	88.8	87.0	89.4	88.1
Female UNK	89.6	86.2	84.3	83.3	82.8
SELECT					
Male & Female	75.2	72.5	69.7	68.4	67.1
Male	74.8	71.8	69.7	68.2	67.1
Female	76.2	73.9	69.7	68.8	67.0
Male NS	74.2	71.3	69.8	68.7	67.5
Male SM	78.5	75.8	70.9	65.9	64.8
Male UNK	69.2	65.6	64.6	68.8	67.3
Female NS	75.3	73.7	69.3	67.9	65.9
Female SM	80.4	76.5	72.4	74.3	74.2
Female UNK	75.3	68.0	68.3	67.5	65.9
ULTIMATE					
Male & Female	83.6	81.6	78.5	78.1	76.3
Male	82.7	80.5	77.1	76.2	74.5
Female	86.2	84.9	82.7	83.6	81.0
Male NS	79.0	76.3	71.8	71.2	69.9
Male SM	88.2	87.2	84.4	82.4	80.2
Male UNK	85.9	84.4	83.0	82.7	81.3
Female NS	79.3	78.8	76.4	78.0	75.4
Female SM	100.8	100.4	99.3	100.9	97.7
Female UNK	91.3	89.2	87.3	86.9	85.9

TABLE 6b: A/E RATIOS BY AMOUNT FOR FIVE-YEAR STUDY PERIODS					
CIA 86-92	2007–2012	2008–2013	2009–2014	2010–2015	2011–2016
SELECT & ULTIMATE					
Male & Female	56.9	55.4	53.5	53.2	52.3
Male	55.4	53.7	51.8	51.2	50.4
Female	61.5	60.4	58.3	58.6	57.3
Male NS	52.4	50.7	48.8	48.3	47.6
Male SM	58.9	57.6	55.1	53.0	52.0
Male UNK	61.7	60.2	59.0	59.0	58.6
Female NS	56.7	56.1	53.8	54.2	52.8
Female SM	74.5	73.5	72.3	74.5	73.6
Female UNK	71.0	67.9	66.3	65.5	65.8
SELECT					
Male & Female	54.4	52.3	50.3	49.4	48.5
Male	52.9	50.7	49.2	48.1	47.3
Female	57.8	56.1	52.9	52.3	51.2
Male NS	51.7	49.7	48.7	47.9	47.1
Male SM	60.2	58.2	54.5	50.7	50.1
Male UNK	45.9	43.5	42.8	45.5	44.4
Female NS	56.3	55.2	52.0	51.2	49.9
Female SM	69.1	66.2	63.2	65.3	65.6
Female UNK	48.3	43.1	43.4	43.0	41.9
ULTIMATE					
Male & Female	59.0	57.8	55.9	55.8	54.7
Male	57.1	55.8	53.6	53.1	52.2
Female	65.3	64.6	63.1	63.9	62.2
Male NS	53.2	51.6	48.8	48.7	48.1
Male SM	57.7	57.2	55.6	54.4	53.1
Male UNK	63.0	62.2	61.4	61.4	60.7
Female NS	57.5	57.3	55.9	57.3	55.8
Female SM	79.6	79.7	79.3	80.9	78.6
Female UNK	74.4	73.1	72.0	72.0	71.6

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9. Policy Sizes $1 Million and Higher

Table 7 provides an overview of the data for policies with face amounts $1,000,000 and higher in the 2015–2016 study. Results by policy count (#) and sum assured ($) are also shown for individual policy year studies since 2011–2012.

TABLE 7: DATA FOR POLICIES WITH FACE AMOUNT ≥ $1,000,000 2011–2012 to 2015–2016					
	2011–2012	**2012–2013**	**2013–2014**	**2014–2015**	**2015–2016**
Exposure #	174,737	199,553	155,360	189,836	253,340
Exposure $ (millions)	278,462	317,480	315,770	381,070	412,786
Claim #	197	226	206	269	264
Claim $ ('000)	345,319	362,579	362,575	538,340	477,345
CIA 97-04					
A/E #	61.0	61.7	63.1	64.9	54.0
A/E $	62.7	57.7	56.5	66.6	55.3
CIA 86-92					
A/E #	43.0	43.6	44.6	45.9	38.7
A/E $	44.3	40.9	40.1	47.3	39.7

10. Credits

This report was approved by the CIA Research Executive Committee, the Experience Studies Research Subcommittee, and the Project Oversight Group:

Keith Walter	(Research Executive Committee Chair)
Damien Lapointe Nguyen	(Experience Studies Research Subcommittee Chair)
Vera Ljucovic	(Project Oversight Group Chair)

Project Oversight Group:

Donna Mann-Campbell	John Pfeffer
Dan (Anh-Khoa) Le	Marie-Claude Rioux
Simon Martel	Colin Sproat

Appendix 1: A description of the fields included in the comma-delimited text file IndLifeMDB. 1516.csv.

Year	2016 = Policy Year 2015–2016
Sex	1 = Male; 2 = Female; 0 = Unknown.
Smoker	1 = Smoker; 2 = Non-smoker; 3 = Smoking status unknown.

Type of Insurance   Policy Type:

1. Whole life;
2. Renewable term with 10-year renewal term (T10);
3. Renewable term with 20-year renewal term (T20);
4. Other renewable terms (ART, T5, T15, other);
5. Term rider with 10-year renewal term (T10);
6. Term rider with 20-year renewal term (T20);
7. Other Renewable Term Riders (ART, T5, T15);
8. Universal Life with YRT Cost of Insurance (UL YRT);
9. Universal Life with Level Cost of Insurance (UL LCOI) or Limited Pay;
10. Term to 100;
11. Other Permanent; and
12. Other (includes other terms and other term riders).

Face Size

1. < $10,000	5. $250,000–$499,999
2. $10,000–$49,999	6. $500,000–$999,999
3. $50,000–$99,999	7. $1,000,000 and over
4. $100,000–$249,999	

Preferred Class

Policy experience is divided between Preferred and Standard underwriting types. If the underwriting type is Preferred, the policy experience is further divided by Preferred Class as either Preferred (better than standard) or Standard (last) class:

01 = standard underwriting and N/A for preferred class

02 = preferred underwriting and preferred class = standard

03 = preferred underwriting and preferred class = preferred

DB Dur	Policy duration
DB Issue Age	Issue age
Sum of # Exposed	
Sum of $ Exposed	
Sum of # Deaths	
Sum of $ Claims	
8692 # Exp Deaths	8692 QX × Sum of # Exposed / 1000
8692 $ Exp Claims	8692 QX × Sum of $ Exposed / 1000
9704 # Exp Deaths	9704 QX × Sum of # Exposed / 1000
9704 $ Exp Claims	9704 QX × Sum of $ Exposed / 1000

Appendix 2:

THE CANADIAN INSTITUTE OF ACTUARIES
INSTRUCTIONS FOR COMPANIES CONTRIBUTING TO THE
CANADIAN MORTALITY INVESTIGATION
FOR POLICY YEAR 2015-2016

1. BASIS OF MORTALITY INVESTIGATION

a. The study will be carried out on a fifteen-year select and ultimate basis. The age nearest birthday at the anniversary will be used throughout.

b. The expected mortality bases will be CIA 86-92 and CIA 97-04.

c. Males and females will be studied separately.

d. Medically examined, paramedical and non-medical policies will be studied separately for the first fifteen policy year durations.

e. Smokers and non-smokers will be studied separately.

f. Policies will be studied separately by type of insurance. "Other" policies refer to those that cannot be accurately described as any of the given categories. Such plans should be described in a letter accompanying your company's submission.

2. INFORMATION TO BE SUBMITTED

a. *Form of submission:*

The 109-column file may be compressed and should be forwarded to Barbara Thomson no later than August 15, 2017.

b. *Requirements:*

The information required for the investigation will be the exposure between the policy anniversaries in 2015 and 2016. Deaths of those policies will be exposed for the full policy year.

The data may be derived from either mortality cards or valuation records, subject to the following general conditions:

c. *Data to be included:*

1) Policies classified by the Company as "Canadian".

2) Standard issues of the Ordinary Department only. Simplified Issue business should be included if it can be tracked under "Underwriting Type: Simplified Issue" in column 94. Simplified Issue refers to products that ask a short list of health questions and require no physical evidence.

3) Direct written business (cessions should not be deducted nor accessions added).

d. *Data to be excluded:*

1) Substandard policies (also see below).

2) Policies issued without evidence of insurability, i.e., Group Conversions, Pure Endowments, possibly Single Premiums, etc.

3) Policies in force under Extended Term Insurance or Reduced Paid-Up provisions.

4) Reinsurance received.

5) Child's Deferred Insurance and similar plans with nominal benefits to age 21, issued without the normal evidence of insurability.

6) Children insured under policies insuring an entire family in one contract.

7) Policies issued as a result of exercise of an option under a guaranteed insurability rider.

8) Policies issued on a "Guaranteed Issue" basis (such as certain Pension Trust business). For example, products that ask few or no questions and guarantee insurance coverage should be excluded. These products sometimes offer a reduced benefit for a period of time. Products that fall into the Simplified Issue definition above should be included if they can be separately identified.

9) Family policy conversions on dependents.

10) Funeral insurance.

11) Bank mortgage insurance. However, decreasing term products that require the same evidence of insurability as ordinary life insurance products may be included.

12) Multi-life policies.

e. *Optional*

The following is the recommended practice for special groups of policies. Any variations from this recommended practice, and your estimate of the extent of the data involved, should be submitted along with your experience.

1) <u>Suicide during the exclusion period.</u> For policies, include both exposures and claims. Include the full amount for exposure and the amount paid for claims.

2) <u>Compromised claims.</u> Same as 1) above.

3) <u>Limited benefits under exclusion clauses (e.g., for aviation, foreign travel, motor sports, sky diving, etc.)</u> Same as 1) above.

4) <u>Term Conversions (original age or attained age).</u> Consider as a continuation of a term policy, i.e., as if issued on the issue date of the term policy.

5) <u>Increasing or decreasing insurance such as pension policies or family income.</u> The exposures and claims by amount must be reported on the same basis.

6) <u>Children's policies.</u> Policies with return of premium benefits or limited death benefits below age 10 are to be included for the ultimate sum assured in both the exposure and the claims.

7) <u>Family policies and Riders.</u> For policies insuring an entire family in one contract, include in the experience the exposures and deaths for the husband, using, where possible, the amount of insurance on the husband's life. If it is not feasible to show the amount of insurance on the husband only and some other amount is reported, then the claims should be reported on the same basis as the exposures. The determination of the amount to be included in both exposures and claims will be left with the individual company reporting. If companies wish to include the data on the wives insured under such policies, then such data should be included only if normal underwriting standards were applicable to wives at the time of issue and the true ages can be reported for both exposures and deaths.

8) <u>Joint Life policies.</u> Exclude if more than two lives are involved. If death benefits are payable on both lives, then the data are to be included as two individual records and column $90 = 0$, with attention being paid to the classification of the data on each life as to sex, etc. Otherwise, the joint policies are first/last to die and all data should be shown in one record with column $90 = 1$ or 2.

9) <u>Age adjustments on death claims.</u> Where the age is adjusted at the time of claims, report the death claims according to the true age for the adjusted amount of insurance and leave the exposure unchanged.

10) <u>Policies with liens or rated in age.</u> Companies reporting from valuation records may not be able to separate these classes from standard. In such cases:

   i.   <u>Liens.</u> Consider liens in the exposed for the full amount and in the claims for amounts paid.

   ii.   <u>Rated in age.</u> Consider exposure and deaths at rated age.

11) <u>Policies with extra premium.</u> These are to be excluded.

4. *INSTRUCTIONS FOR COMPLETION OF EXPOSURE FILE*

The format of the experience file detailing both the exposure and death claims is as follows:

Columns

1-3	Company code number. The company code allotted in 1951 will be continued for the original companies contributing. New contributors will be advised individually of the company code to use.
4-7	Study year (2016)
8-23	Policy number
24-33	Face amount ($)
34-41	Date of issue (ddmmyyyy)
42-49	Date of birth, life 1 (ddmmyyyy)
50-51	Age at issue, life 1 (if DOB not available)
52	Sex, life 1

> 0 = Unknown
> 1 = Male
> 2 = Female

53	Smoking Status, life 1

> 1 = Smoker
> 2 = Nonsmoker
> 3 = Unknown

54-61	Date of birth, life 2 (ddmmyyyy), blank if N/A
62-63	Age at issue, life 2 (if DOB not available), blank if N/A
64	Sex, life 2, blank if N/A

> 0 = Unknown
> 1 = Male
> 2 = Female

65	Smoking status, life 2, blank if N/A

> 1 = Smoker
> 2 = Nonsmoker
> 3 = Unknown

66-73	Date of termination (ddmmyyyy), blank if none
74-75	Duration of termination (if date not available)

76	Termination type

        0 = In force (not on waiver)
        1 = Death[a]
        2 = Surrender
        3 = Lapse
        4 = Maturity
        5 = Reduced paid-up[b]
        6 = Conversion (if conversions cannot be separately identified, please code as lapse)
        7 = Expiry
        8 = Extended term[2]
        9 = In force (on waiver)
        A = In force (waiver status unknown)

77-86	Death benefit ($)
87-88	Leave blank
89	Policy Type

        1 = Whole Life (including enhancement plans & paid-up additions)

        Renewable Term (previously coded as 2)
            A = annual renewal term (ART)
            B = 5 year renewal term (T05)
            C = 10 year renewal term (T10)
            D = 15 year renewal term (T15)
            E = 20 year renewal term (T20)
            F = other renewal term

        Universal Life (previously coded as 3)
            G = UL YRT Cost of Insurance (UL YRT)
            H = UL Level Cost of Insurance (UL LCOI)
            P = UL Limited Pay

        Term Rider (previously coded as 4)
            I = annual renewal term (ART)
            J = 5 year renewal term (T05)
            K = 10 year renewal term (T10)
            L = 15 year renewal term (T15)
            M = 20 year renewal term (T20)
            N = other term rider

        5 = Term to 100
        6 = Other Permanent
        7 = Other Term
        8 = Other (please indicate what plans are being included)

90	Joint Life

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[a] Late-reported claims: Previously submitted deaths should not be in your current data submission. If you have late-reported claims, please submit them in this year's data so that they can be assigned the correct age and policy year based on the actual date of death.
[b] Only for the participants who do not exclude those termination types from their data.

0 = No
1 = Last to die
2 = First to die
3 = Unknown type of joint life policy

91   Premium payment mode

0 = Undetermined
1 = Annual
2 = Monthly
3 = Other

92   Source of business

0 = Career agent
1 = Broker
2 = PPGA
3 = Other
4 = Unknown

93   Age last/nearest

0 = Age nearest
1 = Age last
2 = Other

94   Underwriting type

1 = Medical
2 = Nonmedical
3 = Unknown
4 = Paramedical
5 = Simplified Issue*

* If Simplified Issue business cannot be separately identified, please provide the researcher with an estimate of the total block exposure that is Simplified Issue.

95   Leave blank

96   Adjustable Plan (some feature of the plan is adjustable to reflect experience, e.g., Premium, death benefit, cash values)

0 = Unknown
1 = No
2 = Yes

97   Participating

0 = No
1 = Yes

98   Preferred basis indicator

              0 = No
              1 = Yes

99-100   Preferred class (if column 98 = 1; otherwise leave blank)

              01 = Preferred Class 1 Non-smoker
              02 = Preferred Class 2 Non-smoker
              03 = Preferred Class 3 Non-smoker
              ….
              10 = Standard Class Non-smoker

              11 = Preferred Class 1 Smoker
              12 = Preferred Class 2 Smoker
              ….
              20 = Standard Class Smoker

              21 = Preferred Class 1 Cigar
              22 = Preferred Class 2 Cigar
              ….
              30 = Standard Class Cigar

101   Conversion Code

              0 = Not from a conversion
              1 = Term to Permanent conversion
              2 = Term to Term Exchange
              3 = Converted from UL YRT
              4 = Group Conversion
              5 = Converted from other type
              6 = Converted from unknown type
              7 = Unknown whether this is a conversion

102-109   Date of Conversion (ddmmyyyy) for policies with conversion codes 1, 2, 3, 4,
              or 5 above.

5. AGE LAST BIRTHDAY

The expected mortality rate for age last birthday is equal to the mean of the mortality rates at the particular age at issue/attained age and the rate at the next higher age for the same policy year code.