

Mortality Study

Canadian Standard Ordinary Life Experience 2014–2015 Using 97–04 Tables

Research Executive Committee –
Experience Studies Subcommittee

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Mortality Under Canadian Standard Ordinary Insurance Issues Studied Between the 2014 and 2015 Anniversaries Using 97–04 Tables

This is the 66th annual report of the intercompany mortality experience for Canadian standard ordinary life insurance policies. This study covers the one year period between policy anniversaries in 2014 and 2015 on an age nearest birthday basis. It has been approved by the CIA Research Executive Committee. This is the 22nd year that we have collected data 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 data with attained age less than 16, the expected mortality rates are based on the aggregate CIA 97–04 table. For data submitted without classification by sex, the male table was used.

The CIA 97–04 tables do not contain mortality rates for issue ages beyond 80. For this study, the expected select mortality rates for issue ages 81+ are set equal 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, group conversions, simplified issue, and guarantee issue policies. Note that policies in the post renewal term period are included.

This is the 10th year that participating companies provided a preferred basis indicator (yes, no) according to the type of underwriting. Where the preferred indicator is yes, the companies also specified the underwriting class and whether the business is standard or preferred and smoker, non-smoker, or cigar-smoker. If the underwriting type is preferred, the underwriting class is either Preferred (better than Standard) or Standard (residual) class.

We asked the contributing companies to provide data for converted policies separately. We requested that the date of conversion be provided in addition to the original policy issue date. Unfortunately, not all companies were able to provide adequate data on conversions, so it was decided not to include the experience for converted policies when the issue date was the same as the conversion date. Note that at least one company was not able to separately identify converted policies, so this group of policies with unknown conversion status is still included in the study.

This year we also added two termination type codes: In-force on waiver and In-force with waiver unknown. For the second year we were unable to present results by “Evidence”, i.e., medical, nonmedical and paramedical, as too few companies contributed data for this field. There were also inconsistencies among companies in terms of how business was classified into the evidence categories.

Two years ago we asked each contributing company whether it reports lapse terminations 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.

Throughout the report we include the standard deviation (S.D.) for each of the mortality results. The S.D. provides estimates of the standard deviation of the ratios of actual to expected

mortality based on the numbers of deaths. The S.D. measures the degree of confidence in the mortality ratios. The formula used to calculate the standard deviations is:

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

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.

The results of the 2014–2015 mortality study are presented in the following tables. The table numbering is consistent with previous reports.

- **Table 1** The total experience for the select period by groups of duration and by groups of ages at issue and for the ultimate period by groups of attained ages
- **Table 2** Table 1 classified by sex
- **Table 8** Total experience by smoking status, sex, and band
- **Table 9** Total experience by type of insurance
- **Table 10** Total experience by smoking status, sex, band, and preferred basis
- We also show **tables 1, 2, and 8** based on **five-year aggregate** data (2010–2015).
- We have also included **tables 1, 2, and 8** broken down by the following **face amount bands**:
 - < \$10,000
 - \$10,000–\$49,999
 - \$50,000–\$99,999
 - \$100,000–\$249,999
 - \$250,000–\$499,999
 - \$500,000–\$999,999
 - \$1,000,000 and over

The above tables are appended in Excel format; they have indices at the tops of the files with links to each of the individual tables below the indices.

In addition, we have provided the data as a comma-delimited text file that can be downloaded from the CIA website. The file is [IndLifeMDB.1415.zip](#). A description of the included fields is in the appendix to this report.

The 2014–2015 study is based on data from eight contributing companies. The contribution percentages in table C1 below are based on exposures by dollar amounts. Percentages may not add up to 100% due to rounding.

Table C1. Companies that Participated in the 2013–2014 and 2014–2015 Studies

Company	Includes	Contribution	
		2013–2014	2014–2015
Desjardins Laurentian Life	Imperial Life; Laurier	3.5%	3.3%
Equitable		4.7%	4.3%
Great-West Life	London Life; Canada Life	27.3%	24.4%
Industrial Alliance		13.0%	11.8%
Manulife	Maritime Life	25.4%	23.7%
RBC		7.4%	6.2%
Sun Life		18.7%	16.5%
Transamerica/ivari		0.0%	9.9%
Total Exposures		100.0%	100.0%

In Table C2 we show the Percentage Departure, which represents the absolute relative deviation of the company-specific A/E by amount from the overall A/E by amount (first line of table C4). The absolute relative deviation is calculated as:

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

The median relative Percentage Departure is 5.0%.

Table C2. Company Experience Ratio Variability

Percentage Departure	Number of Companies	Actual Claims	Percentage of Claims
5% or less	4	\$1,276,810,779	41.3%
Over 5%	4	\$1,813,801,676	58.7%
Total	8	\$3,090,612,455	100.0%

Tables C3(a–d): comparison of 2014–2015 total exposures, death claims, average claim, and average exposure with previous studies.

Table C3a. Total Exposures

Exposures	2010–2011	2011–2012	2012–2013	2013–2014	2014–2015
By Number	8,937,129	8,779,040	8,917,330	8,104,149	8,509,835
By Amount (Millions)	\$1,217,823	\$1,270,814	\$1,384,280	\$1,301,344	\$1,512,191

Table C3b. Death Claims

Death Claims	2010–2011	2011–2012	2012–2013	2013–2014	2014–2015
By Number	63,901	63,269	65,611	64,722	68,583
By Amount ('000)	\$2,320,143	\$2,427,673	\$2,566,749	\$2,560,849	\$3,090,612

Table C3c. Average Claims

Average Claim	2010–2011	2011–2012	2012–2013	2013–2014	2014–2015
By Amount	\$36,308	\$38,371	\$39,121	\$39,567	\$45,064

Table C3d. Average Exposures (Sum Assured)

Average Exposures	2010–2011	2011–2012	2012–2013	2013–2014	2014–2015
Males	\$154,464	\$163,491	\$174,962	\$180,663	\$199,878
Females	\$115,397	\$123,431	\$133,040	\$138,159	\$153,142
Combined	\$136,266	\$144,755	\$155,235	\$160,578	\$177,699

Table C4. Comparison of Ratios (A/E) by Amount

	Experience	2010–2011	2011–2012	2012–2013	2013–2014	2014–2015
Male & Female	Select & Ultimate	77.8	75.9	73.0	71.3	73.8
Male	Select & Ultimate	77.0	75.6	71.3	70.8	71.9
Female	Select & Ultimate	79.7	76.4	77.4	72.5	78.2
Male & Female	Select	72.4	69.9	66.5	65.8	67.8
Male	Select	72.7	69.8	64.4	66.7	68.0
Female	Select	71.8	70.1	71.0	63.9	67.5
Male & Female	Ultimate	82.0	80.2	77.7	74.6	77.5
Male	Ultimate	80.1	79.5	75.8	73.0	74.2
Female	Ultimate	87.7	82.3	83.1	79.0	86.2
Male, Smoker	Select	71.0	65.8	66.4	62.5	63.4
Male, Non-smoker	Select	72.8	71.5	64.4	68.1	67.2
Male, Unclassified	Select	75.6	62.3	60.5	61.8	83.4
Female, Smoker	Select	77.0	72.0	71.3	69.6	80.7
Female, Non-smoker	Select	70.4	70.0	71.8	62.3	65.6
Female, Unclassified	Select	76.6	66.6	60.7	71.0	65.5
Male, Smoker	Ultimate	88.0	85.9	85.2	80.2	75.6
Male, Non-smoker	Ultimate	75.1	76.0	68.9	66.7	71.1
Male, Unclassified	Ultimate	84.8	82.9	84.3	81.5	80.5
Female, Smoker	Ultimate	108.2	99.3	98.3	94.8	104.7
Female, Non-smoker	Ultimate	80.5	76.5	78.0	72.9	81.5
Female, Unclassified	Ultimate	90.7	85.3	86.1	85.2	87.6
Male, Smoker, Preferred	Select & Ultimate	61.8	65.1	47.7	48.7	61.6
Male, Non-smoker, Preferred	Select & Ultimate	62.5	66.0	53.2	66.9	62.5
Female, Smoker, Preferred	Select & Ultimate	52.1	51.5	44.2	58.1	86.3
Female, Non-smoker, Preferred	Select & Ultimate	63.6	64.0	53.7	66.4	63.0

Table C5. Exposures for Policies with Face Amounts \geq \$1,000,000 Included in the Five Most Recent Studies

	2010–2011	2011–2012	2012–2013	2013–2014	2014–2015
Exposure #	158,982	174,737	199,553	155,360	189,836
Exposure Amount ('000)	\$252,392,630	\$278,461,795	\$317,479,575	\$315,769,764	\$381,069,916
A/E #	64.0	61.0	61.7	63.1	64.9
A/E Amount	60.9	62.7	57.7	56.5	66.6

Table C6. Claims for Policies with Death Benefit Amounts \geq \$1,000,000 Included in the Five Most Recent Studies

	2010–2011		2011–2012		2012–2013		2013–2014		2014–2015	
	#	\$ (Millions)	#	\$ (Millions)	#	\$ (Millions)	#	\$ (Millions)	#	\$ (Millions)
Select										
Male Smokers	10	13.150	10	13.640	14	21.002	10	15.556	8	14.425
Male Non-smokers	80	142.714	92	164.421	87	133.613	78	156.222	84	207.944
Unclassified Males	13	17.000	5	14.000	17	20.100	11	16.000	21	38.471
Female Smokers	1	1.000	3	3.000	1	1.000	1	1.400	2	6.000
Female Non-smokers	14	16.888	17	26.880	28	50.882	29	46.052	24	39.679
Unclassified Females	2	2.000	0	0.000	2	2.000	3	3.500	4	5.500
Ultimate										
All	68	109.145	70	123.378	77	133.982	74	123.846	126	226.322
TOTAL	188	301.896	197	345.319	226	362.579	206	362.575	269	538.340

In table C6, the Ultimate claims for 2014–2015 were for 99 males (five smokers, 86 non-smokers, eight unclassified) and 27 females (three smokers, 24 non-smokers).

Table C7. Comparison of Ratios (A/E) by Amount for Five-Year Periods

	Experience	2006–2011	2007–2012	2008–2013	2009–2014	2010–2015
Male & Female	Select & Ultimate	82.4	79.8	77.6	74.8	74.2
Male	Select & Ultimate	81.6	79.3	76.9	74.1	73.1
Female	Select & Ultimate	84.5	81.1	79.5	76.6	76.8
Male & Female	Select	78.4	75.2	72.5	69.7	68.4
Male	Select	77.4	74.8	71.8	69.7	68.2
Female	Select	80.7	76.2	73.9	69.7	68.8
Male & Female	Ultimate	85.8	83.6	81.6	78.5	78.1
Male	Ultimate	84.9	82.7	80.5	77.1	76.2
Female	Ultimate	88.7	86.2	84.9	82.7	83.6
Male, Smoker	Select	83.1	78.5	75.8	70.9	65.9
Male, Non-smoker	Select	76.0	74.2	71.3	69.8	68.7
Male, Unclassified	Select	76.3	69.2	65.6	64.6	68.8
Female, Smoker	Select	84.0	80.4	76.5	72.4	74.3
Female, Non-smoker	Select	79.9	75.3	73.7	69.3	67.9
Female, Unclassified	Select	84.4	75.3	68.0	68.3	67.5
Male, Smoker	Ultimate	90.3	88.2	87.2	84.4	82.4
Male, Non-smoker	Ultimate	80.8	79.0	76.3	71.8	71.2
Male, Unclassified	Ultimate	88.4	85.9	84.4	83.0	82.7
Female, Smoker	Ultimate	101.3	100.8	100.4	99.3	100.9
Female, Non-smoker	Ultimate	81.2	79.3	78.8	76.4	78.0
Female, Unclassified	Ultimate	95.0	91.3	89.2	87.3	86.9

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

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Appendix: A description of the fields included in the comma-delimited text file IndLifeMDB.1415.csv.

Year	2015 = Policy Year 2014–2015	
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	
	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	$8692 \text{ QX} \times \text{Sum of \# Exposed} / 1000$	
8692 \$ Exp Claims	$8692 \text{ QX} \times \text{Sum of \$ Exposed} / 1000$	
9704 # Exp Deaths	$9704 \text{ QX} \times \text{Sum of \# Exposed} / 1000$	
9704 \$ Exp Claims	$9704 \text{ QX} \times \text{Sum of \$ Exposed} / 1000$	