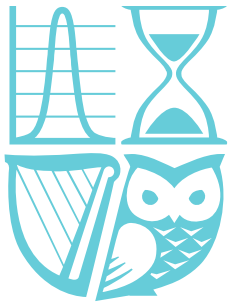

Society of Actuaries in Ireland

Irish Insured Lives Mortality Investigation (IILMI)

February 2019

1. INTRODUCTION 4
2. EXECUTIVE SUMMARY 6
3. HISTORY OF IRISH INSURED LIVES MORTALITY ANALYSIS 9
3.1. CMI IRISH MORTALITY EXPERIENCE 9
3.2. AGGREGATED DATA STUDY 9
3.3. CENTRAL STATISTICS OFFICE MORTALITY TABLES 10
4. OVERVIEW OF DATA AND METHODOLOGY 11
4.1. DATA 11
4.2. DATA CONSIDERATIONS 11
4.3. LIVES BASIS VS AMOUNTS BASIS 12
4.4. METHODOLOGY 12
4.5. ALLOWANCE FOR MORTALITY IMPROVEMENTS 13
5. ANNUITIES 15
5.1. DATA 15
5.1.1. ANNUITY DATA REQUEST 15
5.1.2. AGGREGATION OF ANNUITY DATA – TREATMENT OF DATA LIMITATIONS 15
5.1.3. OVERVIEW OF ANNUITY DATA INCLUDED IN IILMI 15
5.2. CRUDE MORTALITY RATES 18
5.3. STANDARD MORTALITY TABLES FOR COMPARISON 19
5.4. RESULTS WITHOUT ALLOWANCE FOR MORTALITY IMPROVEMENTS 19
5.4.1. RESULTS BY AGE BAND 20
5.4.2. RESULTS BY CALENDAR YEAR 21
5.5. RESULTS ALLOWING FOR MORTALITY IMPROVEMENTS 22
5.5.1. RESULTS BY AGE BAND 23
5.5.2. RESULTS BY CALENDAR YEAR 24
5.6. COMPARISON WITH AGGREGATED DATA STUDY 24
6. ASSURANCES 27
6.1. DATA 27
6.1.1. ASSURANCE DATA REQUEST 27
6.1.2. AGGREGATION OF ASSURANCE DATA – TREATMENT OF DATA LIMITATIONS 27
6.1.3. OVERVIEW OF ASSURANCE DATA INCLUDED IN IILMI 28
6.2. CRUDE MORTALITY RATES 31
6.3. STANDARD MORTALITY TABLES FOR COMPARISON 32
6.4. RESULTS WITHOUT ALLOWANCE FOR MORTALITY IMPROVEMENTS 32
6.4.1. RESULTS BY AGE BAND 33

6.4.2. RESULTS BY CALENDAR YEAR 35
6.4.3. RESULTS BY PRODUCT TYPE 35
6.4.4. RESULTS BY DURATION IN FORCE 36
6.5. RESULTS ALLOWING FOR MORTALITY IMPROVEMENTS 37
6.6. COMPARISON WITH AGGREGATED DATA STUDY 38
7. APPENDICES 40
APPENDIX A – SUPPLEMENTARY ANNUITY ANALYSIS 40
APPENDIX B – SUPPLEMENTARY ASSURANCE DATA 42
APPENDIX C – SAMPLE DATA SUBMISSION TEMPLATES 45

1. Introduction

The Demography Committee of the Society of Actuaries in Ireland ("Society") is pleased to present the results of the Irish Insured Lives Mortality Investigation (IILMI). IILMI provides an analysis of the mortality experience of Irish annuitants and assured lives over the period 2009 to 2015. The results included in this report are for information purposes only. If interpreting or applying information from the report, judgement must be exercised in relation to the appropriateness, sufficiency and suitability of this information for the particular purpose.

IILMI Data Source

The Demography Committee would like to thank the participating insurance companies who supported this investigation by contributing their data for analysis. Participating companies submitted deaths and exposure data to the Society split by pre-specified factors. No policy specific details were requested as part of the investigation. The submitted data was aggregated across the participating companies before being passed to the Demography Committee for analysis.

Overview of Report

The report summarises the data used in the analysis and the approach taken in aggregating and analysing this data. The results are presented with reference to Irish population (ILT16)[1] and Continuous Mortality Investigation[2] (CMI) tables. No attempt has been made to graduate Irish experience or to produce Ireland-specific tables. Supplementary analysis is provided in the appendices and an Excel spreadsheet with the main results tables is available on the Society's website[3]. For reference purposes the report includes an overview of previous Irish insured lives mortality analysis. The executive summary contains an overview of the main findings of the investigation, although readers are encouraged to read the full report.

Governance and Authorship

This report has been prepared in accordance with ASP PA-2 General Actuarial Practice[4] and the Code of Professional Conduct[5]. Authors of the report consist of members of the Demography Committee who are Fellows of the Society. The report was approved by Council as a Society paper. Details of the authors are recorded in a Governance Document. The Governance Document outlines or references, as appropriate, the governance and associated process controls of the IILMI project.

Peer Review

In line with best practice, this report, together with the Governance Document, has been independently peer reviewed. The peer review encompassed a review of the analysis and commentary in the final report only.

[1] http://www.cso.ie/en/releasesandpublications/er/ilt/irishlifetablesno162010-2012/
[2] https://www.actuaries.org.uk/learn-and-develop/continuous-mortality-investigation
[3] https://web.actuaries.ie/press/demography-studies
[4] https://web.actuaries.ie/standards/asp/asp-pa-2
[5] https://web.actuaries.ie/standards-regulation/code-professional-conduct

Disclaimer

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Further Information

The Demography Committee welcomes feedback on the report and suggestions for improvements. Comments or questions can be submitted to info@actuaries.ie.

2. Executive Summary

The Irish Insured Lives Mortality Investigation (IILMI) was carried out by the Society's Demography Committee in 2017/2018. The investigation covered the mortality experience of annuities and assurances over the period 2009-2015. Data on total deaths and total exposure, split by pre-specified factors, was collected from participating companies; no policy-level data was collected. The data was submitted to the Society and was aggregated across participating companies before being passed to the Demography Committee for analysis. Results are presented on an actual over expected (A/E) basis[6] relative to population and industry standard tables[7]. This section provides a summary of the main results of IILMI, however readers are encouraged to read the full report.

Annuities

Table 1 summarises the death and exposure data for the annuity investigation. The data analysed is on a lives basis only due to credibility issues regarding the volume of amounts data received. The data is centred on calendar year 2012 with an average age of 71 for males and 72 for females. The average age was reasonably constant over the period of the investigation for males while females experienced a decline of approximately 0.5 years.

		Calendar year							Total
		2009	2010	2011	2012	2013	2014	2015	
Male	Exposure	34,523	37,483	41,226	45,006	47,919	44,570	45,971	**296,698**
	Death	1,004	1,065	1,050	1,167	1,288	1,304	1,295	**8,173**
Female	Exposure	13,666	14,561	15,653	16,793	18,204	17,942	18,758	**115,576**
	Death	434	455	463	510	502	527	564	**3,455**

Table 1: IILMI annuity death and exposure data for males and females on a lives basis.

The annuity data was collected for all types of annuities in payment combined. Results are analysed by age group, gender and calendar year. Comparison with standard tables[8] indicates that PXL08 are the most representative industry tables for both the male and female IILMI data. Figure 1 compares the IILMI annuity data with PXL08 on an A/E basis over the period of the investigation. The comparison with ILT16 is also shown for information purposes.

[6] See section 4.4 for details of the methodology used
[7] See Table 9 section 5.3 & Table 26 Section 6.3 for details of standard tables used in this report.
[8] See Table 9 section 5.3 & Table 26 Section 6.3 for details of standard tables used in this report

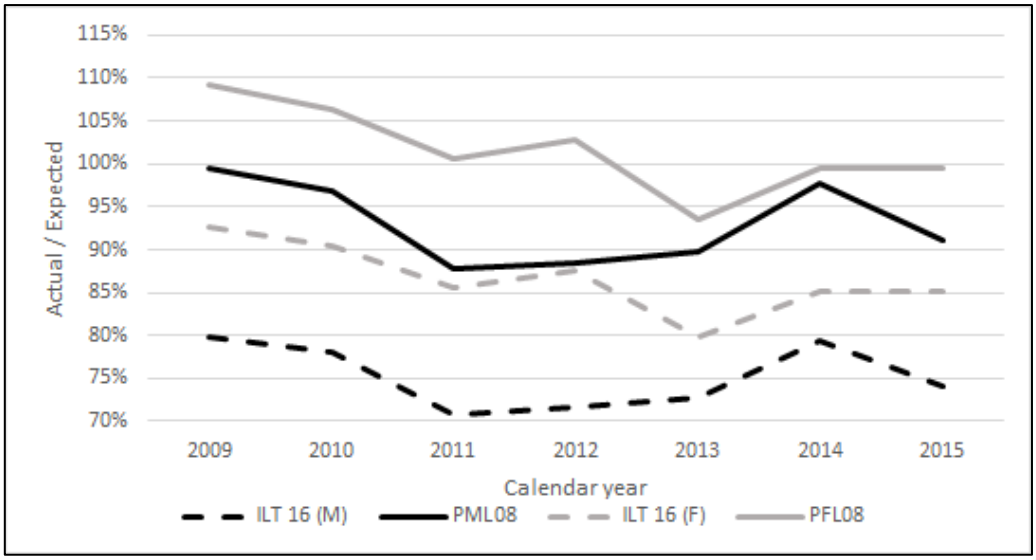

Figure 1: IILMI Annuity A/E results by calendar year on a lives basis

It is clear from the figure above that, as expected, the CMI tables are more representative of the dataset when compared to the ILT16 tables.

Assurances

Table 2 and Table 3 summarise the total death and exposure data, split by smoker status for the assurances investigation. The data is centred on year 2012 and was collected on a lives basis only. The data ages significantly over the period of the investigation with the average age increasing by 3.3 years for both males and females to 47.1 years and 45.9 years respectively in 2015.

Non Smokers		Calendar year							Total
		2009	2010	2011	2012	2013	2014	2015	
Male	Exposure	346,109	344,833	473,780	467,348	458,657	450,047	444,954	**2,985,727**
	Death	526	583	746	689	830	775	754	**4,903**
Female	Exposure	312,240	314,680	430,891	429,438	425,367	420,564	418,240	**2,751,422**
	Death	242	308	426	451	405	412	445	**2,689**

Table 2. IILMI assurances death and exposure non-smoker data for males and females on a lives basis.

Smokers		Calendar year							Total
		2009	2010	2011	2012	2013	2014	2015	
Male	Exposure	104,769	100,546	124,780	118,614	111,885	106,086	101,635	**768,316**
	Death	284	297	371	350	361	408	348	**2,419**
Female	Exposure	89,116	86,822	107,600	103,389	98,195	93,280	89,323	**667,725**
	Death	136	160	238	191	224	222	252	**1,423**

Table 3. IILMI assurances death and exposure smoker data for males and females on a lives basis.

The assurances data was collected for non-linked whole of life, level and decreasing temporary assurances and linked protection policies. Results are analysed by age group, gender, calendar year, smoker status, product type and duration. Comparisons are made (using ultimate mortality) with ILT16

and TXC00 for the combined IILMI smoker/non-smoker data and with TXC00 and TXN/SL08 for the IILMI data split by smoker status. Figures 2 and 3 present the comparisons with TXC00 for the IILMI data split by smoker status for males and females respectively.

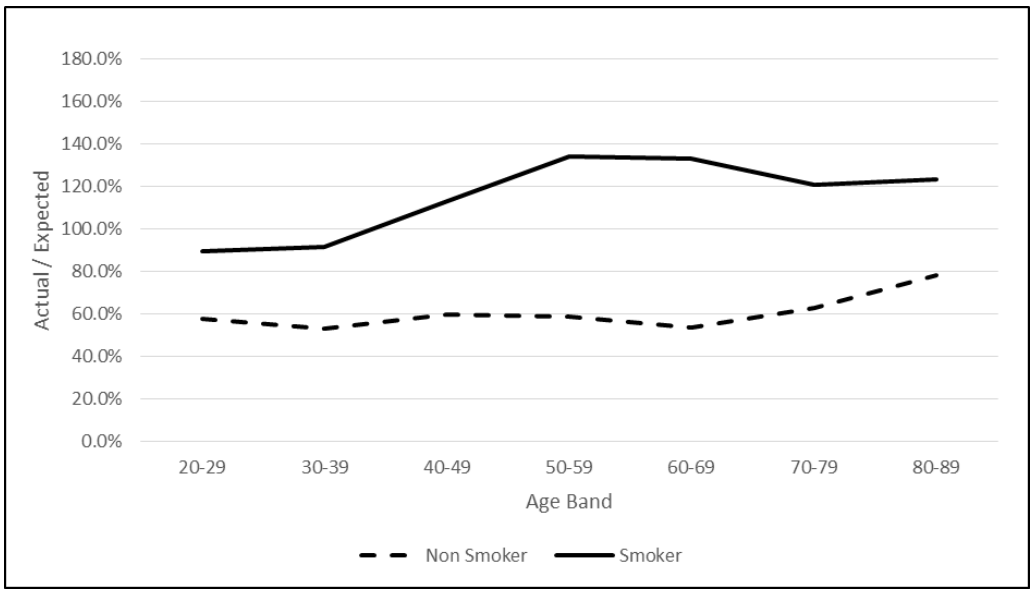

Figure 2. IILMI Assurance A/E results by age group for male smokers and non-smokers relative to TMC00.

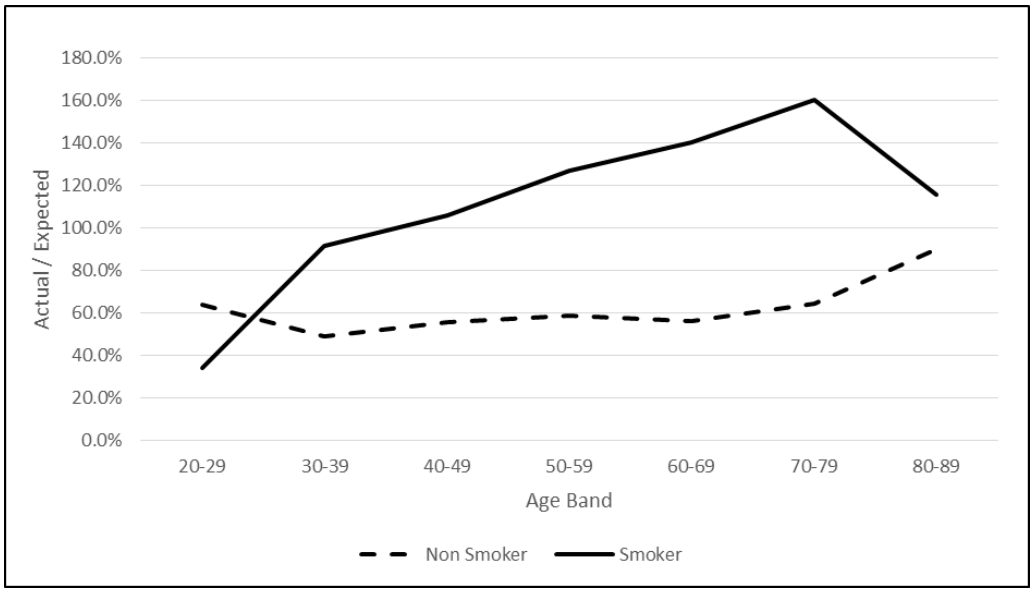

Figure 3. IILMI Assurance A/E results by age group for female smokers and non-smokers relative to TFC00.

The results show that, smoking is a significant factor affecting mortality for both males and females. The gap is most significant between ages 40 and 80 with smoker rates broadly double those of non-smokers in this age range.

3. History of Irish Insured Lives Mortality Analysis

3.1. CMI Irish Mortality Experience

Historically Irish insurance companies contributed to the Central Mortality Investigation (CMI)[9] life office investigations for permanent (whole of life and endowment) assurances. Table 4 lists the CMI reports which refer to the mortality experience of Irish insured lives. Data submissions from Ireland commenced in 1970 for males (with 12 offices contributing data for Ireland) and 1982 for females. CMI Report 11 also reported on the mortality experience of linked contracts in Ireland (two Irish companies' submitted linked data for this report), and CMI Report 14 contained a report on the mortality of retirement annuitants under approved pension arrangements in the Republic of Ireland for the period 1986-1991. Data volumes declined in the 1990s and by Working Paper 42, which refers to 2003-2006 Life Office experience, the CMI had ceased reporting on Irish mortality experience due to insufficient data volumes.

CMI Report No.	Products Covered	Period Covered	Published
3	Assurance	1971-1974	1978
5	Assurance	1975-1978	1981
6			1983
8	Assurance	1979-1982	1986
9			1988
11	Assurance & Linked	1983-1986	1991
14	Assurance	1987-1990	1995
	Pension Annuities	1986-1991	
16	Assurance	1991-1994	1998
19	Assurance	1995-1998	2000
21	Assurance	1999-2002	2004

Table 4: CMI reports reporting on Irish mortality experience

3.2. Aggregated Data Study

The Society has in previous years carried out an Annuitant and Insured Life Aggregated Data Study (ADS). Participating companies provided actual and expected claims data for annuities and assurances (Decreasing and Level Term Assurances). The expected claims were calculated by each company using the same standard tables. The data was aggregated across participating companies by the Society and results were presented split by age group, gender and calendar year for the annuities (lives and amounts) and split by age group, gender, calendar year, smoker status and duration for the assurances.

This investigation was carried out twice with the 2009 study covering the period 2006-2007 and the 2014 study covering the period 2008-2012. Results are available at https://web.actuaries.ie/press/demography-studies.

[9] https://www.actuaries.org.uk/learn-and-develop/continuous-mortality-investigation

3.3. Central Statistics Office Mortality Tables

The only publicly available Irish mortality tables are produced by the Central Statistics Office (CSO) and are based on the mortality experience of the total Irish population. These tables are updated after every census and are split by age and gender only. The most recent tables, Irish Life Tables 16 (ILT16)[10], reflect the mortality experience of the population over the period 2010 to 2012.

[10] http://www.cso.ie/en/releasesandpublications/er/ilt/irishlifetablesno162010-2012/

4. Overview of data and methodology

4.1. Data

Five domestic insurance companies submitted annuity data and seven domestic insurance companies submitted assurances data for IILMI. Participating insurance companies were provided with Excel data submission templates. The submission templates requested exposure data (initial exposed to risk calculated using the exact calculation method[11]) and deaths at each age (using the age definition age last birthday) split by pre-specified factors. No policy specific details were requested as part of the investigation. Separate templates were provided for annuity and assurance data submissions. To facilitate the data collection a flexible collection process was used – companies which could not provide the exact data requested could provide their closest matching data and specify the differences. Participating companies submitted their completed data templates directly to the Society and the data was aggregated across participating companies by Dr Mary Hall (academic and Chair of the Demography Committee).

The Society is not responsible for the data submitted by individual companies. However, reasonableness checks were performed on the data. Sections 5.1 and 6.1 of this report summarise the issues that arose when aggregating the annuity and assurance data respectively.

Aggregated Data Reports, produced separately for the annuities and assurances, were made available to the Demography Committee for analysis. The reports document the aggregation process, reasonableness checks and data issues encountered.

4.2. Data considerations

There are a number of common features of insurance data for which the granularity of the IILMI data did not afford any adjustment.

Duplicate lives

As the data provided was primarily a by-product of each company's own experience study process, duplicate lives (arising from multiple policies written on a given life) have been adjusted for as per each company's normal practice. No further adjustments were made by the Committee in respect of duplicate lives either within or between companies. Lives with policies across multiple companies could not be identified as the data provided was not at a policy level and therefore no adjustment was made to reflect this feature.

Incurred but not reported

No adjustments were made to reflect the impact of incurred but not reported (IBNR) claims. The data provided did not include details of the reporting date for claims as no policy level information was provided. Any IBNR adjustment is likely to vary by company. Therefore, companies were asked not to include any IBNR adjustments in the data provided in order to maintain consistency across the dataset.

[11] Examples of the exposure calculation were provided in the data request template under a range of scenarios and these are shown in appendix C for reference.

Ill-heath retirement (annuities study only)

No adjustments were made in respect of ill-health retirements. The data provided did not identify the nature of the retirements (e.g. ill health or normal) so adjusting for the impact of this feature was not possible. Nonetheless, the higher A/E results observed for lives under age 65 indicates the presence of such a feature in the underlying data (see Table 11 and Table 12).

4.3. Lives basis vs amounts basis

A lives basis reflects the number of lives (or more commonly policies) which die in each band and the number to which the insurer is exposed to the risk of death.

An amounts basis weights the mortality experience by the size of each member's policy (e.g. annuity premium or sum assured), either current or that applicable in the calendar year of the data, and will generally result in lower mortality rates than a lives basis for the same population.

Annuity data was requested on both a lives and amounts basis and assurance data was requested on a lives basis only. In both cases, analysis was performed on a lives basis only due to the limited credibility of the amounts data provided (see sections 5.1 and 6.1).

4.4. Methodology

Crude mortality rates were calculated using the formula:

$$q_x = \frac{\sum_i \sum_y D_{x,y,i}}{\sum_i \sum_y E_{x,y,i}}$$

where $D_{x,y,i}$ is the number of deaths at age *x* in calendar year y submitted by company *i* and $E_{x,y,i}$ is the corresponding initial exposed to risk submitted.

Results are presented in terms of Actual deaths ("A") over Expected deaths ("E") where "E" is calculated by reference to standard tables.

$$Expected\ Deaths\ at\ Age\ x = Actual\ Exposure\ at\ Age\ x\ \times q_x^S$$

where q_x^S is the mortality rate at age *x* from the standard table.

Total results were calculated using the formula:

$$\frac{A}{E} = \frac{\sum_x \sum_y Actual\ Deaths\ at\ Age\ x\ in\ calendar\ year\ y}{\sum_x \sum_y Expected\ Deaths\ at\ Age\ x\ \ in\ calendar\ year\ y}$$

Results by age band and calendar year were calculated similarly but with the summation restricted to the given age band or calendar year.

Confidence intervals[12], where shown, are at a 95% level and are calculated in line with the methodology set out in CMI working paper 62 for lives analysis. In summary 95% confidence intervals

[12] Confidence intervals reflect statistical fluctuation within the data. The A/E results have not been adjusted to control for factors such as seasonal variation.

of the lives weighted 100A/Es were estimated by assuming that the number of deaths follows a Poisson distribution[13]. The following formula, as specified in working paper 62, was used to calculate the confidence intervals (CI):

$$Standard\ Deviation\ (s.d.) = \frac{\sqrt{A}}{E} \times 100$$

$$CI = \left[\frac{100A}{E} - 1.96 \times s.d., \frac{100A}{E} + 1.96 \times s.d.\right]$$

Important: The confidence intervals only capture statistical fluctuations from the central position based on the size of the dataset. There are many factors which impact mortality that can change over time which are not captured in this simple statistical based confidence interval.

4.5. Allowance for Mortality Improvements

The standard tables used in the A/E comparisons are based on data for earlier years than the period covered by IILMI (2009-2015). Therefore, to allow for the impact of mortality improvements over the intervening period the A/E comparisons were repeated using the standard tables adjusted to reflect mortality improvements.

The improvements applied to the standard tables were obtained from the CMI_2016 mortality projection model. This provides smoothed estimates of the mortality improvements for the population of England and Wales by age, gender and calendar year up to 31 December 2016. Details of the CMI mortality projection model and the smoothing method applied can be found in CMI working papers 97[14], 98[15] and 103[16]. For this analysis the model's core (default) parameter values were used. The model is primarily designed to support estimates of projected improvements and therefore requires the user to input a long-term rate in order to produce an output. However, the mortality improvements used for analysis in this paper are based on actual, historic improvements and consequently are not dependent on the user provided long-term rate of improvement required by the model. Separate improvements were calculated for males and females. This allowance for mortality improvements enables a comparison of the IILMI experience relative to the CMI standard tables on a consistent basis over time.

When allowing for mortality improvements over time, the standard mortality rates, q_x^s, were improved as follows:

$$r_{x,y} = \prod_{c}^{y}(1 - f_{x,i})$$

$$q_{x,y}^s = q_x^s * r_{x,y}$$

[13] CMI WP 62 - https://www.actuaries.org.uk/documents/cmi-working-paper-62-report-preliminary-results-analysis-mortality-experience-pensioners
[14] CMI WP 97 - https://www.actuaries.org.uk/documents/cmi-working-paper-97-cmi-mortality-projections-model-cmi2016
[15] CMI WP 98 - https://www.actuaries.org.uk/documents/cmi-working-paper-98-cmi-mortality-projections-model-methods
[16] CMI WP 103 - https://www.actuaries.org.uk/learn-and-develop/continuous-mortality-investigation/cmi-working-papers/mortality-projections/cmi-working-paper-103

where:

- $f_{x,i}$ is the improvement factor specified by the CMI model in respect of age x and calendar year i.
- c is the central year of the standard table.
- $r_{x,y}$ is referred to as the reduction factor for age x and calendar year y.
- $q^{s}_{x,y}$ is the improved standard mortality rate for age x and calendar year y.

The improved standard mortality rates were then used to derive the expected mortality as follows:

$$Expected\ Deaths\ at\ age\ x\ in\ year\ y = Actual\ Exposure\ at\ age\ x\ in\ year\ y\ \times q^{s}_{x,y}$$

5. Annuities

5.1. Data

5.1.1. Annuity data request

Participating insurance companies were requested to submit data on annuities in payment sold to lives resident in Ireland at the point of sale. Companies were asked to include all annuity pension type products including compulsory purchase, purchased life, conventional, enhanced, level/escalating, etc. Insurers were asked to exclude contingent second life data.

Data (deaths and exposure) was requested, on both a lives and amounts basis, split by the following factors:

Factor	Description
Age	50-120; age last birthday
Gender	Male/Female
Annuity Amount Band	Annual pension based on current annuity amount: - €0 - ≤ €2,500 - €2,500 - €4,999 - €5,000 - €9,999 - €10,000 - €29,999 - €30,000 +
Calendar Year	2009-2015

Table 5: Requested annuity data for IILMI

5.1.2. Aggregation of annuity data – treatment of data limitations

The data was submitted to the Society and aggregated across the participating insurance companies before been passed to the Demography Committee for analysis. As part of the data aggregation process the following points were noted[17]:

- Not all companies provided data on an amounts basis and in some cases the amounts data provided was only approximate. It was concluded that there was insufficient data for a credible analysis on an amounts basis; this aspect of the data was excluded from the analysis.
- Not all companies split their data into annuity amount bands and in some cases only approximate annuity amount bands were used. Again, it was concluded that there was insufficient data to allow a credible analysis by amount band and therefore this aspect of the data was excluded from the analysis.
- Some companies could not provide data covering the full investigation period; the data was included over the period for which it was available.
- Some partial or full data sets were excluded from the analysis for reasons such as large annual fluctuations in experience which could not be explained.

5.1.3. Overview of annuity data included in IILMI

Table 6 presents the total death counts and exposure data on a lives basis included in the analysis. The data is split by Age, Gender and Calendar Year for this analysis.

[17] An Aggregated Data Report, which documents the aggregation process, reasonableness checks and data issues encountered, was made available to the Demography Committee for analysis.

		Calendar year							Total
		2009	2010	2011	2012	2013	2014	2015	
Male	Exposure	34,523	37,483	41,226	45,006	47,919	44,570	45,971	**296,698**
	Death	1,004	1,065	1,050	1,167	1,288	1,304	1,295	**8,173**
Female	Exposure	13,666	14,561	15,653	16,793	18,204	17,942	18,758	**115,576**
	Death	434	455	463	510	502	527	564	**3,455**

Table 6: Total male and female annuity data by calendar year on a lives basis

At a total level, the table above shows that the crude mortality rate for female lives is higher than that for males. This is due to the higher average age of the female population (see Table 7 below). When considered by age band, the crude mortality rate for males is higher than that for females as expected. The impact of age is considered further in later sections of this paper.

The general trend is an increase in exposure and deaths over the period of the study. The fall in exposure from 2013 to 2014 is a result of one company not providing data from 2014 onward. Figure 4 and Figure 5 present the progression of the exposure and deaths by calendar year for males and females respectively.

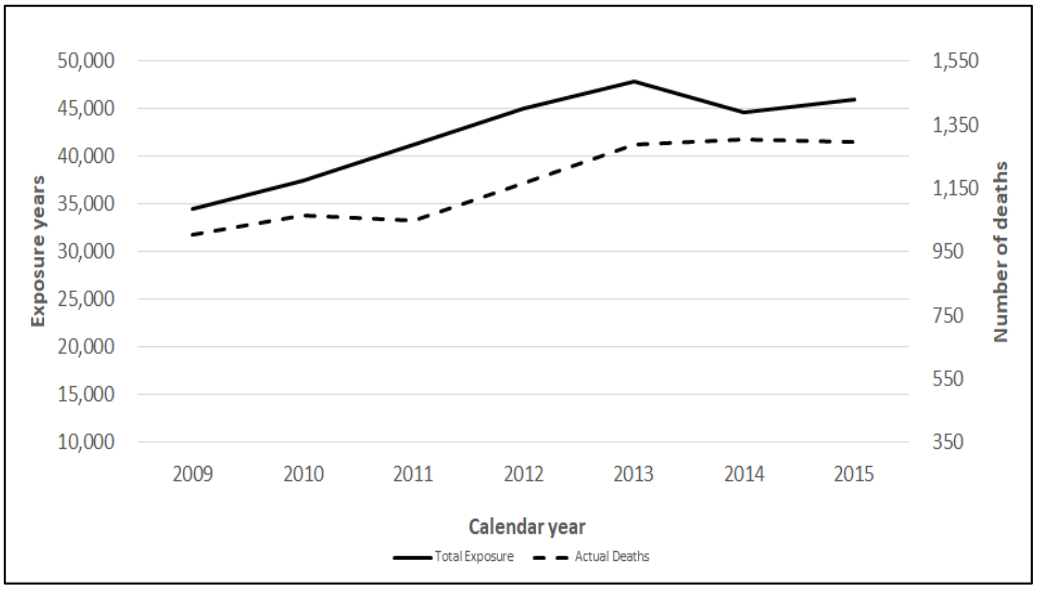

Figure 4: Total male annuity data deaths and exposure by calendar year on a lives basis

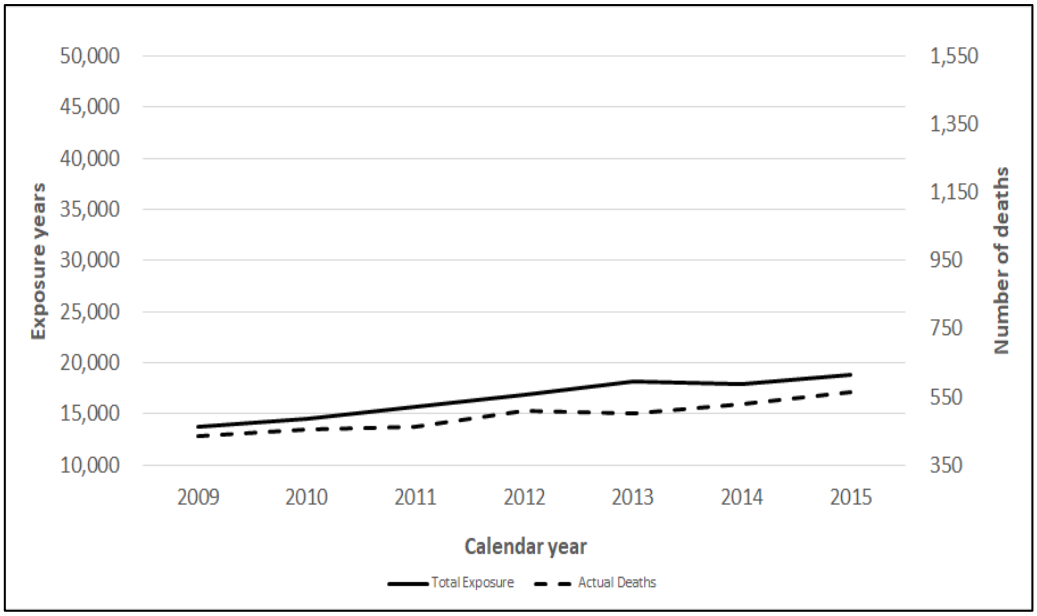

Figure 5: Total female annuity data deaths and exposure by calendar year on a lives basis

The average age (weighted by exposure) of the population is reasonably constant during the study. Although there is a slight decline in the average age of females, as the table below shows:

Calendar year	Average age	
	Males	Females
2009	71.4	73.1
2010	71.3	73.1
2011	71.0	72.9
2012	71.0	72.7
2013	71.1	72.6
2014	71.0	72.4
2015	71.3	72.6
Change	**(0.1)**	**(0.5)**

Table 7: Average age male and female annuity data by calendar year

Table 8 shows a breakdown of actual deaths by age band. The volume of deaths for lives under 65 and aged 95+ is low for both males and females and therefore 5-year bands are not used for these categories but rather all ages are grouped together.

		Males		Females	
		Exposure	Deaths	Exposure	Deaths
Age Band	<65	59,260	368	23,086	114
	65-69	75,004	751	22,365	172
	70-74	64,246	1,095	20,034	226
	75-79	48,582	1,557	19,571	428
	80-84	31,103	1,911	15,859	772
	85-89	14,178	1,635	9,875	895
	90-94	3,675	702	3,837	630
	95+	651	154	948	218
Total		**296,698**	**8,173**	**115,576**	**3,455**

Table 8: Total male and female annuity data by age band on a lives basis

The tables above clearly demonstrate some limitations with the size of the dataset. This is particularly the case when considering data split by individual segments such as by Age Band or by Calendar Year. This report includes results for data segments which are not credible in their own right because of the low volume of data underpinning that result. Results included in this paper are for information only. Potential users of the information presented in this paper must consider the credibility and appropriateness of the relevant data segment.

5.2. Crude mortality rates

Figure 6 presents the crude mortality rates[18] based on the actual deaths and exposure for ages 50-100. Ages over 100 are excluded due to the sparsity of data in this range. No graduation of the rates has been attempted; they are presented here as unadjusted crude rates for reader information only.

Figure 6: Crude mortality rates by age for male and female annuitants on a lives basis

As expected, mortality rates increase with age for both genders with male mortality rates higher than female rates. The crude mortality rates become increasingly volatile at older ages as the credibility of the experience decreases.

[18] See section 4.4 for method of calculation

5.3. Standard mortality tables for comparison

Results are presented on an A/E basis by reference to the relevant standard table listed in Table 9. The standard tables used are the ultimate versions of the table in all instances. Note that the period underlying the standard tables does not correspond to the IILMI investigation period in any instance.

Table*	Full name	Data Set / Source	Data period	Central year
PNXL00	Pensioners, Normal, Lives	CMI Assured Lives Working Paper 22[19]	1999 - 2002	2000
PNXA00	Pensioners, Normal, Amounts			
RXC00	Retirement Annuitants, Combined, Lives			
S2PXL	All pensioners (excluding dependants), Lives	CMI Self-Administered Pension Schemes Working Paper 71[19]	2004 - 2011	2007
S2PXA	All pensioners (excluding dependants) Amounts			
PXL08	Pension annuities in payment, Lives	CMI Assured Lives Working Paper 81[19]	2007 – 2010	2008
PXA08	Pension annuities in payment, Amounts			
ILT16 (X)	Irish Life Table No. 16,	CSO Irish Population (Census)[20]	2010 – 2012	2011

** In the table names shown X denotes M (male) or F (female), all information shown in this table applies to both*

Table 9: Standard tables used for annuity analysis

5.4. Results without allowance for mortality improvements

All results presented in this section are in respect of the full age range (50-120) of the annuity data set. As the data provided for this analysis did not include credible amounts data, all analysis in this section is performed on a lives basis with comparison against lives standard tables. For the purposes of comparison with previous Society studies, analysis on a lives basis, against amounts tables is included in appendix A. Table 10 presents the A/E results for males and females relative to the standard tables on a lives basis.

		PNXL00	RXC00	PXL08	S2PXL	ILT 16 (X)
Male	**Total A/E**	**73%**	**83%**	**93%**	**79%**	**75%**
	CI Lower	71%	81%	91%	77%	73%
	CI Upper	74%	84%	95%	81%	77%
Female	**Total A/E**	**84%**	**103%**	**101%**	**90%**	**86%**
	CI Lower	81%	99%	98%	87%	83%
	CI Upper	87%	106%	105%	94%	89%

Table 10: Annuity A/E results for males and females

For both male and female lives, the PXL08 table appears to be the most representative of the dataset. This is as expected as this is the most recent of the insured lives tables considered and therefore best reflects both the nature of the underlying business and the greatest proportion of the improvements observed to date. The least representative is ILT16 which is as expected given that ILT16 is based on

[19] https://www.actuaries.org.uk/learn-and-develop/continuous-mortality-investigation
[20] http://www.cso.ie/en/releasesandpublications/er/ilt/irishlifetablesno162010-2012/

the total Irish population rather than an insured population. The other tables are insured lives tables but based on older data without any allowance for improvements over the intervening period. The impact of improvements over the period from the central year of the tables is considered in section 5.5.

5.4.1. Results by age band

Table 11 and Table 12 present the results of the A/E experience analysis split by age band. Five-year age bands were used to allow age-specific variations to be captured while maintaining a reasonable degree of credibility in each band.

MALE	All ages	Actual Deaths	PNML00	RMC00	PML08	S2PML	ILT 16 (M)
Age Band	<65	368	84%	92%	83%	78%	76%
	65-69	751	63%	71%	83%	66%	63%
	70-74	1,095	60%	70%	87%	67%	63%
	75-79	1,557	63%	75%	92%	73%	70%
	80-84	1,911	73%	85%	96%	82%	79%
	85-89	1,635	91%	97%	101%	93%	89%
	90-94	702	104%	103%	98%	99%	92%
	95+	154	88%	80%	78%	81%	71%
Total		**8,173**	**73%**	**83%**	**93%**	**79%**	**75%**

Table 11: Male annuity A/E results by age band

FEMALE	All ages	Actual Deaths	PNFL00	RFC00	PFL08	S2PFL	ILT 16 (F)
Age Band	<65	114	116%	126%	115%	101%	102%
	65-69	172	80%	98%	105%	85%	80%
	70-74	226	62%	84%	90%	71%	69%
	75-79	428	64%	87%	93%	75%	75%
	80-84	772	82%	105%	106%	91%	90%
	85-89	895	91%	109%	104%	97%	90%
	90-94	630	104%	116%	105%	106%	95%
	95+	218	90%	91%	86%	89%	81%
Total		**3,455**	**84%**	**103%**	**101%**	**90%**	**86%**

Table 12: Female annuity A/E results by age band

Consistent with the results in Table 10, the PML08 table is the most representative for males across all age bands except the youngest and oldest where experience is least credible. For females the picture is less clear but PFL08 is on balance the most representative across age bands except the youngest and oldest. There is some volatility in the A/E ratios across the age bands, particularly at the youngest and oldest bands.

5.4.2. Results by calendar year

Table 13 and Table 14 present the results of the analysis split by calendar year.

MALE	Calendar year							TOTAL
All ages	2009	2010	2011	2012	2013	2014	2015	
Actual deaths	**1,004**	**1,065**	**1,050**	**1,167**	**1,288**	**1,304**	**1,295**	**8,173**
PNML00	77%	75%	69%	70%	71%	77%	72%	**73%**
RMC00	88%	86%	78%	79%	80%	87%	82%	**83%**
PML08	99%	97%	88%	89%	90%	98%	91%	**93%**
S2PML	84%	82%	74%	75%	77%	83%	78%	**79%**
ILT 16 (M)	80%	78%	71%	72%	73%	79%	74%	**75%**

Table 13: Male annuity A/E results by calendar year

FEMALE	Calendar year							TOTAL
All ages	2009	2010	2011	2012	2013	2014	2015	
Actual deaths	**434**	**455**	**463**	**510**	**502**	**527**	**564**	**3,455**
PNFL00	89%	87%	83%	85%	78%	83%	83%	**84%**
RFC00	110%	108%	102%	104%	95%	101%	101%	**103%**
PFL08	109%	106%	101%	103%	94%	99%	99%	**101%**
S2PFL	97%	95%	90%	92%	84%	89%	90%	**90%**
ILT 16 (F)	93%	90%	86%	88%	80%	85%	85%	**86%**

Table 14: Female annuity A/E results by calendar year

Consistent with the results in Table 10, the PML08 table is the most representative for males across all calendar years. For females, PFL08 is the most representative across calendar years.

For male lives, A/E experience shows a similar pattern for all tables: heavier mortality in 2009-2010 followed lighter mortality in 2011-2013 increasing in 2014 before falling again in 2015. There is more variation in the female experience against the various tables.

The year-on-year experience is volatile, particularly for females. Considering the study period as a whole, there is some evidence of mortality improvements coming through for both males and females. Taking a 3 year average of the A/E result, where:

$$A/E(year\ x) = \frac{\sum_{all\ ages} Actual\ Deaths\ in\ year\ x}{\sum_{all\ ages} Expected\ Deaths\ in\ year\ x}$$

and

$$Improvement\ Rate = 1 - \left(\frac{average(A/E(2013), A/E(2014), A/E(2015))}{average(A/E(2009), A/E(2010), A/E(2011))}\right)^{0.25}$$

Applying the above formula against the PXL08 tables suggests annual improvements of 0.5% for males and 1.9% for females over the investigation period. However, users of this information should consider the fact that the exact improvement derived using this methodology depends on the choice of table and the age mix of the experience.

The graphs below show the trend over the period of the study for the CMI table (PXL08) and ILT16.

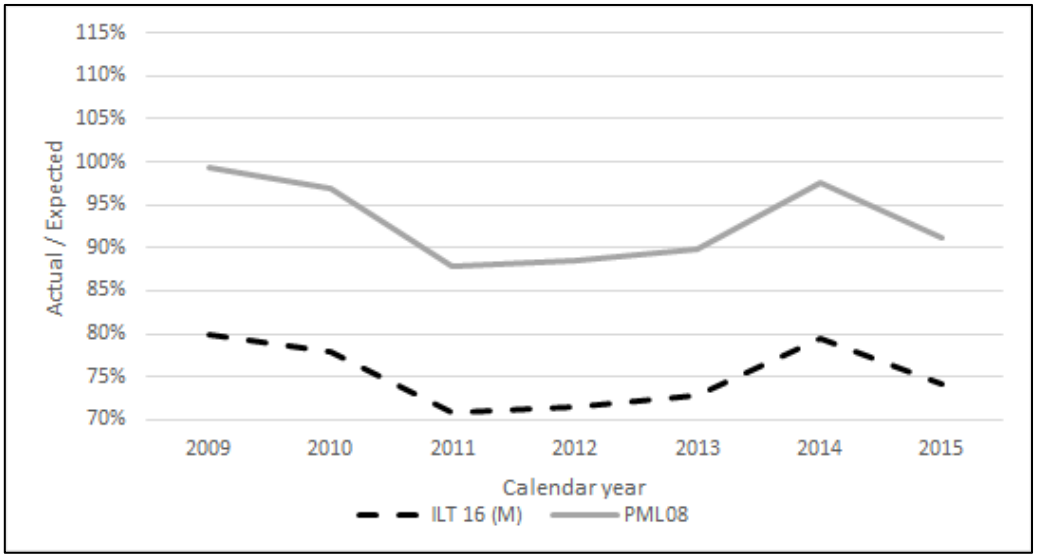

Figure 7: IILMI Annuity A/E results by calendar year for males relative to PML08 & ILT16 (M)

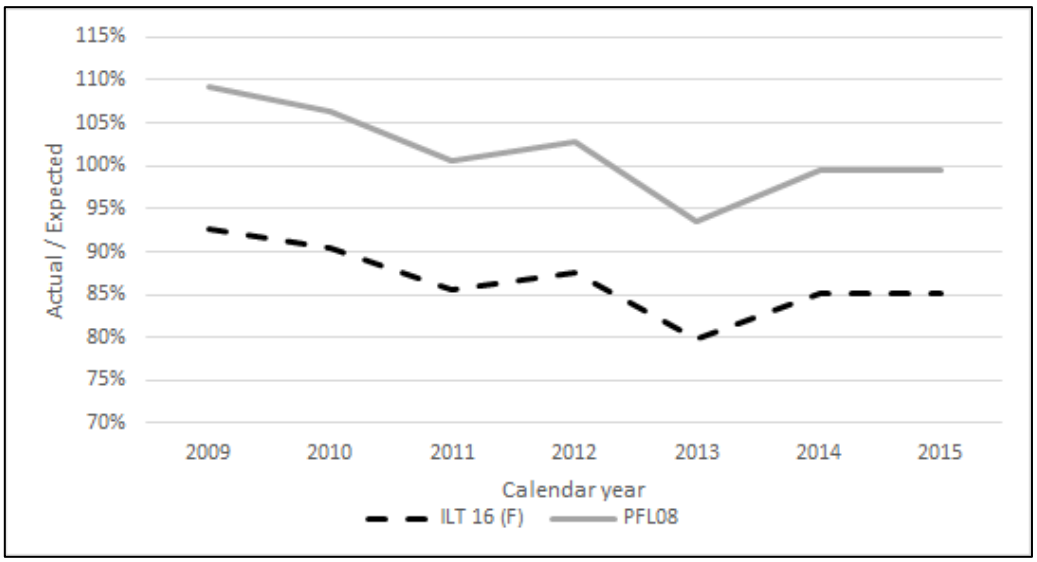

Figure 8: IILMI Annuity A/E results by calendar year for females relative to PFL08 & ILT16 (F)

5.5. Results allowing for mortality improvements

The IILMI data and the standard tables used in the A/E comparisons are based on different time periods. To allow for the effect of mortality improvements over time this section shows the A/E comparisons from sections 5.4.1and 5.4.2 recalculated using the standard tables adjusted to allow for mortality improvements using the method described in section 4.5.

The A/E results are considered using a number of standard tables in section 5.4. PXL08 is the most representative of the dataset in the analysis without improvements and so the analysis of the results allowing for mortality improvements is focused on this table. In addition, PNXL00 is included in this section to illustrate the difference, after allowing for improvements, between the standard tables with central year 2008 (i.e. PXL08) and those with central year 2000 (i.e. PNXL00).

Table 15 presents the A/E results for males and females relative to the standard tables, allowing for improvements, on a lives basis.

		PNXL00	PXL08
Male	**Total A/E**	**100%**	**102%**
	CI Lower	98%	100%
	CI Upper	102%	104%
Female	**Total A/E**	**104%**	**108%**
	CI Lower	101%	104%
	CI Upper	108%	112%

Table 15: Annuity A/E results allowing for improvements for males and females

5.5.1. Results by age band

The tables below show the results of the A/E experience analysis by age band against PNXL00 and PXL08 after allowing for mortality improvements.

MALE All ages		Actual Deaths	PNML00	PML08
Age band	<65	368	115%	89%
	65-69	751	92%	92%
	70-74	1,095	92%	97%
	75-79	1,557	94%	104%
	80-84	1,911	99%	108%
	85-89	1,635	112%	108%
	90-94	702	117%	101%
	95+	154	93%	78%
Total		**8,173**	**100%**	**102%**

Table 16. Male annuity A/E results by age band (improved)

FEMALE All ages		Actual Deaths	PNFL00	PFL08
Age band	<65	114	149%	122%
	65-69	172	110%	115%
	70-74	226	88%	100%
	75-79	428	90%	104%
	80-84	772	105%	117%
	85-89	895	107%	109%
	90-94	630	114%	107%
	95+	218	94%	86%
Total		**3,455**	**104%**	**108%**

Table 17. Female annuity A/E results by age band (improved)

5.5.2. Results by calendar year

The tables below show the results of the A/E experience analysis by calendar year against PNXL00 and PXL08 after allowing for mortality improvements.

MALE	By calendar year							TOTAL
All ages	2009	2010	2011	2012	2013	2014	2015	
Actual deaths	**1,004**	**1,065**	**1,050**	**1,167**	**1,288**	**1,304**	**1,295**	**8,173**
PNML00	99%	100%	93%	96%	99%	110%	105%	**100%**
PML08	102%	102%	95%	97%	100%	111%	105%	**102%**

Table 18. Male annuity A/E results by calendar year (improved)

FEMALE	By calendar year							TOTAL
All ages	2009	2010	2011	2012	2013	2014	2015	
Actual deaths	**434**	**455**	**463**	**510**	**502**	**527**	**564**	**3,455**
PNFL00	106%	106%	102%	106%	98%	105%	107%	**104%**
PFL08	111%	110%	106%	110%	101%	109%	110%	**108%**

Table 19. Female annuity A/E results by calendar year (improved)

After adjusting the standard tables to allow for improvements to the calendar year of the IILMI data exposure, the male analysis looks fairly stable over time with the exception of 2014 which clearly exhibits higher mortality. This is consistent with the features of the raw data discussed in section 5.1.3 where exposure dropped significantly in 2014 but deaths remained fairly stable. For female lives, there is no clear trend by calendar year.

5.6. Comparison with aggregated data study

As a sense check on the reasonability of the IILMI results, the results were compared with results from the 2014 ADS[21]. The ADS collected data for all annuities for the period 2008–2012 and presented results on an A/E basis by gender, age and calendar year. For the purposes of the comparison between IILMI and ADS, the actual mortality experience from IILMI and ADS is compared to the expected mortality experience based on the PNXA00 tables. Although this is an amounts table, analysis in both studies was performed on a lives basis and is therefore directly comparable.

The table below shows the results from each study by gender.

A/E	ADS	IILMI
Male	88%	84%
Female	98%	92%

Table 20. Comparison of ILLMI results against ADS results for Annuities

The ADS study indicated significantly heavier mortality than IILMI. The IILMI study is based on a longer period and a higher volume of data (i.e. 11,628 deaths in IILMI vs 6,671 deaths in ADS) so differences are expected. Given the PNXA00 tables have been used without improvements, heavier mortality is consistent with the earlier period of the ADS study.

[21] See paragraph 3.2

The following two graphs compare the A/E ratios by calendar year for males and females. The ratios in each year are similar for both males and females, though slightly closer for females.

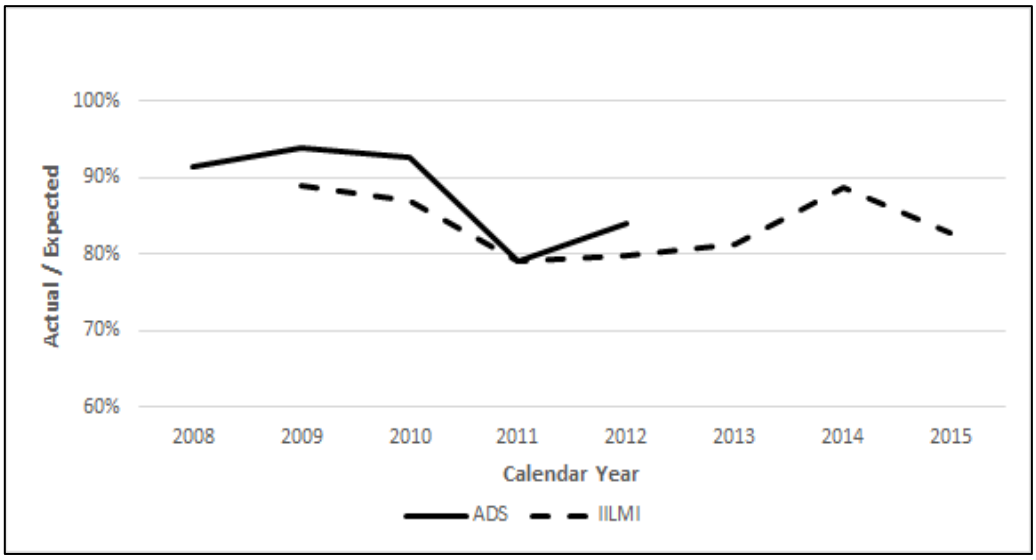

Figure 9: Annuity A / E comparison IILMI to ADS by calendar year for male lives

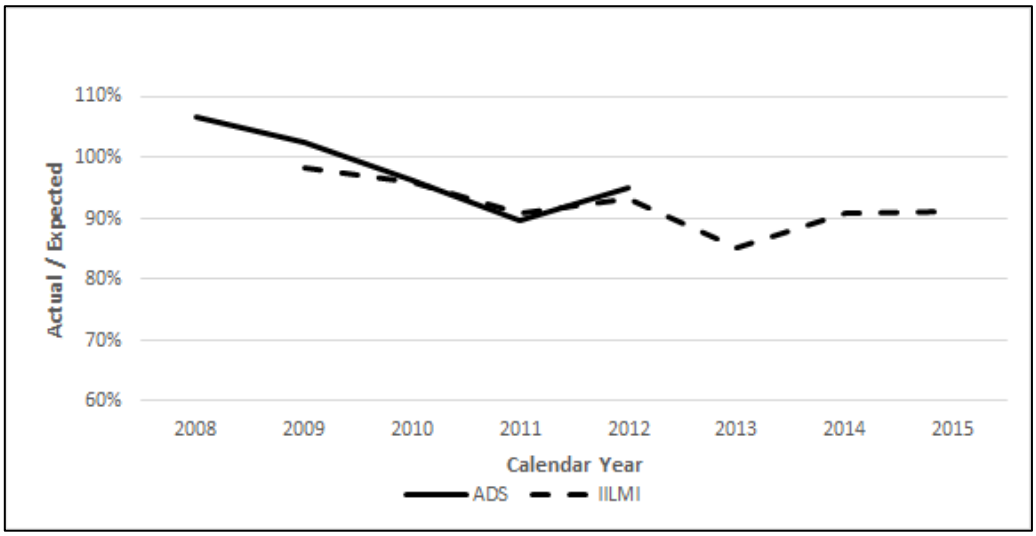

Figure 10: Annuity A / E comparison IILMI to ADS by calendar year for female lives

The following graphs compare the A/E ratios by age band for males and females using the average rates over the years of data available for each age band (over calendar years 2008 – 2012 for ADS and over calendar years 2009 – 2015 for IILMI).

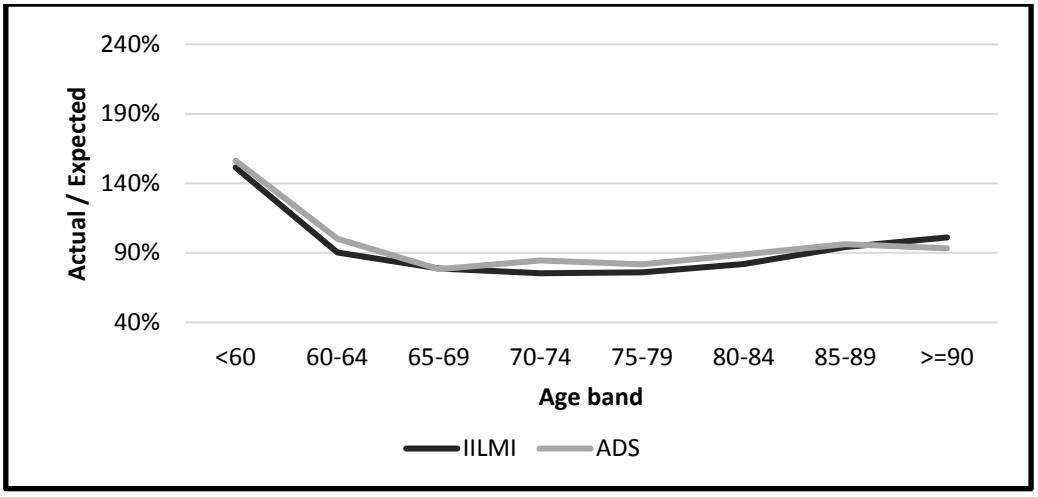

Figure 11: Annuity A / E comparison IILMI to ADS by age band for male lives

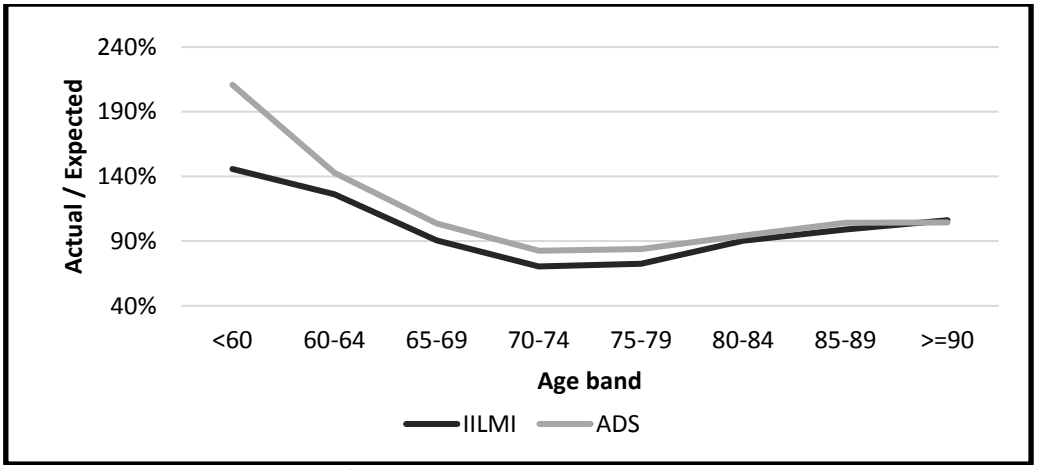

Figure 12: Annuity A / E comparison IILMI to ADS by age band for female lives

The ratios for each age band are similar between the two studies for both males and females, though the IILMI results are generally lower than the ADS results except for ages greater than 90 years. This is as expected given the ADS analysis is based on an earlier period and no allowance is made for improvements in mortality over the intervening period.

Appendix A presents further analysis of the annuity data relative to the amounts tables for the purpose of comparison with the ADS study.

6. Assurances

6.1. Data

6.1.1. Assurance data request

Participating insurance companies were requested to submit data on assurance policies sold to lives resident in Ireland at the point of sale. Insurers were asked to exclude data on polices with accelerated critical illness attaching, underwriting loadings or ratings, joint life last survivor benefits and policies with zero underwriting. Insurers were also asked to exclude unit-linked investments/savings/pensions type products. Data (deaths and exposure) was requested on a lives basis[22] only, split by the following factors:

Factor	Description
Age	21-120; age last birthday
Gender	Male/Female
Smoker Status	Smoker/Non Smoker
Product Type	Non-linked-Whole of Life Non-linked Term Level Non-linked-Term-Decreasing Linked Protection
Duration	0,1,2,3+
Distribution Channel	Independent Broker Tied / Direct Business Bank assurance
Calendar Year	2009-2015

Table 21: Requested assurances data for IILMI

The submission templates specified that death data should include all settled claims, pending claims, partial-payment death claims and terminal illness claims. Insurers were asked to exclude from the death data declined claims, child claims and any allowances/additions for incurred but not reported (IBNR) claims.

6.1.2. Aggregation of assurance data – treatment of data limitations

The data was submitted to the Society and aggregated across the participating insurance companies before being passed to the Demography Committee for analysis. As part of the data aggregation process the following were noted:

- Some companies could not split their data by distribution channel. Therefore, it was felt that there was insufficient data for analysis by distribution channel to be credible.
- In some cases, the data received included certain categories of policies that the data request had excluded e.g. rated policies, joint life policies etc. There was an approximately even split in the number of companies submitting data which did and did not match the requested policyholder categories. Although it was not clear whether the datasets including rated lives were adjusted accordingly, a comparison of the companies with rated lives and those without indicated there was little difference between the groups. Consequently, it is likely companies made adjustments in respect of rated lives and no further adjustment was required as part of

[22] See section 4.2

the analysis in this paper. Therefore the groups were combined for the remainder of the analysis.

- Where duration data was not available it was assumed that the data related to duration band year 3+.
- Data for partial years and approximated data were excluded from the analysis.
- The data collection template included one overall category for those aged 21 and under and therefore individuals aged 21 or less are grouped together for analysis purposes. All these individuals (age 21 or less) are treated as if they are age 21 for the purpose of the analysis. The upper age range in the investigation is restricted to age 89 as the data available above this upper age is sparse and the results are not credible when compared to the standard tables.
- Some companies could not supply data for all calendar years and have only been included for years in which data is available.

6.1.3. Overview of assurance data included in IILMI

Table 22 presents the total death counts and exposure data on a lives basis included in the analysis. The data is split by Age, Gender, Smoker Status, Product Type, Duration and Calendar Year for this analysis. There are significantly more deaths in the male dataset (7,332) compared to the female dataset (4,112).

		Calendar year							Total
		2009	2010	2011	2012	2013	2014	2015	
Male	Exposure	450,878	445,379	598,559	585,962	570,543	556,133	546,589	**3,754,043**
	Death	810	880	1117	1039	1191	1183	1102	**7,322**
Female	Exposure	401,356	401,502	538,492	532,827	523,562	513,844	507,563	**3,419,147**
	Death	378	468	664	642	629	634	697	**4,112**

Table 22: Total male and female assurance data by calendar year on a lives basis

The progression of the exposure and deaths by calendar year for males and females are shown in Figure 13 and Figure 14. The marked increase in the deaths and exposure from 2010 to 2011 is a result of one company only providing data from 2011 onwards.

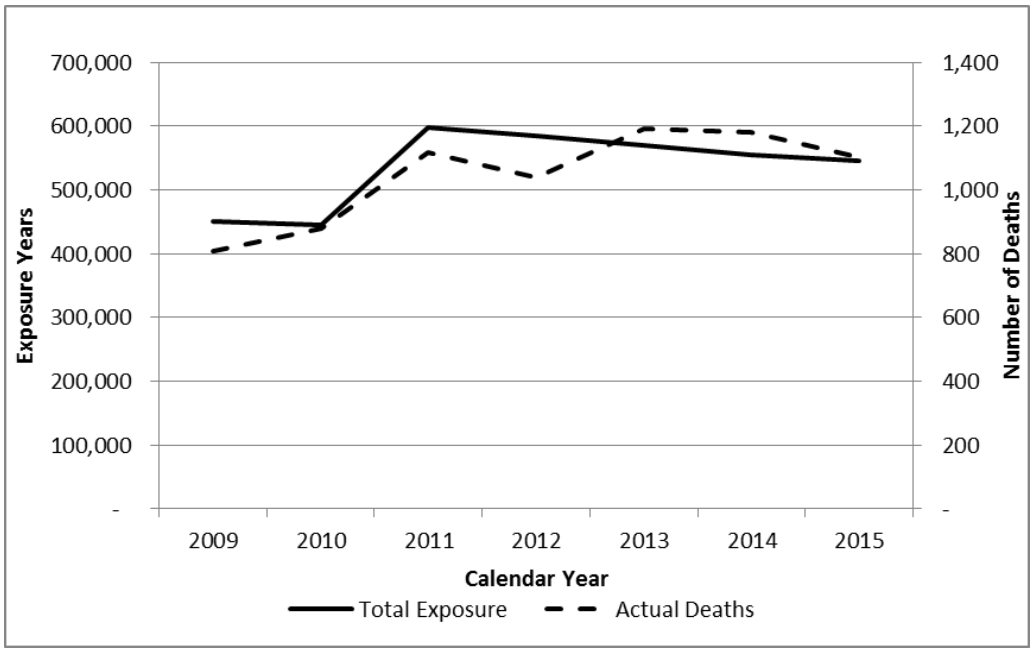

Figure 13. Total assurances deaths and exposure by calendar year for male lives

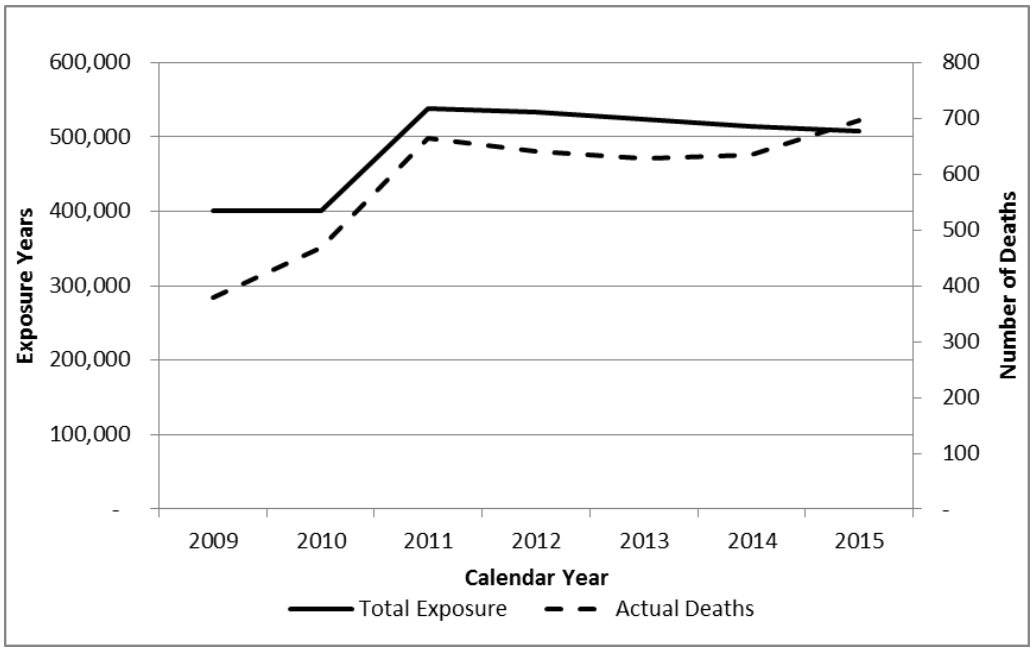

Figure 14. Total assurances deaths and exposure by calendar year for female lives

The data has aged considerably over the investigation period. The table below shows the average age (weighted by exposure) for males and females for each calendar year over the investigation period. The average age has increased by 3.3 years throughout the period of the investigation.

Calendar Year	Average Age	
	Male	Female
2009	43.8	42.6
2010	44.5	43.2
2011	44.9	43.6
2012	45.5	44.2
2013	46.1	44.8
2014	46.6	45.3
2015	47.1	45.9
Change	**3.3**	**3.3**

Table 23: Average age male and female assurance data by calendar year

The tables below show the exposure and deaths by gender and calendar year over the term of the investigation period for the smokers, non-smokers and combined (smokers + non-smokers) datasets included in the investigation.

Males		Calendar year							Total
		2009	2010	2011	2012	2013	2014	2015	
Smokers	Exposure	104,769	100,546	124,780	118,614	111,885	106,086	101,635	**768,316**
	Deaths	284	297	371	350	361	408	348	**2,419**
Non Smokers	Exposure	346,109	344,833	473,780	467,348	458,657	450,047	444,954	**2,985,727**
	Deaths	526	583	746	689	830	775	754	**4,903**
Combined	Exposure	450,878	445,379	598,559	585,962	570,543	556,133	546,589	**3,754,043**
	Deaths	810	880	1,117	1,039	1,191	1,183	1,102	**7,322**

Table 24: Assurances deaths and exposure by calendar year for male lives

Females		Calendar year							Total
		2009	2010	2011	2012	2013	2014	2015	
Smokers	Exposure	89,116	86,822	107,600	103,389	98,195	93,280	89,323	**667,725**
	Deaths	136	160	238	191	224	222	252	**1,423**
Non Smokers	Exposure	312,240	314,680	430,891	429,438	425,367	420,564	418,240	**2,751,422**
	Deaths	242	308	426	451	405	412	445	**2,689**
Combined	Exposure	401,356	401,502	538,492	532,827	523,562	513,844	507,563	**3,419,147**
	Deaths	378	468	664	642	629	634	697	**4,112**

Table 25: Assurances deaths and exposure by calendar year for female lives

Data volumes are further reduced when split by the factors listed above and this report includes results for data segments which are not credible in their own right because of the low volume of data

underpinning that result. Results included in this report are for information purposes only. Potential users of the information presented in this paper must consider the credibility and appropriateness of the relevant data segment.

6.2. Crude mortality rates

Figure 15 and Figure 16 present the crude mortality rates on a log scale for ages 30-89 based on the actual deaths and exposure for each age in the combined, non-smokers and smokers dataset for males and females respectively. Ages less than 30 and over 89 are excluded due to the sparsity of data at these ages.

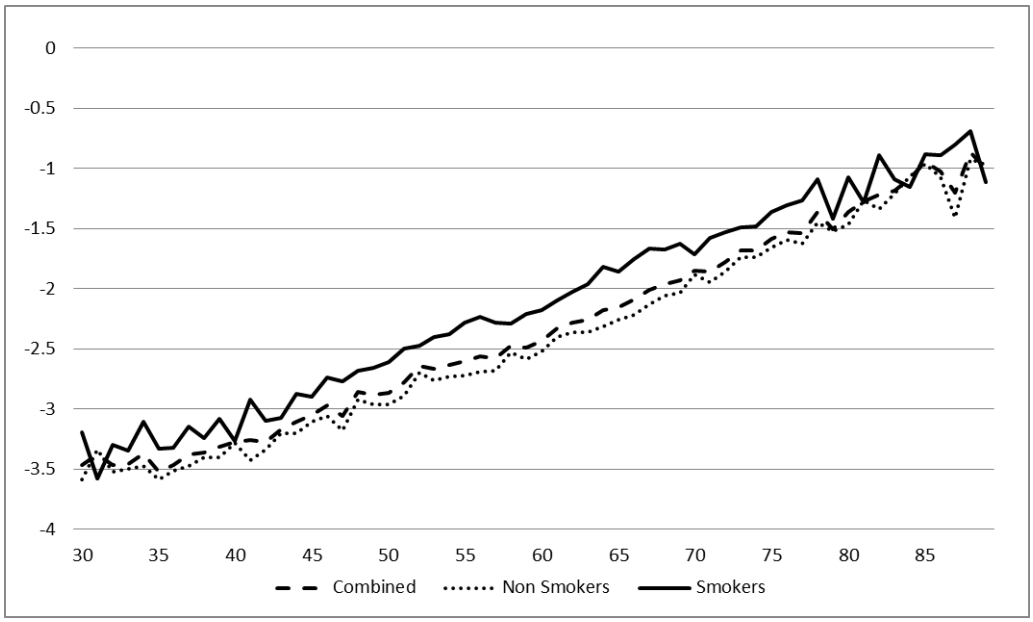

Figure 15. IILMI assurances crude mortality rates (log scale) by age for male lives

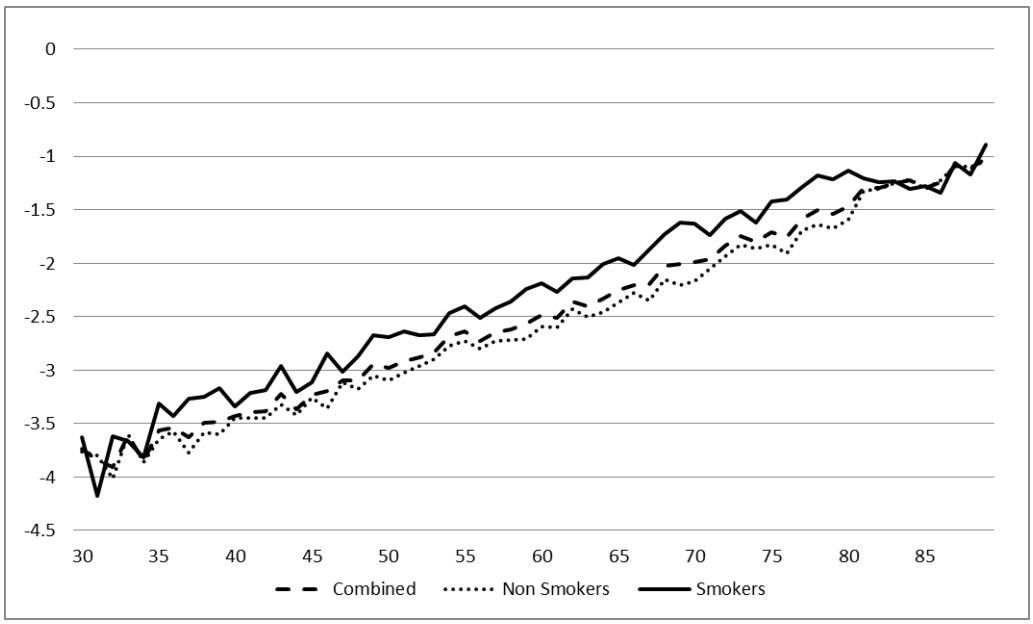

Figure 16. IILMI assurances crude mortality rates (log scale) by age for female lives

The graphs above show a broadly consistent progression by age that is in line with known norms by gender and smoking status (i.e. male mortality heavier than female and smoker mortality heavier than

non-smoker). The data is sparse at very young and very old ages and the progression at these ages is much more volatile.

6.3. Standard mortality tables for comparison

Results are presented on an A/E basis[23] by reference to the relevant standard table listed in Table 26. The standard tables used in this paper are the ultimate versions of the table in all instances. Note that the period underlying the standard tables does not correspond to the IILMI investigation period in any instance.

Table *	Full Name	Data Set / Source	Data period	Central year
TXC00	Temporary Assurances, combined (smokers & non-smokers), Duration 5+ Years	CMI Assured Lives Working Paper 21[24]	1999 – 2002	2000
TXNL08	Term Assurances, non-Smoker Lives, Duration 5+Years	CMI Assured Lives Working Paper 94[24]	2007 – 2010	2008
TXSL08	Term Assurances, Smoker Lives, Duration 5+Years	CMI Assured Lives Working Paper 94[24]	2007 – 2010	2008
ILT16 (X)	Irish Life Table No. 16	CSO Irish Population (Census)[25]	2010 – 2012	2011

** In the table names shown X denotes M (male) or F (female), all information shown in this table applies to both*

Table 26: Summary of standard tables for the assurances investigation

6.4. Results without allowance for mortality improvements

All results presented in this section are in respect of ages up to and including 89 in the assurance data set.

Table 27 and Table 28 present the A/E results for males and females relative to standard tables for the combined, non-smoker and smoker datasets respectively.

Male	Combined		Non-Smokers		Smokers	
	TMC00	ILT 16 (M)	TMC00	TMNL08	TMC00	TMSL08
Total A/E	70.9%	52.9%	58.5%	97.6%	124.1%	95.5%
CI Lower	69.2%	51.7%	56.8%	94.9%	119.2%	91.7%
CI Upper	72.5%	54.1%	60.1%	100.3%	129.1%	99.3%
Actual Deaths	7,322	7,322	4,903	4,903	2,419	2,419

Table 27. Assurance A/E results for males

Female	Combined		Non-Smokers		Smokers	
	TMC00	ILT 16 (F)	TFC00	TFNL08	TFC00	TFSL08
Total A/E	71.9%	61.5%	58.7%	98.2%	125.9%	90.1%
CI Lower	69.8%	59.6%	56.4%	94.4%	119.3%	85.4%
CI Upper	74.1%	63.4%	60.9%	101.9%	132.4%	94.8%
Actual Deaths	4,112	4,112	2,689	2,689	1,423	1,423

Table 28. Assurance A/E results for females

[23] Section 4.4
[24] https://www.actuaries.org.uk/learn-and-develop/continuous-mortality-investigation
[25] http://www.cso.ie/en/releasesandpublications/er/ilt/irishlifetablesno162010-2012/

The TXNL08 tables are the most representative of the non-smoker datasets for both males and females. The TXSL08 tables are the most representative of the smoker datasets for both males and females. Both the smoker and non-smoker datasets are also presented relative to TXC00 in order to allow comparisons between the smoker and non-smoker experience. Confidence intervals for the smoker datasets are wider than for the non-smoker datasets due to the lower data volumes submitted in respect of smokers. The ILT16 tables do not reflect the combined datasets well, which is to be expected given that ILT16 is based on the total Irish population data rather than an insured population.

The following sections present the results split by age group, calendar year, product type and duration.

6.4.1. Results by age band

Table 29 and Table 30 present the results of the A/E analysis split by age band for the combined, smoker and non-smoker datasets respectively. Ten-year age bands are used to allow age-specific variations to be captured while maintaining a reasonable level of data in each age band.

Males	Combined			Non-Smokers			Smokers		
Age Band	Actual Deaths	TMC00	ILT 16 (M)	Actual Deaths	TMC00	TMNL08	Actual Deaths	TMC00	TMSL08
20-29	46	64.6%	39.6%	32	57.6%	101.0%	14	89.3%	123.5%
30-39	405	60.9%	36.3%	276	52.7%	86.4%	129	91.3%	117.0%
40-49	1,113	70.9%	42.6%	735	59.5%	96.1%	378	113.1%	96.9%
50-59	2,057	72.8%	51.9%	1,340	58.5%	100.0%	717	134.1%	90.9%
60-69	2,030	67.2%	56.3%	1,324	53.2%	94.4%	706	132.9%	92.6%
70-79	1,174	73.0%	65.9%	830	62.8%	105.1%	344	120.5%	97.4%
80-89	497	86.5%	76.6%	366	78.2%	97.9%	131	123.1%	112.0%
Total	**7,322**	**70.9%**	**52.9%**	**4,903**	**58.5%**	**97.6%**	**2,419**	**124.1%**	**95.5%**

Table 29. Male assurance A/E results by age band

Female	Combined			Non-Smokers			Smokers		
Age Band	Actual Deaths	TFC00	ILT 16 (F)	Actual Deaths	TFC00	TFNL08	Actual Deaths	TFC00	TFSL08
20-29	24	57.4%	58.7%	21	63.8%	94.6%	3	33.9%	34.9%
30-39	249	56.7%	46.6%	175	48.9%	69.3%	74	91.3%	90.0%
40-49	735	65.2%	48.3%	502	55.3%	84.4%	233	105.7%	89.8%
50-59	1,302	72.7%	60.0%	833	58.6%	101.1%	469	126.6%	90.0%
60-69	1,029	72.4%	69.1%	642	56.1%	105.9%	387	139.9%	88.8%
70-79	539	83.3%	83.8%	334	64.4%	118.9%	205	160.2%	98.6%
80-89	234	94.4%	82.8%	182	89.7%	115.1%	52	115.4%	81.5%
Total	**4,112**	**71.9%**	**61.5%**	**2,689**	**58.7%**	**98.2%**	**1,423**	**125.9%**	**90.1%**

Table 30. Female assurance A/E results by age band

It is clear that smoking is a significant factor at all age ranges. The gap between smoker and non-smoker mortality rates is most significant between ages 40 and 80. Comparison of the TXC00 results in this age range shows that smokers mortality rates are broadly double that of non-smokers for both males and females. The graphs below show the trend over age band for the TXC00 table.

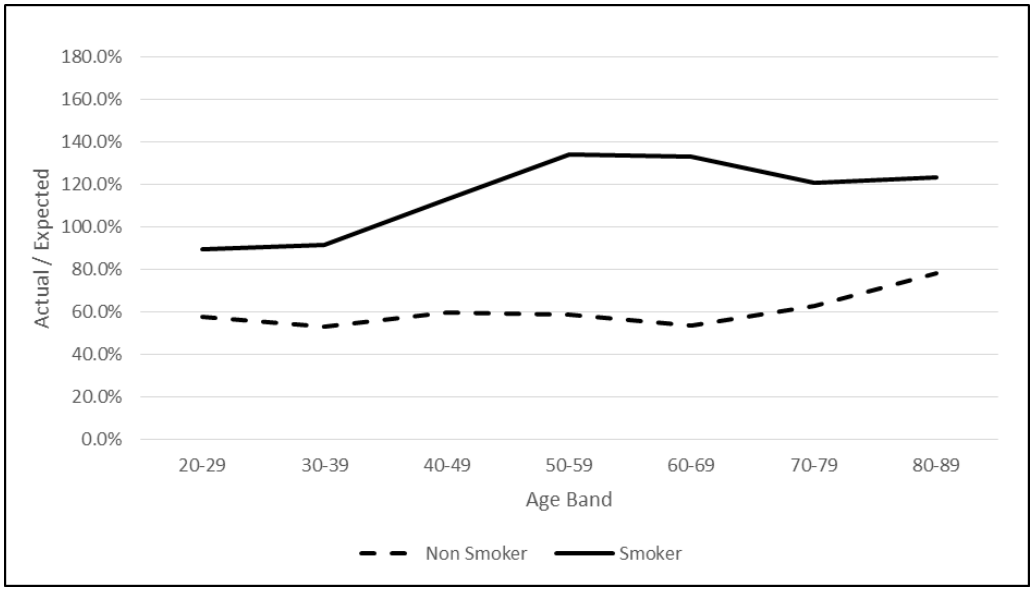

Figure 17. A/E results by age group for male smokers and non-smokers relative to TMC00.

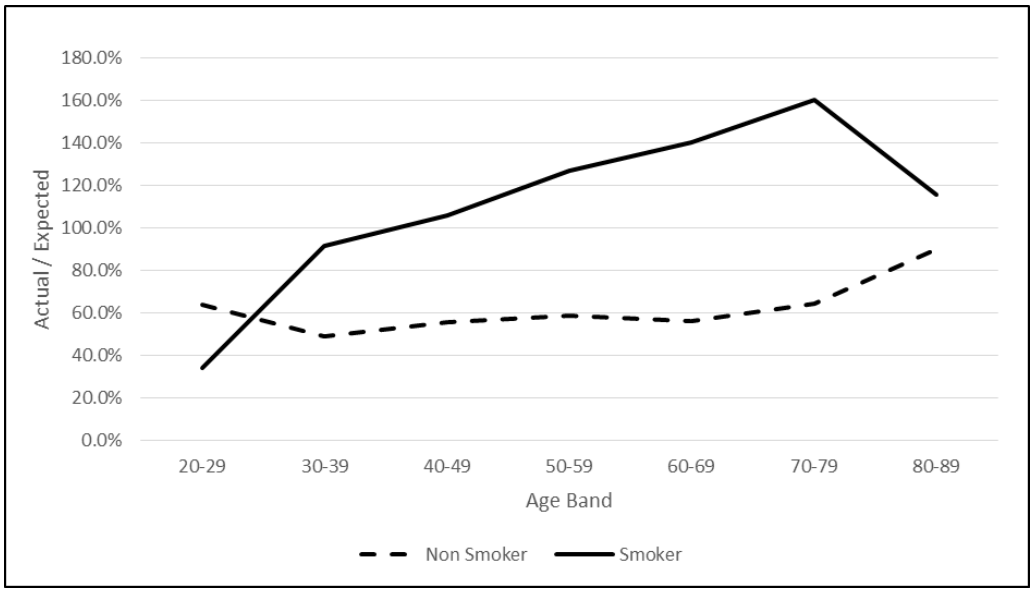

Figure 18. A/E results by age group for female smokers and non-smokers relative to TFC00.

6.4.2. Results by calendar year

Table 31 and Table 32 present the results of the A/E analysis by calendar year for the combined, non-smoker and smoker datasets respectively.

Males	Combined			Non-Smokers			Smokers		
Year	Actual Deaths	TMC00	ILT 16 (M)	Actual Deaths	TMC00	TMNL08	Actual Deaths	TMC00	TMSL08
2009	810	75.2%	55.3%	526	62.2%	104.0%	284	123.2%	96.1%
2010	880	78.0%	57.8%	583	65.4%	109.3%	297	125.8%	97.5%
2011	1,117	73.3%	54.2%	746	60.6%	101.4%	371	126.9%	98.1%
2012	1,039	65.8%	48.9%	689	53.7%	89.7%	350	118.2%	91.0%
2013	1,191	73.3%	54.9%	830	62.4%	104.1%	361	122.3%	93.7%
2014	1,183	70.8%	53.4%	775	56.5%	94.1%	408	137.2%	104.7%
2015	1,102	63.7%	48.3%	754	52.8%	87.8%	348	115.5%	88.0%
Total	**7,322**	**70.9%**	**52.9%**	**4,903**	**58.5%**	**97.6%**	**2,419**	**124.1%**	**95.5%**

Table 31. Male assurance A/E results by calendar year

Female	Combined			Non-Smokers			Smokers		
Year	Actual Deaths	TFC00	ILT 16 (F)	Actual Deaths	TFC00	TFNL08	Actual Deaths	TFC00	TFSL08
2009	378	65.7%	55.8%	242	54.1%	89.8%	136	106.6%	77.9%
2010	468	76.6%	65.3%	308	64.5%	107.4%	160	120.3%	87.1%
2011	664	80.1%	68.0%	426	64.3%	107.3%	238	142.2%	102.9%
2012	642	73.8%	62.9%	451	64.5%	107.9%	191	111.7%	80.2%
2013	629	69.5%	59.5%	405	55.4%	92.8%	224	129.1%	92.0%
2014	634	67.4%	57.9%	412	53.9%	90.5%	222	125.7%	88.9%
2015	697	70.8%	61.1%	445	55.4%	93.4%	252	139.0%	97.6%
Total	**4,112**	**71.9%**	**61.5%**	**2,689**	**58.7%**	**98.2%**	**1,423**	**125.9%**	**90.1%**

Table 32. Female assurance A/E results by calendar year

The experience is very volatile by year for both males and females, in particular when the analysis is broken down by smoking status. However, considering the study period as a whole, there is some evidence of mortality improvements coming through for both males and females. Taking a 3 year average of the A/E result against the TXC00 tables, using the same formula as used for annuities (section 5.4.2), suggests annual improvements of 2.1% for males and 1.7% for females over the investigation period.

6.4.3. Results by product type

Table 33 and Table 34 present the results by product type for the combined, smoker and non-smoker datasets respectively. The product types are denoted as follows:

- **LP** – Linked Protection
- **NL WoL** – Non-Linked Whole of Life
- **NL Term D** – Non-Linked Term Decreasing
- **NL Term L** – Non-Linked Term Level.

Males	Combined			Non-Smokers			Smokers		
Policy Type	Actual Deaths	TMC00	ILT 16 (M)	Actual Deaths	TMC00	TMNL08	Actual Deaths	TMC00	TMSL08
LP	3,009	78.4%	62.7%	1,935	63.6%	105.8%	1,074	135.0%	101.2%
NL WoL	468	74.3%	63.6%	311	65.1%	95.7%	157	103.3%	84.9%
NL Term D	1,801	65.5%	45.4%	1,198	54.1%	91.8%	603	112.5%	88.1%
NL Term L	2,044	65.5%	47.1%	1,459	55.0%	93.3%	585	125.7%	97.0%
Total	**7,322**	**70.9%**	**52.9%**	**4,903**	**58.5%**	**97.6%**	**2,419**	**124.1%**	**95.5%**

Table 33: Male assurance A/E results by product type

Female	Combined			Non-Smokers			Smokers		
Policy Type	Actual Deaths	TFC00	ILT 16 (F)	Actual Deaths	TFC00	TFNL08	Actual Deaths	TFC00	TFSL08
LP	1,715	84.5%	75.9%	1,076	68.9%	119.1%	639	136.6%	92.1%
NL WoL	164	69.6%	62.7%	106	57.0%	85.6%	58	116.9%	79.5%
NL Term D	1,054	61.7%	50.6%	699	50.7%	83.1%	355	107.3%	82.2%
NL Term L	1,179	67.7%	56.7%	808	55.4%	92.7%	371	131.4%	97.6%
Total	**4,112**	**71.9%**	**61.5%**	**2,689**	**58.7%**	**98.2%**	**1,423**	**125.9%**	**90.1%**

Table 34: Female assurance A/E results by product type

Across both genders, non-linked term assurances (both decreasing and level) show the lightest mortality rates while linked protection displays relatively heavier mortality rates. There are considerable differences in the age profile between the various policy types which could partially explain some of these differences.

6.4.4. Results by duration in force

Table 35 and Table 36 present the results by duration in force for the combined, non-smoker and smoker datasets respectively.

Males	Combined			Non-Smokers			Smokers		
Duration	Actual Deaths	TMC00	ILT 16 (M)	Actual Deaths	TMC00	TMNL08	Actual Deaths	TMC00	TMSL08
0	156	35.0%	24.0%	107	28.7%	48.6%	49	67.1%	55.7%
1	208	48.2%	33.2%	145	40.4%	68.3%	63	87.5%	72.4%
2	290	67.6%	46.5%	195	54.8%	92.7%	95	130.7%	108.2%
3+	6,668	73.9%	55.9%	4,456	61.1%	101.7%	2,212	127.8%	97.4%
Total	**7,322**	**70.9%**	**52.9%**	**4,903**	**58.5%**	**97.6%**	**2,419**	**124.1%**	**95.5%**

Table 35: Male assurance A/E results by duration

Female	Combined			Non-Smokers			Smokers		
Duration	Actual Deaths	TFC00	ILT 16 (F)	Actual Deaths	TFC00	TFNL08	Actual Deaths	TFC00	TFSL08
0	67	25.9%	21.5%	43	19.9%	32.4%	24	56.2%	44.1%
1	108	42.4%	35.1%	77	36.5%	59.3%	31	71.1%	55.6%
2	148	56.8%	47.0%	91	42.3%	68.9%	57	125.1%	97.5%
3+	3,789	76.7%	65.9%	2,478	62.9%	105.7%	1,311	131.3%	92.9%
Total	**4,112**	**71.9%**	**61.5%**	**2,689**	**58.7%**	**98.2%**	**1,423**	**125.9%**	**90.1%**

Table 36: Female assurance A/E results by duration

Data at early durations is limited but the results demonstrate a clear select effect in the mortality rates by policy duration in force. This is in line with expectations as the study is based on underwritten lives. This is evident across both males and females and the effects by gender are very close. The gap between smokers and non-smokers is visible at all durations.

Appendix B presents further analyses of the combined assurances dataset where the results by Calendar Year, Product Type and Duration in Force are split by age band and compared with TXC00.

6.5. Results allowing for mortality improvements

The IILMI investigation and the standard tables used in the A/E comparisons refer to different time periods. To allow for the effect of mortality improvements over time this section repeats the A/E comparisons where the expected deaths are calculated using mortality rates from the standard tables which have been improved using the method described in section 4.5.

Table 37 shows the A/E analysis before and after an allowance for mortality improvements. Improvements are applied from 2008, the central year of the standard tables TXN/SL08, to the calendar year of the applicable exposure. The results are split by gender and smoking status.

		Table	Actual Deaths	A/E without improvements	A/E Base with improvements
Male	Smoker	TMSL08	2,419	95.5%	102.9%
	Non-Smoker	TMNL08	4,903	97.6%	105.6%
Female	Smoker	TFSL08	1,423	90.1%	96.4%
	Non-Smoker	TFNL08	2,689	98.2%	104.7%

Table 37: Assurances A/E results to TXN/SL08 for male and female lives with and without mortality improvements

The analysis suggests that on average the mortality experience of the combined Irish insured lives is slightly heavier than the insured lives underlying the standard tables. The exception to this is for female smokers where the Irish mortality experience is lighter than the standard table after allowing for improvements.

6.6. Comparison with aggregated data study

As a sense check on the reasonability of the IILMI results, the results were compared with the results from the 2014 ADS[26]. The ADS collected data for level and decreasing term assurances only for the period 2008–2012 and presented results on an A/E basis by gender, smoker status, product type and duration. Expected deaths were determined with reference to the following tables: TMS00, TMN00, TFS00 and TFN00. Select mortality rates were used for durations 0-4 and ultimate rates for durations 5+. To compare the results of IILMI with those of the ADS it was necessary to calculate A/E values for the IILMI data with reference to the same tables used for the ADS (TMS00, TMN00, TFS00 and TFN00). Analysis is restricted to durations where both studies have used ultimate mortality. This represents durations 5+ for ADS and durations 3+ for IILMI. Table 38 compares the experience of the ADS to IILMI for decreasing and level term assurances for males and females. The results are reasonably volatile: this is expected given both the ADS and IILMI data sets are relatively small and collected over different, though overlapping, time-periods.

A/E	Decreasing Term Assurances				Level Term Assurances			
	Non Smokers		Smokers		Non-Smokers		Smokers	
	ADS	IILMI	ADS	IILMI	ADS	IILMI	ADS	IILMI
Male	71%	70%	70%	70%	79%	74%	68%	81%
Female	78%	67%	69%	68%	93%	78%	77%	84%

Table 38. Comparison of ILLMI results against ADS results for Decreasing and Level Term Assurances.

Figure 19 and Figure 20 below compare the above results by calendar year. This more granular approach demonstrates that the shape of the IILMI and ADS experience is more consistent than initially observed in Table 38.

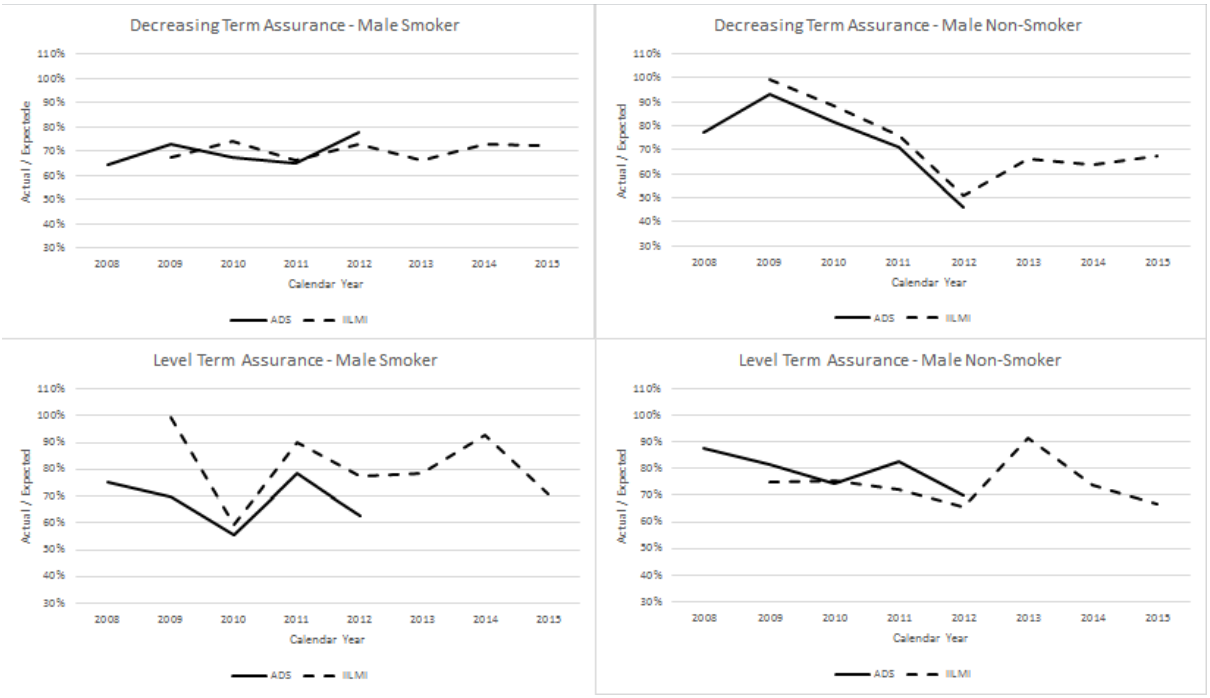

Figure 19. Comparison of IIMI and ADS results for Male lives

[26] See section 3.2

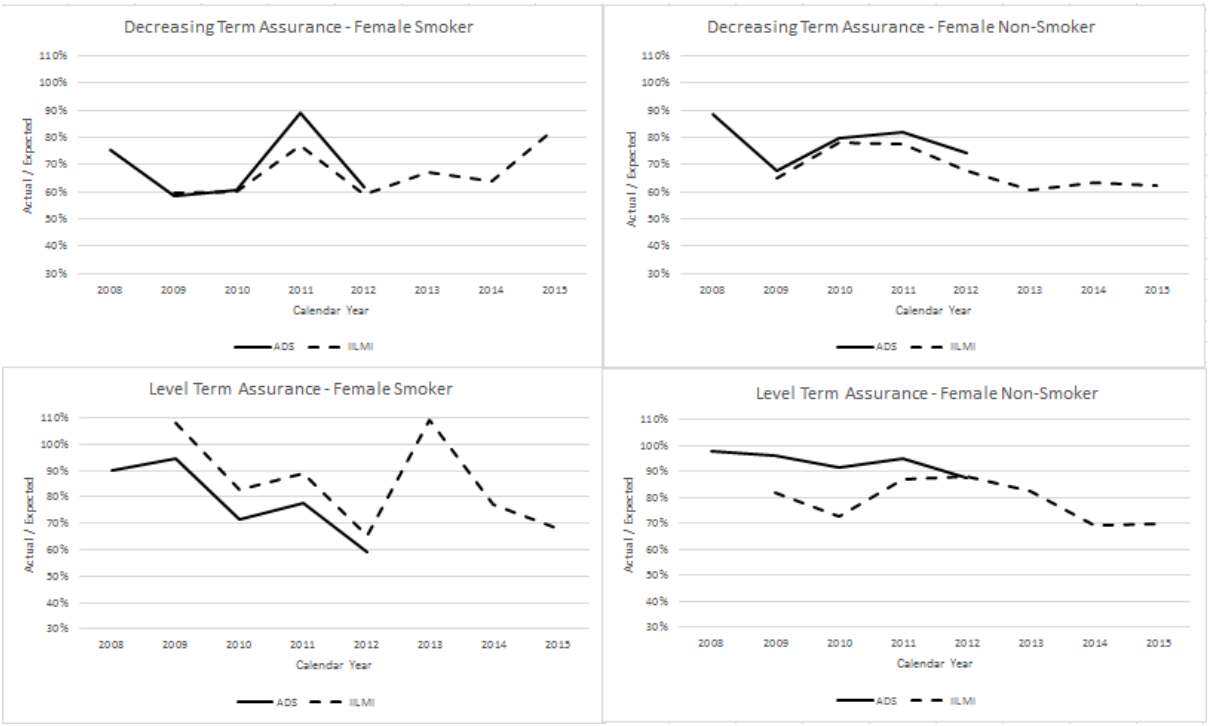

Figure 20. Comparison of IIMI and ADS results for Female lives

7. Appendices

Appendix A – Supplementary Annuity Analysis

Results

Table 39 below shows the results of the experience analysis for the annuity data against a range of amounts tables. This section is included to facilitate comparison with the 2014 ADS where the expected deaths were calculated using an amounts table (i.e. PNXA00).

Amounts data is not included in the analysis due to credibility concerns (see section 5.1.2). Consequently, analysis against amounts tables is performed on a lives basis and therefore differences between the lives and amounts results reflect the relative shape of the tables only.

Confidence intervals shown are at a 95% level and are calculated in line with the methodology set out in CMI working paper 62[27] for lives analysis. This methodology is used here for amounts tables as a sufficient level of amounts data, required for the equivalent amounts methodology, is not available.

		PNXA00	PXA08	S2PXA
Male	Total A/E	**84%**	**105%**	**92%**
	CI Lower	82%	103%	90%
	CI Upper	84%	107%	94%
Female	Total A/E	**92%**	**111%**	**93%**
	CI Lower	89%	107%	90%
	CI Upper	92%	114%	97%

Table 39: Annuity A/E results (amounts tables)

Analysis by calendar year

Table 40 and Table 41 show the results of the experience analysis split by calendar year.

MALE	By calendar year							TOTAL
All ages	2009	2010	2011	2012	2013	2014	2015	
Actual deaths	**1,004**	**1,065**	**1,050**	**1,167**	**1,288**	**1,304**	**1,295**	**8,173**
PNMA00	89%	87%	79%	80%	81%	89%	83%	84%
PMA08	113%	110%	100%	100%	102%	110%	103%	105%
S2PMA	98%	95%	87%	87%	89%	97%	90%	92%

Table 40: Male annuity A/E results by calendar year (amounts tables)

[27] CMI WP 62 - https://www.actuaries.org.uk/documents/cmi-working-paper-62-report-preliminary-results-analysis-mortality-experience-pensioners

FEMALE	By calendar year							TOTAL
All ages	2009	2010	2011	2012	2013	2014	2015	
Actual deaths	434	455	463	510	502	527	564	3,455
PNFA00	98%	96%	91%	93%	85%	91%	91%	92%
PFA08	120%	117%	110%	112%	102%	109%	109%	111%
S2PFA	100%	98%	93%	95%	86%	92%	92%	93%

Table 41: Female annuity A/E results by calendar year (amounts tables)

Analysis by age band

The tables below show the results of the experience analysis split by age band. Consistent with the analysis against lives tables, five-year age bands are used.

MALE		Actual Deaths	PNMA00	PMA08	S2PMA
All ages					
Age Band	<65	368	101%	99%	101%
	65-69	751	78%	100%	85%
	70-74	1,095	76%	103%	83%
	75-79	1,557	76%	106%	86%
	80-84	1,911	82%	108%	93%
	85-89	1,635	94%	110%	102%
	90-94	702	104%	103%	102%
	95+	154	88%	79%	77%
Total		**8,173**	**84%**	**105%**	**92%**

Table 42: Male annuity A/E results by age band (amounts tables)

FEMALE		Actual Deaths	PNFA00	PFA08	S2PFA
All ages					
Age Band	<65	114	129%	125%	101%
	65-69	172	90%	110%	89%
	70-74	226	70%	95%	76%
	75-79	428	72%	101%	79%
	80-84	772	90%	119%	95%
	85-89	895	98%	118%	99%
	90-94	630	110%	113%	106%
	95+	218	94%	87%	88%
Total		**3,455**	**92%**	**111%**	**93%**

Table 43: Female annuity A/E results by age band (amounts tables)

Appendix B – Supplementary Assurance Data

Results by age band for the combined (smoker + non-smoker) assurance dataset relative to TXC00.

Results by Product Type

MALE Age <89		Actual Deaths	Linked Protection	Non-linked Whole of Life	Non-linked Term – decreasing	Non-linked Term – level	Total
Age Band	20-29	46	98.2%	0.0%	55.4%	62.0%	64.6%
	30-39	405	70.4%	26.6%	58.3%	61.3%	60.9%
	40-49	1,113	76.4%	77.5%	68.8%	70.2%	70.9%
	50-59	2,057	78.8%	76.5%	70.2%	70.6%	72.8%
	60-69	2,030	76.5%	71.7%	59.5%	58.9%	67.2%
	70-79	1,174	78.4%	66.6%	65.1%	59.8%	73.0%
	80-89	497	89.4%	82.1%	0.0%	95.8%	86.5%
Total		**7,322**	**78.4%**	**74.3%**	**65.5%**	**65.5%**	**70.9%**

Table 44: Assurances A/E to TXC00 by Age Band and Product Type for male lives

FEMALE Age <89		Actual Deaths	Linked Protection	Non-linked Whole of Life	Non-linked Term – decreasing	Non-linked Term – level	Total
Age Band	20-29	24	41.3%	0.0%	48.8%	73.0%	57.4%
	30-39	249	91.5%	125.4%	47.2%	57.3%	56.7%
	40-49	735	79.1%	63.3%	53.4%	71.8%	65.2%
	50-59	1,302	88.9%	44.7%	68.4%	65.1%	72.7%
	60-69	1,029	78.1%	38.1%	70.4%	67.8%	72.4%
	70-79	539	87.4%	67.9%	75.2%	77.5%	83.3%
	80-89	234	97.5%	87.9%	0.0%	122.6%	94.4%
Total		**4,112**	**84.5%**	**69.6%**	**61.7%**	**67.7%**	**71.9%**

Table 45: Assurances A/E to TXC00 by Age Band and Product Type for female lives

Results by Duration in Force

MALE		Actual Deaths	Duration				Total
Age <89			0	1	2	3+	
Age Band	20-29	46	48.8%	23.8%	76.1%	83.2%	64.6%
	30-39	405	42.2%	43.5%	70.4%	65.0%	60.9%
	40-49	1,113	35.2%	62.5%	75.6%	74.0%	70.9%
	50-59	2,057	34.1%	45.5%	69.1%	76.7%	72.8%
	60-69	2,030	24.8%	43.3%	59.6%	70.1%	67.2%
	70-79	1,174	64.8%	47.4%	38.3%	73.8%	73.0%
	80-89	497	0.0%	515.7%	1130.6%	86.2%	86.5%
Total		**7,322**	**35.0%**	**48.2%**	**67.6%**	**73.9%**	**70.9%**

Table 46: Assurances A/E to TXC00 by Age Band and Duration for male lives

FEMALE		Actual Deaths	Duration				Total
Age <89			0	1	2	3+	
Age Band	20-29	24	33.9%	39.4%	57.1%	76.5%	57.4%
	30-39	249	35.7%	34.9%	52.7%	63.4%	56.7%
	40-49	735	20.2%	49.3%	37.9%	71.9%	65.2%
	50-59	1,302	20.3%	31.3%	65.4%	78.2%	72.7%
	60-69	1,029	30.5%	60.9%	75.8%	74.2%	72.4%
	70-79	539	35.5%	33.0%	44.6%	84.7%	83.3%
	80-89	234	870.1%	0.0%	0.0%	94.2%	94.4%
Total		**4,112**	**25.9%**	**42.4%**	**56.8%**	**76.7%**	**71.9%**

Table 47: Assurances A/E to TXC00 by Age Band and Duration for female lives

Results by Calendar Year

MALE		Actual Deaths	Calendar year							Total
Age <89			2009	2010	2011	2012	2013	2014	2015	
Age Band	20-29	46	76.7%	60.0%	60.0%	50.3%	27.4%	106.3%	85.2%	64.6%
	30-39	405	79.0%	50.2%	67.0%	57.0%	70.5%	54.0%	46.1%	60.9%
	40-49	1,113	81.0%	79.2%	75.4%	61.9%	70.4%	67.7%	65.6%	70.9%
	50-59	2,057	79.7%	84.9%	71.7%	71.9%	73.7%	70.8%	63.3%	72.8%
	60-69	2,030	68.6%	74.9%	71.4%	60.2%	70.5%	68.6%	60.2%	67.2%
	70-79	1,174	72.4%	81.9%	76.7%	73.7%	70.3%	76.6%	64.2%	73.0%
	80-89	497	70.0%	89.9%	89.3%	65.9%	107.6%	86.8%	87.9%	86.5%
Total		**7,322**	**75.2%**	**78.0%**	**73.3%**	**65.8%**	**73.3%**	**70.8%**	**63.7%**	**70.9%**

Table 48: Assurances A/E to TXC00 by Age Band and Calendar Year for male lives

FEMALE		Actual Deaths	Calendar year							Total
Age <89			2009	2010	2011	2012	2013	2014	2015	
Age Band	20-29	24	33.0%	26.5%	100.4%	82.2%	21.7%	112.7%	34.0%	57.4%
	30-39	249	57.9%	49.6%	62.4%	61.8%	52.9%	64.0%	45.8%	56.7%
	40-49	735	57.0%	78.2%	87.0%	63.9%	62.5%	49.3%	59.3%	65.2%
	50-59	1,302	65.1%	79.6%	73.1%	76.6%	67.5%	68.7%	77.7%	72.7%
	60-69	1,029	60.6%	78.0%	85.7%	70.5%	73.6%	71.8%	66.6%	72.4%
	70-79	539	92.0%	80.2%	85.2%	95.4%	81.7%	74.1%	80.8%	83.3%
	80-89	234	115.2%	103.6%	86.2%	87.2%	93.5%	88.7%	97.2%	94.4%
Total		**4,112**	**65.7%**	**76.6%**	**80.1%**	**73.8%**	**69.5%**	**67.4%**	**70.8%**	**71.9%**

Table 49: Assurances A/E to TXC00 by Age Band and Calendar Year for female lives

Appendix C – Sample Data Submission Templates

Exposed to Risk Calculation

The data submission templates sent to companies specified that the Exposed to Risk should be recorded as the initial exposed to risk using the exact calculation method.

The following example calculation for annuity amounts was included in the Annuity data submission template:

Simple examples of actual death and exposure calculations :

		Example 1		Example 2		Example 3		Example 4		Example 5	
Annuity start date		01-Apr-02		01-Jul-98		05-Sep-04		06-Aug-13		15-May-12	
Birthday		27-Oct-43		12-Mar-43		27-Aug-43		04-Feb-43		10-Oct-43	
Date of death				03-Jun-13		02-Jan-16				20-Sep-14	
		Exposure Count	Death Count	Exposure Count	Death Count	Exposure Count	Death Count	Exposure Count	Death Count	Exposure Count	Death Count
65	2009	0.81862000	0	0.19165000	0	0.65161000	0	0.00000000	0	0.00000000	0
66	2009	0.18138000	0	0.80835000	0	0.34839000	0	0.00000000	0	0.00000000	0
66	2010	0.81862000	0	0.19165000	0	0.65161000	0	0.00000000	0	0.00000000	0
67	2010	0.18138000	0	0.80835000	0	0.34839000	0	0.00000000	0	0.00000000	0
67	2011	0.81862000	0	0.19165000	0	0.65161000	0	0.00000000	0	0.00000000	0
68	2011	0.18138000	0	0.80835000	0	0.34839000	0	0.00000000	0	0.00000000	0
68	2012	0.81862000	0	0.19165000	0	0.65161000	0	0.00000000	0	0.40520000	0
69	2012	0.18138000	0	0.80835000	0	0.34839000	0	0.00000000	0	0.22793000	0
69	2013	0.81862000	0	0.19165000	0	0.65161000	0	0.00000000	0	0.77207000	0
70	2013	0.18138000	0	0.80835000	1	0.34839000	0	0.40520000	0	0.22793000	0
70	2014	0.81862000	0	0.00000000	0	0.65161000	0	0.09309000	0	0.77207000	1
71	2014	0.18138000	0	0.00000000	0	0.34839000	0	0.90691000	0	0.00000000	0
71	2015	0.81862000	0	0.00000000	0	0.65161000	0	0.09309000	0	0.00000000	0
72	2015	0.18138000	0	0.00000000	0	0.34839000	0	0.90691000	0	0.00000000	0

Note: The exposure count in the above examples is based on the excel formula (DATE X - DATE Y) / 365.25

The following example calculation for Assurance amounts was included in the Assurances data submission template:

Simple examples of actual death and exposure calculations :

		Example 1		Example 2		Example 3		Example 4		Example 5	
Policy start date		01/04/2002		01/07/1998		05/09/2004		06/08/2013		15/05/2012	
Date of birth		27/10/1943		12/03/1943		27/08/1943		04/02/1943		10/10/1943	
Date of death				03/06/2013		02/01/2016				20/09/2014	
		Exposure	Death	Exposure	Death	Exposure	Death	Exposure	Death	Exposure	Death
65	2009	0.81862000	0	0.19165000	0	0.65161000	0	0.00000000	0	0.00000000	0
66	2009	0.18138000	0	0.80835000	0	0.34839000	0	0.00000000	0	0.00000000	0
66	2010	0.81862000	0	0.19165000	0	0.65161000	0	0.00000000	0	0.00000000	0
67	2010	0.18138000	0	0.80835000	0	0.34839000	0	0.00000000	0	0.00000000	0
67	2011	0.81862000	0	0.19165000	0	0.65161000	0	0.00000000	0	0.00000000	0
68	2011	0.18138000	0	0.80835000	0	0.34839000	0	0.00000000	0	0.00000000	0
68	2012	0.81862000	0	0.19165000	0	0.65161000	0	0.00000000	0	0.40520000	0
69	2012	0.18138000	0	0.80835000	0	0.34839000	0	0.00000000	0	0.22793000	0
69	2013	0.81862000	0	0.19165000	0	0.65161000	0	0.00000000	0	0.77207000	0
70	2013	0.18138000	0	0.80835000	1	0.34839000	0	0.40520000	0	0.22793000	0
70	2014	0.81862000	0	0.00000000	0	0.65161000	0	0.09309000	0	0.77207000	1
71	2014	0.18138000	0	0.00000000	0	0.34839000	0	0.90691000	0	0.00000000	0
71	2015	0.81862000	0	0.00000000	0	0.65161000	0	0.09309000	0	0.00000000	0
72	2015	0.18138000	0	0.00000000	0	0.34839000	0	0.90691000	0	0.00000000	0

Note: The exposure count in the above examples is based on the excel formula (DATE X - DATE Y) / 365.25

Data Declarations

The data submission templates sent to companies included the following declaration checklists to be completed when submitting the data:

Annuities

Data submission declaration	
Company:	
Contact name:	
Data extraction date:	dd/mm/yyyy
The data submitted is defined as follows:	
General	
Records included:	
☐	As per data request (one per life)
☐	Other (please specify, e.g. one per policy etc)
Lives included:	
☐	As per data request (all annuity pension products, excluding contingent second life data)
☐	Other (please specify, e.g. includes second lives, etc)
Completeness of the experience data submitted:	
☐	All years complete, no expected impact from IBNR claims
☐	Other (please specify, e.g. 2015 claims not complete etc)
	If "other" was selected above, please specify the expected/average lag between incurred and reported claims in the submitted data
Death data	
Age:	
☐	As per data request (age last birthday)
☐	Other (please specify, e.g. age attained / next / nearest at death / etc)
Deaths (date):	
☐	As per data request (actual date of death)
☐	Other (please specify, e.g. date of notification, date of final annuity payment, etc)
Deaths (definition):	
☐	As per data request (actual deaths only)
☐	Other (please specify, e.g. includes suspended policies, includes IBNR adjustment etc)
Exposure data	
Age:	
☐	As per data request (age last birthday)
☐	Other (please specify, e.g. age attained / next / nearest at death / etc)
Exposed to risk:	
☐	As per data request (initial exposed to risk using the exact calculation method)
☐	Other (please specify)
Annuity amount	
Annuity Amount bands: (amount definition)	
☐	Amount as per data request (current annual annuity)
☐	Other (please specify, e.g. annuity applicable in calendar year)
Annuity Amount bands: (band definition)	
☐	Bands as per data request (see Notes)
☐	Other (please specify)
Any other deviations from the data request:	
Any other comments:	

Assurances

Data submission declaration

Company:
Contact name:
Data extraction date: dd/mm/yyyy

The data submitted is defined as follows:

Exposed to risk:
- ☐ As per data request (i.e. initial exposed to risk using the exact calculation method)
- ☐ Other (please specify)

Product lines:
- ☐ As per data request (see Notes)
- ☐ Other (please specify)

Age:
- ☐ As per data request (see Notes)
- ☐ Other (please specify, e.g. age attained / next / nearest at death / etc)

Smoker status:
- ☐ As per data request (see Notes)
- ☐ Other (please specify)

Distribution channel:
- ☐ As per data request (see Notes)
- ☐ Other (please specify)

Duration bands:
- ☐ As per data request (see Notes)
- ☐ Other (please specify)

Lives included / excluded:
- ☐ As per data request (see Notes e.g. exclude accelerated ci etc.)
- ☐ Other (please specify)

Deaths (date):
- ☐ As per data request (i.e. actual date of death)
- ☐ Other (please specify, e.g. date of notification, date of settlement etc.)

Deaths (definition, exclusions):
- ☐ As per data request (see Notes)
- ☐ Other (please specify)

Completeness of the experience data submitted:
- ☐ All years complete
- ☐ Other (please specify, e.g. 2015 claims not complete etc)

If 'Other' was selected above, please provide further information

Any other deviations from the data request:

Any other comments: