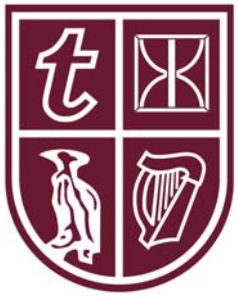


Report of the Mortality Working Party

November 2005

Contents

Introduction

This report sets out the results of an investigation commissioned by the Society of Actuaries in Ireland into the pensioner mortality experience of self administered pension schemes covering the period 1998 to 2003. A similar review is currently being carried out of self-administered pension schemes in the UK by the CMI Bureau.

The purpose of the review was to look at the pensioner mortality experience of Irish self-administered schemes relative to tables based on UK annuitant experience. The primary aim was to establish whether further investigation is required and to provide a reference point for pension scheme actuaries in setting mortality assumptions.

It is anticipated that further reviews be carried out every 2-3 years. In particular, it is evident from the data submitted that a number of significant schemes were excluded from the investigation and any future review would need to ensure that these schemes are included.

Data

The main pension consultancies and the Department of Finance were asked to contribute data. The requirement was to provide data in respect of annuitants, over a three year period – typically from the most recent actuarial valuation and the previous actuarial valuation. There was a focus on gathering experience of schemes with a large number of annuitants in order to maximize the volume of data gathered.

The criterion set out was for census data to be provided split by sex, type of pensioner and industry sector. Information was requested in respect of both lives and amounts.

Data provided

Data was provided by five pension consultancies and the Department of Finance. In total, data in respect of 45 schemes and approximately 51,000 lives were submitted.

The data submitted covered the period 1998 to 2003. For just over 90% of the submissions made the data covered a three year period, i.e. between triennial valuations. Data for the remaining schemes were primarily split between four year and two year periods.

Summary of data provided

	Male	**Female**	**Total**
Lives	37,100	14,000	51,100
Deaths	4,500	1,400	5,900

Source	**Number of Schemes**	**Number of lives (end of investigation)**
Mercer HR Consulting	33	30,600
Department of Finance	1	9,600
Hewitt	6	7500
Coyle Hamilton Willis	2	1700
Heissmann Consultants	2	1100
Watson Wyatt	1	600
Total	**45**	**51,100**

Data constraints

The ability to draw conclusions from the analysis of the data provided is constrained by both the quality and volume of data provided.

For the majority of schemes the data was not subdivided by the type of pensioner or by industry sector. In particular, ill-health retirements were only identified for less than a third of the schemes submitted.

Dependants' pensions were indicated for approximately 60% of schemes. From an inspection of the data where dependants are identified, however, it is clear that the majority of dependants (94%) were female members. In addition, dependant pensioners represented nearly half of all female pensioners. Thus the female experience could be taken as a proxy to the overall mortality experience for dependants. This situation may not hold for future investigations since, in time, annuitants will better reflect the higher female proportion of the current active membership.

The date of death was not recorded in most cases and in these instances death mid way through the inter-valuation period was assumed. Where date of entry was not recorded a similar assumption was made for consistency.

As highlighted in the introduction, if data had been provided in respect of some significant pension schemes this would have improved the overall credibility of the analysis carried out.

Methodology

Exposure and deaths

In calculating the exposed to risk, the census method was applied to the data using the calendar year rate interval.

In the investigation period the total exposure for the lives based investigation was of the order of 105,000 (males) and 41,000 (females). The corresponding figures for the amounts investigation were €1,162m (males) and €293m (females).

For the lives investigation the number of deaths was 4,521 (males) and 1,409 (females). By amounts, the deaths were €36.8m (males) and €9.52m (females).

Crude Mortality rates

From the data analysed, initial exposed to risk figures were calculated for males and females. Crude mortality rates (q_x) were then calculated at each age.

For ages below 60 the results were quite erratic – due to a combination of ill-health early retirements and scarcity of data. Results at older ages were also quite volatile – largely due to the scarcity of data.

For graduation purposes we discarded data below age 60 and over 95. The data was then collated into five year age bands and a curve fitted to the data graphically.

The resulting rates are shown in Appendix A for both male and female experience.

Initial Analysis

The limited nature of the data provided constrained the level of analysis carried out of the pensioner mortality experience.

An initial analysis was carried out based on the crude mortality rates derived from the investigation. As the female experience is distorted due to the combined effect of the limited volume of data and the high proportion of dependants apparent, the analysis was concentrated on the male experience. Similarly, while some data had been submitted identifying ill-health pensioners, there was not sufficient data to analyse this aspect separately.

Comparison with standard tables

The number of actual deaths in each analysis was compared against the expected deaths from the population based on standard tables currently in use by pension scheme actuaries. Comparisons were made with:-

1. PA (90) less three years – the table used at the date of the investigation for the calculation of transfer values and hence the calculation of the liability for active and deferred members for minimum funding standard purposes, and

2. The relevant '92' series tables projected for both lives and amounts which are the tables generally in use for triennial actuarial valuations.

Comparison with UK study

An investigation into the mortality experience of UK self-administered schemes is currently being completed by the Continuous Mortality Investigation (CMI) Bureau. At the time the SOAI investigation was carried out, the initial results of the UK investigation had been outlined in CMI Working Paper 4.

In order to explore the extent of difference between the mortality experience of UK and Irish self-administered schemes, a comparison of both male and female experience was carried out with the initial results of the UK study as set out in Working Paper 4.

Financial impact

To put the outcome of the investigation into context, the financial impact of the differences in the rates derived from the SOAI mortality investigation and the UK study and rates underlying the standard tables (as set out above) were considered. The difference in a male single life annuity based on each set of rates was taken as a proxy for the overall financial impact.

The outcome of the above analysis is shown in Appendix B.

Results and Conclusions

It is important that any conclusions drawn from the analysis of the experience shown by this investigation need to take into account the limited nature of the data available.

Standard tables

The results of the study indicate that PA (90)-3 is the wrong shape – the mortality rates are too heavy up to approximately age 80 and too light at ages over age 80. Since the investigation was carried out, the mortality basis underlying the GN11 minimum transfer value basis has been updated to incorporate the outcome of this study.

The PMA92 Table (C=2001) exhibits lighter mortality over all age groups. As expected, the PMA92 Tables (C=2010) and (C=2020) are exhibiting much lighter mortality at all ages than the results of the investigation indicate.

UK study

The results of this investigation indicate that mortality of Irish pensioners may not be in line with their UK counterparts. However, in order to place any real weight on the findings of this study, a more detailed comparison would need to be carried out by looking at the differences in the type of data collected, in particular the type of pensioner and industry sector underlying the analysis.

In any event, the differences identified are not considerable when viewed in financial terms, in particular at the younger ages where the impact on the value of the liabilities would be most significant.

Next steps

This investigation has made no attempt to project mortality improvements. It is widely acknowledged that the allowance for future mortality improvements is a key factor in setting mortality assumptions for self-administered schemes. Therefore, we would recommend that a working party be set up to consider this issue.

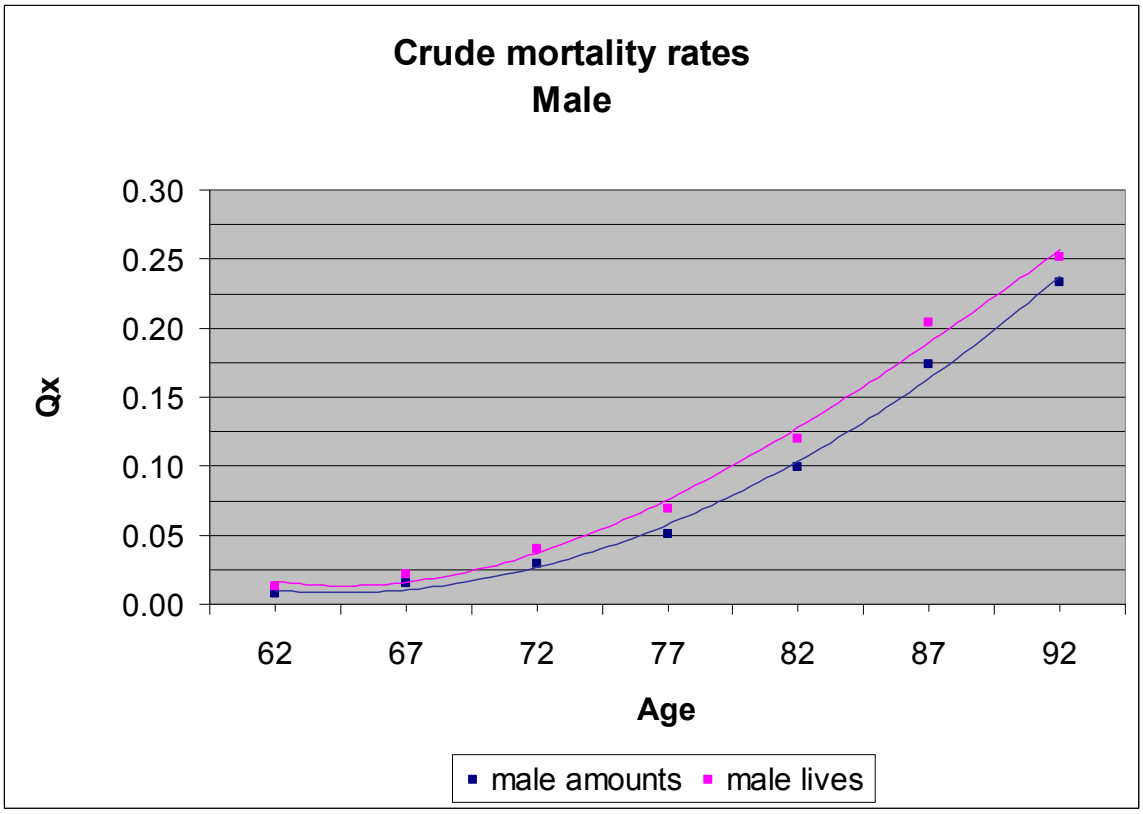
In order to ensure that the assumptions used by pension scheme actuaries take cognizance of the actual mortality experience of Irish self-administered pension schemes we recommend that: -

1) A similar study to be carried out in 2007 based on data from 2004 to 2006 inclusive.

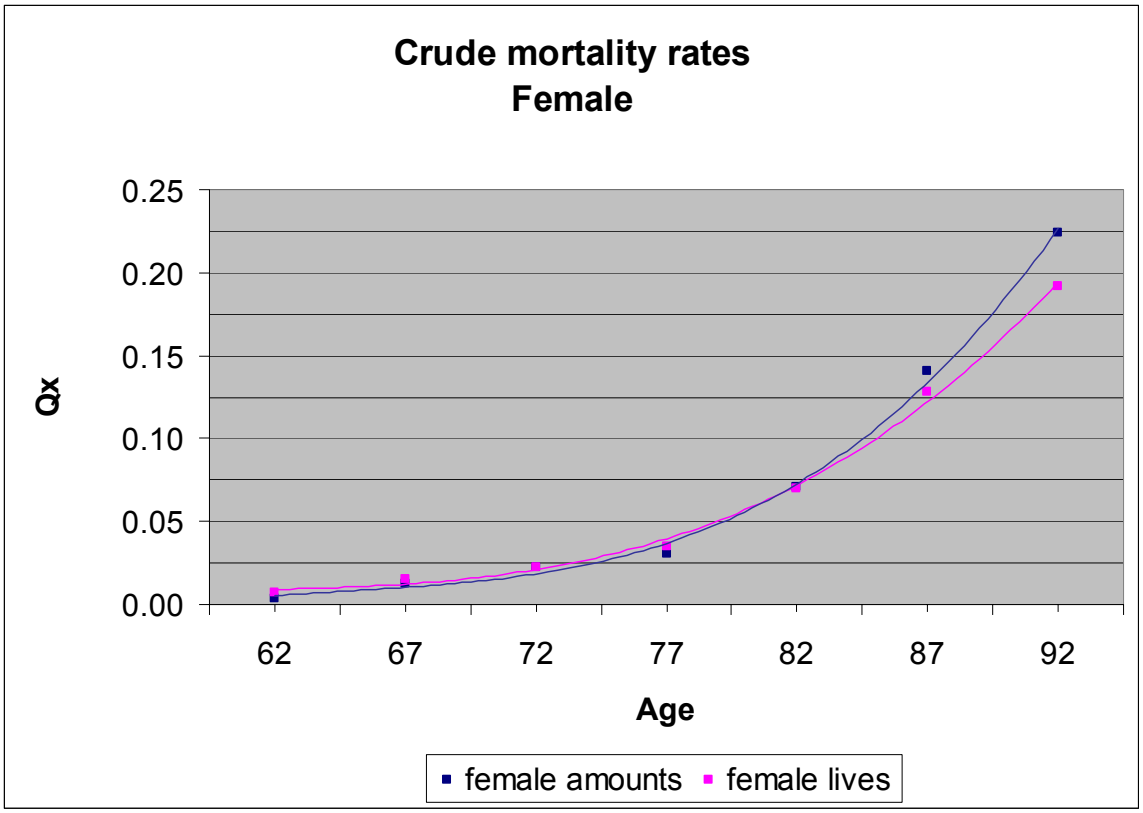
2) A process is put in place to ensure that experience omitted from this investigation in respect of a number of large plans be included in the next investigation.

3) The mortality assumptions outlined in the various pension guidance notes be reviewed to take into account the outcome of this study and any further research carried out in the future.

Appendix A

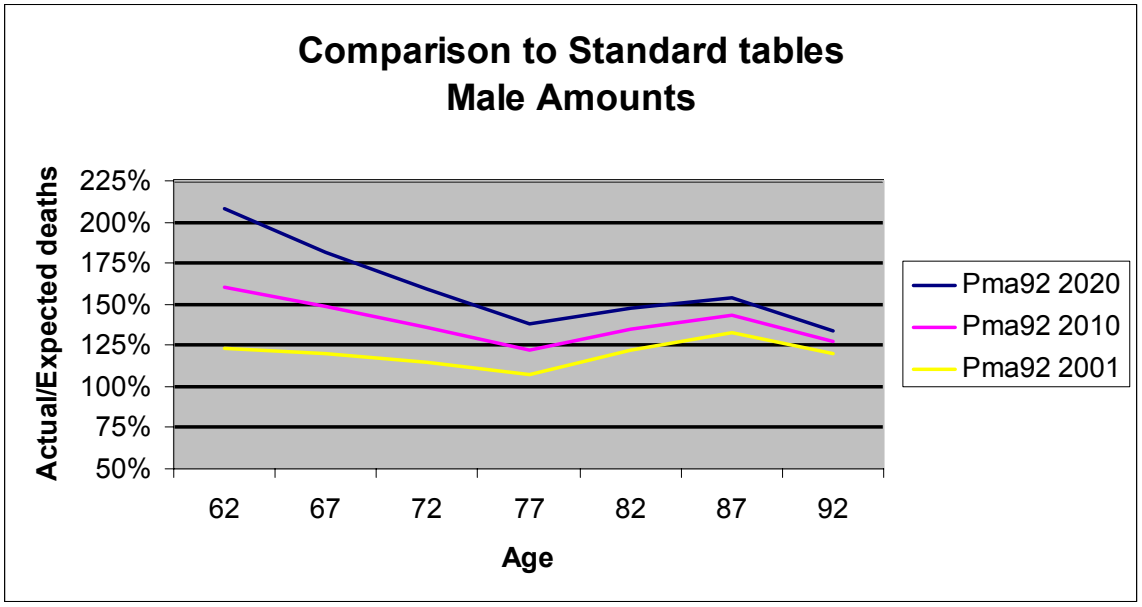


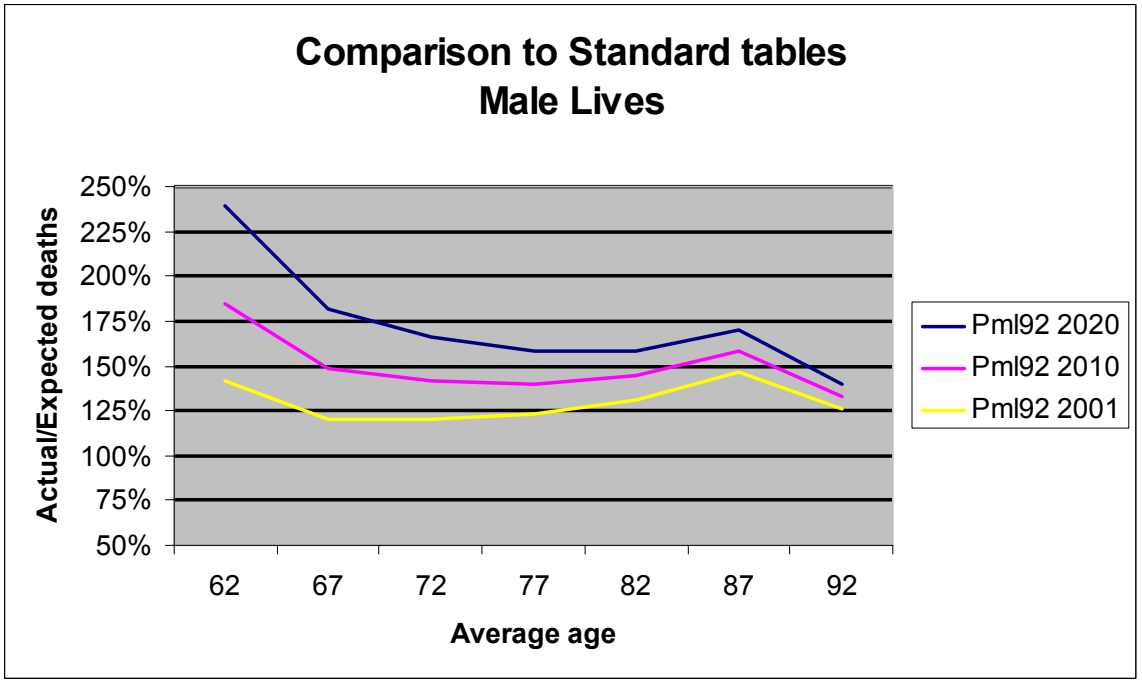
	Crude mortality rates Male	
Age	Amounts	Lives
62	0.00740	0.01345
67	0.01536	0.02185
72	0.02925	0.03956
77	0.05055	0.06952
82	0.09952	0.11950
87	0.17418	0.20428
92	0.23340	0.25124

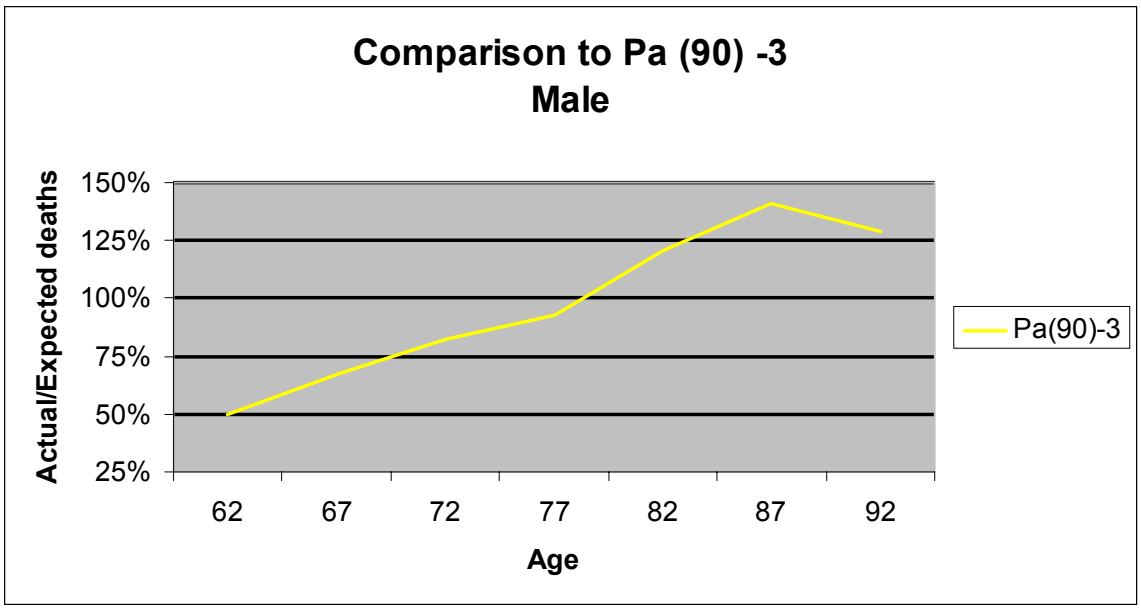


	Crude mortality rates Female	
Age	**Amounts**	**Lives**
62	0.00372	0.00760
67	0.01243	0.01509
72	0.02226	0.02265
77	0.03011	0.03523
82	0.07101	0.06971
87	0.14028	0.12799
92	0.22416	0.19214

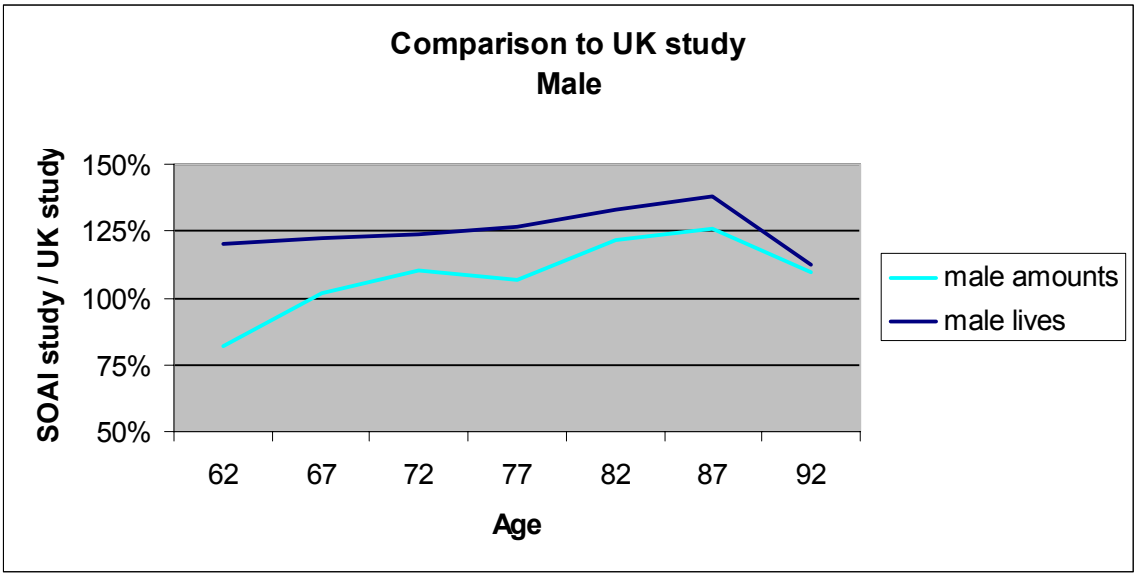
Appendix B

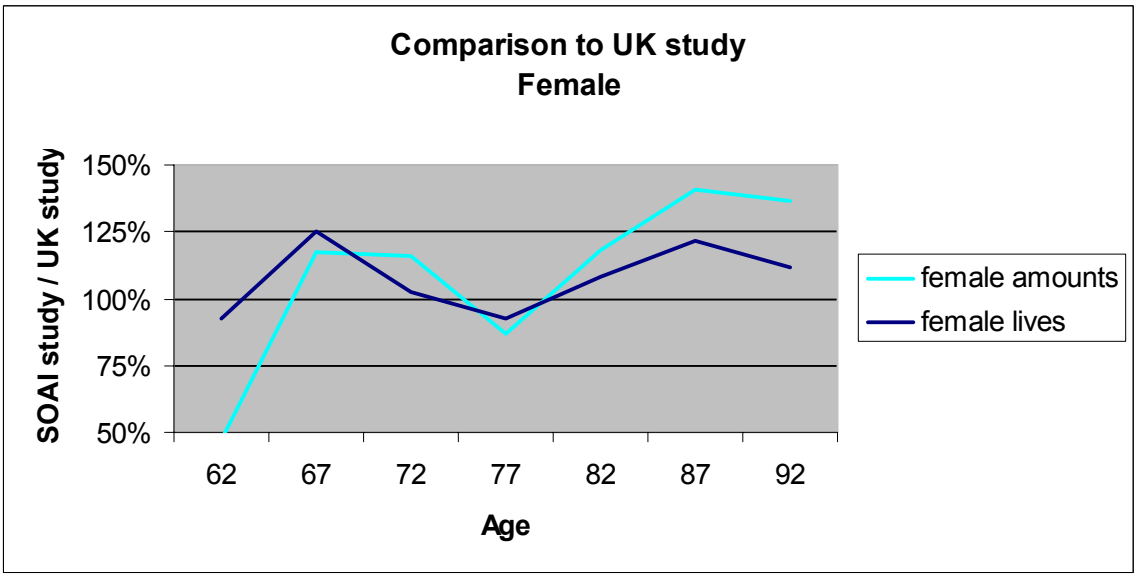

Comparison to Standard tables
Male Amounts
Actual/Expected deaths
225%
200%
175%
150%
125%
100%
75%
50%
62
67
72
77
82
87
92
Age
Pma92 2020
Pma92 2010
Pma92 2001


Comparison to Standard tables
Male Lives
Actual/Expected deaths
250%
225%
200%
175%
150%
125%
100%
75%
50%
62
67
72
77
82
87
92
Average age
Pml92 2020
Pml92 2010
Pml92 2001

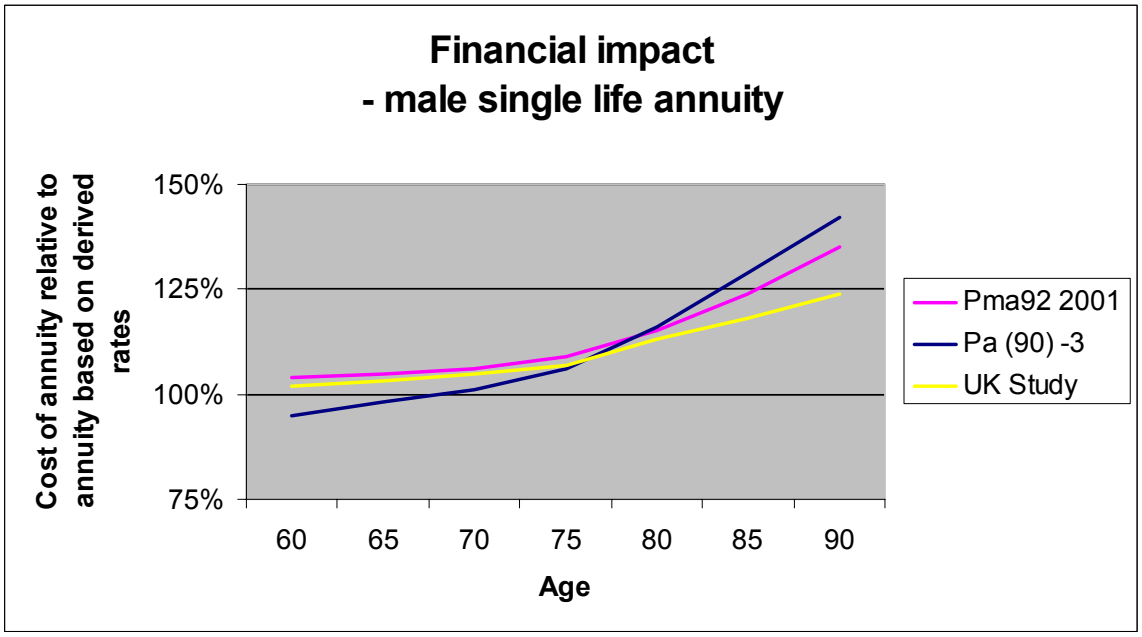


Age	Pma92 C=2001	Pma92 C=2010	Pma92 C=2020	Pml92 C=2001	Pml92 C=2010	Pml92 C=2020	Pa(90)-3
62	123%	160%	208%	142%	185%	185%	50%
67	120%	148%	182%	120%	148%	148%	67%
72	115%	136%	159%	120%	142%	142%	83%
77	107%	122%	138%	123%	140%	140%	93%
82	122%	135%	148%	131%	144%	144%	121%
87	133%	144%	154%	147%	158%	158%	141%
92	120%	127%	134%	126%	133%	133%	129%





Age	Male Amounts	Male Lives	Female Amounts	Female Lives
62	82%	120%	47%	93%
67	102%	123%	117%	125%
72	111%	124%	116%	102%
77	107%	127%	87%	92%
82	122%	133%	118%	108%
87	126%	138%	141%	122%
92	110%	112%	137%	111%



Age	Pa (90) -3	Pma92 c=2001	UK Study
60	95%	104%	102%
65	98%	105%	103%
70	101%	106%	105%
75	106%	109%	107%
80	116%	115%	113%
85	129%	124%	118%
90	142%	135%	124%