Continuous Mortality Investigation

SAPS Mortality Committee

Working Paper 32

Proposed graduations of the CMI SAPS 2000-2006 mortality experience based on data collected to 30 June 2007

January 2008

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Introduction

The SAPS (Self-administered Pension Schemes) mortality investigation started to collect data in January 2003. As valuations tend to be triennial, the early data collected contained data primarily for 2000, 2001 and 2002, with small amounts of data for earlier years. The investigation was initially carried out under the auspices of the Pensions Board of the Actuarial Profession and was incorporated within the CMI in June 2006 when the Pensions Board SAPS Working Party became the CMI Self-administered Pension Schemes Mortality Committee. The transition was seamless and the switch of reporting line had no adverse effect on the investigation. Indeed, the additional resources made available to the Committee by the CMI have greatly facilitated its work.

By June 2007 the SAPS Mortality Committee considered that it had sufficient data to start the process of producing graduated tables of mortality. It was decided that a Graduation Working Party separate from the Committee was not necessary but that the Committee members would greatly benefit from the experience of a member of the Mortality Graduation Working Party that produced the "00" Series tables. John Ellam very kindly volunteered his services. This paper is, therefore, the work of the CMI SAPS Mortality Committee members, being Brian Wilson (Chairman), Nigel Bodie, Andrew Gaches, Jonathan Lawlor and Richard Campbell, plus John Ellam, ably assisted by Simon Spencer and Vivienne Sharples of the CMI secretariat.

The data underlying these draft graduations on which we are now consulting is set out in CMI Working Paper 31, published at the same time as this Working Paper but previously exposed in draft form to CMI SAPS members. The data is briefly summarised below.

Any feedback on this Working Paper is very welcome, particularly in response to the questions directly raised, and should be addressed by 29 February 2008 to:

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Following consideration of the responses the Committee will finalise the graduations as quickly as it can. Provided the changes are minor, no further consultation will be undertaken.

Data

The total data that has been considered for graduation purposes is summarised below, split by calendar year.

TABLE A

	Males Lives	Males Amounts (£'000)	Average Amounts (Males) (£ pa)	Females Lives	Females Amounts (£'000)	Average Amounts (Females) (£ pa)
Exposure						
2000	506,154	3,190,669	6,304	361,057	958,095	2,654
2001	956,992	5,743,737	6,002	777,141	1,984,051	2,553
2002	1,267,219	7,724,181	6,095	1,023,193	2,706,551	2,645
2003	1,197,060	7,116,734	5,945	991,696	2,638,695	2,661
2004	963,691	6,082,438	6,312	723,304	2,000,039	2,765
2005	665,720	4,997,072	7,506	480,788	1,475,366	3,069
2006	156,307	1,223,590	7,828	120,702	359,996	2,983
All	5,713,143	36,078,421	6,315	4,477,881	12,122,793	2,707
Deaths						
2000	18,620	80,554	4,326	12,817	28,353	2,212
2001	35,941	152,382	4,240	26,547	57,681	2,173
2002	50,052	213,677	4,269	37,779	86,780	2,297
2003	47,928	191,701	4,000	35,871	80,076	2,232
2004	38,483	161,754	4,203	26,777	62,973	2,352
2005	24,398	127,787	5,238	17,848	47,003	2,634
2006	5,470	29,815	5,451	4,149	10,408	2,509
All	220,892	957,670	4,335	161,788	373,274	2,307

Pensioner data submitted is labelled as either (a) "Normal Health", (b) "Ill-health" or (c) "Combined" where the data cannot be distinguished between normal health and ill-health retirees.

Most schemes distinguish pensioners from dependants, but where this is not possible the record is submitted as "Unknown". As the graduation has split pensioners from dependants for graduation purposes, the data shown as "Unknown" have not been used in the graduation process.

The split by type of data is as follows:

Table B – Males

		Number or amount of exposure	Number or amount of deaths
Lives	**Normal Health**	2,117,244	83,600
	Ill-health	360,862	12,372
	Combined	2,673,806	102,358
	Dependant	103,596	4,496
	Unknown	457,635	18,066
	All	5,713,143	220,892
	All less unknown	5,255,508	202,826
Amounts (£'000)	**Normal Health**	14,553,682	400,914
	Ill-health	1,896,868	53,620
	Combined	17,170,190	425,268
	Dependant	177,431	6,674
	Unknown	2,280,249	71,194
	All	36,078,421	957,670
	All less unknown	33,798,172	886,476

Table C – Females

		Number or amount of exposure	Number or amount of deaths
Lives	**Normal Health**	987,700	26,755
	Ill-health	216,434	4,149
	Combined	1,230,909	32,628
	Dependant	1,724,400	84,616
	Unknown	318,438	13,640
	All	4,477,881	161,788
	All less unknown	4,159,443	148,148
Amounts (£'000)	**Normal Health**	2,664,753	62,059
	Ill-health	675,865	11,326
	Combined	3,267,453	70,722
	Dependant	4,831,839	204,903
	Unknown	682,883	24,265
	All	12,122,793	373,274
	All less unknown	11,439,910	349,009

Tables considered

The Committee considered the tables that might be useful to actuaries.

Analyses of the data have shown that splitting the data in bands by amounts of pension has produced groups that are relatively homogeneous (as demonstrated by amounts and lives experiences being relatively close) but which demonstrate distinctly different experiences from each other. Further detail is given in Working Paper 31. For males the Committee has split the data into five amount bands and for females into four amount bands. For graduation purposes the Committee has, for both sexes, aggregated the top two amount bands, which in both cases contain approximately 25% of the data, to produce graduations that we refer to as

"Light" and we have aggregated the balance of the data to produce graduations that we refer to as "Heavy".

More precisely, for males the "Light" tables are based on pensioners with pensions of £8,500 p.a. or more and for female pensioners and widows with pensions of £3,000 p.a. or more. The "Heavy" tables have been derived from pensioner and widow data for those with annual pensions under the above amounts.

The use of "Light" and "Heavy" descriptors for these tables could cause problems in use, both from the length of the names and the possible abbreviation of "Light" to "L", causing possible confusion with a "Lives" table. **Feedback on alternative names or abbreviations to use for Light and Heavy tables is requested. (Q1)**

It would be possible to graduate the "Light" tables based on the top 12.5% of pension amounts rather than on the top 25%. An indication of the likely changes to the "Light" graduations can be seen from Charts 1 and 3 in Working Paper 31, although it should be borne in mind that Chart 3 combines female pensioners and widows. **Feedback is requested as to whether this should be done and a further round of consultation embarked on (Q2).** Any such further consultation would delay the finalisation of tables.

Initially, the following were considered as possible for inclusion in the graduation exercise, where "M" and "F" refer to males and females respectively and "All" refers to all amount groups combined:

- Pensioners (excluding dependants) – All, M&F, Lives and Amounts
- Pensioners (excluding dependants) – Light, M&F, Lives and Amounts
- Pensioners (excluding dependants) – Heavy, M&F, Lives and Amounts
- Normal health pensioners – All, M&F, Lives and Amounts
- Normal health pensioners – Light, M&F, Lives and Amounts
- Normal health pensioners – Heavy, M&F, Lives and Amounts
- Ill-health pensioners – All, M&F, Lives and Amounts
- Dependants – All, M&F, Lives and Amounts
- Dependants – Light, M&F, Lives and Amounts
- Dependants – Heavy, M&F, Lives and Amounts

As expected, it quickly became clear that there was no appetite for all of the above 40 possible tables and, after some preliminary enquiries at ACA and Actuarial Profession Current Issues seminars, that the list should be pruned.

For many of the above, lives and amounts graduations were very close to each other and it was decided only to proceed with the amounts graduations. There was no call for a male dependants table. This left the list to be examined as the following:

- Pensioners (excluding dependants) – All, M&F, Lives and Amounts
- Pensioners (excluding dependants) – Light, M&F, Amounts only
- Pensioners (excluding dependants) – Heavy, M&F, Amounts only
- Normal Health pensioners – All, M&F, Amounts only
- Normal Health pensioners – Light, M&F, Amounts only
- Normal Health pensioners – Heavy, M&F, Amounts only
- Ill-health pensioners – All, M&F, Amounts only

- Dependants – All, Females only, Lives and Amounts
- Dependants – Light, Females only, Amounts only
- Dependants – Heavy, Females only, Amounts only

(Female dependants are below referred to as 'widows' for consistency with other CMI tables.)

This would produce 20 graduations, which the Committee still feels may be too many. Having considered the graduations produced, the Committee thinks that, in particular, Light and Heavy Female Pensioners may not be sufficiently distinguished from All Female Pensioners to warrant separate tables. Also, if Light and Heavy Normal Health tables are to be produced for males and females, we would question the need for Light and Heavy all (excluding dependants) Pensioners tables. **The Committee would welcome feedback on the retention of Light and Heavy graduations for both "all (excluding dependants) Pensioners" and "Normal Health Retirees" and, more generally, on which tables should be dropped if the number of proposed tables is thought to be too high. (Q3).** The section "*Comparisons of graduated rates*" on pages 25 to 29 is aimed to assist in decision making on this.

Extension of tables to younger ages

Data at younger ages is sparse. For ill-health retirees there is no significant data below age 35 and for widows there is no significant data below age 45.

For normal health retirees there is data below age 50 (at all ages from 20 to 49 for both males and females), much of which has clearly been misclassified and must relate to either ill-health retirees or, possibly, to dependants. The female normal health retiree lives exposure increases by age to 400 at age 49 and the males to 733 at age 49. The ages above 49 will presumably be similarly contaminated and if this is only at the levels of 400 and 733 a year will distort the data, probably for all higher ages. The issue is at what age is the distortion likely to be sufficiently small that it no longer remains significant. There are step jumps in female and male exposure at 50 and at 60. For female lives the jump from age 49 to age 50 is from 400 to 3,045 and from 59 to 60 from 17,471 to 35,894. For males the corresponding jumps are from 733 to 8,934 and from 46,321 to 58,097. The crude lives q_x averaged over the ages 45 to 49 and from ages 50 to 54 are respectively 0.013 and 0.004 for females and 0.020 and 0.004 for males. For males the value of lives crude q_xs at ages 59 and 60 are almost identical at 0.0078 to four decimal places. The Committee is of the view that any extension to younger ages of the normal retirement tables should blend into the pensioner graduation at age 60 rather than at age 50 for both males and females.

If a single table is needed that would be applicable to individuals in receipt of pension at any age (for instance to value pensions in payment), then a blend of an ill-health pensioner graduation to age 50 or 60 together with an "all (excluding dependants) Pensioners" graduation above whichever of these ages is suitable to the scheme may be the best for the purpose. However, this has a particular problem in that these two graduations could not be continuous at the age of the switch, as the "all (excluding dependants) Pensioner" graduations have lighter mortality from ages 50 upwards than the ill-health pensioner graduations. This is illustrated in Figures 31 and 34. Any blending of rates from, say, age 50 to age 65 would result in a "U" shaped curve and, when used, in an overstatement or understatement of the expected deaths (as the actual blend required for any particular scheme would be scheme-specific) in all or part of the age range 50 to 65. The choice, therefore, would be between using a table with a discontinuity at either 50 or 60 or some age in between or for a scheme to

use its own blended table that would be more appropriate to the scheme. The Committee is, therefore, minded to graduate the "all (excluding dependants) Pensioner" tables from age 50 upwards only.

The question of which graduations to continue down to a lower age of, say 20, is one on which the Committee would particularly value feedback (Q4). The Committee would value feedback on whether the "all (excluding dependants) Pensioners" table should stop at a lowest age of 50 (Q5). For tables that are extended downwards, would a starting age of 16 or 17 be preferable to 20? (Q6)

The "Normal Health" tables from ages 60 and upwards with graduated rates below age 60 have been blended into "00" Series assured lives at the youngest ages, and do not exhibit the discontinuity referred to above. See Figures 36 and 38.

No select period tables have been considered.

Overview of graduation methodology

The Committee has used the same methodology as was the case with the "00" Series graduations, described in Working Paper 12, namely the methodology developed by Forfar, McCutcheon and Wilkie (1988). This involves fitting a formula of the μ_x = GM(r,s) class, making subsequent adjustments as necessary, and then calculating values of q_x as

$$q_x = 1 - e^{-\int_0^1 \mu_{x+t}\,dt}$$

The integral has been estimated using the method of approximation adopted for the "00" Series:

$$\int_0^1 \mu_{x+t}\,dt \approx [7\mu_x + 32\mu_{x+¼} + 12\mu_{x+½} + 32\mu_{x+¾} + 7\mu_{x+1}] / 90.$$

For each table, the graduation was performed over an an age range that was considered to be sufficiently large for reliable results to be calculated. Extensions to higher and lower ages were then considered separately. The age ranges chosen for initial graduations were:

- Dependants – 45 to 95
- Ill-health pensioners – 35 to 95
- All other – 55 to 95

Old age mortality rates

The Committee has no credible data at the oldest ages, and so whatever mortality rates are published will necessarily be subjective. We have therefore decided to "blend" the graduated formulae into arbitrary upper limits, which we believe will provide a sensible and consistent end to the tables.

The Committee is minded to fix values of μ_x (and hence q_x), separately for males and females, for all ages from 105 to 120 and then set μ_{121} equal to 999 (being an arbitrarily high number so that q_{120} is equal to 1 to six decimal places). Based on recent work published by ONS on population data in England and Wales (see References on page 43 for web-link), the values of q_x chosen have been 0.45 for males and 0.40 for females (and hence μ_x values of –log(1 – 0.45) = 0.597837 for males and –log(1 – 0.40) = 0.510826 for females). Blending from ages

95 to 105 would then be based on the method used for older ages in Working Papers 21 and 22, using the formula:

$$\mu_x = \frac{(105-x)^{curve}}{(105-95)^{curve}} \times \mu_{95} + \left(1 - \frac{(105-x)^{curve}}{(105-95)^{curve}}\right) \times \mu_{105}$$

The power factor "curve" in the weights affects the speed (or "curvature") at which the rates blend into the target value. The value of "curve" has been taken as 1.2 for all graduations so as to avoid introducing new anomalies between ages 95 and 105 and the resultant curves are shown on Figures 30 to 41.

In practical terms, this methodology produces annuity values (at 5% interest) and expectations of life at all ages up to 80 (assuming no future improvement in mortality) that differ by no more than 0.05% from those that would be calculated were we to use the Working Paper 21 and 22 methodology.

As this method differs from that used previously, the Committee would value feedback on this proposal for older ages. (Q7)

Extension of tables to younger ages

The graduated rates cover limited age ranges as shown in the next section. They do not include rates below age 35 for ill-health pensioners, 45 for widows and 55 for other classes. The "other classes" graduations could be extended downwards to age 50 without the need to adjust the formulae. See Figures 1 to 8 for "all (excluding dependants) Pensioner" graduations and crude values from which it is apparent that the graduations neither fit the data nor behave "sensibly" below that age. Normal Health retirements below age 50 have been discussed above. However the Committee is aware of the demand that the "00" Series pensioner tables be extended downwards to age 20 for all tables and is inclined to follow the lead set by the "00" Series tables, as extended, in some cases. The particular issue of whether to extend downwards both the "Normal Health" table and the "all (excluding dependants) Pensioner" table has been discussed above.

In all cases where we are proposing downward extensions the extended rates are arbitrary in that there is either no data or insufficient data for graduated rates to be reliably calculated. The work to date has been based on the following principles:

- For female ill-health pensioners the rate at age 42 (being 0.007620, the minimum value of μ_x in the graduated range) has been retained for all ages 20 to 42 and for male ill-health pensioners the rate at age 41 (being 0.009112, the minimum value of μ_x in the graduated range) has been retained for all ages 20 to 41;
- For normal health pensioners the tables have been blended below age 60 into the "00" Series assured lives values – this has been done by interpolating between the "00" Series Combined, Smoker and Non-smoker tables, as appropriate, at age 60 and then retaining the percentages of these tables at age 60 for all younger ages. For the female graduation the percentages of the "00" Series Combined table used were 21.38631%, 12.36207% and 49.53575% respectively for the "All", "Light" and "Heavy" graduations with one minus these percentages of the "00" Series Smoker table. For the male graduations the percentages of the "00" Series Combined table used were 88.63246%, 48.88526% and 14.73946% respectively for the "All", "Light" and

"Heavy" graduations with one minus these percentages of the "00" Series Smoker table for the "All" and "Heavy" graduations and (100 – 48.88526)% of the "00" Series Non-smoker table being used for the male "Light" graduation;

- For widows the "All" tables (Lives and Amounts) have been blended below age 45 into the average of the "AFN00" and "AFS00" tables at age 20. The Light table has been blended below age 45 into the "AFN00" table at age 20 and the Heavy table has been blended into the "AFS00" table at age 20 using a GM(0,3) curve that has a continuous first derivative at age 45.

The Committee would value feedback as to whether the rates chosen for younger ages are the most suitable. (Q8)

Fitted formulae

Table D. Male pensioners – all excluding dependants – values used for ages 50 to 95

Sex	Male	Male	Male	Male
Category	Pensioners - All	Pensioners - All	Pensioners - Light	Pensioners - Heavy
Lives / Amounts	Lives	Amounts	Amounts	Amounts
GM formula	GM(1,4)	GM(0,4)	GM(0,4)	GM(1,4)
Age range fitted	55-95	55-95	55-95	55-95
Optimised parameters				
$100\times a_1$	0.584681			0.810871
b_1	–6.305036	–3.040895	–2.684163	–7.382862
b_2	9.652618	2.562332	1.736837	12.108065
b_3	–2.392672	0.870570	1.486421	–3.356365
b_4	0.793698	–1.053750	–1.395762	1.411356

Table E. Female pensioners – all excluding dependants – values used for ages 50 to 95

Sex	Female	Female	Female	Female
Category	Pensioners - All	Pensioners - All	Pensioners - Light	Pensioners - Heavy
Lives / Amounts	Lives	Amounts	Amounts	Amounts
GM formula	GM(1,4)	GM(1,4)	GM(1,3)	GM(2,2)
Age range fitted	55-95	55-95	55-95	55-95
Optimised parameters				
$100\times a_1$	0.581202	0.497361	0.442858	–0.698084
$100\times a_2$				–2.783597
b_1	–9.796065	–8.600953	–6.508120	–3.809327
b_2	16.382108	13.620091	8.439283	5.209929
b_3	–5.108970	–3.831515	–1.690559	
b_4	2.246370	1.488678		

Table F. Male Normal Health pensioners – values used for ages 60 to 95

Sex	Male	Male	Male
Category	Normal Health Pensioners - All	Normal Health Pensioners - Light	Normal Health Pensioners - Heavy
Lives / Amounts	Amounts	Amounts	Amounts
GM formula	GM(0,4)	GM(0,4)	GM(1,4)
Age range fitted	55-95	55-95	55-95
Optimised parameters			
$100\times a_1$			0.558891
b_1	–3.363977	–2.950665	–5.999314
b_2	3.082296	2.011529	9.053498
b_3	0.583844	1.232195	–2.064804
b_4	–0.988589	–1.393659	0.613392

Table G. Female Normal Health pensioners – values used for ages 60 to 95

Sex	Female	Female	Female
Category	Normal Health Pensioners - All	Normal Health Pensioners - Light	Normal Health Pensioners - Heavy
Lives / Amounts	Amounts	Amounts	Amounts
GM formula	GM(1,3)	GM(1,3)	GM(1,3)
Age range fitted	55-95	55-95	55-95
Optimised parameters			
$100\times a_1$	0.342194	0.325759	0.450969
b_1	–6.316752	–6.447117	–6.487347
b_2	8.198774	8.382136	8.354586
b_3	–1.650273	–1.702598	–1.858701

Table H. Male and Female Ill-health pensioners – values used for ages 41(m)/42(f) to 95

Sex	Male	Female
Category	Ill-health Pensioners - All	Ill-health Pensioners - All
Lives / Amounts	Amounts	Amounts
GM formula	GM(2,2)*	GM(2,2)*
Age range fitted	35-95	35-95
Optimised parameters		
$100\times a_1$	–0.083934	0.529377
$100\times a_2$	–1.236799	–0.321705
b_1	–3.256262	–4.138902
b_2	4.534372	6.097710

* In both cases the 'best' graduated curve gave lower values of μ_x than the graduated rates for normal health pensioners at ages over 90. This is a feature of the graduation rather than a feature of the data. GM(2,2) graduations have been substituted to correct what may otherwise appear as an anomaly.

Table I. Widows – values used for ages 20 to 95

Sex	Female	Female	Female	Female
Category	Widows - All	Widows - All	Widows - Light	Widows - Heavy
Lives / Amounts	Lives	Amounts	Amounts	Amounts
For ages 45 to 95				
GM formula	GM(1,2)	GM(1,2)	GM(1,2)	GM(1,2)
Age range fitted	45-95	45-95	45-95	45-95
Optimised parameters				
$100\times a_1$	0.198058	0.167005	0.173088	0.248087
b_1	–4.100438	–4.316443	–4.544088	–4.045837
b_2	5.597148	5.924113	6.329827	5.543214
For ages 20 to 45				
GM formula	GM(0,3)	GM(0,3)	GM(0,3)	GM(0,3)
Age range fitted	n/a	n/a	n/a	n/a
Fitted parameters				
b_1	–9.795245	–9.635461	–10.826028	–10.126457
b_2	–4.680467	–4.204507	–5.828833	–5.424728
b_3	–3.284632	–2.968456	–3.566042	–3.560822

Note: Whilst all parameter values are shown to six decimal places, the graduated values used in the tables have been calculated without truncating the values. It has been pointed out to the Committee that it would be preferable if the two were consistent. The Committee therefore proposes to recalculate the values in Appendix A using truncated values (which may change from those above when optimised) and so the values in Appendix A are subject to minor changes for this reason in addition to any changes that might be made as a result of feedback received.

Removal of anomalies

The graduations have been tested for anomalies and the following is a list of those found and how they have been rectified.

Table	Anomaly	Age range	How rectified
Females Normal Health Pensioners Light	Values higher than those of Female All Pensioners Light	75 to 104	Values set to the lower of the two graduated rates in both tables
Females Normal Health Pensioners All	Values higher than those of Female All Pensioners All	80 to 92	Values set to the lower of the two graduated rates in both tables
Males Normal Health Pensioners Light	Values higher than those of Male All Pensioners Light	73 to 94	Values set to the lower of the two graduated rates in both tables
Males Normal Health Pensioners All	Values higher than those of Male All Pensioners All	78 to 104	Values set to the lower of the two graduated rates in both tables
Males Normal Health Pensioners Heavy	Values higher than those of Male All Pensioners Heavy	80 to 104	Values set to the lower of the two graduated rates in both tables

Fitted curves for μ_x

Note: all graphs shown have a logarithmic y axis.

The high gate shown is the 97.5th percentile and the low gate is the 2.5th percentile. In order to show greater detail for the ages used to graduate the data, some of the high and low gates are above the top or below the bottom of the charts and so cannot be seen.

Figure 1. Crude Mu, gates and graduated Mu for Male Pensioner Lives: GM(1,4)

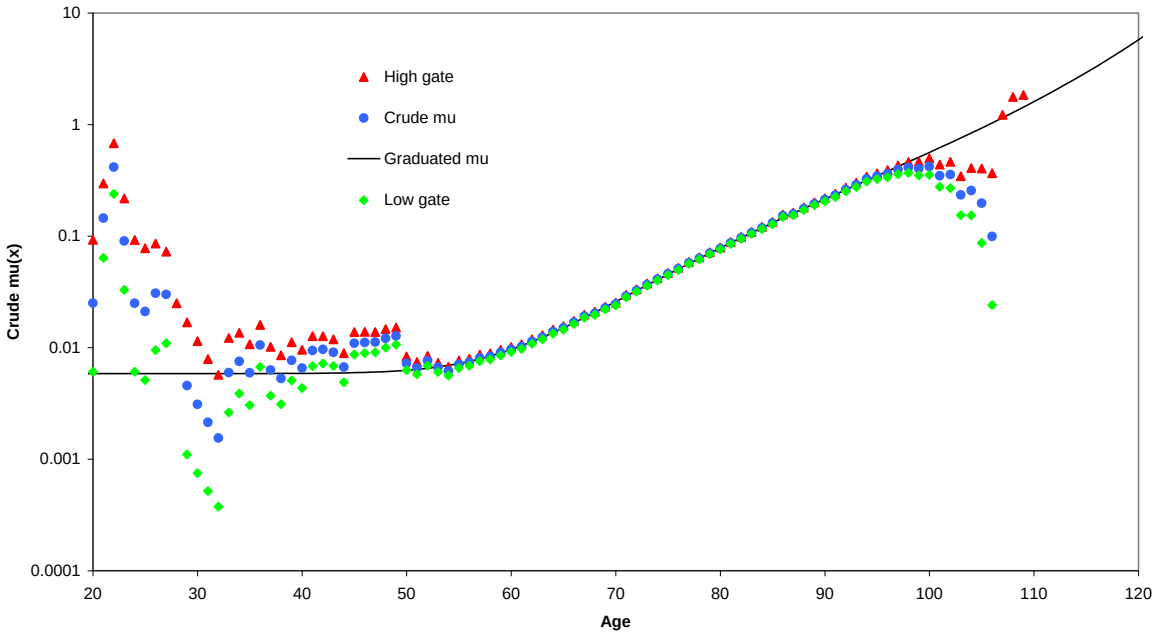


Figure 2: Crude Mu, gates and graduated Mu for Male Pensioner Amounts: GM(0,4)

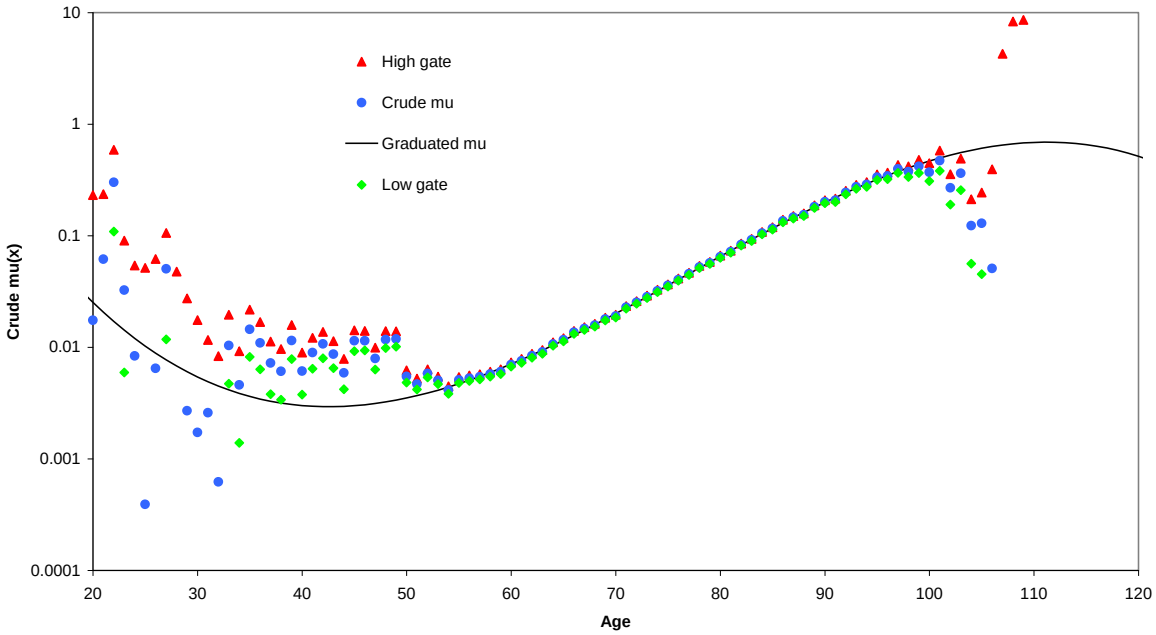


Figure 3: Crude Mu, gates and graduated Mu for Male Pensioner Amounts Light: GM(0,4)

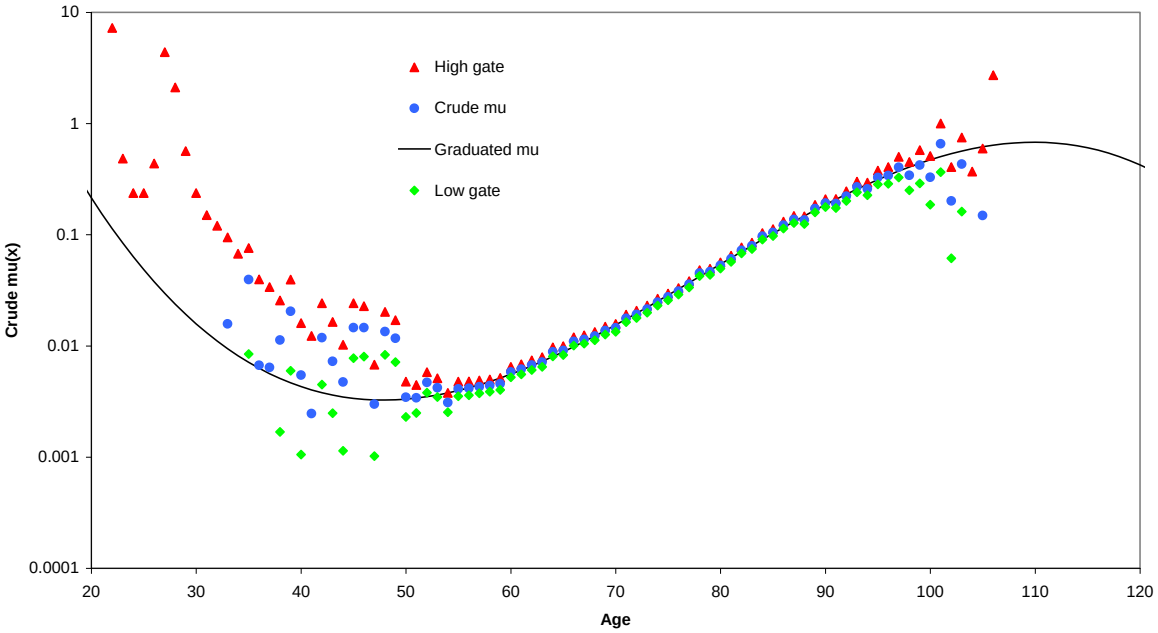


Figure 4: Crude Mu, gates and graduated Mu for Male Pensioner Amounts Heavy: GM(1,4)

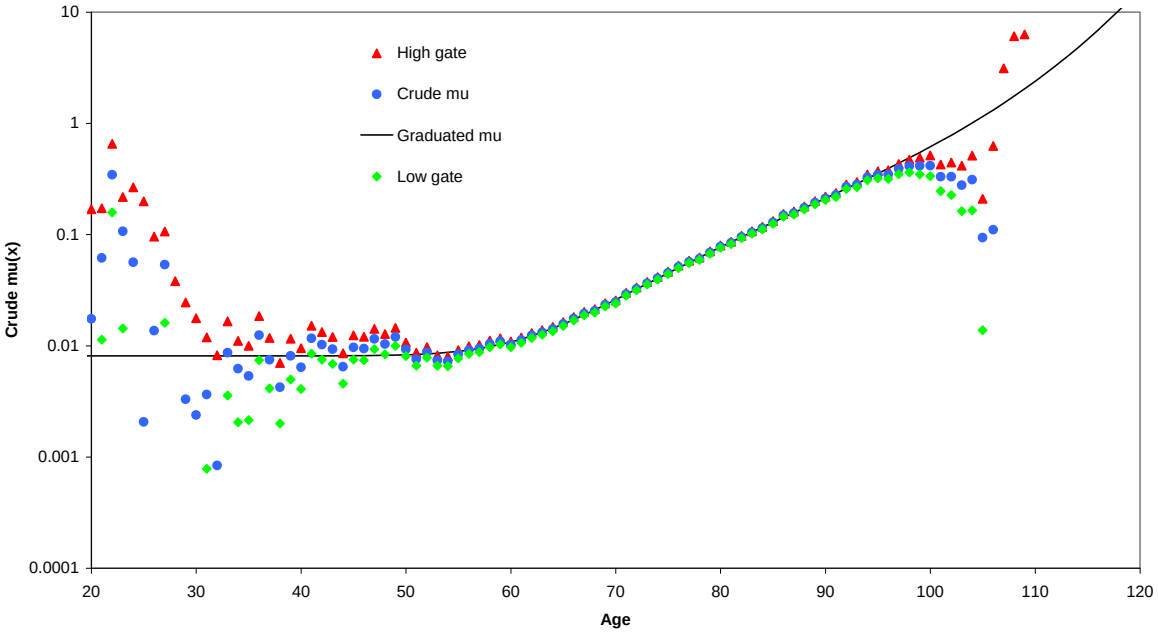


Figure 5: Crude Mu, gates and graduated Mu for Female Pensioner Lives: GM(1,4)

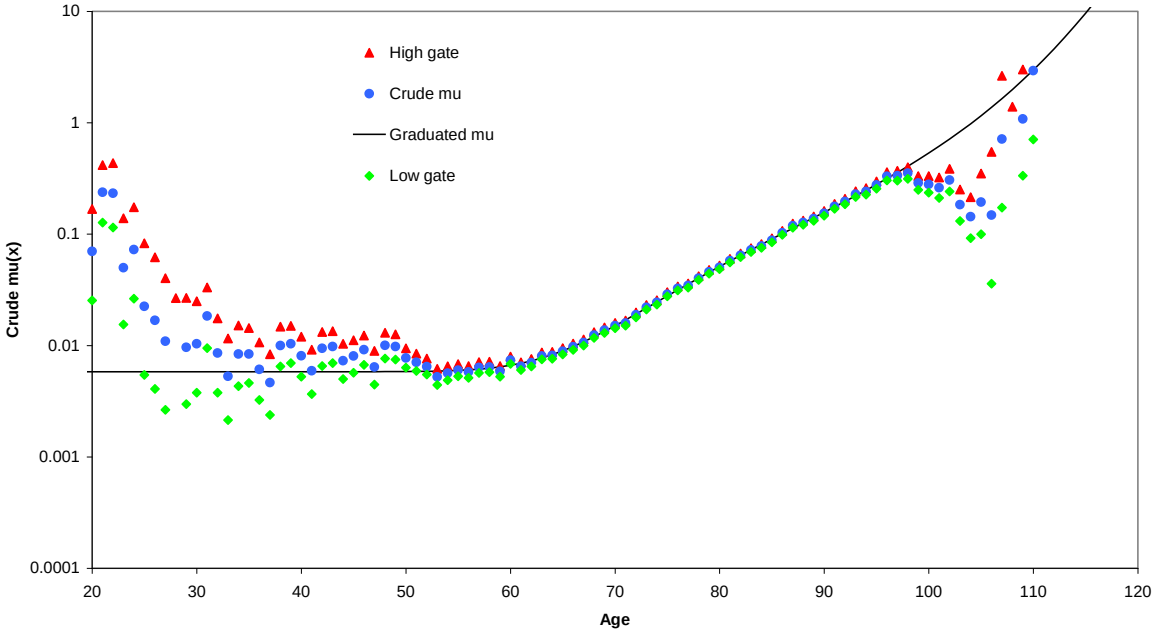


Figure 6: Crude Mu, gates and graduated Mu for Female Pensioner Amounts: GM(1,4)

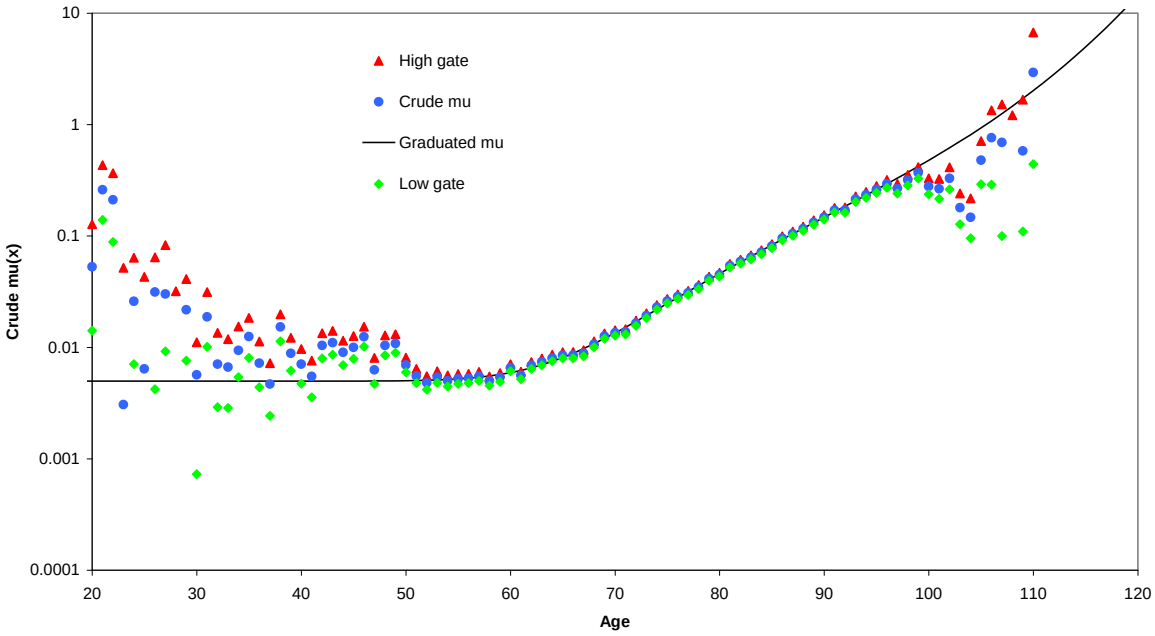


Figure 7: Crude Mu, gates and graduated Mu for Female Pensioner Amounts Light: GM(1,3)

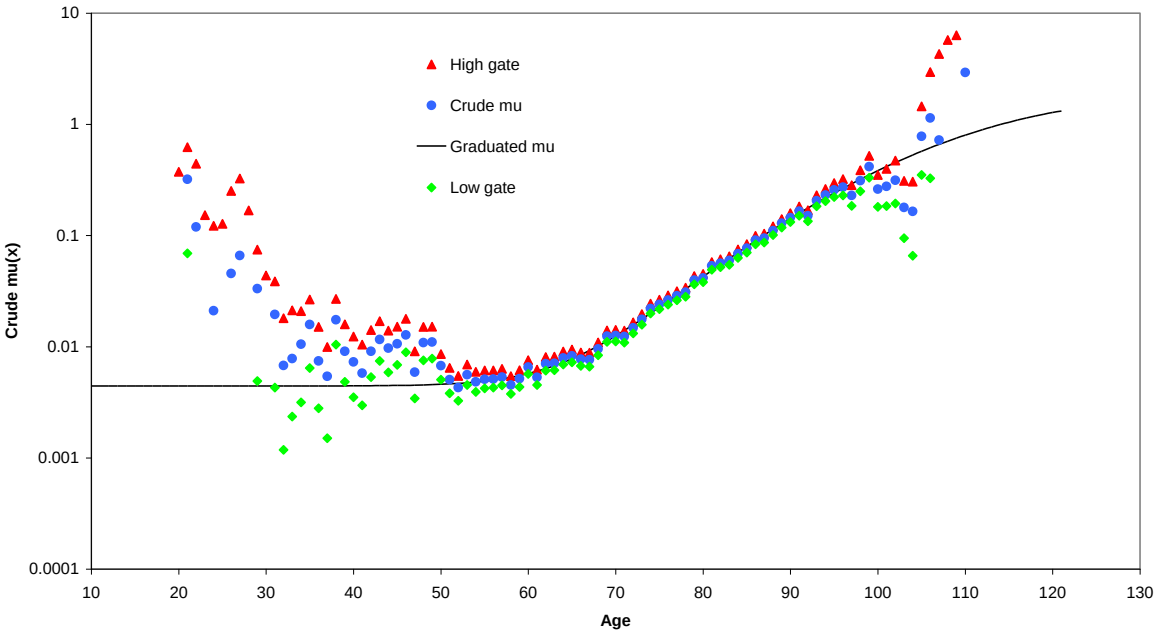


Figure 8: Crude Mu, gates and graduated Mu for Female Pensioner Amounts Heavy: GM(2,2)

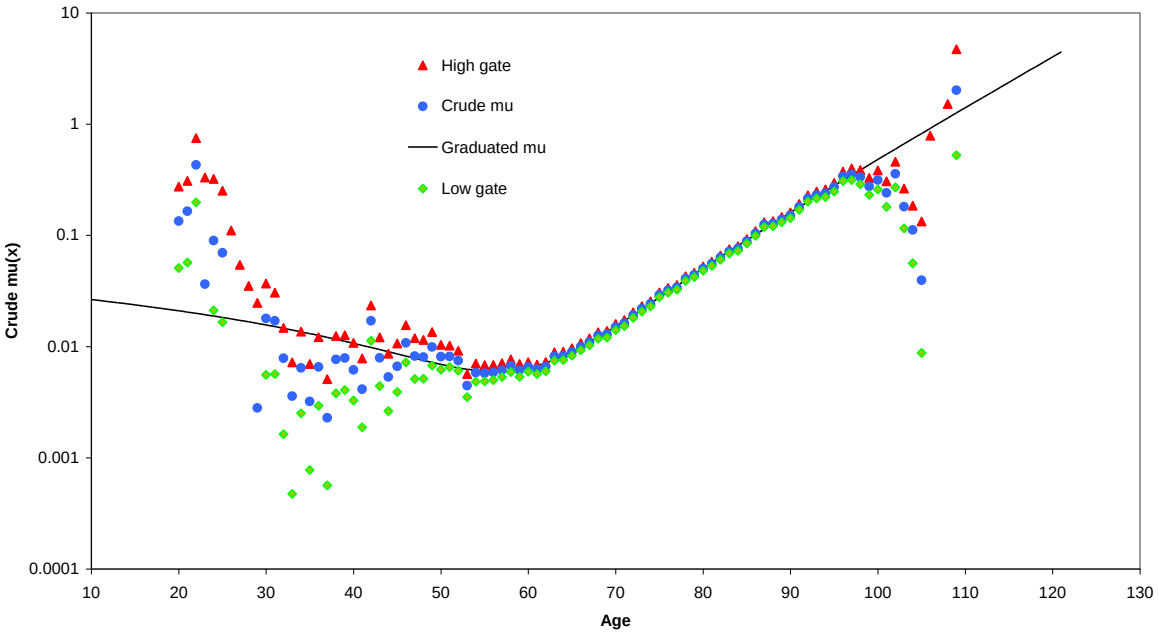


Figure 9: Crude Mu, gates and graduated Mu for Male Normal Health Amounts: GM(0,4)

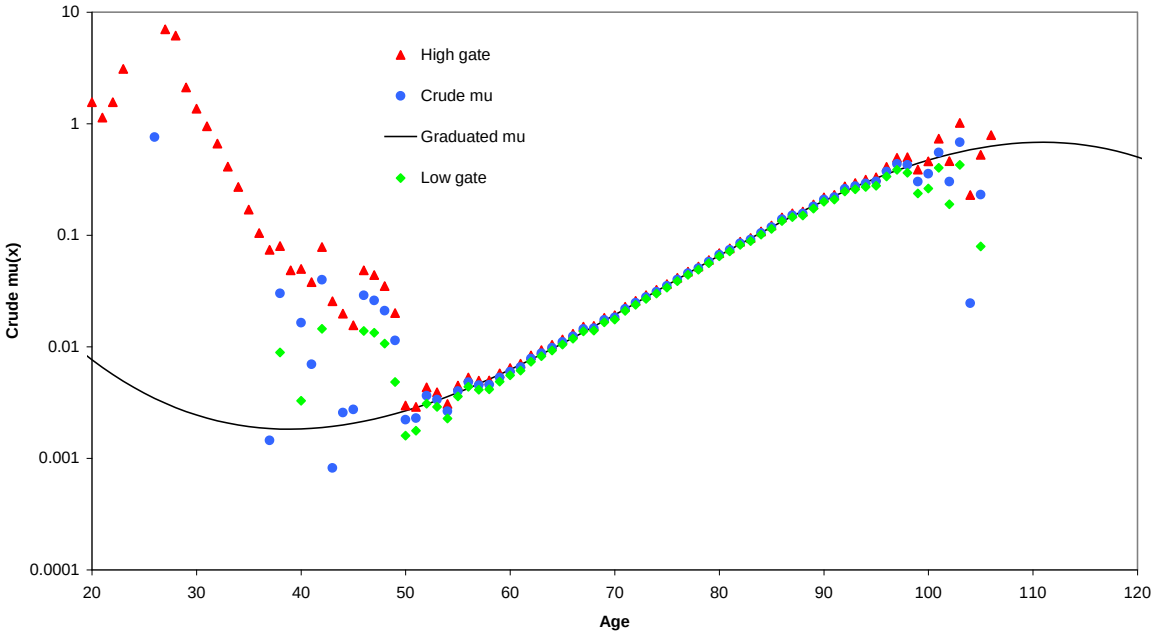


Figure 10: Crude Mu, gates and graduated Mu for Male Normal Health Amounts Light: GM(0,4)

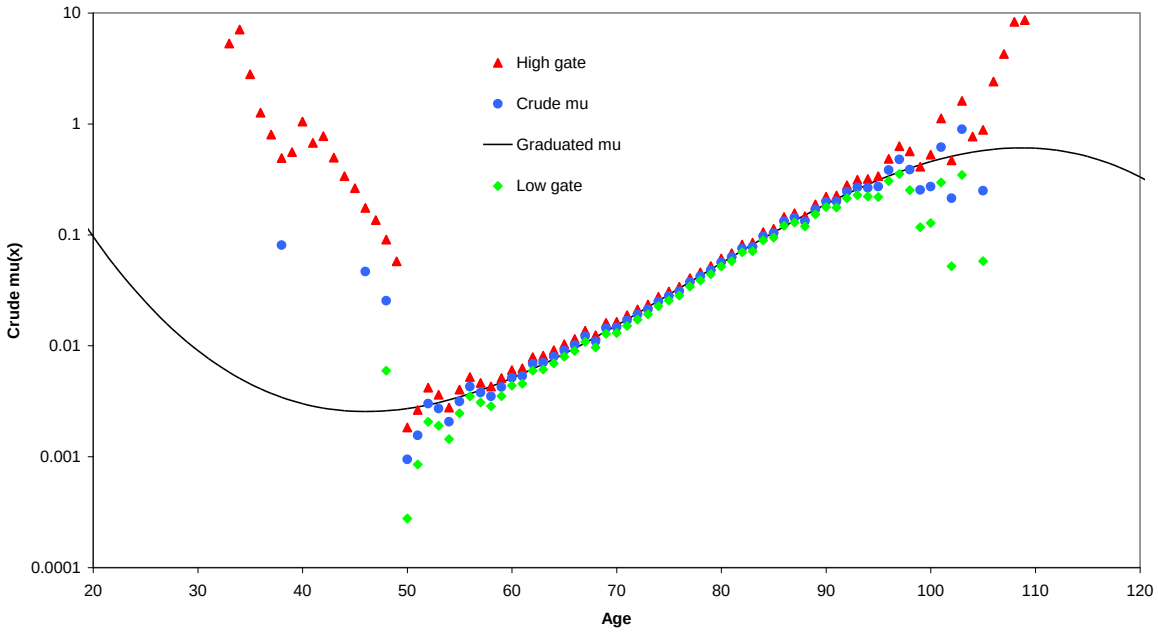


Figure 11: Crude Mu, gates and graduated Mu for Male Normal Amounts Heavy: GM(1,4)

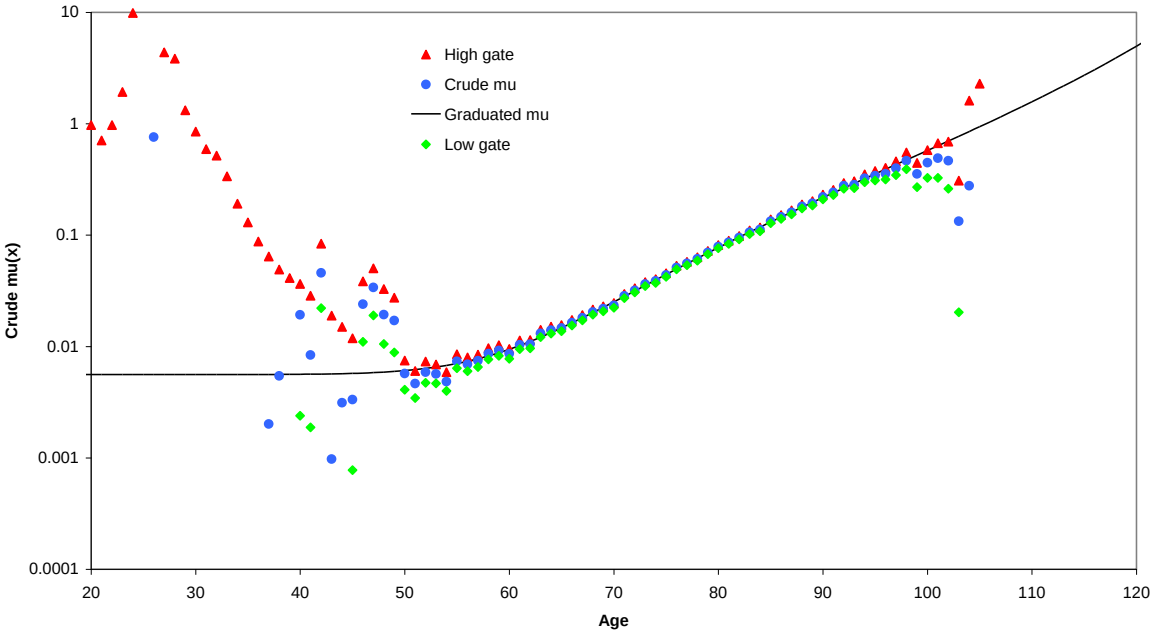


Figure 12: Crude Mu, gates and graduated Mu for Female Normal Health Amounts: GM(1,3)

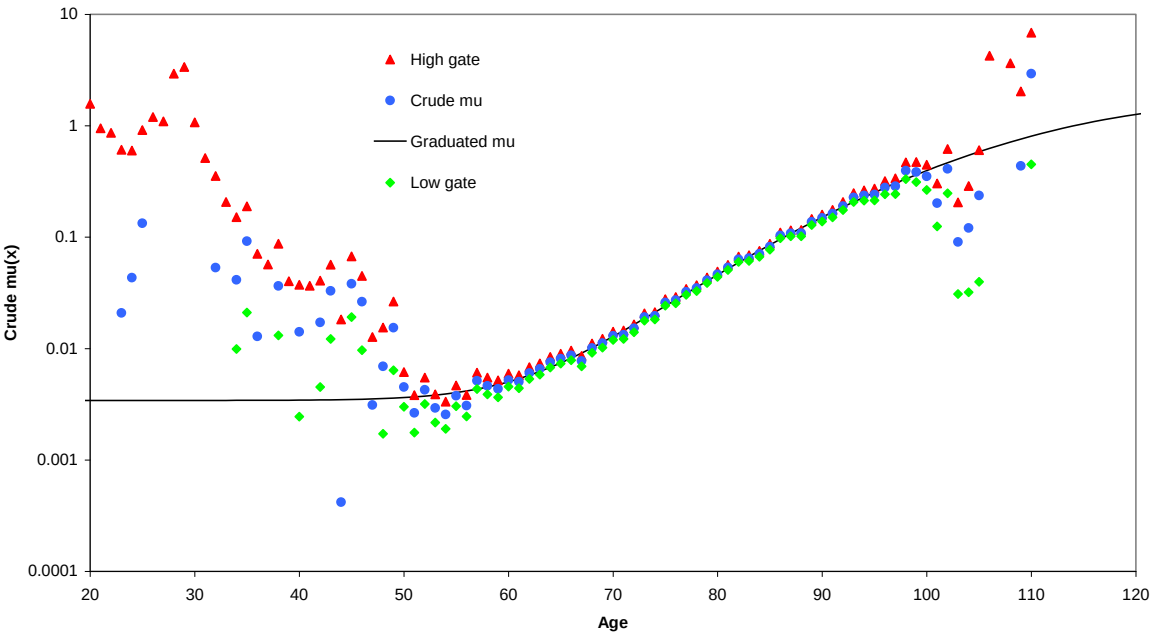


Figure 13: Crude Mu, gates and graduated Mu for Female Normal Health Amounts Light: GM(1,3)

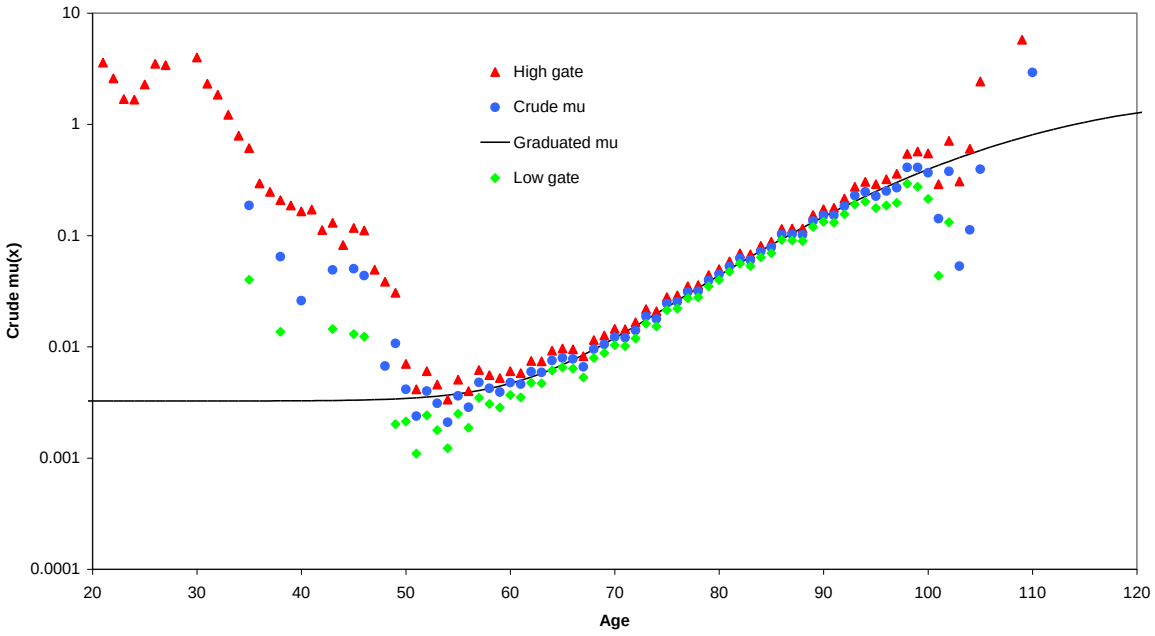


Figure 14: Crude Mu, gates and graduated Mu for Female Normal Health Amounts Heavy: GM(1,3)

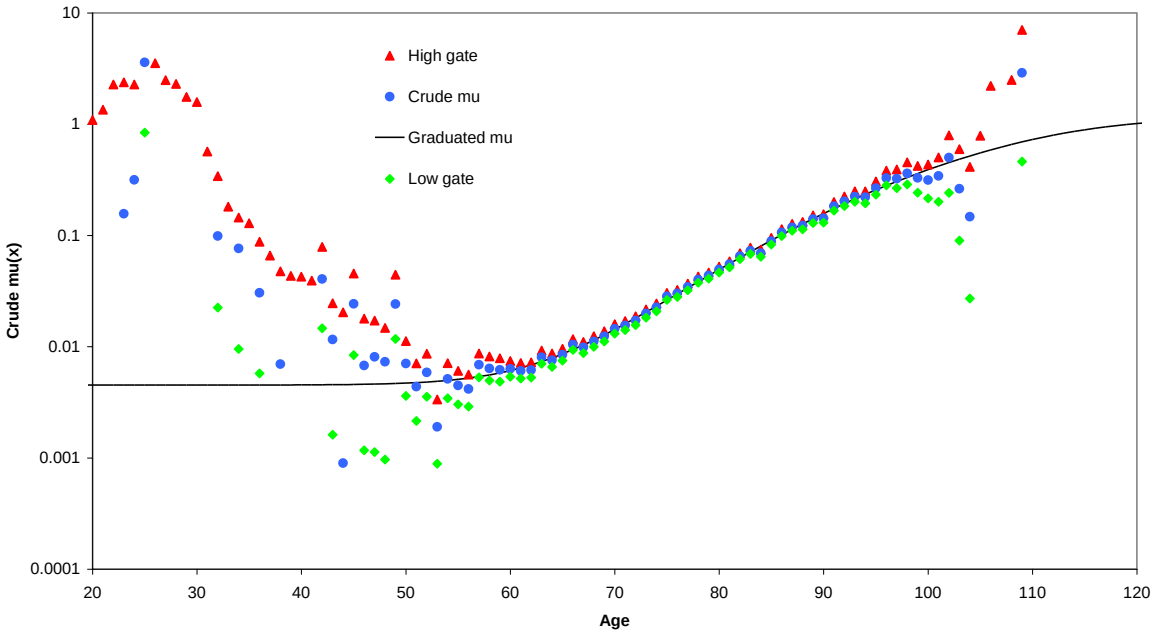


Figure 15: Crude Mu, gates and graduated Mu for Male Ill-health Amounts: GM(2,2)

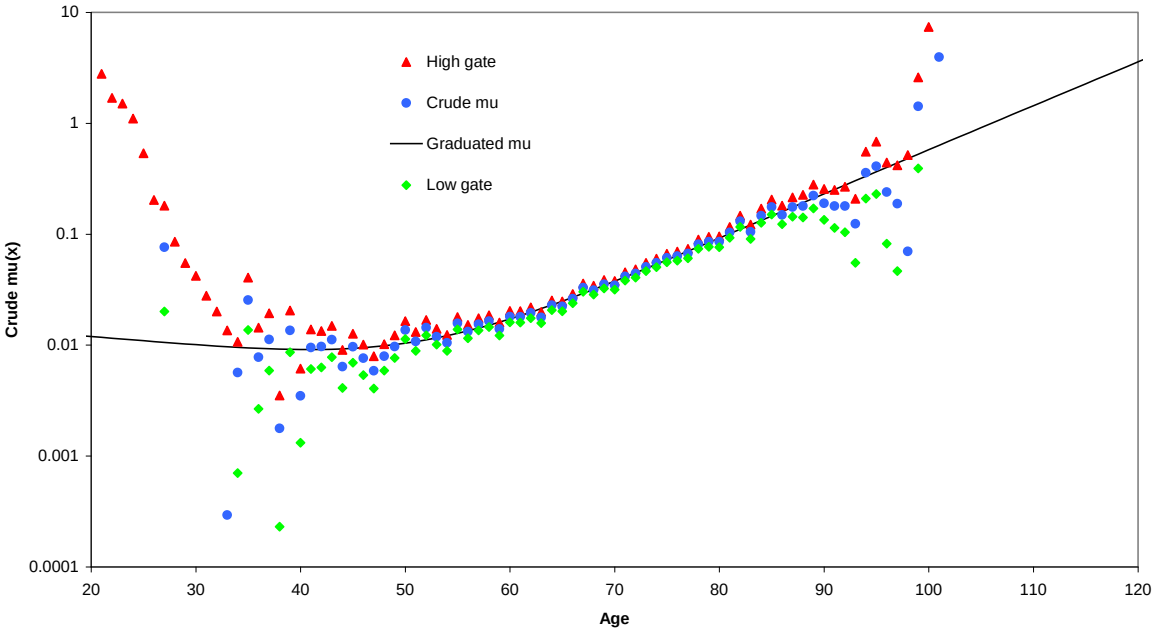


Figure 16: Crude Mu, gates and graduated Mu for Female Ill-health Amounts: GM(2,2)

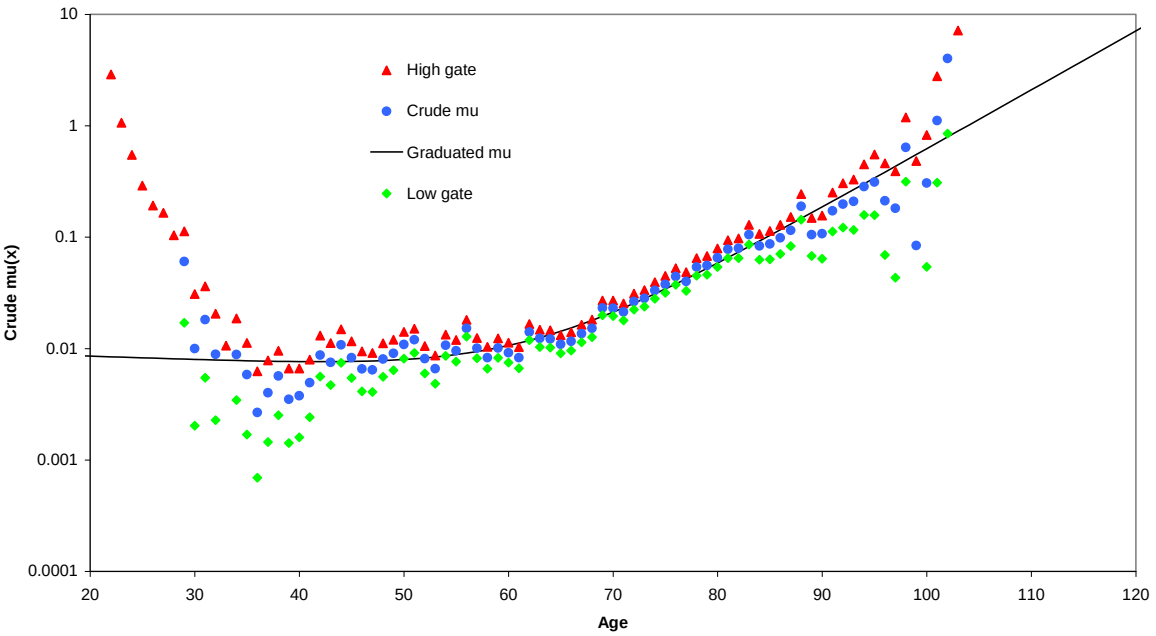


Figure 17: Crude Mu, gates and graduated Mu for Widow Lives: GM(1,2)

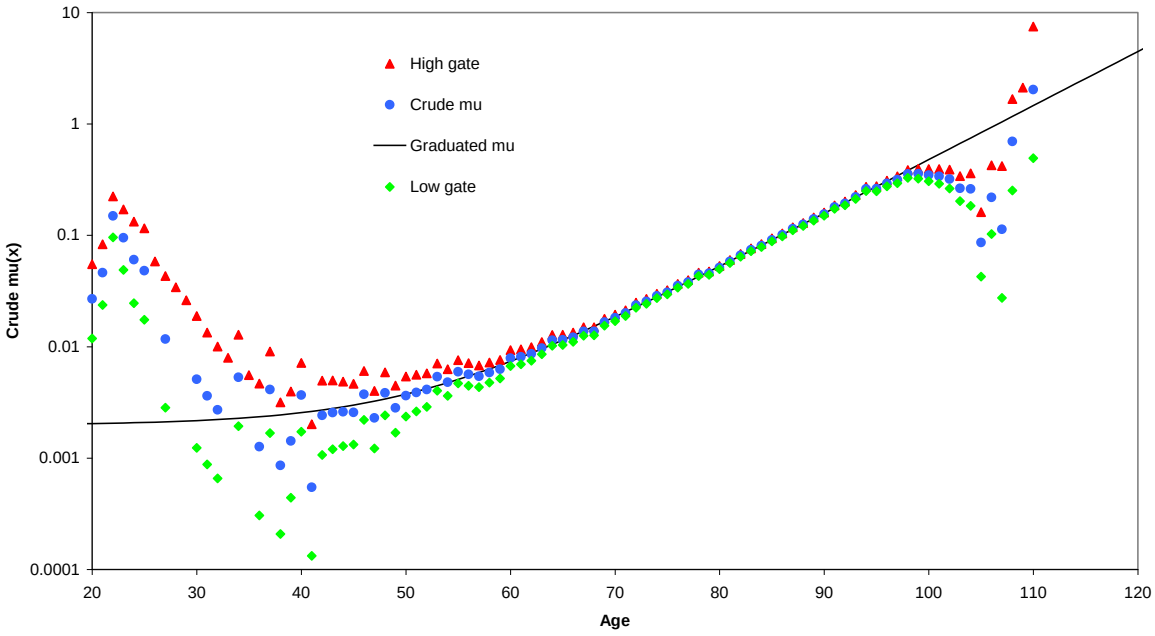


Figure 18: Crude Mu, gates and graduated Mu for Widow Amounts: GM(1,2)

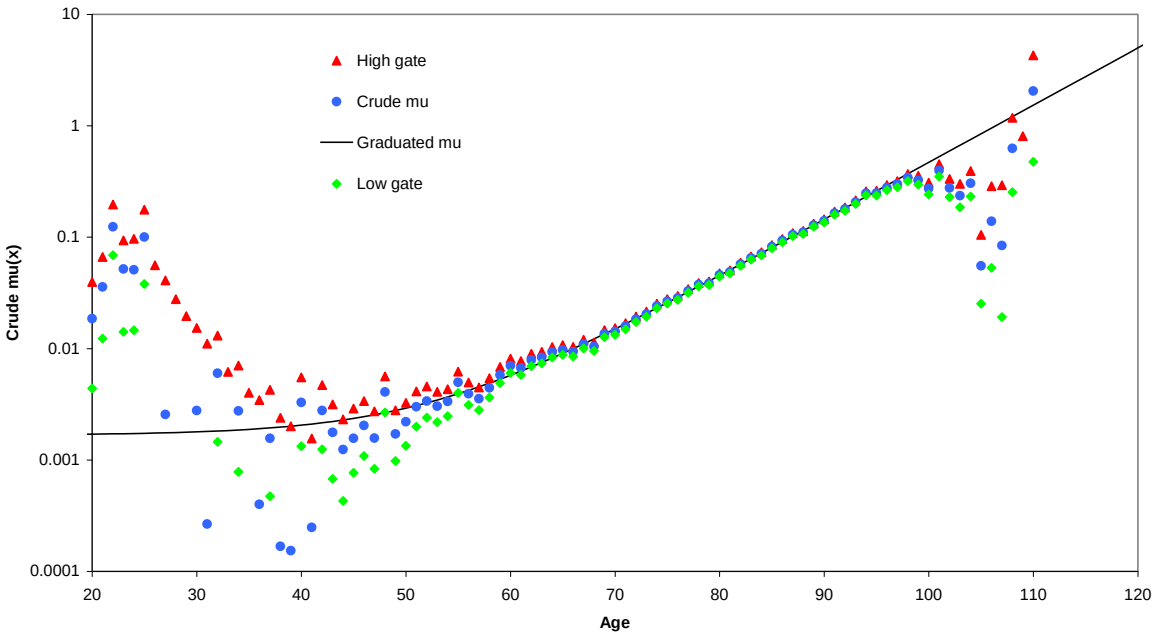


Figure 19: Crude Mu, gates and graduated Mu for Widow Amounts Light: GM(1,2)

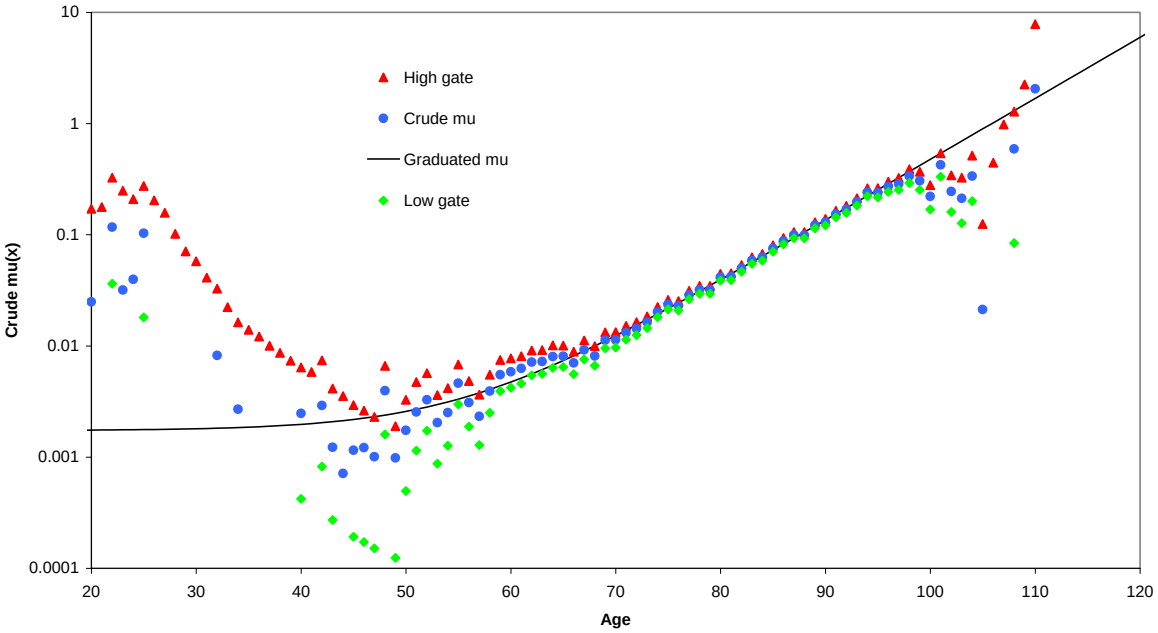
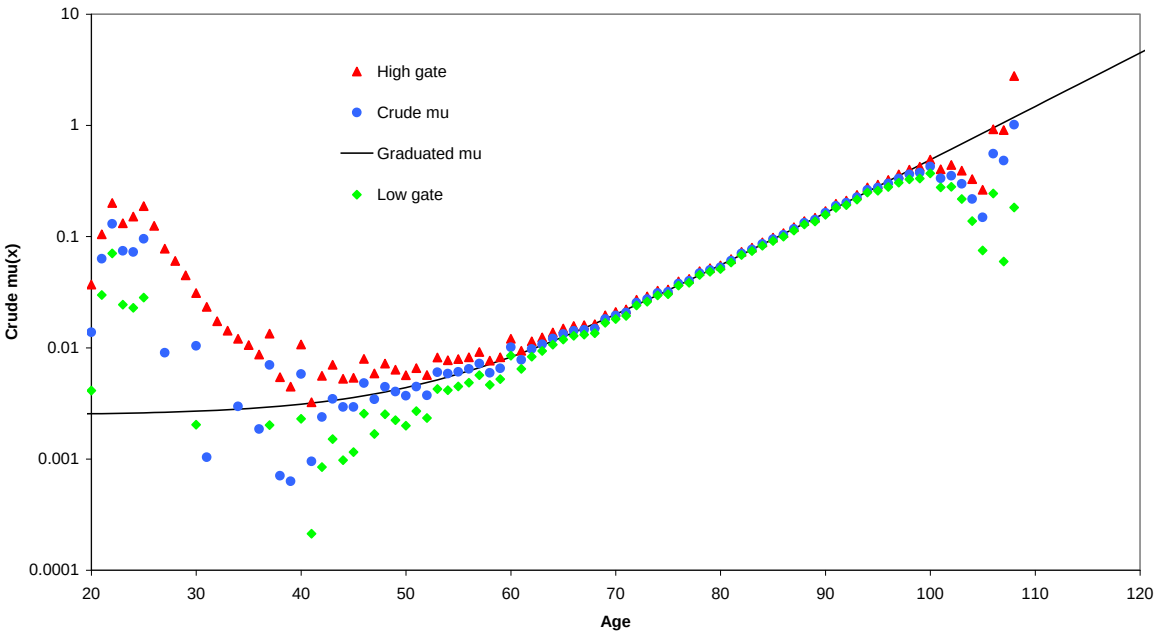


Figure 20: Crude Mu, gates and graduated Mu for Widow Amounts Heavy: GM(1,2)



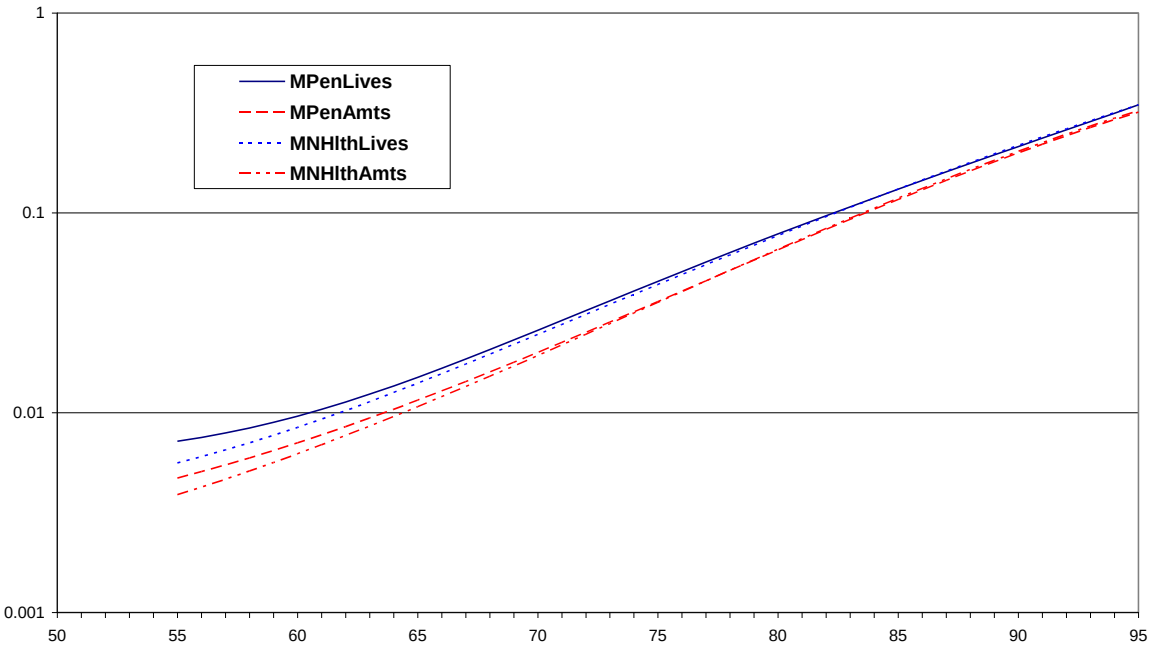
Comparisons of graduated rates

The following graphs give comparisons of graduated rates where it is questionable as to whether separate tables will be of practical use. Feedback on the tentative conclusions arrived at by the Committee is requested (see Question 3.) These comparisons are shown before the adjustments set out on page 14 have been made.

Note that the apparent separation between curves at younger ages may be the effect of using a log scale rather than being separations in relative terms compared to those at older ages.

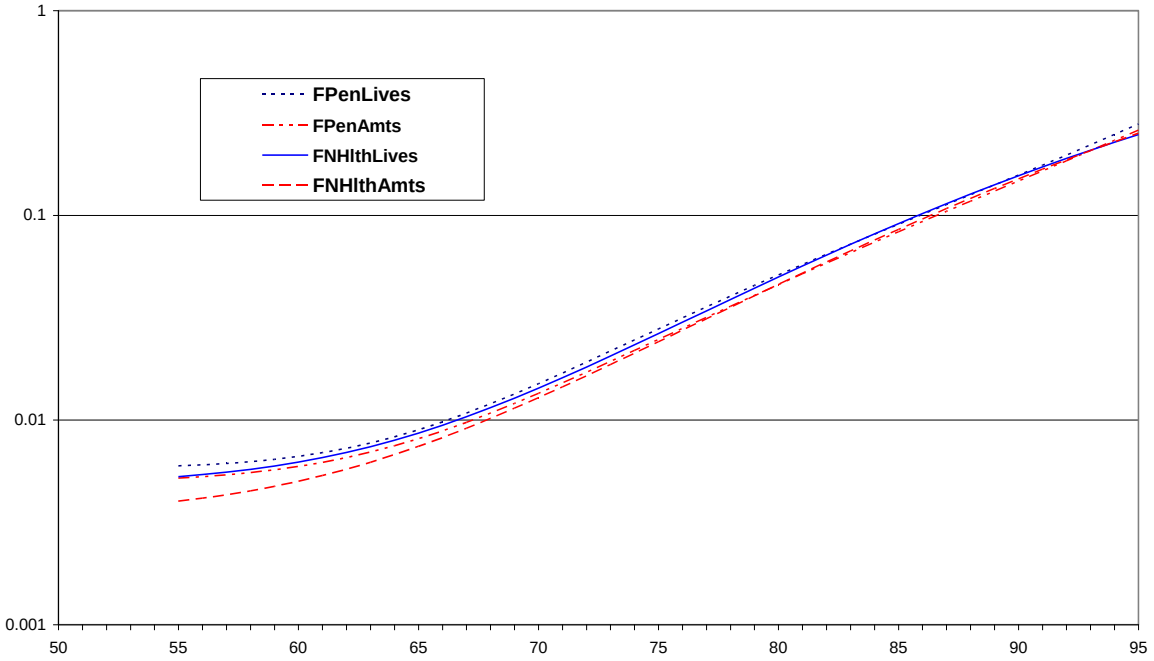
The relative effects of different graduations can be seen in terms of expectations of life and annuity values in Appendix B.

Figure 21: Male All Pensioners/Normal Health Amounts & Lives Graduated mux



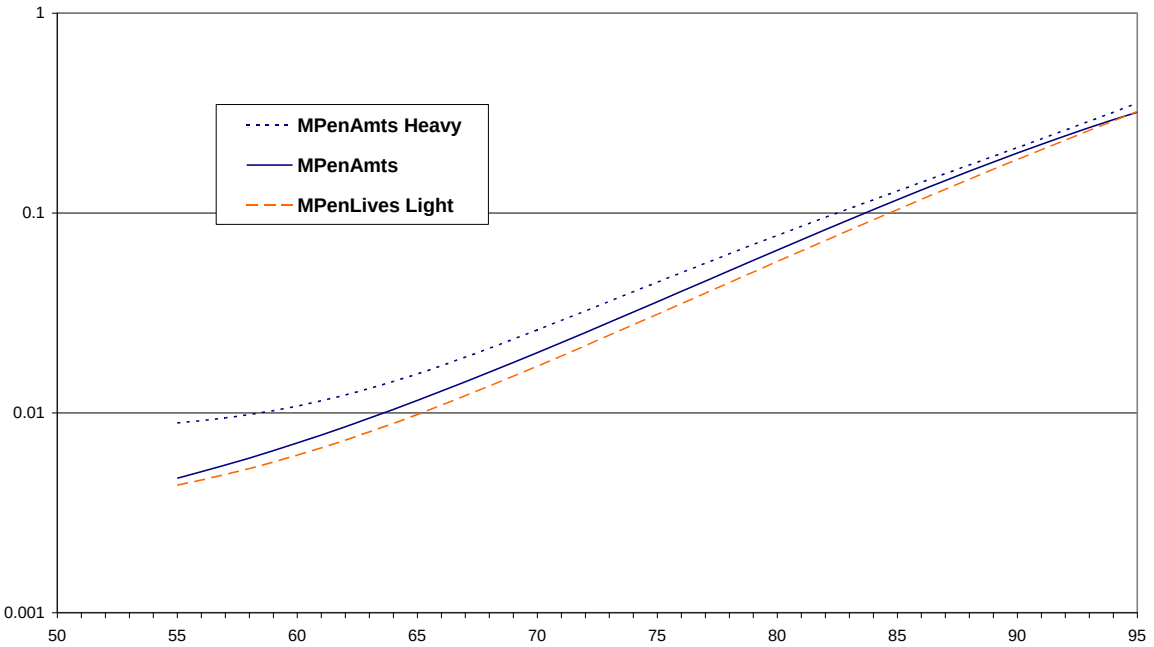
The Committee is of the view that only one Lives table may be necessary and it has retained the "all excluding dependants Pensioners" graduation for this purpose, whilst retaining the amounts tables for both "all excluding dependants Pensioners" and "Normal Health Pensioners" for the purposes of consultation.

Figure 22: Female All Pensioners/Normal Health Amounts & Lives Graduated mux



The Committee's conclusion is the same as for males shown above.

Figure 23: Male Pensioners Amounts Heavy-All-Light Graduated mux



The Committee's conclusion is to retain all three as there are distinct differences.

Figure 24: Female Pensioners Amounts Heavy-All-Light Graduated mux

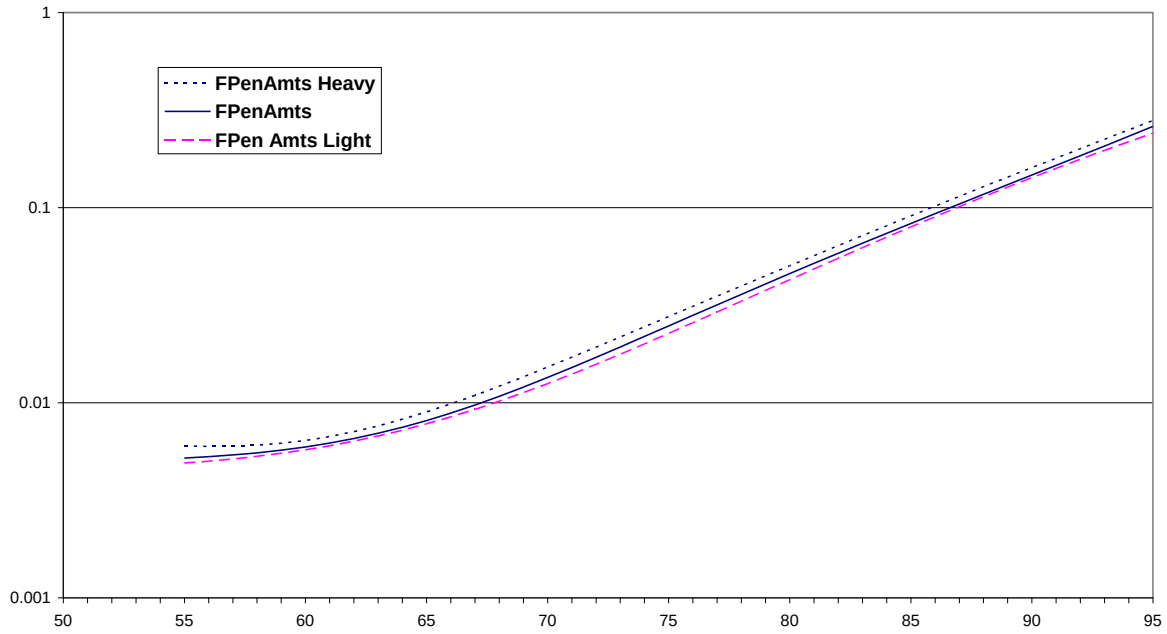
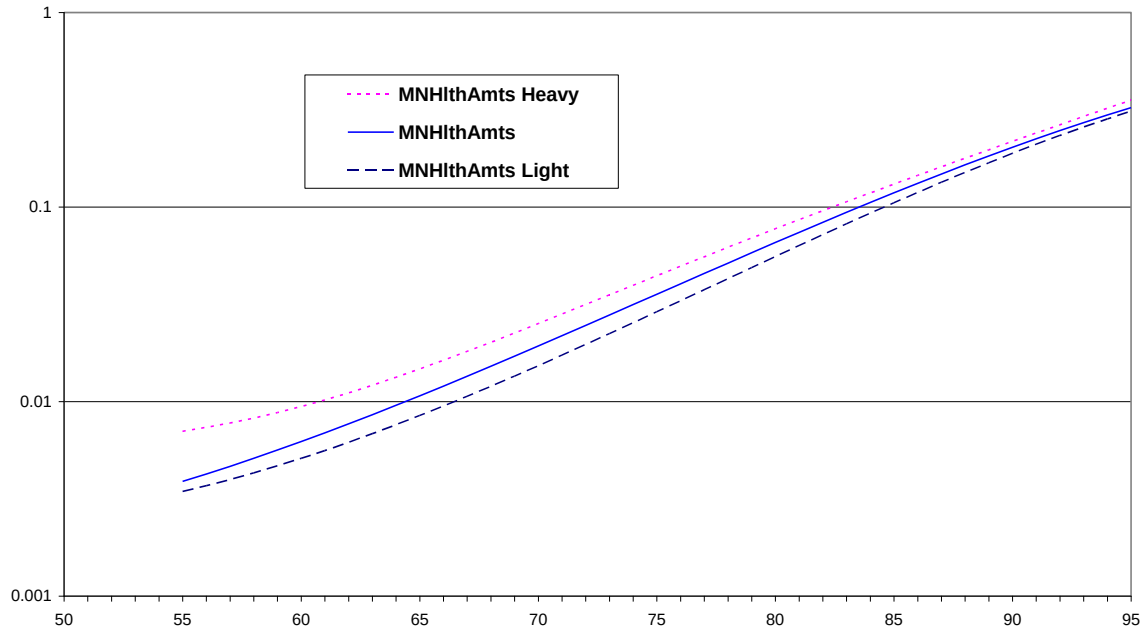


Figure 25: Male Normal Health Amounts Heavy-All-Light Graduated mux



"All", "Light" and "Heavy" graduations appear to show distinct differences, and so the Committee's conclusion is to retain all three.

Figure 26: Female Normal Health Amounts Heavy-All-Light Graduated mux

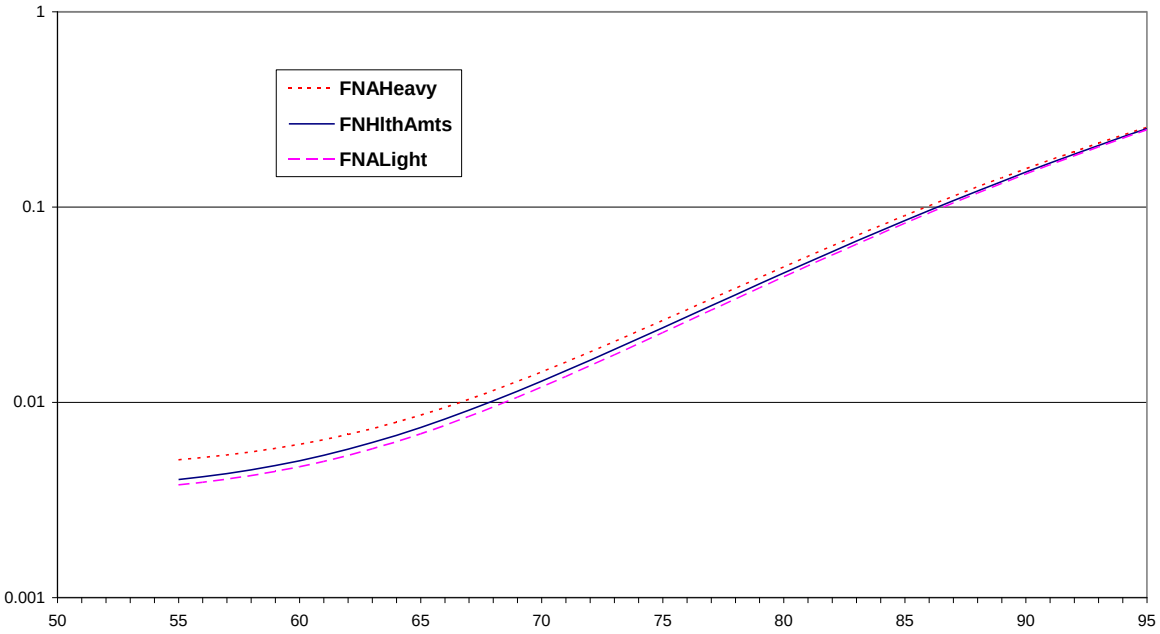
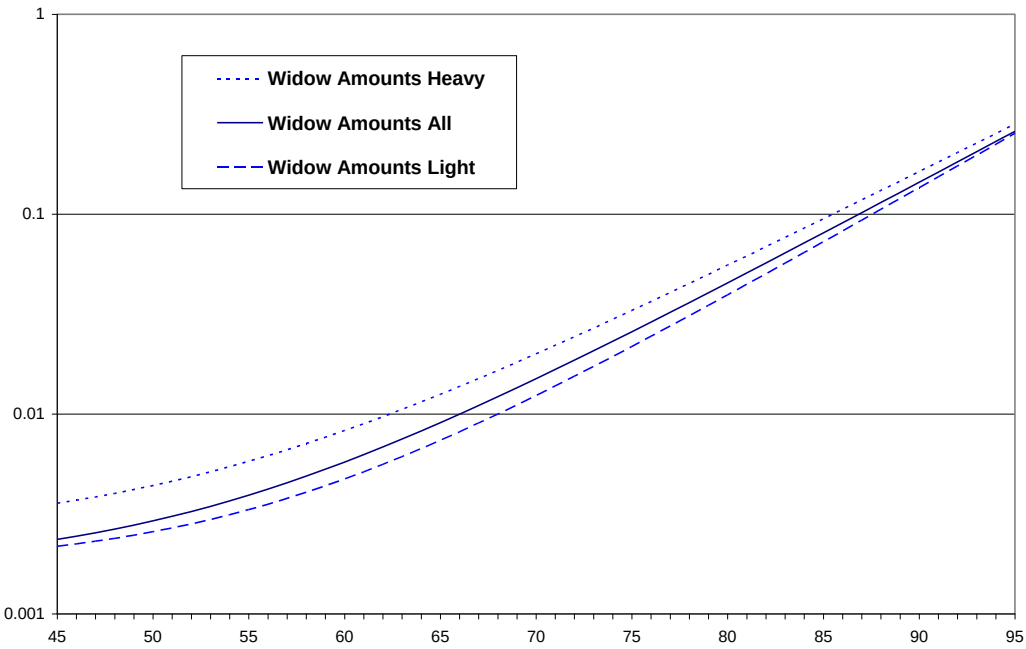
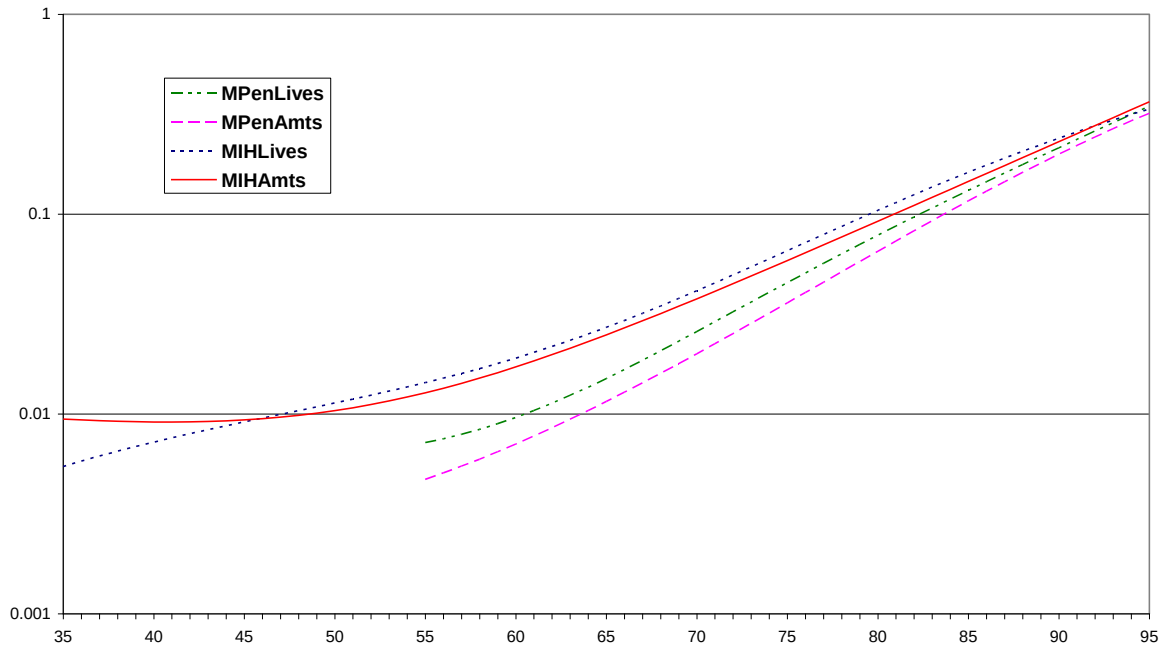


Figure 27: Widow Amounts Heavy-All-Light Graduated mux



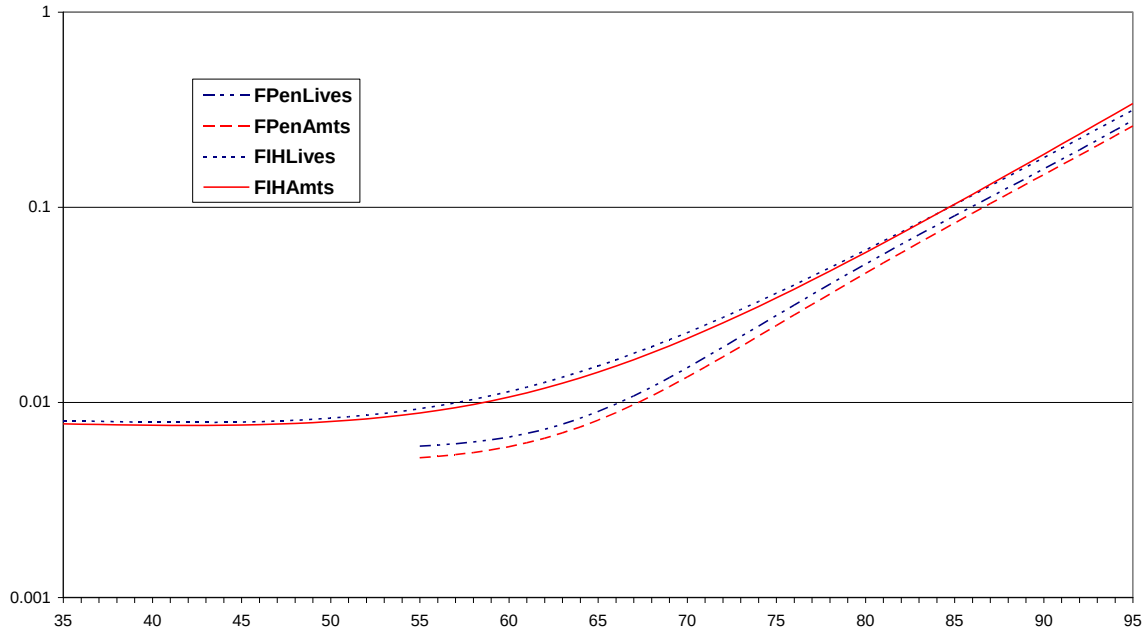
The Committee's conclusion is that Widows Light and Heavy are much more distinct than for female pensioners (both all excluding dependants and Normal Health only) - so retain on an amounts basis. This may also be thought desirable if the Widow tables are to be used alongside differentiated male pensioner tables.

Figure 28: Male Pensioner and Ill-Health Lives/Amounts Graduated mux



Ill-health are distinct from all (excluding dependants) pensioners - so retain - but the Committee questions the need for both Lives and Amounts ill-health, so retain only amounts.

Figure 29: Female Pensioner and Ill-H Lives/Amounts Graduated mux

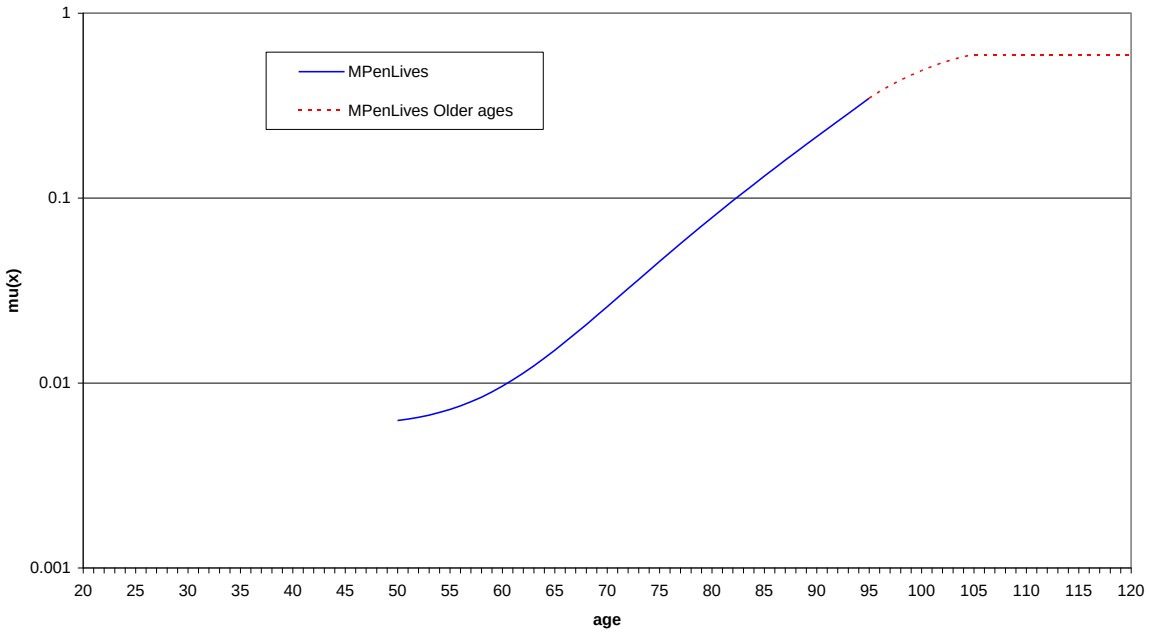


Ill-health are distinct from all (excluding dependants) pensioners so retain ill-health. Ill-health Lives and Amounts graduations are too similar to each other, so drop ill-health lives graduation.

Blended rates for μ_x

Blending the main graduations of μ_x with the older age extensions and younger age extensions gives the following curves. These are shown after the adjustments shown on page 14 have been made.

Figure 30: Male All Pensioners Lives



The Committee is minded to publish the graduations in Figures 30 to 35 from ages 50 to 120, as the rates between 50 and 60 are heavily influenced by ill-health retirees and so a smooth blend into rates at younger ages would not produce a table that would be useful.

Figure 31: Male Pensioners Amounts - Discontinuity at some age between 50 and 55

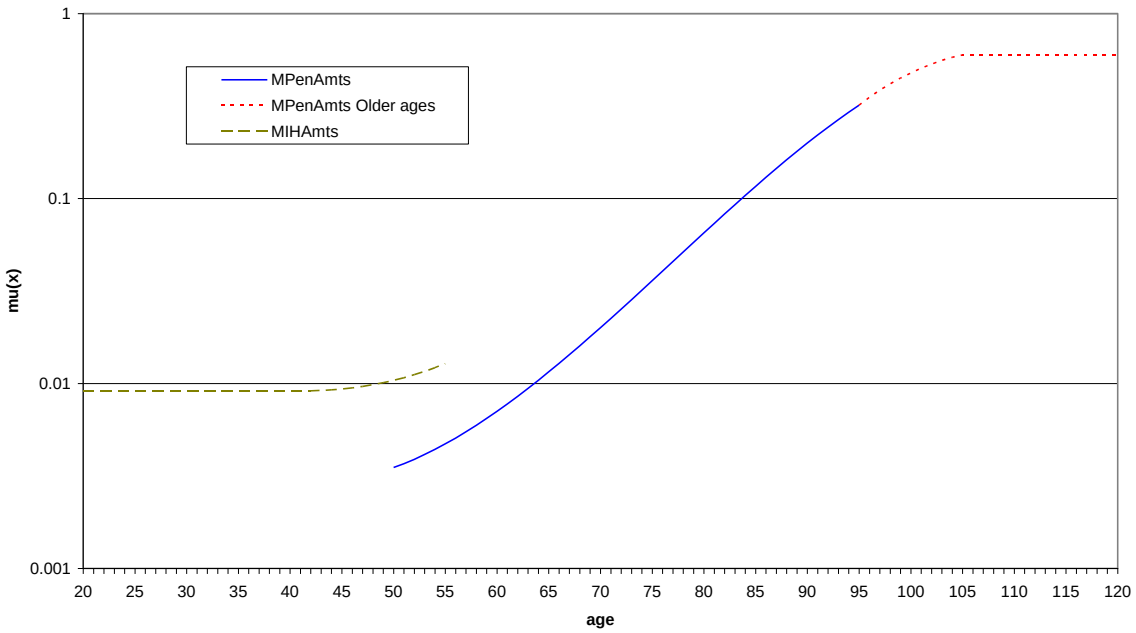


Figure 32: Male Pensioner Amounts Heavy-All-Light

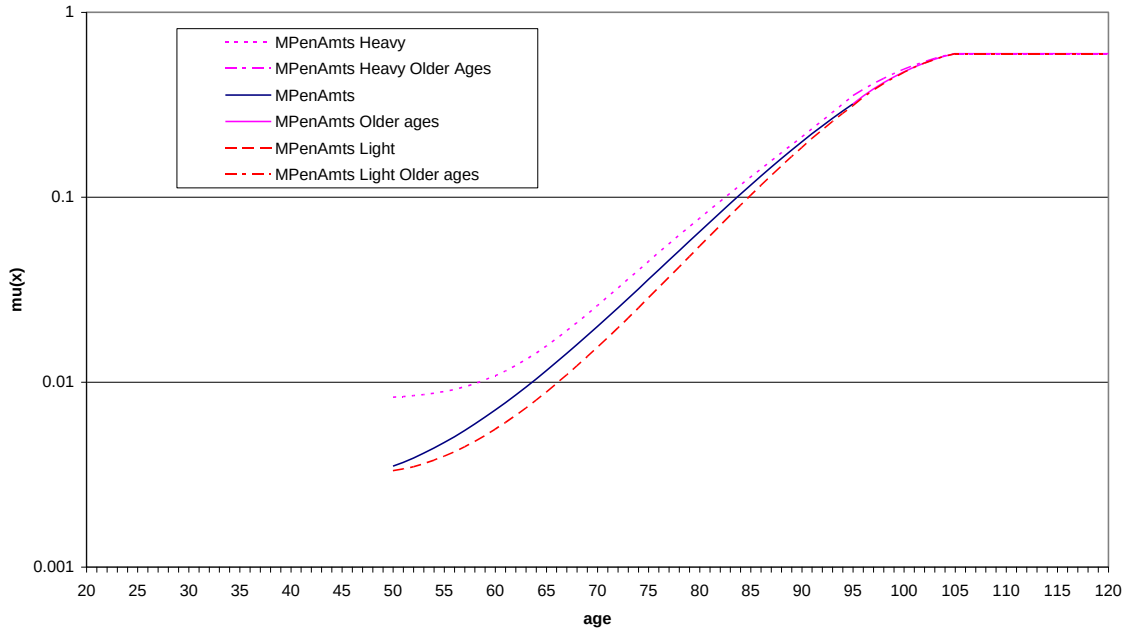


Figure 33: Female All Pensioners Lives

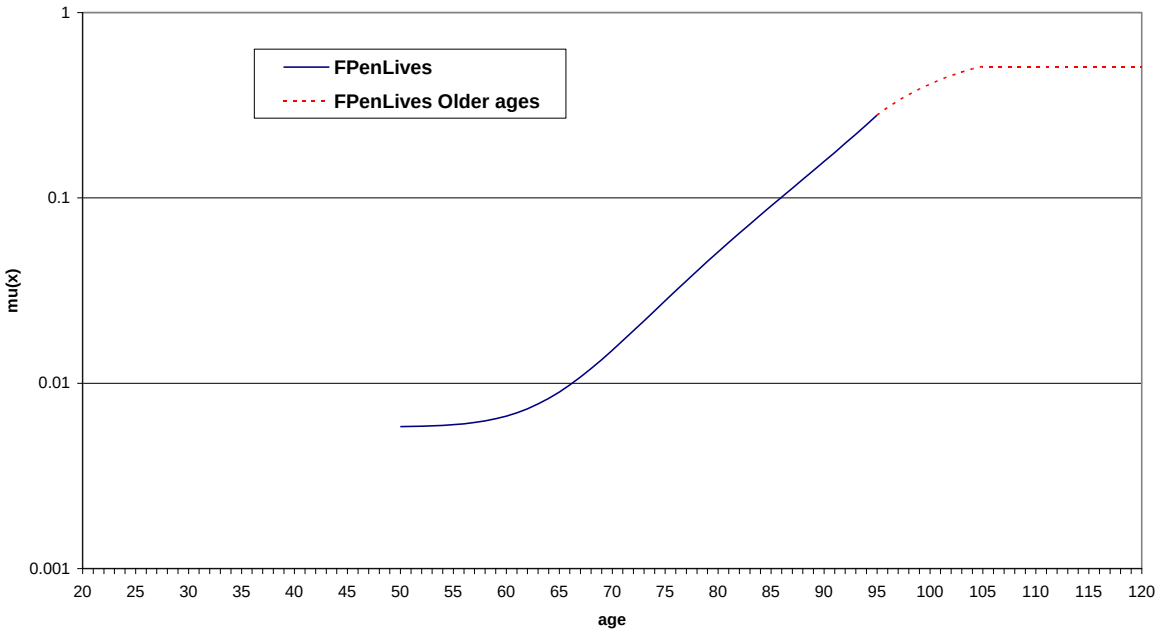


Figure 34: Female All Pensioners Amounts - Discontinuity between ages 50 and 55

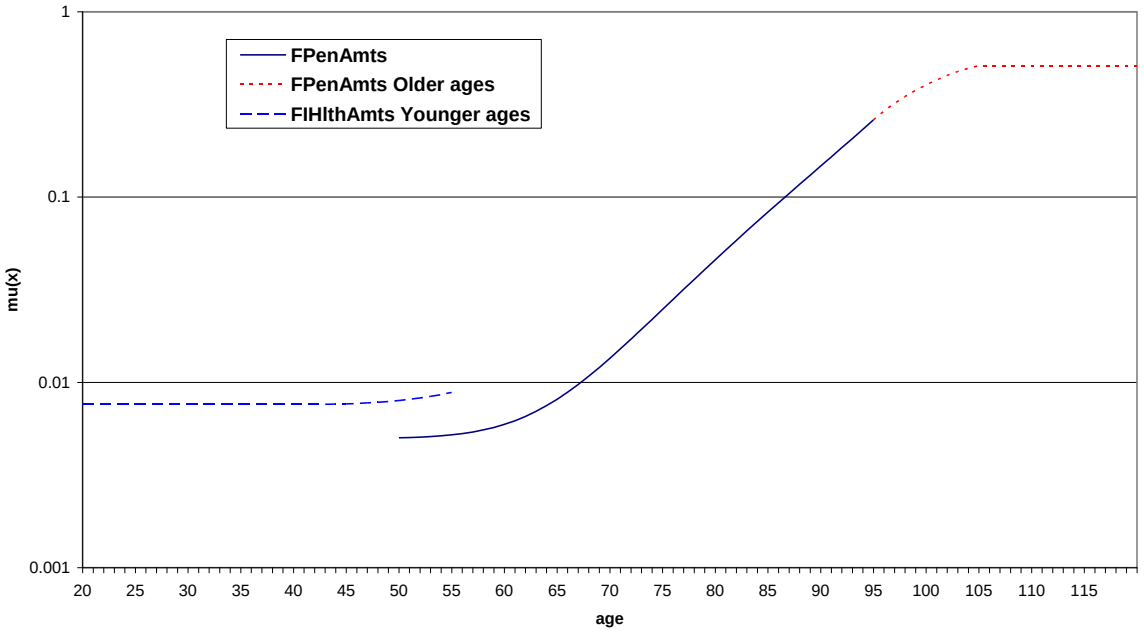


Fig 35: Female Pensioners Amounts Heavy-All-Light

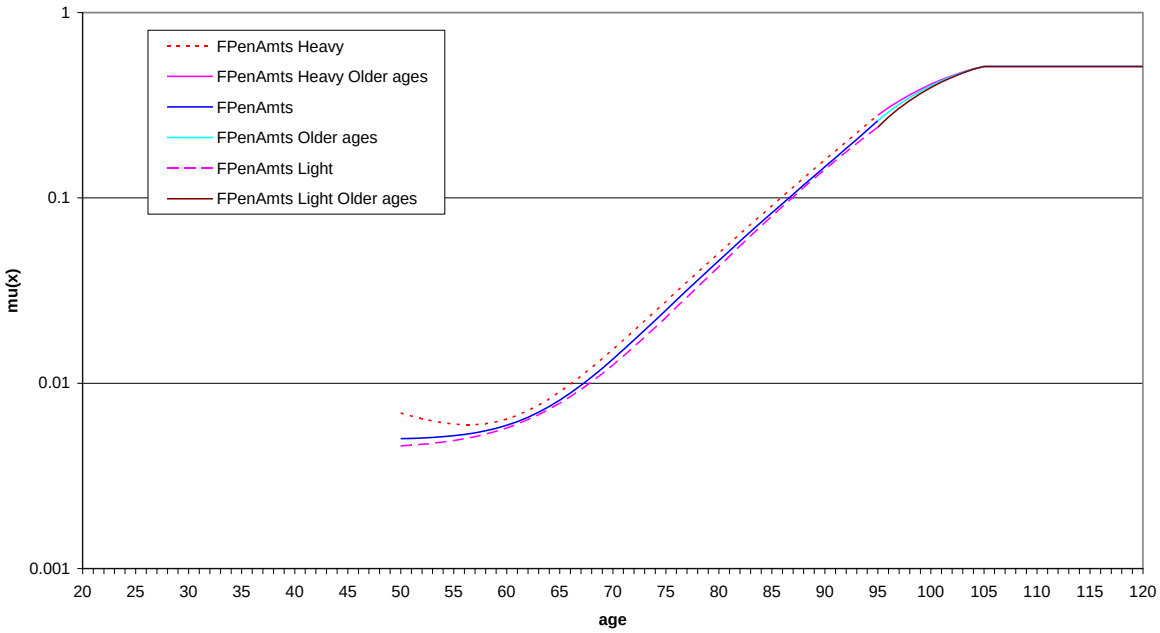


Figure 36: Male Normal Health Amounts Heavy-All-Light

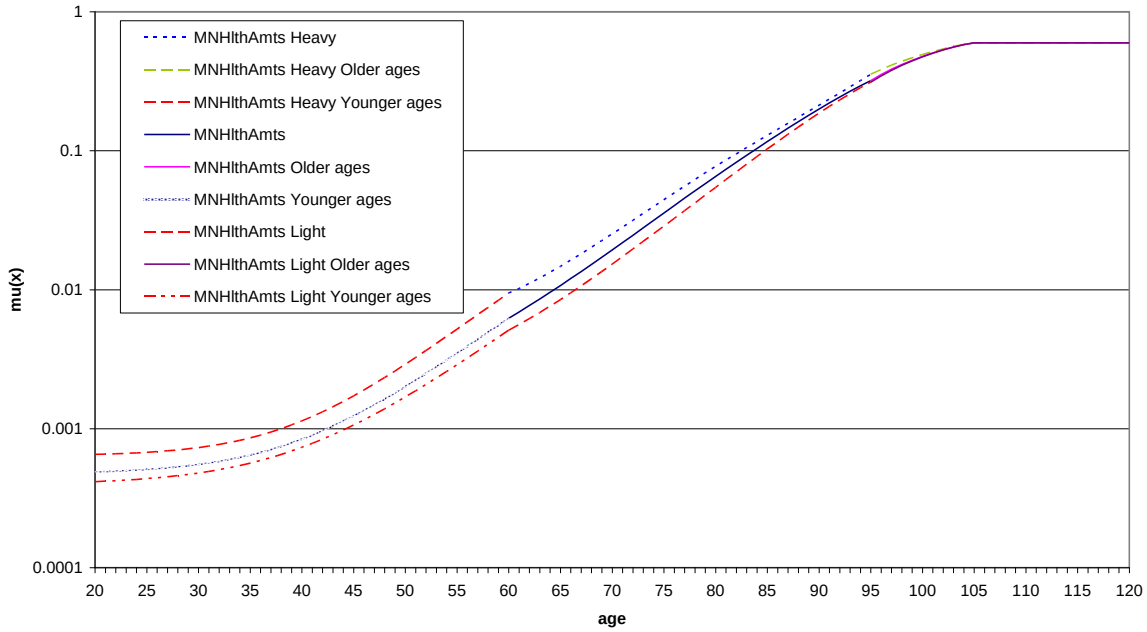


Figure 37: Male Ill-health Amounts

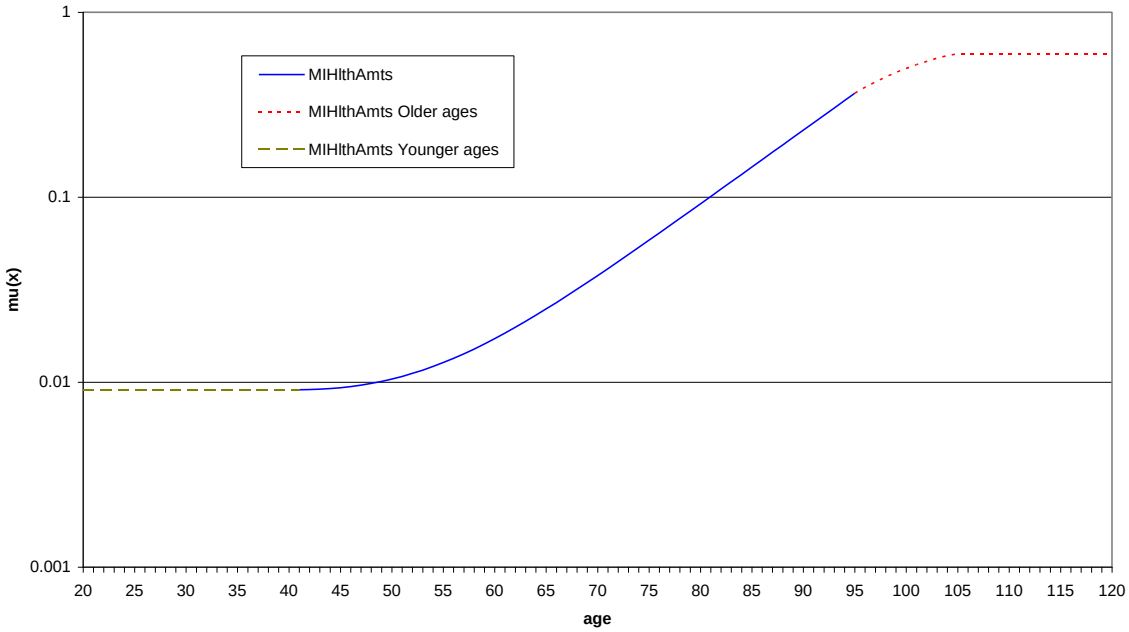
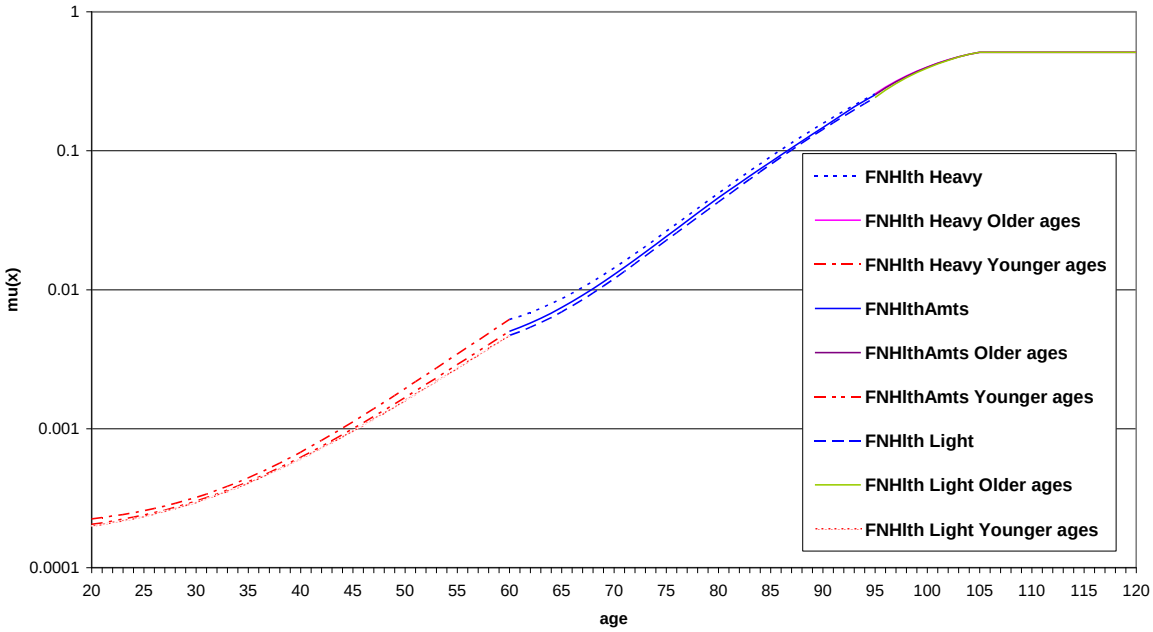


Fig 38: Female Normal Health Amounts



There is very little difference between the "All", "Light" and "Heavy" graduations.

Fig 39: Female Ill-health Amounts

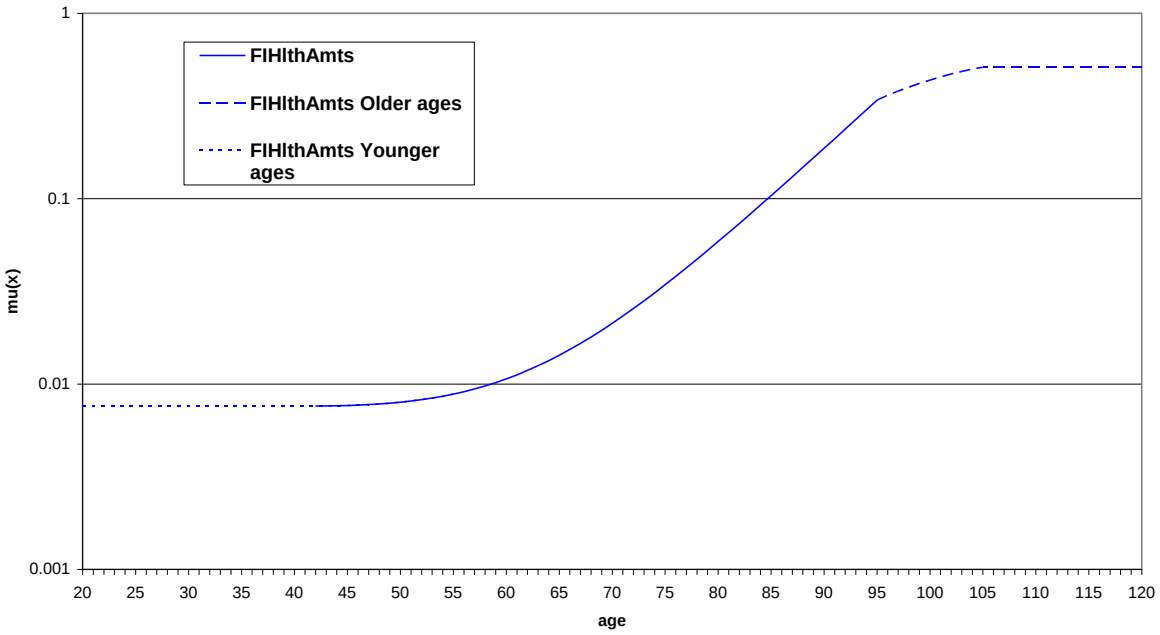


Figure 40: Widow Lives

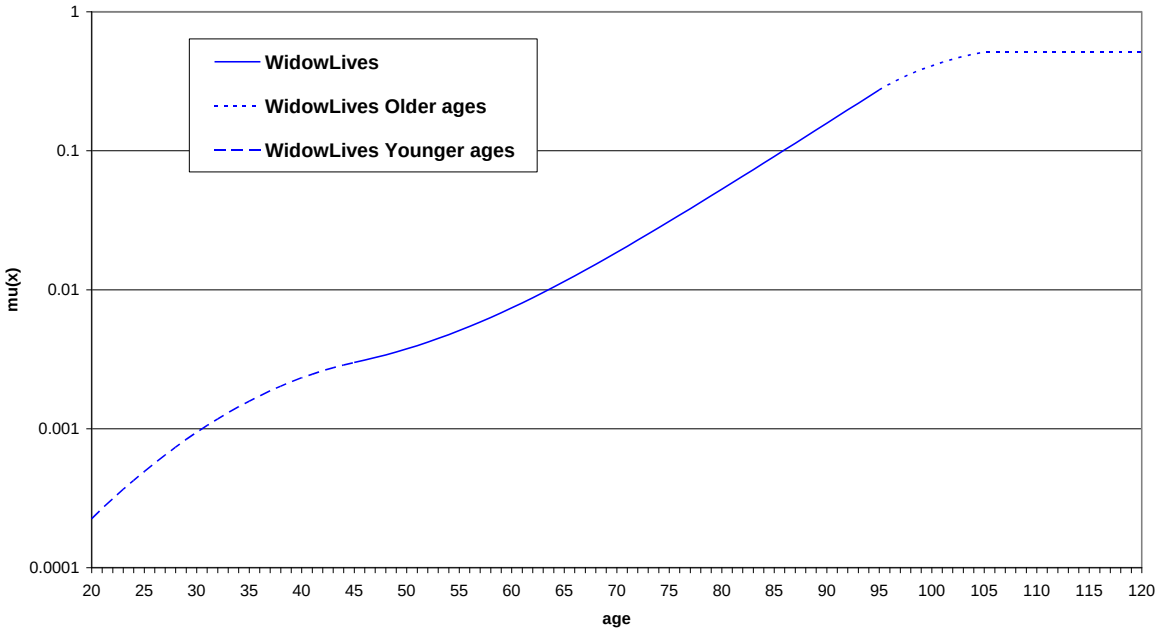
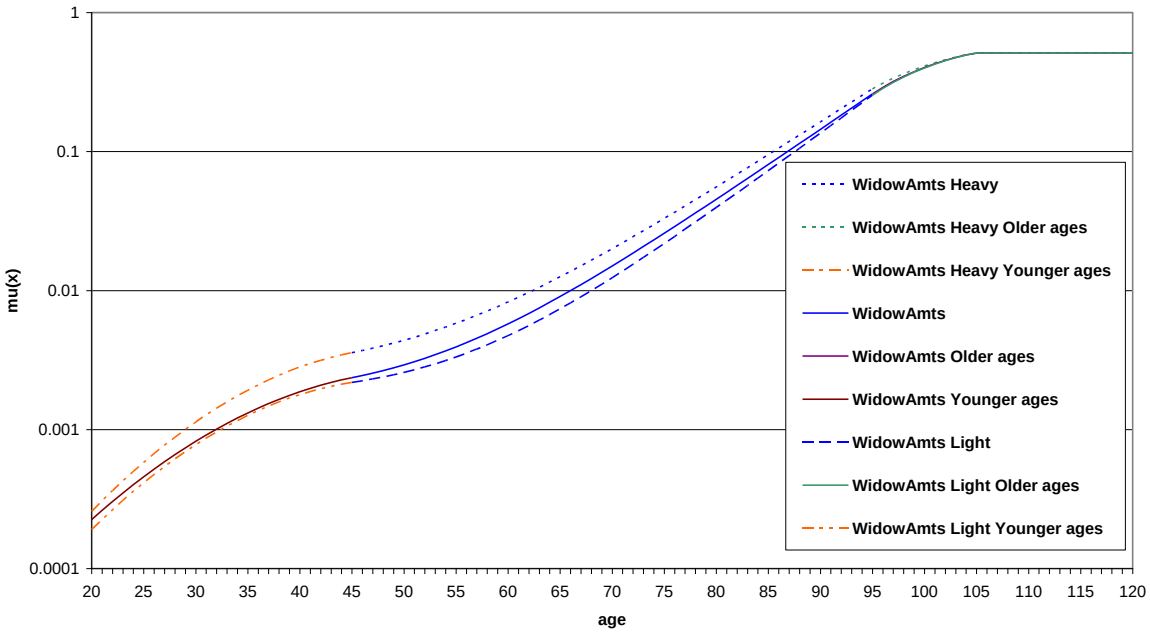


Figure 41: Widow Amounts Heavy-All-Light



Comparisons with "00" Series tables

The following graphs show the ratios of the graduated q_x to "00" Series tables with projection from 2000 to 2003 using Medium Cohort projection factors. The fact that this projection basis has been used for comparative purposes in no way implies that it is recommended for use in any particular situation.

Figure 42: Ratio of Male Pensioners Lives qx to PCML00(C=2003)mc

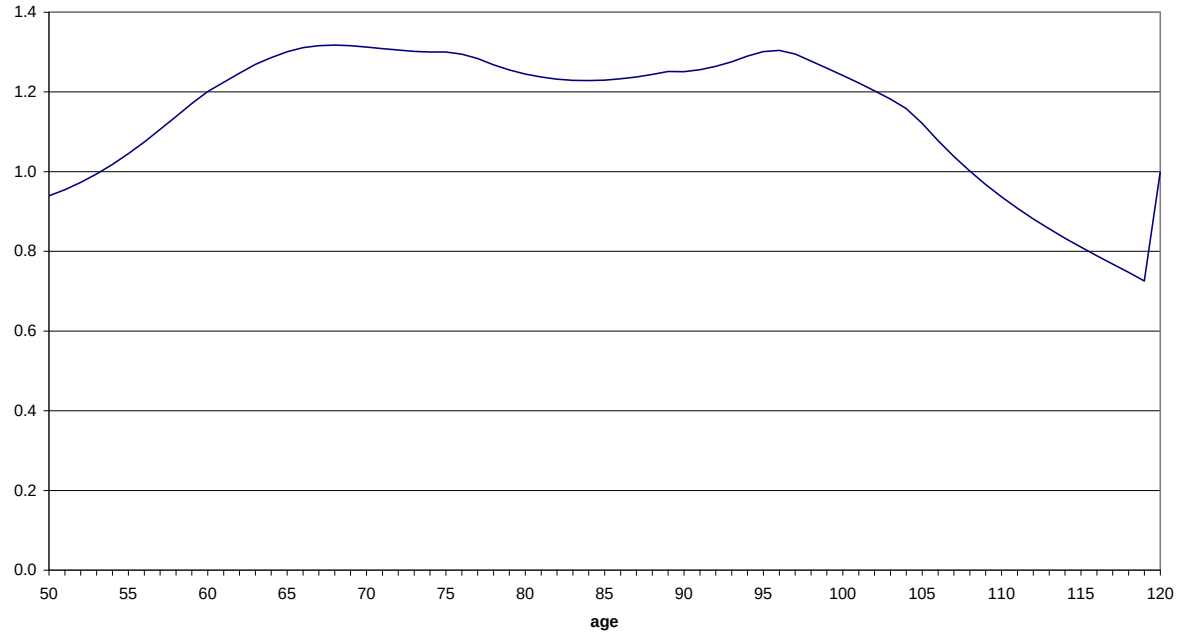


Figure 43: Ratio of Male Pensioners Amounts Heavy-All-Light qx to PCMA00(C=2003)mc qx

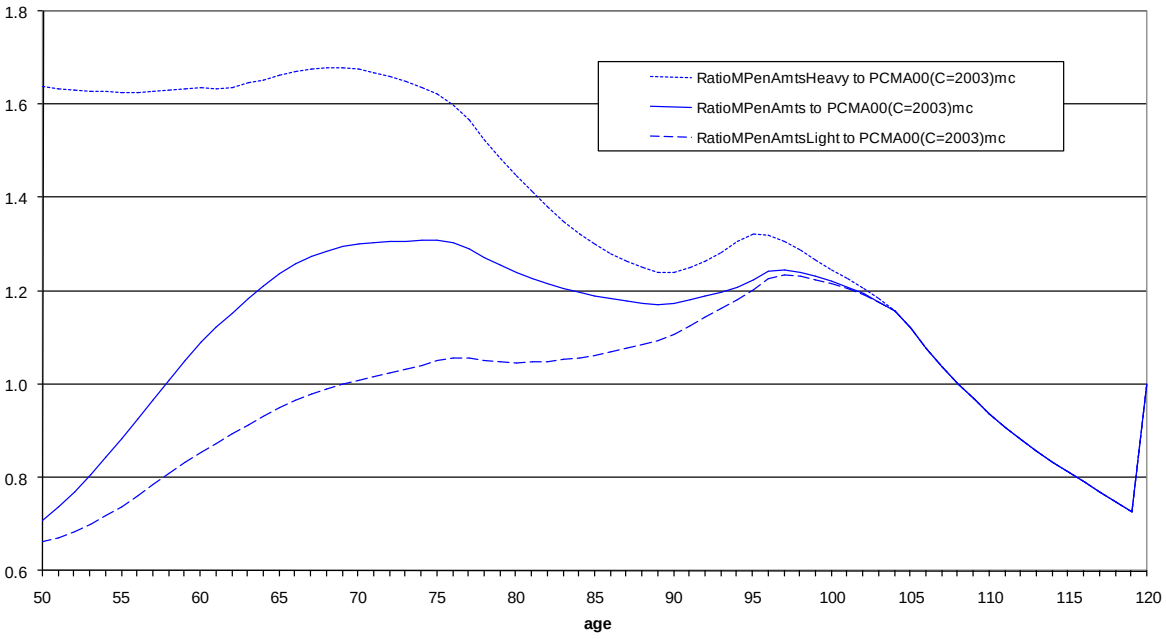


Figure 44: Ratio of Male Normal Health Amounts Heavy/All/Light qx to PNMA00(C=2003)mc qx

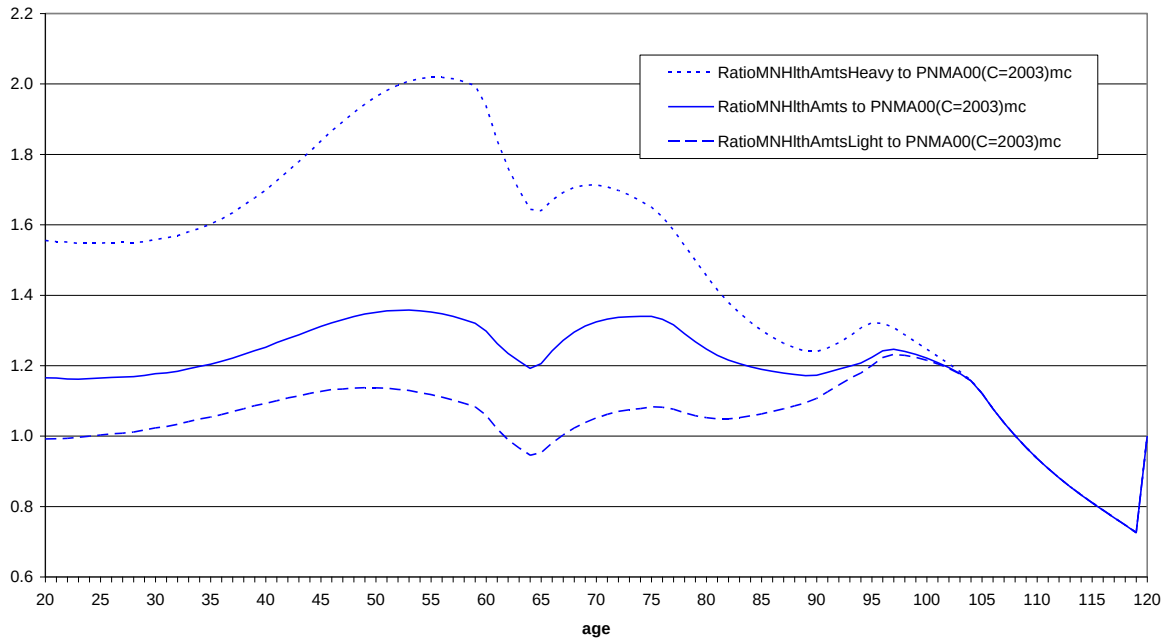


Figure 45: Ratio of Male Ill-health Amounts qx to PEMA00(C=2003)mc qx

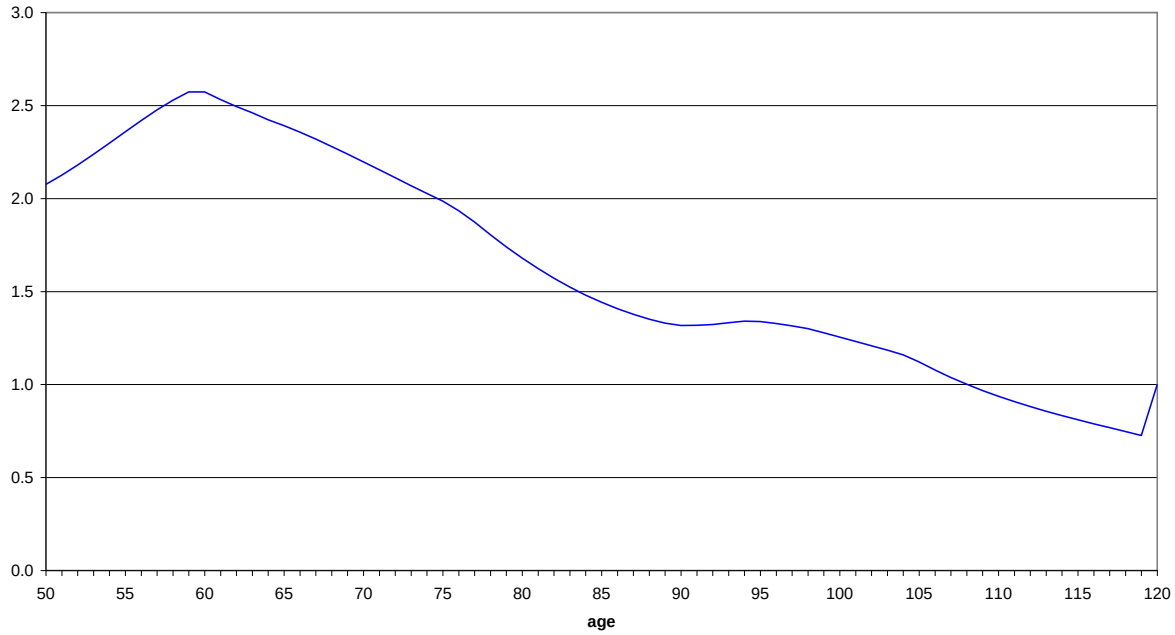


Figure 46: Ratio of Female Pensioners Lives qx to PCFL00(C=2003)mc qx

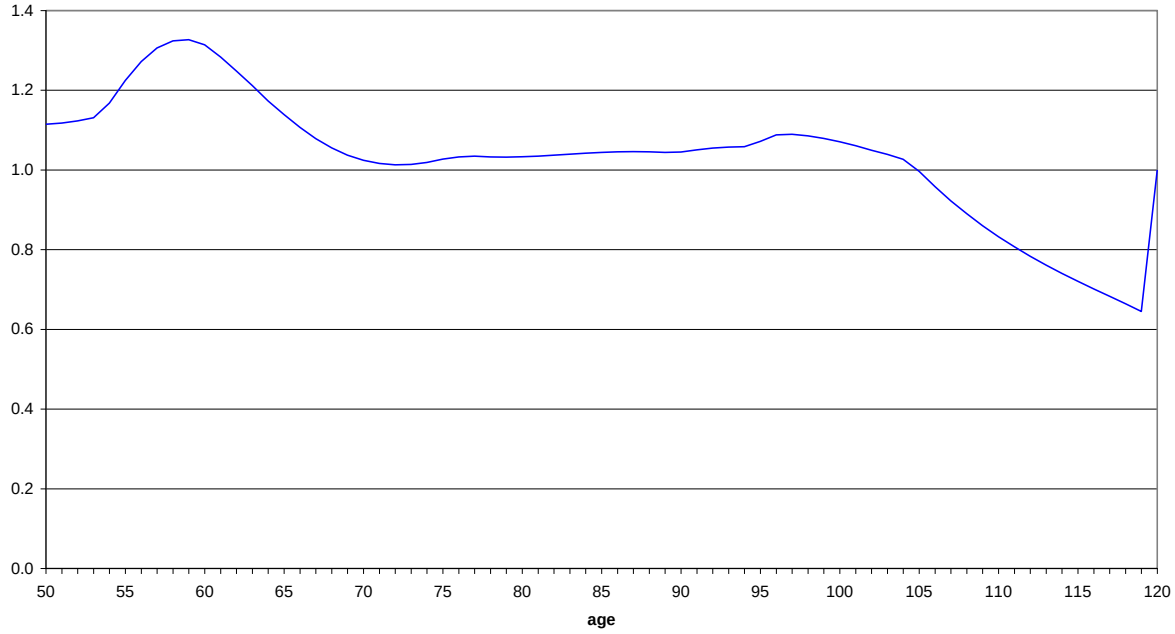


Figure 47: Ratio of Female Pensioners Amounts Heavy-All-Light qx to PCFA00(C=2003)mc qx

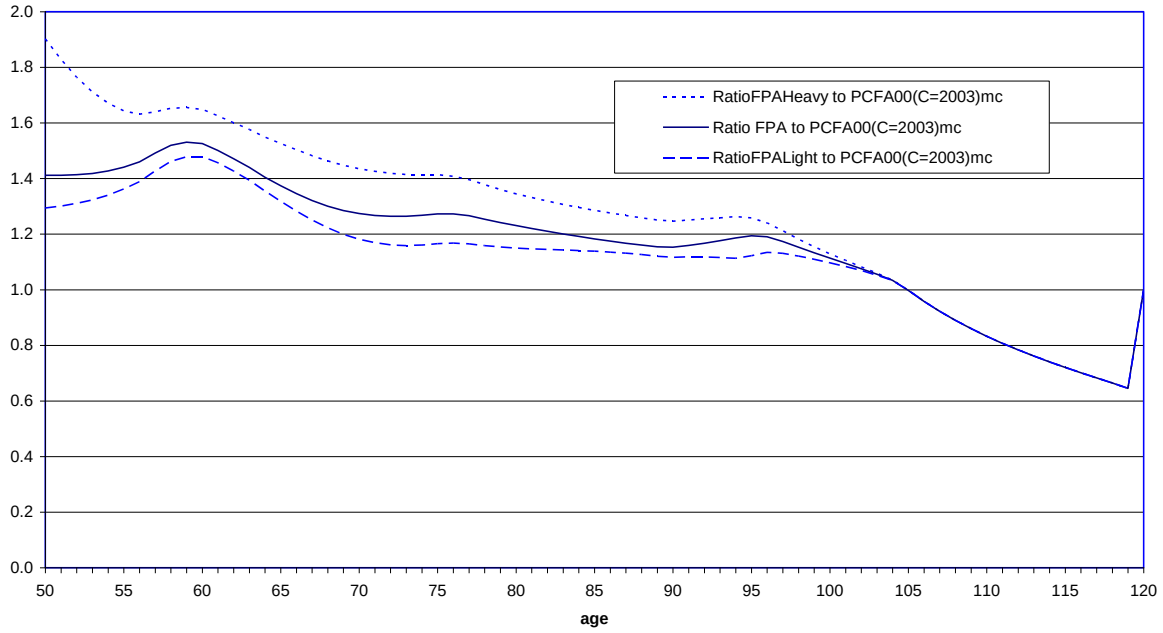


Figure 48: Ratio of Female Normal Health Amounts Heavy-All-Light qx to PNFA00(C=2003)mc qx

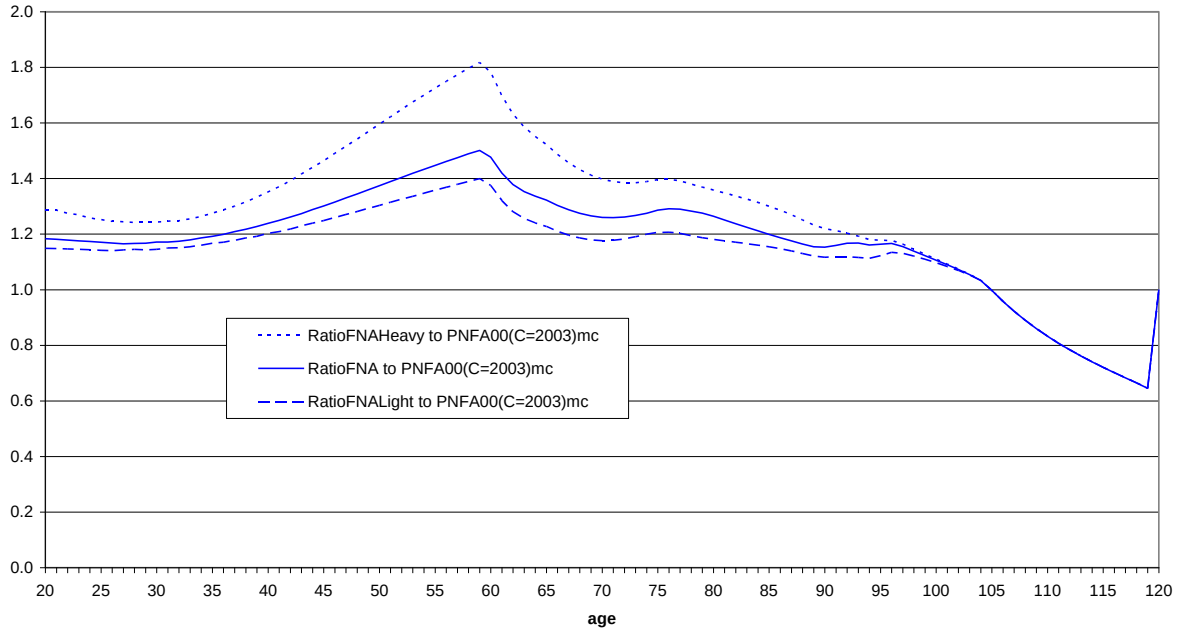


Figure 49: Ratio of Female Ill-health Amounts qx to PEFA00(C=2003)mc qx

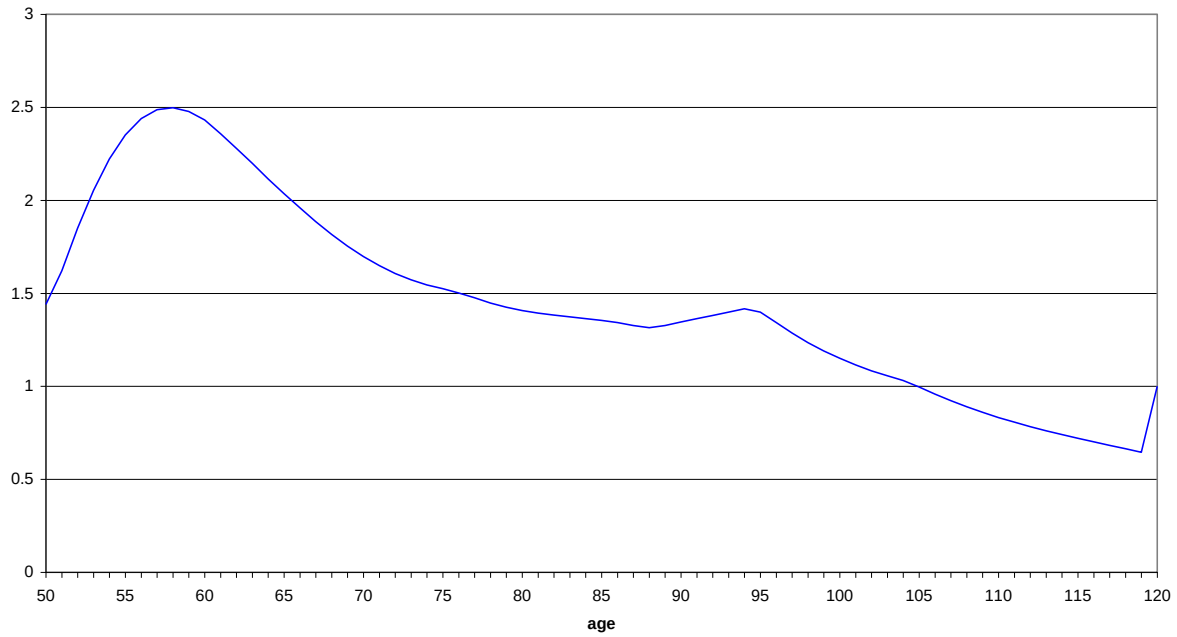


Figure 50: Ratio Widow Lives qx to WL00(C=2003)mc qx

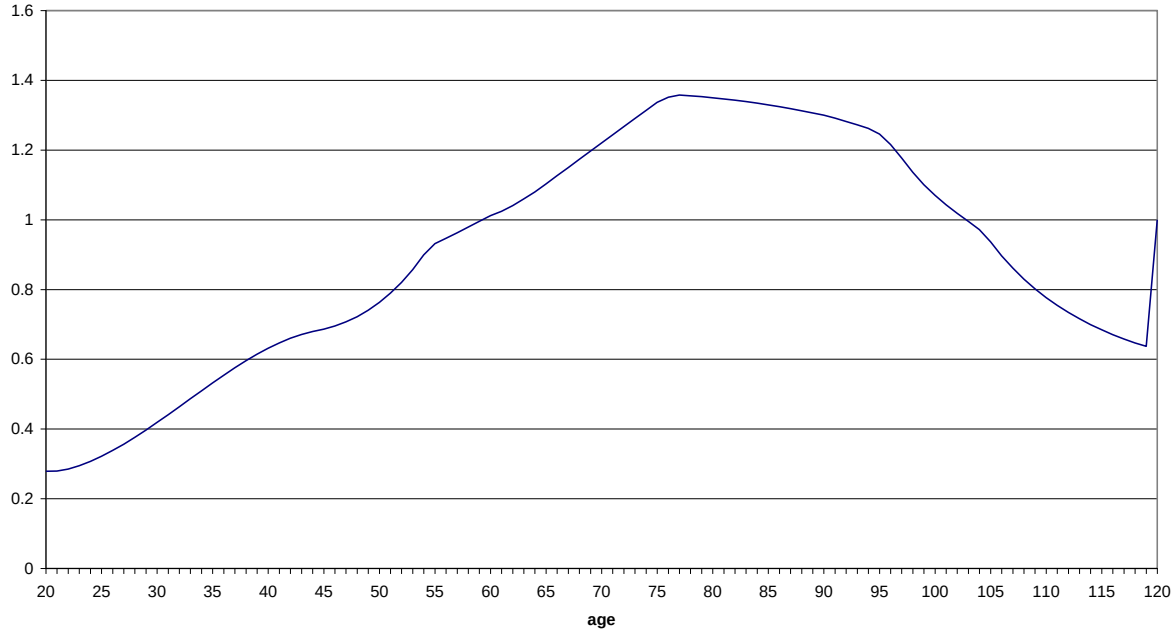
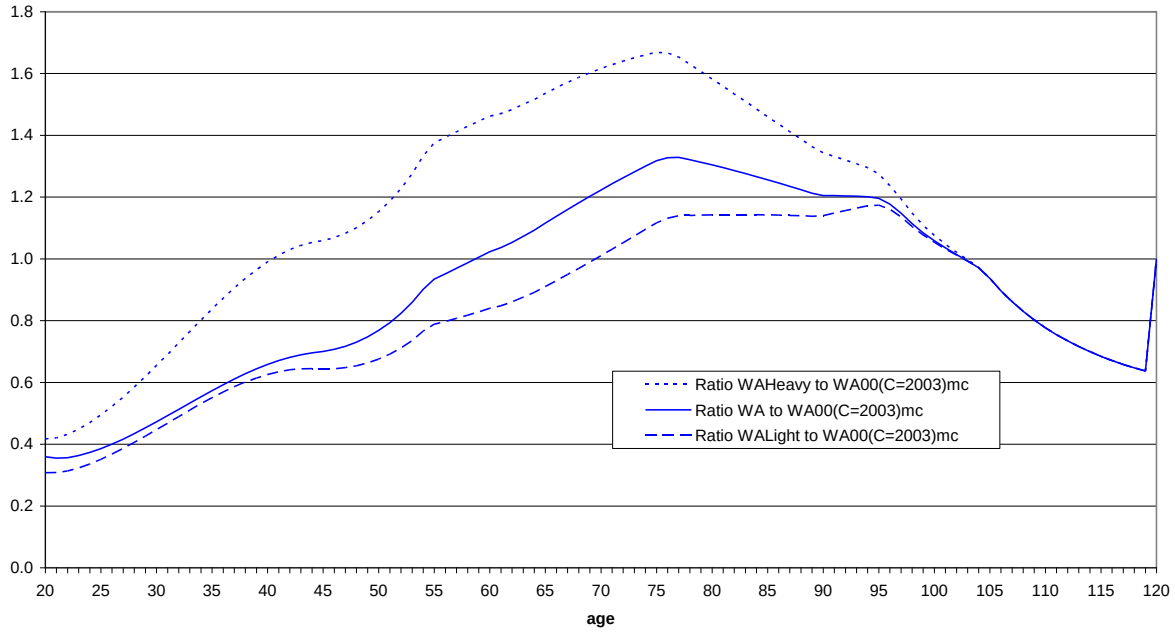


Figure 51: Ratio of Widows Heavy-All-Light qx to WA00(C=2003)mc qx



Naming convention

The data under analysis is for calendar years 2000 to 2006, with most from 2002 to 2004. For both males and females the "weighted average" date to which the data relates is the year starting March 2003.

It is therefore proposed that the tables will be known by the year 2003 and to differentiate the tables from those derived from life office data will be prefaced with the letter "S".

Thus the "All pensioners" amounts table for males would be called the SPMA03 tables, and so forth, as set out below. **Feedback on the suggested table names is requested (Q9).**

Data Type	Sex	Amounts/Lives	Light/Heavy	Table Name
All pensioners (excluding widows)	Female	Lives	-	SPFL03
All pensioners (excluding widows)	Female	Amounts	-	SPFA03
All pensioners (excluding widows)	Female	Amounts	Light	SPFA03Light
All pensioners (excluding widows)	Female	Amounts	Heavy	SPFA03Heavy
All pensioners (excluding widowers)	Male	Lives	-	SPML03
All pensioners (excluding widowers)	Male	Amounts	-	SPMA03
All pensioners (excluding widowers)	Male	Amounts	Light	SPMA03Light
All pensioners (excluding widowers)	Male	Amounts	Heavy	SPMA03Heavy
Widows	Female	Lives	-	SWL03
Widows	Female	Amounts	-	SWA03
Widows	Female	Amounts	Light	SWA03Light
Widows	Female	Amounts	Heavy	SWA03Heavy
Normal Health Pensioners	Female	Amounts	-	SNFA03
Normal Health Pensioners	Female	Amounts	Light	SNFA03Light
Normal Health Pensioners	Female	Amounts	Heavy	SNFA03Heavy
Normal Health Pensioners	Male	Amounts	-	SNMA03
Normal Health Pensioners	Male	Amounts	Light	SNMA03Light

Normal Health Pensioners	Male	Amounts	Heavy	SNMA03Heavy
Ill-health Pensioners	Female	Amounts	-	SIFA03
Ill-health Pensioners	Male	Amounts	-	SIMA03

References

Forfar, D O, McCutcheon, J J and Wilkie, A D (1988) On Graduation by Mathematical Formula. *J.I.A.* **115**, 1-149 and *T.F.A.* **41**, 97-269 and discussion thereon *J.I.A.* **115**, 693-708.

C.M.I. (2004) Working Paper 8: Considerations for the Graduation of the CMI 1999-2002 Mortality Experience.

C.M.I. (2005) Working Paper 12: The Graduation of the CMI 1999-2002 Mortality Experience: Feedback on Working Paper 8 and Proposed Assured Lives Graduations.

C.M.I. (2005) Working Paper 16: The Graduation of the CMI 1999-2002 Mortality Experience: Proposed Annuitant and Pensioner Graduations

C.M.I. (2005) Working Paper 21: The Graduation of the CMI 1992-2002 Mortality Experience: Final "00" Series Mortality Tables – Assured Lives.

C.M.I. (2005) Working Paper 22: The Graduation of the CMI 1992-2002 Mortality Experience: Final "00" Series Mortality Tables – Annuitants and Pensioners.

C.M.I. (2007) Working Paper 26: Extensions to Younger Ages of the "00" Series Pensioner Tables of Mortality

C.M.I (2008) Working Paper 31: Report on the preliminary results of an analysis into the mortality experience of pensioners of self-administered pension schemes for the period 2000 to 2006 based on data collected by 30 June 2007

ONS (2007) Mid-2002 to Mid-2006 Estimates of the very elderly (including centenarians) (experimental) with web-link to data at http://www.statistics.gov.uk/StatBase/Product.asp?vlnk=15003

Appendix A: Tables of proposed mortality rates

Table A1: Pensioners, females, all, lives – SPFL03 – values of q_x and μ_x

Age x	q_x	μ_x	Age x	q_x	μ_x
50	0.005822	0.005833	85	0.091075	0.090295
51	0.005836	0.005845	86	0.101163	0.100875
52	0.005857	0.005862	87	0.112267	0.112643
53	0.005886	0.005887	88	0.124508	0.125768
54	0.005928	0.005922	89	0.138024	0.140449
55	0.005986	0.005972	90	0.152979	0.156930
56	0.006066	0.006040	91	0.169558	0.175505
57	0.006174	0.006133	92	0.187978	0.196532
58	0.006317	0.006258	93	0.208482	0.220446
59	0.006506	0.006424	94	0.231347	0.247781
60	0.006751	0.006640	95	0.253974	0.279191
61	0.007064	0.006919	96	0.274001	0.306701
62	0.007460	0.007273	97	0.293042	0.333606
63	0.007955	0.007719	98	0.311100	0.359845
64	0.008566	0.008274	99	0.328168	0.385343
65	0.009313	0.008955	100	0.344221	0.410001
66	0.010215	0.009784	101	0.359210	0.433687
67	0.011295	0.010782	102	0.373038	0.456206
68	0.012576	0.011972	103	0.385499	0.477249
69	0.014080	0.013378	104	0.395998	0.496211
70	0.015833	0.015025	105	0.400000	0.510826
71	0.017858	0.016940	106	0.400000	0.510826
72	0.020181	0.019150	107	0.400000	0.510826
73	0.022828	0.021681	108	0.400000	0.510826
74	0.025824	0.024564	109	0.400000	0.510826
75	0.029196	0.027828	110	0.400000	0.510826
76	0.032972	0.031505	111	0.400000	0.510826
77	0.037182	0.035629	112	0.400000	0.510826
78	0.041856	0.040236	113	0.400000	0.510826
79	0.047029	0.045369	114	0.400000	0.510826
80	0.052739	0.051072	115	0.400000	0.510826
81	0.059029	0.057398	116	0.400000	0.510826
82	0.065946	0.064407	117	0.400000	0.510826
83	0.073548	0.072168	118	0.400000	0.510826
84	0.081899	0.080765	119	0.400000	0.510826
			120	1.000000	0.510826

Table A2: Pensioners, females, all, amounts – SPFA03 – values of q_x and μ_x

Age x	q_x	μ_x	Age x	q_x	μ_x
50	0.005014	0.005017	85	0.084121	0.082890
51	0.005036	0.005036	86	0.093885	0.093036
52	0.005066	0.005062	87	0.104653	0.104348
53	0.005106	0.005097	88	0.116523	0.116971
54	0.005160	0.005144	89	0.129609	0.131072
55	0.005232	0.005206	90	0.144033	0.146850
56	0.005325	0.005288	91	0.159935	0.164536
57	0.005446	0.005395	92	0.177467	0.184404
58	0.005600	0.005532	93	0.196799	0.206777
59	0.005797	0.005707	94	0.218114	0.232041
60	0.006043	0.005928	95	0.240855	0.260654
61	0.006349	0.006204	96	0.262841	0.290366
62	0.006727	0.006547	97	0.283700	0.319424
63	0.007190	0.006968	98	0.303441	0.347763
64	0.007751	0.007481	99	0.322061	0.375301
65	0.008427	0.008101	100	0.339539	0.401932
66	0.009234	0.008846	101	0.355829	0.427513
67	0.010192	0.009733	102	0.370828	0.451835
68	0.011319	0.010783	103	0.384324	0.474562
69	0.012639	0.012017	104	0.395676	0.495041
70	0.014174	0.013459	105	0.400000	0.510826
71	0.015948	0.015133	106	0.400000	0.510826
72	0.017988	0.017066	107	0.400000	0.510826
73	0.020321	0.019288	108	0.400000	0.510826
74	0.022976	0.021829	109	0.400000	0.510826
75	0.025985	0.024722	110	0.400000	0.510826
76	0.029379	0.028002	111	0.400000	0.510826
77	0.033194	0.031710	112	0.400000	0.510826
78	0.037468	0.035887	113	0.400000	0.510826
79	0.042241	0.040579	114	0.400000	0.510826
80	0.047556	0.045837	115	0.400000	0.510826
81	0.053462	0.051719	116	0.400000	0.510826
82	0.060010	0.058289	117	0.400000	0.510826
83	0.067259	0.065617	118	0.400000	0.510826
84	0.075272	0.073786	119	0.400000	0.510826
			120	1.000000	0.510826

Table A3: Pensioners, females, all, amounts, light – SPFA03Light – values of q_x and μ_x

Age x	q_x	μ_x	Age x	q_x	μ_x
50	0.004598	0.004590	85	0.080961	0.079443
51	0.004642	0.004629	86	0.090738	0.089589
52	0.004697	0.004679	87	0.101447	0.100847
53	0.004763	0.004739	88	0.113125	0.113297
54	0.004845	0.004813	89	0.125803	0.127024
55	0.004944	0.004903	90	0.139504	0.142108
56	0.005064	0.005013	91	0.154241	0.158631
57	0.005210	0.005146	92	0.170016	0.176670
58	0.005386	0.005307	93	0.186820	0.196299
59	0.005599	0.005501	94	0.204630	0.217588
60	0.005854	0.005735	95	0.226402	0.240600
61	0.006159	0.006015	96	0.250575	0.272694
62	0.006523	0.006351	97	0.273455	0.304081
63	0.006957	0.006751	98	0.295059	0.334691
64	0.007472	0.007226	99	0.315391	0.364437
65	0.008082	0.007790	100	0.334437	0.393203
66	0.008801	0.008457	101	0.352150	0.420835
67	0.009646	0.009243	102	0.368429	0.447106
68	0.010637	0.010167	103	0.383049	0.471655
69	0.011796	0.011250	104	0.395328	0.493776
70	0.013146	0.012515	105	0.400000	0.510826
71	0.014714	0.013989	106	0.400000	0.510826
72	0.016530	0.015701	107	0.400000	0.510826
73	0.018626	0.017684	108	0.400000	0.510826
74	0.021036	0.019973	109	0.400000	0.510826
75	0.023799	0.022608	110	0.400000	0.510826
76	0.026955	0.025633	111	0.400000	0.510826
77	0.030550	0.029095	112	0.400000	0.510826
78	0.034628	0.033043	113	0.400000	0.510826
79	0.039238	0.037535	114	0.400000	0.510826
80	0.044431	0.042627	115	0.400000	0.510826
81	0.050258	0.048385	116	0.400000	0.510826
82	0.056773	0.054873	117	0.400000	0.510826
83	0.064027	0.062162	118	0.400000	0.510826
84	0.072073	0.070327	119	0.400000	0.510826
			120	1.000000	0.510826

Table A4: Pensioners, females, all, amounts, heavy – SPFA03Heavy – values of q_x and μ_x

Age x	q_x	μ_x	Age x	q_x	μ_x
50	0.006759	0.006911	85	0.091429	0.090453
51	0.006523	0.006658	86	0.101987	0.101514
52	0.006322	0.006437	87	0.113614	0.113850
53	0.006159	0.006253	88	0.126395	0.127603
54	0.006040	0.006111	89	0.140417	0.142927
55	0.005968	0.006013	90	0.155767	0.159995
56	0.005949	0.005967	91	0.172532	0.178998
57	0.005988	0.005976	92	0.190799	0.200150
58	0.006093	0.006047	93	0.210649	0.223685
59	0.006270	0.006188	94	0.232155	0.249867
60	0.006527	0.006404	95	0.253829	0.278984
61	0.006872	0.006706	96	0.273877	0.306519
62	0.007317	0.007102	97	0.292938	0.333448
63	0.007870	0.007603	98	0.311015	0.359710
64	0.008545	0.008220	99	0.328100	0.385231
65	0.009354	0.008966	100	0.344169	0.409911
66	0.010311	0.009855	101	0.359173	0.433618
67	0.011433	0.010903	102	0.373013	0.456157
68	0.012737	0.012126	103	0.385486	0.477219
69	0.014243	0.013546	104	0.395994	0.496198
70	0.015971	0.015182	105	0.400000	0.510826
71	0.017945	0.017060	106	0.400000	0.510826
72	0.020192	0.019204	107	0.400000	0.510826
73	0.022739	0.021645	108	0.400000	0.510826
74	0.025618	0.024416	109	0.400000	0.510826
75	0.028862	0.027552	110	0.400000	0.510826
76	0.032509	0.031093	111	0.400000	0.510826
77	0.036599	0.035084	112	0.400000	0.510826
78	0.041177	0.039575	113	0.400000	0.510826
79	0.046291	0.044620	114	0.400000	0.510826
80	0.051992	0.050281	115	0.400000	0.510826
81	0.058337	0.056624	116	0.400000	0.510826
82	0.065386	0.063725	117	0.400000	0.510826
83	0.073205	0.071667	118	0.400000	0.510826
84	0.081861	0.080542	119	0.400000	0.510826
			120	1.000000	0.510826

Table A5: Pensioners, males, all, lives – SPML03 – values of q_x and μ_x

Age x	q_x	μ_x	Age x	q_x	μ_x
50	0.006297	0.006261	85	0.128982	0.131294
51	0.006427	0.006378	86	0.141476	0.145100
52	0.006588	0.006523	87	0.154945	0.160210
53	0.006787	0.006703	88	0.169446	0.176747
54	0.007030	0.006924	89	0.185039	0.194852
55	0.007324	0.007193	90	0.201784	0.214679
56	0.007680	0.007520	91	0.219747	0.236407
57	0.008108	0.007913	92	0.238990	0.260235
58	0.008618	0.008383	93	0.259580	0.286392
59	0.009223	0.008943	94	0.281581	0.315139
60	0.009936	0.009606	95	0.303533	0.346773
61	0.010774	0.010387	96	0.323775	0.376591
62	0.011751	0.011301	97	0.342977	0.405752
63	0.012886	0.012367	98	0.361147	0.434192
64	0.014197	0.013602	99	0.378285	0.461829
65	0.015704	0.015028	100	0.394370	0.488555
66	0.017430	0.016667	101	0.409360	0.514227
67	0.019396	0.018542	102	0.423161	0.538636
68	0.021626	0.020677	103	0.435578	0.561444
69	0.024146	0.023100	104	0.446022	0.581996
70	0.026982	0.025840	105	0.450000	0.597837
71	0.030161	0.028926	106	0.450000	0.597837
72	0.033712	0.032391	107	0.450000	0.597837
73	0.037665	0.036268	108	0.450000	0.597837
74	0.042050	0.040594	109	0.450000	0.597837
75	0.046899	0.045409	110	0.450000	0.597837
76	0.052246	0.050752	111	0.450000	0.597837
77	0.058126	0.056668	112	0.450000	0.597837
78	0.064573	0.063206	113	0.450000	0.597837
79	0.071627	0.070416	114	0.450000	0.597837
80	0.079325	0.078354	115	0.450000	0.597837
81	0.087709	0.087080	116	0.450000	0.597837
82	0.096820	0.096660	117	0.450000	0.597837
83	0.106705	0.107168	118	0.450000	0.597837
84	0.117409	0.118683	119	0.450000	0.597837
			120	1.000000	0.597837

Table A6: Pensioners, males, all, amounts – SPMA03 – values of q_x and μ_x

Age x	q_x	μ_x	Age x	q_x	μ_x
50	0.003588	0.003509	85	0.115804	0.116310
51	0.003777	0.003684	86	0.128466	0.130062
52	0.003996	0.003889	87	0.142143	0.145172
53	0.004250	0.004126	88	0.156830	0.161705
54	0.004540	0.004398	89	0.172507	0.179717
55	0.004873	0.004710	90	0.189133	0.199247
56	0.005252	0.005067	91	0.206646	0.220313
57	0.005684	0.005474	92	0.224959	0.242912
58	0.006176	0.005937	93	0.243961	0.267011
59	0.006735	0.006464	94	0.263521	0.292546
60	0.007370	0.007063	95	0.285382	0.319415
61	0.008091	0.007745	96	0.308378	0.352482
62	0.008910	0.008519	97	0.330123	0.384821
63	0.009841	0.009400	98	0.350637	0.416360
64	0.010897	0.010400	99	0.369926	0.447008
65	0.012095	0.011537	100	0.387978	0.476647
66	0.013456	0.012829	101	0.404754	0.505117
67	0.015000	0.014297	102	0.420159	0.532185
68	0.016750	0.015965	103	0.433984	0.557478
69	0.018735	0.017860	104	0.445587	0.580270
70	0.020983	0.020011	105	0.450000	0.597837
71	0.023528	0.022453	106	0.450000	0.597837
72	0.026405	0.025223	107	0.450000	0.597837
73	0.029655	0.028362	108	0.450000	0.597837
74	0.033320	0.031918	109	0.450000	0.597837
75	0.037447	0.035940	110	0.450000	0.597837
76	0.042085	0.040484	111	0.450000	0.597837
77	0.047287	0.045611	112	0.450000	0.597837
78	0.053108	0.051386	113	0.450000	0.597837
79	0.059603	0.057880	114	0.450000	0.597837
80	0.066830	0.065166	115	0.450000	0.597837
81	0.074845	0.073322	116	0.450000	0.597837
82	0.083703	0.082432	117	0.450000	0.597837
83	0.093453	0.092577	118	0.450000	0.597837
84	0.104141	0.103842	119	0.450000	0.597837
			120	1.000000	0.597837

Table A7: Pensioners, males, all, amounts, light – SPMA03Light – values of q_x and μ_x

Age x	q_x	μ_x	Age x	q_x	μ_x
50	0.003349	0.003322	85	0.103487	0.102640
51	0.003434	0.003393	86	0.116126	0.116090
52	0.003546	0.003491	87	0.129946	0.131053
53	0.003688	0.003619	88	0.144960	0.147622
54	0.003862	0.003777	89	0.161162	0.165880
55	0.004070	0.003968	90	0.178516	0.185891
56	0.004317	0.004196	91	0.196960	0.207696
57	0.004606	0.004464	92	0.216399	0.231306
58	0.004942	0.004777	93	0.236702	0.256696
59	0.005332	0.005141	94	0.257710	0.283795
60	0.005782	0.005562	95	0.280711	0.312487
61	0.006301	0.006048	96	0.304423	0.346377
62	0.006899	0.006608	97	0.326828	0.379521
63	0.007586	0.007253	98	0.347948	0.411844
64	0.008375	0.007994	99	0.367791	0.443255
65	0.009282	0.008847	100	0.386349	0.473631
66	0.010323	0.009827	101	0.403582	0.502809
67	0.011519	0.010953	102	0.419396	0.530551
68	0.012890	0.012247	103	0.433579	0.556474
69	0.014464	0.013735	104	0.445477	0.579833
70	0.016268	0.015443	105	0.450000	0.597837
71	0.018336	0.017406	106	0.450000	0.597837
72	0.020705	0.019659	107	0.450000	0.597837
73	0.023416	0.022245	108	0.450000	0.597837
74	0.026514	0.025211	109	0.450000	0.597837
75	0.030050	0.028609	110	0.450000	0.597837
76	0.034080	0.032500	111	0.450000	0.597837
77	0.038663	0.036947	112	0.450000	0.597837
78	0.043865	0.042025	113	0.450000	0.597837
79	0.049752	0.047812	114	0.450000	0.597837
80	0.056397	0.054394	115	0.450000	0.597837
81	0.063873	0.061863	116	0.450000	0.597837
82	0.072251	0.070317	117	0.450000	0.597837
83	0.081603	0.079860	118	0.450000	0.597837
84	0.091996	0.090599	119	0.450000	0.597837
			120	1.000000	0.597837

Table A8: Pensioners, males, all, amounts, heavy – SPMA03Heavy – values of q_x and μ_x

Age x	q_x	μ_x	Age x	q_x	μ_x
50	0.008288	0.008291	85	0.126548	0.128619
51	0.008365	0.008358	86	0.138915	0.142203
52	0.008465	0.008446	87	0.152343	0.157163
53	0.008595	0.008561	88	0.166926	0.173666
54	0.008761	0.008709	89	0.182769	0.191906
55	0.008971	0.008897	90	0.199989	0.212110
56	0.009236	0.009135	91	0.218712	0.234546
57	0.009565	0.009433	92	0.239077	0.259530
58	0.009971	0.009802	93	0.261232	0.287436
59	0.010467	0.010255	94	0.285334	0.318708
60	0.011069	0.010807	95	0.308166	0.353871
61	0.011791	0.011474	96	0.327713	0.382846
62	0.012653	0.012273	97	0.346271	0.411183
63	0.013673	0.013222	98	0.363846	0.438819
64	0.014870	0.014342	99	0.380435	0.465674
65	0.016267	0.015655	100	0.396018	0.491645
66	0.017884	0.017183	101	0.410549	0.516591
67	0.019746	0.018951	102	0.423938	0.540310
68	0.021876	0.020983	103	0.435991	0.562473
69	0.024297	0.023305	104	0.446135	0.582444
70	0.027037	0.025945	105	0.450000	0.597837
71	0.030119	0.028933	106	0.450000	0.597837
72	0.033570	0.032296	107	0.450000	0.597837
73	0.037418	0.036068	108	0.450000	0.597837
74	0.041691	0.040281	109	0.450000	0.597837
75	0.046416	0.044971	110	0.450000	0.597837
76	0.051625	0.050174	111	0.450000	0.597837
77	0.057350	0.055933	112	0.450000	0.597837
78	0.063626	0.062292	113	0.450000	0.597837
79	0.070488	0.069300	114	0.450000	0.597837
80	0.077977	0.077013	115	0.450000	0.597837
81	0.086137	0.085491	116	0.450000	0.597837
82	0.095017	0.094805	117	0.450000	0.597837
83	0.104671	0.105034	118	0.450000	0.597837
84	0.115159	0.116270	119	0.450000	0.597837
			120	1.000000	0.597837

Table A9: Widows, lives – SWL03 – values of q_x

Age x	q_x	Age x	q_x	Age x	q_x
		50	0.003841	85	0.091489
		51	0.004062	86	0.101545
		52	0.004308	87	0.112661
		53	0.004584	88	0.124930
		54	0.004892	89	0.138452
20	0.000245	55	0.005236	90	0.153327
21	0.000288	56	0.005622	91	0.169661
22	0.000338	57	0.006052	92	0.187557
23	0.000394	58	0.006534	93	0.207115
24	0.000457	59	0.007072	94	0.228433
25	0.000527	60	0.007673	95	0.250327
26	0.000605	61	0.008346	96	0.270896
27	0.000690	62	0.009097	97	0.290441
28	0.000784	63	0.009937	98	0.308966
29	0.000885	64	0.010875	99	0.326465
30	0.000995	65	0.011924	100	0.342915
31	0.001112	66	0.013095	101	0.358266
32	0.001236	67	0.014404	102	0.372420
33	0.001367	68	0.015866	103	0.385170
34	0.001504	69	0.017498	104	0.395908
35	0.001646	70	0.019320	105	0.400000
36	0.001792	71	0.021354	106	0.400000
37	0.001941	72	0.023624	107	0.400000
38	0.002091	73	0.026156	108	0.400000
39	0.002240	74	0.028981	109	0.400000
40	0.002388	75	0.032130	110	0.400000
41	0.002533	76	0.035641	111	0.400000
42	0.002672	77	0.039552	112	0.400000
43	0.002804	78	0.043908	113	0.400000
44	0.002927	79	0.048757	114	0.400000
45	0.003043	80	0.054150	115	0.400000
46	0.003169	81	0.060146	116	0.400000
47	0.003310	82	0.066808	117	0.400000
48	0.003468	83	0.074202	118	0.400000
49	0.003644	84	0.082403	119	0.400000
				120	1.000000

Table A10: Widows, lives – SWL03 – values of μ_x

Age x	μ_x	Age x	μ_x	Age x	μ_x
		50	0.003746	85	0.090787
		51	0.003955	86	0.101306
		52	0.004189	87	0.113071
		53	0.004451	88	0.126230
		54	0.004743	89	0.140947
20	0.000225	55	0.005071	90	0.157408
21	0.000266	56	0.005437	91	0.175818
22	0.000312	57	0.005846	92	0.196409
23	0.000365	58	0.006304	93	0.219439
24	0.000424	59	0.006816	94	0.245196
25	0.000491	60	0.007389	95	0.274005
26	0.000565	61	0.008029	96	0.302131
27	0.000646	62	0.008746	97	0.329639
28	0.000736	63	0.009547	98	0.356465
29	0.000834	64	0.010443	99	0.382533
30	0.000939	65	0.011446	100	0.407744
31	0.001052	66	0.012567	101	0.431960
32	0.001173	67	0.013821	102	0.454983
33	0.001301	68	0.015223	103	0.476497
34	0.001436	69	0.016792	104	0.495884
35	0.001575	70	0.018546	105	0.510826
36	0.001720	71	0.020508	106	0.510826
37	0.001868	72	0.022703	107	0.510826
38	0.002018	73	0.025157	108	0.510826
39	0.002168	74	0.027903	109	0.510826
40	0.002317	75	0.030973	110	0.510826
41	0.002464	76	0.034407	111	0.510826
42	0.002607	77	0.038248	112	0.510826
43	0.002743	78	0.042544	113	0.510826
44	0.002871	79	0.047348	114	0.510826
45	0.002989	80	0.052722	115	0.510826
46	0.003109	81	0.058733	116	0.510826
47	0.003242	82	0.065455	117	0.510826
48	0.003392	83	0.072973	118	0.510826
49	0.003559	84	0.081382	119	0.510826
				120	0.510826

Table A11: Widows, amounts – SWA03 – values of q_x

Age x	q_x	Age x	q_x	Age x	q_x
		50	0.002991	85	0.081915
		51	0.003157	86	0.091541
		52	0.003344	87	0.102257
		53	0.003554	88	0.114170
		54	0.003791	89	0.127392
20	0.000243	55	0.004058	90	0.142042
21	0.000282	56	0.004358	91	0.158240
22	0.000325	57	0.004696	92	0.176110
23	0.000374	58	0.005076	93	0.195775
24	0.000428	59	0.005504	94	0.217351
25	0.000487	60	0.005985	95	0.240227
26	0.000552	61	0.006527	96	0.262308
27	0.000622	62	0.007136	97	0.283254
28	0.000698	63	0.007822	98	0.303075
29	0.000780	64	0.008593	99	0.321770
30	0.000867	65	0.009461	100	0.339317
31	0.000959	66	0.010437	101	0.355668
32	0.001056	67	0.011534	102	0.370723
33	0.001157	68	0.012768	103	0.384268
34	0.001262	69	0.014156	104	0.395661
35	0.001370	70	0.015715	105	0.400000
36	0.001480	71	0.017468	106	0.400000
37	0.001591	72	0.019438	107	0.400000
38	0.001703	73	0.021650	108	0.400000
39	0.001814	74	0.024135	109	0.400000
40	0.001923	75	0.026925	110	0.400000
41	0.002029	76	0.030057	111	0.400000
42	0.002130	77	0.033570	112	0.400000
43	0.002226	78	0.037510	113	0.400000
44	0.002315	79	0.041926	114	0.400000
45	0.002400	80	0.046874	115	0.400000
46	0.002492	81	0.052413	116	0.400000
47	0.002595	82	0.058611	117	0.400000
48	0.002712	83	0.065539	118	0.400000
49	0.002843	84	0.073279	119	0.400000
				120	1.000000

Table A12: Widows, amounts – SWA03 – values of μ_x

Age x	μ_x	Age x	μ_x	Age x	μ_x
		50	0.002918	85	0.080599
		51	0.003075	86	0.090527
		52	0.003252	87	0.101704
		53	0.003451	88	0.114287
		54	0.003675	89	0.128453
20	0.000225	55	0.003927	90	0.144400
21	0.000262	56	0.004211	91	0.162354
22	0.000303	57	0.004531	92	0.182566
23	0.000349	58	0.004891	93	0.205320
24	0.000400	59	0.005296	94	0.230937
25	0.000457	60	0.005752	95	0.259775
26	0.000518	61	0.006265	96	0.289591
27	0.000586	62	0.006843	97	0.318751
28	0.000659	63	0.007494	98	0.347190
29	0.000738	64	0.008226	99	0.374825
30	0.000823	65	0.009051	100	0.401550
31	0.000912	66	0.009979	101	0.427221
32	0.001007	67	0.011025	102	0.451628
33	0.001106	68	0.012201	103	0.474435
34	0.001210	69	0.013526	104	0.494986
35	0.001316	70	0.015017	105	0.510826
36	0.001426	71	0.016696	106	0.510826
37	0.001537	72	0.018586	107	0.510826
38	0.001649	73	0.020714	108	0.510826
39	0.001760	74	0.023110	109	0.510826
40	0.001870	75	0.025806	110	0.510826
41	0.001978	76	0.028843	111	0.510826
42	0.002082	77	0.032260	112	0.510826
43	0.002181	78	0.036108	113	0.510826
44	0.002274	79	0.040440	114	0.510826
45	0.002360	80	0.045317	115	0.510826
46	0.002447	81	0.050807	116	0.510826
47	0.002545	82	0.056988	117	0.510826
48	0.002655	83	0.063946	118	0.510826
49	0.002779	84	0.071780	119	0.510826
				120	0.510826

Table A13: Widows, amounts, light – SWA03Light – values of q_x

Age x	q_x	Age x	q_x	Age x	q_x
		50	0.002628	85	0.074495
		51	0.002750	86	0.083901
		52	0.002887	87	0.094460
		53	0.003043	88	0.106296
		54	0.003221	89	0.119543
20	0.000208	55	0.003422	90	0.134340
21	0.000245	56	0.003650	91	0.150832
22	0.000286	57	0.003909	92	0.169170
23	0.000333	58	0.004203	93	0.189504
24	0.000385	59	0.004536	94	0.211980
25	0.000443	60	0.004914	95	0.235742
26	0.000507	61	0.005343	96	0.258499
27	0.000577	62	0.005830	97	0.280070
28	0.000652	63	0.006382	98	0.300469
29	0.000733	64	0.007008	99	0.319694
30	0.000820	65	0.007718	100	0.337728
31	0.000911	66	0.008524	101	0.354522
32	0.001007	67	0.009437	102	0.369976
33	0.001107	68	0.010473	103	0.383870
34	0.001210	69	0.011647	104	0.395552
35	0.001314	70	0.012978	105	0.400000
36	0.001420	71	0.014486	106	0.400000
37	0.001526	72	0.016195	107	0.400000
38	0.001630	73	0.018132	108	0.400000
39	0.001731	74	0.020325	109	0.400000
40	0.001828	75	0.022807	110	0.400000
41	0.001919	76	0.025618	111	0.400000
42	0.002004	77	0.028798	112	0.400000
43	0.002080	78	0.032394	113	0.400000
44	0.002147	79	0.036460	114	0.400000
45	0.002207	80	0.041054	115	0.400000
46	0.002271	81	0.046241	116	0.400000
47	0.002344	82	0.052094	117	0.400000
48	0.002427	83	0.058694	118	0.400000
49	0.002522	84	0.066128	119	0.400000
				120	1.000000

Table A14: Widows, amounts, light – SWA03Light – values of μ_x

Age x	μ_x	Age x	μ_x	Age x	μ_x
		50	0.002576	85	0.072726
		51	0.002690	86	0.082308
		52	0.002820	87	0.093182
		53	0.002966	88	0.105525
		54	0.003133	89	0.119532
20	0.000191	55	0.003322	90	0.135431
21	0.000225	56	0.003537	91	0.153475
22	0.000265	57	0.003781	92	0.173954
23	0.000309	58	0.004058	93	0.197197
24	0.000358	59	0.004372	94	0.223577
25	0.000413	60	0.004728	95	0.253517
26	0.000474	61	0.005133	96	0.284077
27	0.000541	62	0.005592	97	0.313964
28	0.000614	63	0.006113	98	0.343111
29	0.000692	64	0.006704	99	0.371434
30	0.000776	65	0.007375	100	0.398826
31	0.000865	66	0.008137	101	0.425137
32	0.000959	67	0.009002	102	0.450152
33	0.001057	68	0.009983	103	0.473528
34	0.001159	69	0.011097	104	0.494591
35	0.001263	70	0.012361	105	0.510826
36	0.001368	71	0.013795	106	0.510826
37	0.001474	72	0.015424	107	0.510826
38	0.001579	73	0.017271	108	0.510826
39	0.001682	74	0.019369	109	0.510826
40	0.001782	75	0.021749	110	0.510826
41	0.001876	76	0.024451	111	0.510826
42	0.001965	77	0.027517	112	0.510826
43	0.002045	78	0.030997	113	0.510826
44	0.002118	79	0.034947	114	0.510826
45	0.002180	80	0.039430	115	0.510826
46	0.002240	81	0.044518	116	0.510826
47	0.002309	82	0.050292	117	0.510826
48	0.002387	83	0.056846	118	0.510826
49	0.002476	84	0.064284	119	0.510826
				120	0.510826

Table A15: Widows, amounts, heavy – SWA03Heavy – values of q_x

Age x	q_x	Age x	q_x	Age x	q_x
		50	0.004486	85	0.095231
		51	0.004721	86	0.105525
		52	0.004983	87	0.116887
		53	0.005277	88	0.129411
		54	0.005605	89	0.143193
20	0.000282	55	0.005970	90	0.158333
21	0.000334	56	0.006379	91	0.174931
22	0.000394	57	0.006836	92	0.193089
23	0.000462	58	0.007345	93	0.212904
24	0.000539	59	0.007914	94	0.234467
25	0.000625	60	0.008550	95	0.256031
26	0.000720	61	0.009259	96	0.275753
27	0.000825	62	0.010051	97	0.294510
28	0.000940	63	0.010935	98	0.312306
29	0.001066	64	0.011922	99	0.329130
30	0.001201	65	0.013024	100	0.344960
31	0.001345	66	0.014253	101	0.359744
32	0.001498	67	0.015624	102	0.373387
33	0.001659	68	0.017154	103	0.385685
34	0.001827	69	0.018861	104	0.396048
35	0.002001	70	0.020764	105	0.400000
36	0.002179	71	0.022886	106	0.400000
37	0.002359	72	0.025251	107	0.400000
38	0.002539	73	0.027887	108	0.400000
39	0.002718	74	0.030823	109	0.400000
40	0.002893	75	0.034093	110	0.400000
41	0.003061	76	0.037734	111	0.400000
42	0.003221	77	0.041785	112	0.400000
43	0.003370	78	0.046290	113	0.400000
44	0.003506	79	0.051299	114	0.400000
45	0.003632	80	0.056865	115	0.400000
46	0.003767	81	0.063044	116	0.400000
47	0.003918	82	0.069899	117	0.400000
48	0.004087	83	0.077500	118	0.400000
49	0.004275	84	0.085917	119	0.400000
				120	1.000000

Table A16: Widows, amounts, heavy – SWA03Heavy – values of μ_x

Age x	μ_x	Age x	μ_x	Age x	μ_x
		50	0.004386	85	0.094766
		51	0.004610	86	0.105586
		52	0.004859	87	0.117674
		53	0.005138	88	0.131180
		54	0.005449	89	0.146269
20	0.000258	55	0.005798	90	0.163127
21	0.000307	56	0.006186	91	0.181962
22	0.000363	57	0.006621	92	0.203005
23	0.000427	58	0.007106	93	0.226515
24	0.000499	59	0.007648	94	0.252781
25	0.000580	60	0.008254	95	0.282127
26	0.000671	61	0.008931	96	0.309289
27	0.000771	62	0.009688	97	0.335853
28	0.000881	63	0.010532	98	0.361759
29	0.001002	64	0.011476	99	0.386933
30	0.001132	65	0.012531	100	0.411279
31	0.001272	66	0.013709	101	0.434664
32	0.001421	67	0.015026	102	0.456899
33	0.001579	68	0.016497	103	0.477675
34	0.001744	69	0.018140	104	0.496396
35	0.001915	70	0.019976	105	0.510826
36	0.002092	71	0.022027	106	0.510826
37	0.002271	72	0.024319	107	0.510826
38	0.002452	73	0.026879	108	0.510826
39	0.002632	74	0.029740	109	0.510826
40	0.002810	75	0.032936	110	0.510826
41	0.002982	76	0.036506	111	0.510826
42	0.003148	77	0.040495	112	0.510826
43	0.003303	78	0.044952	113	0.510826
44	0.003446	79	0.049932	114	0.510826
45	0.003575	80	0.055495	115	0.510826
46	0.003704	81	0.061711	116	0.510826
47	0.003847	82	0.068655	117	0.510826
48	0.004007	83	0.076413	118	0.510826
49	0.004186	84	0.085082	119	0.510826
				120	0.510826

Table A17. Pensioners, females, normal health, amounts – SNFA03 – values of q_x

Age x	q_x	Age x	q_x	Age x	q_x
		50	0.001766	85	0.084121
		51	0.001966	86	0.093885
		52	0.002191	87	0.104653
		53	0.002444	88	0.116523
		54	0.002727	89	0.129609
20	0.000208	55	0.003044	90	0.144033
21	0.000213	56	0.003400	91	0.159935
22	0.000220	57	0.003797	92	0.177459
23	0.000227	58	0.004243	93	0.195402
24	0.000235	59	0.004741	94	0.213416
25	0.000244	60	0.005169	95	0.234610
26	0.000254	61	0.005531	96	0.257538
27	0.000265	62	0.005960	97	0.279268
28	0.000278	63	0.006469	98	0.299812
29	0.000293	64	0.007069	99	0.319171
30	0.000310	65	0.007775	100	0.337328
31	0.000328	66	0.008604	101	0.354233
32	0.000349	67	0.009574	102	0.369787
33	0.000373	68	0.010705	103	0.383770
34	0.000400	69	0.012020	104	0.395525
35	0.000430	70	0.013545	105	0.400000
36	0.000464	71	0.015307	106	0.400000
37	0.000503	72	0.017338	107	0.400000
38	0.000546	73	0.019669	108	0.400000
39	0.000595	74	0.022337	109	0.400000
40	0.000650	75	0.025382	110	0.400000
41	0.000712	76	0.028843	111	0.400000
42	0.000782	77	0.032765	112	0.400000
43	0.000860	78	0.037194	113	0.400000
44	0.000949	79	0.042172	114	0.400000
45	0.001048	80	0.047556	115	0.400000
46	0.001160	81	0.053462	116	0.400000
47	0.001286	82	0.060010	117	0.400000
48	0.001428	83	0.067259	118	0.400000
49	0.001587	84	0.075272	119	0.400000
				120	1.000000

Table A18. Pensioners, females, normal health, amounts – SNFA03 – values of μ_x

Age x	μ_x	Age x	μ_x	Age x	μ_x
		50	0.001674	85	0.082890
		51	0.001864	86	0.093036
		52	0.002077	87	0.104348
		53	0.002315	88	0.116971
		54	0.002583	89	0.131072
20	0.000205	55	0.002884	90	0.146850
21	0.000210	56	0.003220	91	0.164536
22	0.000216	57	0.003597	92	0.184404
23	0.000223	58	0.004020	93	0.206648
24	0.000231	59	0.004492	94	0.228454
25	0.000239	60	0.005021	95	0.251943
26	0.000249	61	0.005354	96	0.282690
27	0.000259	62	0.005750	97	0.312759
28	0.000272	63	0.006220	98	0.342085
29	0.000285	64	0.006775	99	0.370582
30	0.000301	65	0.007430	100	0.398141
31	0.000319	66	0.008201	101	0.424612
32	0.000338	67	0.009105	102	0.449781
33	0.000361	68	0.010162	103	0.473299
34	0.000386	69	0.011394	104	0.494492
35	0.000414	70	0.012827	105	0.510826
36	0.000447	71	0.014489	106	0.510826
37	0.000483	72	0.016409	107	0.510826
38	0.000524	73	0.018622	108	0.510826
39	0.000570	74	0.021166	109	0.510826
40	0.000621	75	0.024081	110	0.510826
41	0.000680	76	0.027411	111	0.510826
42	0.000746	77	0.031205	112	0.510826
43	0.000820	78	0.035513	113	0.510826
44	0.000903	79	0.040392	114	0.510826
45	0.000997	80	0.045837	115	0.510826
46	0.001103	81	0.051719	116	0.510826
47	0.001222	82	0.058289	117	0.510826
48	0.001355	83	0.065617	118	0.510826
49	0.001505	84	0.073786	119	0.510826
				120	0.510826

Table A19. Pensioners, females, normal health, amounts, light – SNFA03Light – values of q_x

Age x	q_x	Age x	q_x	Age x	q_x
		50	0.001675	85	0.080961
		51	0.001861	86	0.090738
		52	0.002069	87	0.101447
		53	0.002302	88	0.113125
		54	0.002564	89	0.125803
20	0.000202	55	0.002857	90	0.139504
21	0.000207	56	0.003184	91	0.154241
22	0.000214	57	0.003551	92	0.170016
23	0.000221	58	0.003961	93	0.186820
24	0.000229	59	0.004420	94	0.204630
25	0.000238	60	0.004813	95	0.226402
26	0.000248	61	0.005143	96	0.250575
27	0.000260	62	0.005537	97	0.273455
28	0.000273	63	0.006005	98	0.295059
29	0.000287	64	0.006560	99	0.315391
30	0.000303	65	0.007216	100	0.334437
31	0.000322	66	0.007989	101	0.352150
32	0.000342	67	0.008897	102	0.368429
33	0.000365	68	0.009960	103	0.383049
34	0.000391	69	0.011200	104	0.395328
35	0.000421	70	0.012643	105	0.400000
36	0.000453	71	0.014317	106	0.400000
37	0.000490	72	0.016253	107	0.400000
38	0.000532	73	0.018483	108	0.400000
39	0.000578	74	0.021019	109	0.400000
40	0.000631	75	0.023799	110	0.400000
41	0.000689	76	0.026955	111	0.400000
42	0.000755	77	0.030550	112	0.400000
43	0.000830	78	0.034628	113	0.400000
44	0.000913	79	0.039238	114	0.400000
45	0.001006	80	0.044431	115	0.400000
46	0.001111	81	0.050258	116	0.400000
47	0.001229	82	0.056773	117	0.400000
48	0.001361	83	0.064027	118	0.400000
49	0.001509	84	0.072073	119	0.400000
				120	1.000000

Table A20. Pensioners, females, normal health, amounts, light – SNFA03Light – values of μ_x

Age x	μ_x	Age x	μ_x	Age x	μ_x
		50	0.001590	85	0.079443
		51	0.001766	86	0.089589
		52	0.001963	87	0.100847
		53	0.002184	88	0.113297
		54	0.002431	89	0.127024
20	0.000199	55	0.002708	90	0.142108
21	0.000204	56	0.003019	91	0.158631
22	0.000211	57	0.003367	92	0.176670
23	0.000217	58	0.003756	93	0.196299
24	0.000225	59	0.004191	94	0.217588
25	0.000233	60	0.004678	95	0.240600
26	0.000243	61	0.004981	96	0.272694
27	0.000254	62	0.005343	97	0.304081
28	0.000266	63	0.005774	98	0.334691
29	0.000280	64	0.006287	99	0.364437
30	0.000295	65	0.006894	100	0.393203
31	0.000312	66	0.007611	101	0.420835
32	0.000332	67	0.008454	102	0.447106
33	0.000353	68	0.009445	103	0.471655
34	0.000378	69	0.010604	104	0.493776
35	0.000405	70	0.011957	105	0.510826
36	0.000436	71	0.013531	106	0.510826
37	0.000471	72	0.015356	107	0.510826
38	0.000510	73	0.017467	108	0.510826
39	0.000554	74	0.019901	109	0.510826
40	0.000604	75	0.022608	110	0.510826
41	0.000659	76	0.025633	111	0.510826
42	0.000721	77	0.029095	112	0.510826
43	0.000791	78	0.033043	113	0.510826
44	0.000870	79	0.037535	114	0.510826
45	0.000958	80	0.042627	115	0.510826
46	0.001057	81	0.048385	116	0.510826
47	0.001168	82	0.054873	117	0.510826
48	0.001293	83	0.062162	118	0.510826
49	0.001433	84	0.070327	119	0.510826
				120	0.510826

Table A21. Pensioners, females, normal health, amounts, heavy – SNFA03Heavy – values of q_x

Age x	q_x	Age x	q_x	Age x	q_x
		50	0.002050	85	0.091208
		51	0.002296	86	0.101657
		52	0.002573	87	0.112985
		53	0.002885	88	0.125205
		54	0.003235	89	0.138324
20	0.000226	55	0.003629	90	0.152339
21	0.000232	56	0.004070	91	0.167235
22	0.000238	57	0.004565	92	0.182986
23	0.000245	58	0.005120	93	0.199557
24	0.000252	59	0.005740	94	0.216896
25	0.000261	60	0.006239	95	0.237461
26	0.000271	61	0.006611	96	0.259958
27	0.000283	62	0.007054	97	0.281290
28	0.000296	63	0.007581	98	0.301467
29	0.000312	64	0.008206	99	0.320489
30	0.000329	65	0.008944	100	0.338336
31	0.000349	66	0.009812	101	0.354961
32	0.000371	67	0.010831	102	0.370262
33	0.000397	68	0.012022	103	0.384022
34	0.000426	69	0.013410	104	0.395594
35	0.000460	70	0.015022	105	0.400000
36	0.000498	71	0.016886	106	0.400000
37	0.000541	72	0.019036	107	0.400000
38	0.000590	73	0.021504	108	0.400000
39	0.000646	74	0.024330	109	0.400000
40	0.000709	75	0.027552	110	0.400000
41	0.000781	76	0.031211	111	0.400000
42	0.000863	77	0.035351	112	0.400000
43	0.000956	78	0.040018	113	0.400000
44	0.001061	79	0.045256	114	0.400000
45	0.001179	80	0.051113	115	0.400000
46	0.001314	81	0.057633	116	0.400000
47	0.001466	82	0.064862	117	0.400000
48	0.001637	83	0.072842	118	0.400000
49	0.001831	84	0.081612	119	0.400000
				120	1.000000

Table A22. Pensioners, females, normal health, amounts, heavy – SNFA03Heavy – values of μ_x

Age x	μ_x	Age x	μ_x	Age x	μ_x
		50	0.001938	85	0.090215
		51	0.002170	86	0.101239
		52	0.002432	87	0.113356
		53	0.002726	88	0.126627
		54	0.003058	89	0.141110
20	0.000224	55	0.003430	90	0.156856
21	0.000229	56	0.003848	91	0.173914
22	0.000235	57	0.004318	92	0.192321
23	0.000241	58	0.004844	93	0.212110
24	0.000248	59	0.005433	94	0.233303
25	0.000257	60	0.006093	95	0.255911
26	0.000266	61	0.006435	96	0.286186
27	0.000277	62	0.006843	97	0.315795
28	0.000290	63	0.007329	98	0.344671
29	0.000304	64	0.007907	99	0.372731
30	0.000320	65	0.008591	100	0.399868
31	0.000338	66	0.009399	101	0.425934
32	0.000360	67	0.010348	102	0.450717
33	0.000384	68	0.011461	103	0.473875
34	0.000411	69	0.012762	104	0.494742
35	0.000442	70	0.014278	105	0.510826
36	0.000478	71	0.016037	106	0.510826
37	0.000518	72	0.018073	107	0.510826
38	0.000565	73	0.020421	108	0.510826
39	0.000617	74	0.023119	109	0.510826
40	0.000676	75	0.026211	110	0.510826
41	0.000744	76	0.029742	111	0.510826
42	0.000821	77	0.033760	112	0.510826
43	0.000908	78	0.038317	113	0.510826
44	0.001006	79	0.043468	114	0.510826
45	0.001118	80	0.049270	115	0.510826
46	0.001245	81	0.055784	116	0.510826
47	0.001388	82	0.063072	117	0.510826
48	0.001549	83	0.071196	118	0.510826
49	0.001732	84	0.080223	119	0.510826
				120	0.510826

Table A23. Pensioners, males, normal health, amounts – SNMA03 – values of q_x

Age x	q_x	Age x	q_x	Age x	q_x
		50	0.002110	85	0.115804
		51	0.002350	86	0.128466
		52	0.002622	87	0.142143
		53	0.002931	88	0.156830
		54	0.003282	89	0.172507
20	0.000490	55	0.003679	90	0.189133
21	0.000493	56	0.004129	91	0.206646
22	0.000496	57	0.004637	92	0.224959
23	0.000500	58	0.005210	93	0.243961
24	0.000505	59	0.005857	94	0.263521
25	0.000511	60	0.006536	95	0.285382
26	0.000518	61	0.007256	96	0.308378
27	0.000526	62	0.008076	97	0.330123
28	0.000535	63	0.009009	98	0.350637
29	0.000546	64	0.010070	99	0.369926
30	0.000559	65	0.011279	100	0.387978
31	0.000573	66	0.012653	101	0.404754
32	0.000590	67	0.014217	102	0.420159
33	0.000610	68	0.015994	103	0.433984
34	0.000633	69	0.018014	104	0.445587
35	0.000659	70	0.020306	105	0.450000
36	0.000690	71	0.022906	106	0.450000
37	0.000725	72	0.025851	107	0.450000
38	0.000766	73	0.029181	108	0.450000
39	0.000813	74	0.032943	109	0.450000
40	0.000867	75	0.037182	110	0.450000
41	0.000930	76	0.041951	111	0.450000
42	0.001002	77	0.047273	112	0.450000
43	0.001084	78	0.053108	113	0.450000
44	0.001179	79	0.059603	114	0.450000
45	0.001287	80	0.066830	115	0.450000
46	0.001411	81	0.074845	116	0.450000
47	0.001553	82	0.083703	117	0.450000
48	0.001715	83	0.093453	118	0.450000
49	0.001900	84	0.104141	119	0.450000
				120	1.000000

Table A24. Pensioners, males, normal health, amounts – SNMA03 – values of μ_x

Age x	μ_x	Age x	μ_x	Age x	μ_x
		50	0.002003	85	0.116310
		51	0.002228	86	0.130062
		52	0.002483	87	0.145172
		53	0.002774	88	0.161705
		54	0.003104	89	0.179717
20	0.000488	55	0.003479	90	0.199247
21	0.000491	56	0.003903	91	0.220313
22	0.000494	57	0.004382	92	0.242912
23	0.000498	58	0.004924	93	0.267011
24	0.000503	59	0.005536	94	0.292546
25	0.000508	60	0.006226	95	0.319415
26	0.000515	61	0.006905	96	0.352482
27	0.000522	62	0.007678	97	0.384821
28	0.000530	63	0.008559	98	0.416360
29	0.000540	64	0.009562	99	0.447008
30	0.000552	65	0.010706	100	0.476647
31	0.000566	66	0.012008	101	0.505117
32	0.000581	67	0.013492	102	0.532185
33	0.000600	68	0.015182	103	0.557478
34	0.000621	69	0.017107	104	0.580270
35	0.000646	70	0.019297	105	0.597837
36	0.000674	71	0.021787	106	0.597837
37	0.000707	72	0.024618	107	0.597837
38	0.000745	73	0.027831	108	0.597837
39	0.000789	74	0.031476	109	0.597837
40	0.000839	75	0.035604	110	0.597837
41	0.000898	76	0.040273	111	0.597837
42	0.000965	77	0.045545	112	0.597837
43	0.001042	78	0.051386	113	0.597837
44	0.001130	79	0.057880	114	0.597837
45	0.001231	80	0.065166	115	0.597837
46	0.001347	81	0.073322	116	0.597837
47	0.001480	82	0.082432	117	0.597837
48	0.001632	83	0.092577	118	0.597837
49	0.001805	84	0.103842	119	0.597837
				120	0.597837

Table A25. Pensioners, males, normal health, amounts, light – SNMA03Light – values of q_x

Age x	q_x	Age x	q_x	Age x	q_x
		50	0.001775	85	0.103487
		51	0.001969	86	0.116126
		52	0.002188	87	0.129946
		53	0.002438	88	0.144960
		54	0.002720	89	0.161162
20	0.000417	55	0.003041	90	0.178516
21	0.000420	56	0.003403	91	0.196960
22	0.000424	57	0.003814	92	0.216399
23	0.000429	58	0.004279	93	0.236702
24	0.000434	59	0.004804	94	0.257282
25	0.000440	60	0.005330	95	0.279835
26	0.000447	61	0.005862	96	0.303683
27	0.000454	62	0.006473	97	0.326211
28	0.000463	63	0.007176	98	0.347444
29	0.000474	64	0.007985	99	0.367392
30	0.000486	65	0.008915	100	0.386044
31	0.000499	66	0.009985	101	0.403363
32	0.000515	67	0.011214	102	0.419254
33	0.000533	68	0.012627	103	0.433504
34	0.000554	69	0.014250	104	0.445456
35	0.000577	70	0.016114	105	0.450000
36	0.000604	71	0.018252	106	0.450000
37	0.000635	72	0.020693	107	0.450000
38	0.000670	73	0.023416	108	0.450000
39	0.000711	74	0.026514	109	0.450000
40	0.000757	75	0.030050	110	0.450000
41	0.000809	76	0.034080	111	0.450000
42	0.000870	77	0.038663	112	0.450000
43	0.000938	78	0.043865	113	0.450000
44	0.001017	79	0.049752	114	0.450000
45	0.001106	80	0.056397	115	0.450000
46	0.001208	81	0.063873	116	0.450000
47	0.001323	82	0.072251	117	0.450000
48	0.001455	83	0.081603	118	0.450000
49	0.001605	84	0.091996	119	0.450000
				120	1.000000

Table A26. Pensioners, males, normal health, amounts, light – SNMA03Light – values of μ_x

Age x	μ_x	Age x	μ_x	Age x	μ_x
		50	0.001688	85	0.102640
		51	0.001870	86	0.116090
		52	0.002076	87	0.131053
		53	0.002310	88	0.147622
		54	0.002576	89	0.165880
20	0.000415	55	0.002878	90	0.185891
21	0.000419	56	0.003220	91	0.207696
22	0.000422	57	0.003607	92	0.231306
23	0.000426	58	0.004045	93	0.256696
24	0.000431	59	0.004541	94	0.283795
25	0.000437	60	0.005102	95	0.311194
26	0.000443	61	0.005599	96	0.345238
27	0.000450	62	0.006172	97	0.378532
28	0.000459	63	0.006831	98	0.411002
29	0.000469	64	0.007591	99	0.442554
30	0.000480	65	0.008464	100	0.473068
31	0.000492	66	0.009470	101	0.502379
32	0.000507	67	0.010627	102	0.530246
33	0.000524	68	0.011959	103	0.556286
34	0.000543	69	0.013492	104	0.579751
35	0.000565	70	0.015255	105	0.597837
36	0.000590	71	0.017282	106	0.597837
37	0.000619	72	0.019613	107	0.597837
38	0.000652	73	0.022245	108	0.597837
39	0.000690	74	0.025211	109	0.597837
40	0.000733	75	0.028609	110	0.597837
41	0.000782	76	0.032500	111	0.597837
42	0.000839	77	0.036947	112	0.597837
43	0.000903	78	0.042025	113	0.597837
44	0.000976	79	0.047812	114	0.597837
45	0.001060	80	0.054394	115	0.597837
46	0.001155	81	0.061863	116	0.597837
47	0.001264	82	0.070317	117	0.597837
48	0.001387	83	0.079860	118	0.597837
49	0.001528	84	0.090599	119	0.597837
				120	0.597837

Table A27. Pensioners, males, normal health, amounts, heavy – SNMA03Heavy – values of q_x

Age x	q_x	Age x	q_x	Age x	q_x
		50	0.003066	85	0.126548
		51	0.003435	86	0.138915
		52	0.003857	87	0.152343
		53	0.004335	88	0.166926
		54	0.004878	89	0.182769
20	0.000654	55	0.005493	90	0.199989
21	0.000657	56	0.006188	91	0.218712
22	0.000662	57	0.006973	92	0.239077
23	0.000666	58	0.007856	93	0.261232
24	0.000672	59	0.008850	94	0.285334
25	0.000679	60	0.009753	95	0.308166
26	0.000688	61	0.010569	96	0.327713
27	0.000698	62	0.011518	97	0.346271
28	0.000709	63	0.012617	98	0.363846
29	0.000723	64	0.013885	99	0.380435
30	0.000740	65	0.015342	100	0.396018
31	0.000759	66	0.017009	101	0.410549
32	0.000782	67	0.018909	102	0.423938
33	0.000809	68	0.021067	103	0.435991
34	0.000840	69	0.023509	104	0.446135
35	0.000877	70	0.026262	105	0.450000
36	0.000920	71	0.029357	106	0.450000
37	0.000970	72	0.032824	107	0.450000
38	0.001029	73	0.036697	108	0.450000
39	0.001097	74	0.041008	109	0.450000
40	0.001176	75	0.045795	110	0.450000
41	0.001268	76	0.051095	111	0.450000
42	0.001375	77	0.056948	112	0.450000
43	0.001498	78	0.063393	113	0.450000
44	0.001640	79	0.070449	114	0.450000
45	0.001804	80	0.077977	115	0.450000
46	0.001993	81	0.086137	116	0.450000
47	0.002209	82	0.095017	117	0.450000
48	0.002457	83	0.104671	118	0.450000
49	0.002741	84	0.115159	119	0.450000
				120	1.000000

Table A28. Pensioners, males, normal health, amounts, heavy – SNMA03Heavy – values of μ_x

Age x	μ_x	Age x	μ_x	Age x	μ_x
		50	0.002900	85	0.128619
		51	0.003248	86	0.142203
		52	0.003644	87	0.157163
		53	0.004094	88	0.173666
		54	0.004606	89	0.191906
20	0.000653	55	0.005187	90	0.212110
21	0.000656	56	0.005844	91	0.234546
22	0.000660	57	0.006587	92	0.259530
23	0.000664	58	0.007425	93	0.287436
24	0.000669	59	0.008369	94	0.318708
25	0.000676	60	0.009430	95	0.353871
26	0.000684	61	0.010192	96	0.382846
27	0.000693	62	0.011081	97	0.411183
28	0.000703	63	0.012114	98	0.438819
29	0.000716	64	0.013310	99	0.465674
30	0.000731	65	0.014688	100	0.491645
31	0.000749	66	0.016270	101	0.516591
32	0.000770	67	0.018080	102	0.540310
33	0.000795	68	0.020144	103	0.562473
34	0.000824	69	0.022489	104	0.582444
35	0.000858	70	0.025144	105	0.597837
36	0.000898	71	0.028142	106	0.597837
37	0.000944	72	0.031517	107	0.597837
38	0.000999	73	0.035306	108	0.597837
39	0.001062	74	0.039547	109	0.597837
40	0.001135	75	0.044285	110	0.597837
41	0.001221	76	0.049564	111	0.597837
42	0.001320	77	0.055433	112	0.597837
43	0.001435	78	0.061946	113	0.597837
44	0.001567	79	0.069160	114	0.597837
45	0.001720	80	0.077013	115	0.597837
46	0.001896	81	0.085491	116	0.597837
47	0.002098	82	0.094805	117	0.597837
48	0.002330	83	0.105034	118	0.597837
49	0.002596	84	0.116270	119	0.597837
				120	0.597837

Table A29. Pensioners, females, ill-health, amounts – SIFA03 – values of q_x

Age x	q_x	Age x	q_x	Age x	q_x
		50	0.007995	85	0.104083
		51	0.008122	86	0.116215
		52	0.008273	87	0.129730
		53	0.008452	88	0.144756
		54	0.008662	89	0.161427
20	0.007591	55	0.008908	90	0.179876
21	0.007591	56	0.009194	91	0.200237
22	0.007591	57	0.009525	92	0.222638
23	0.007591	58	0.009908	93	0.247197
24	0.007591	59	0.010348	94	0.274015
25	0.007591	60	0.010853	95	0.295363
26	0.007591	61	0.011432	96	0.309372
27	0.007591	62	0.012093	97	0.322786
28	0.007591	63	0.012848	98	0.335595
29	0.007591	64	0.013709	99	0.347782
30	0.007591	65	0.014688	100	0.359320
31	0.007591	66	0.015801	101	0.370159
32	0.007591	67	0.017066	102	0.380218
33	0.007591	68	0.018501	103	0.389332
34	0.007591	69	0.020127	104	0.397049
35	0.007591	70	0.021970	105	0.400000
36	0.007591	71	0.024055	106	0.400000
37	0.007591	72	0.026414	107	0.400000
38	0.007591	73	0.029080	108	0.400000
39	0.007591	74	0.032091	109	0.400000
40	0.007591	75	0.035489	110	0.400000
41	0.007591	76	0.039321	111	0.400000
42	0.007592	77	0.043641	112	0.400000
43	0.007600	78	0.048505	113	0.400000
44	0.007617	79	0.053978	114	0.400000
45	0.007645	80	0.060131	115	0.400000
46	0.007684	81	0.067042	116	0.400000
47	0.007737	82	0.074796	117	0.400000
48	0.007805	83	0.083486	118	0.400000
49	0.007891	84	0.093212	119	0.400000
				120	1.000000

Table A30. Pensioners, females, ill-health, amounts – SIFA03 – values of μ_x

Age x	μ_x	Age x	μ_x	Age x	μ_x
		50	0.007971	85	0.103631
		51	0.008087	86	0.116446
		52	0.008227	87	0.130932
		53	0.008393	88	0.147305
		54	0.008588	89	0.165810
20	0.007620	55	0.008818	90	0.186724
21	0.007620	56	0.009085	91	0.210358
22	0.007620	57	0.009396	92	0.237066
23	0.007620	58	0.009755	93	0.267247
24	0.007620	59	0.010169	94	0.301351
25	0.007620	60	0.010645	95	0.339886
26	0.007620	61	0.011192	96	0.360188
27	0.007620	62	0.011817	97	0.380043
28	0.007620	63	0.012532	98	0.399406
29	0.007620	64	0.013348	99	0.418223
30	0.007620	65	0.014279	100	0.436420
31	0.007620	66	0.015338	101	0.453899
32	0.007620	67	0.016543	102	0.470518
33	0.007620	68	0.017913	103	0.486047
34	0.007620	69	0.019468	104	0.500040
35	0.007620	70	0.021234	105	0.510826
36	0.007620	71	0.023237	106	0.510826
37	0.007620	72	0.025509	107	0.510826
38	0.007620	73	0.028083	108	0.510826
39	0.007620	74	0.030999	109	0.510826
40	0.007620	75	0.034302	110	0.510826
41	0.007620	76	0.038042	111	0.510826
42	0.007620	77	0.042276	112	0.510826
43	0.007623	78	0.047066	113	0.510826
44	0.007636	79	0.052487	114	0.510826
45	0.007658	80	0.058619	115	0.510826
46	0.007692	81	0.065554	116	0.510826
47	0.007738	82	0.073397	117	0.510826
48	0.007799	83	0.082266	118	0.510826
49	0.007876	84	0.092294	119	0.510826
				120	0.510826

Table A31. Pensioners, males, ill-health, amounts – SIMA03 – values of q_x

Age x	q_x	Age x	q_x	Age x	q_x
		50	0.010505	85	0.141460
		51	0.010877	86	0.153967
		52	0.011309	87	0.167472
		53	0.011804	88	0.182031
		54	0.012369	89	0.197698
20	0.009070	55	0.013011	90	0.214528
21	0.009070	56	0.013736	91	0.232569
22	0.009070	57	0.014553	92	0.251864
23	0.009070	58	0.015469	93	0.272453
24	0.009070	59	0.016494	94	0.294363
25	0.009070	60	0.017639	95	0.315303
26	0.009070	61	0.018914	96	0.333786
27	0.009070	62	0.020331	97	0.351356
28	0.009070	63	0.021903	98	0.368017
29	0.009070	64	0.023645	99	0.383761
30	0.009070	65	0.025571	100	0.398568
31	0.009070	66	0.027698	101	0.412392
32	0.009070	67	0.030045	102	0.425142
33	0.009070	68	0.032630	103	0.436631
34	0.009070	69	0.035476	104	0.446310
35	0.009070	70	0.038605	105	0.450000
36	0.009070	71	0.042042	106	0.450000
37	0.009070	72	0.045814	107	0.450000
38	0.009070	73	0.049949	108	0.450000
39	0.009070	74	0.054478	109	0.450000
40	0.009070	75	0.059434	110	0.450000
41	0.009076	76	0.064853	111	0.450000
42	0.009105	77	0.070772	112	0.450000
43	0.009159	78	0.077232	113	0.450000
44	0.009242	79	0.084275	114	0.450000
45	0.009356	80	0.091946	115	0.450000
46	0.009504	81	0.100293	116	0.450000
47	0.009689	82	0.109366	117	0.450000
48	0.009915	83	0.119215	118	0.450000
49	0.010185	84	0.129895	119	0.450000
				120	1.000000

Table A32. Pensioners, males, ill-health, amounts – SIMA03 – values of μ_x

Age x	μ_x	Age x	μ_x	Age x	μ_x
		50	0.010390	85	0.145626
		51	0.010739	86	0.159634
		52	0.011145	87	0.174996
		53	0.011612	88	0.191839
		54	0.012148	89	0.210304
20	0.009112	55	0.012758	90	0.230546
21	0.009112	56	0.013449	91	0.252733
22	0.009112	57	0.014229	92	0.277050
23	0.009112	58	0.015107	93	0.303698
24	0.009112	59	0.016091	94	0.332900
25	0.009112	60	0.017193	95	0.364897
26	0.009112	61	0.018423	96	0.392562
27	0.009112	62	0.019792	97	0.419619
28	0.009112	63	0.021316	98	0.446006
29	0.009112	64	0.023007	99	0.471647
30	0.009112	65	0.024882	100	0.496444
31	0.009112	66	0.026959	101	0.520263
32	0.009112	67	0.029257	102	0.542910
33	0.009112	68	0.031796	103	0.564071
34	0.009112	69	0.034600	104	0.583139
35	0.009112	70	0.037693	105	0.597837
36	0.009112	71	0.041103	106	0.597837
37	0.009112	72	0.044861	107	0.597837
38	0.009112	73	0.048999	108	0.597837
39	0.009112	74	0.053553	109	0.597837
40	0.009112	75	0.058562	110	0.597837
41	0.009112	76	0.064071	111	0.597837
42	0.009128	77	0.070127	112	0.597837
43	0.009169	78	0.076780	113	0.597837
44	0.009238	79	0.084089	114	0.597837
45	0.009337	80	0.092115	115	0.597837
46	0.009468	81	0.100926	116	0.597837
47	0.009636	82	0.110597	117	0.597837
48	0.009843	83	0.121210	118	0.597837
49	0.010093	84	0.132853	119	0.597837
				120	0.597837

Appendix B: Comparative period expectation of life (eol) and annuity values (at 5% p.a. interest) with no allowance for mortality improvement

Table	eol(50)	eol(65)	eol(80)	ä(50)	ä65)	ä(80)
SPFL03	31.893	19.380	8.678	15.889	12.348	7.137
SPFA03	32.815	20.077	9.085	16.120	12.622	7.389
SPFA03Light	33.331	20.518	9.328	16.239	12.793	7.535
SPFA03Heavy	31.852	19.382	8.663	15.866	12.350	7.132
SNFA03	33.672	20.202	9.098	16.449	12.683	7.394
SNFA03Light	34.151	20.606	9.328	16.555	12.840	7.535
SNFA03Heavy	32.851	19.619	8.752	16.244	12.449	7.179
SIFA03	29.338	17.811	7.953	15.152	11.661	6.700
SWL03	31.450	18.796	8.644	15.821	12.056	7.112
SWA03	32.993	19.923	9.183	16.219	12.529	7.450
SWA03Light	34.190	20.868	9.621	16.507	12.918	7.725
SWA03Heavy	30.793	18.380	8.442	15.635	11.879	6.985
SPML03	28.360	16.220	6.971	15.051	11.001	6.045
SPMA03	30.448	17.580	7.528	15.673	11.621	6.418
SPMA03Light	31.991	18.839	8.061	16.059	12.177	6.773
SPMA03Heavy	27.926	16.263	7.042	14.852	11.011	6.094
SNMA03	30.928	17.673	7.528	15.859	11.672	6.418
SNMA03Light	32.363	18.868	8.062	16.210	12.193	6.774
SNMA03Heavy	28.997	16.371	7.042	15.309	11.070	6.094
SIMA03	25.005	14.412	6.490	13.930	10.088	5.717

Values relative to SPFA03 (female) and SPMA03 (male)

Table	eol(50) %	eol(65) %	eol(80) %	ä(50) %	ä(65) %	ä(80) %
SPFL03	97.2	96.5	95.5	98.6	97.8	96.6
SPFA03	100.0	100.0	100.0	100.0	100.0	100.0
SPFA03Light	101.6	102.2	102.7	100.7	101.4	102.0
SPFA03Heavy	97.1	96.5	95.4	98.4	97.8	96.5
SNFA03	102.6	100.6	100.1	102.0	100.5	100.1
SNFA03Light	104.1	102.6	102.7	102.7	101.7	102.0
SNFA03Heavy	100.1	97.7	96.3	100.8	98.6	97.2
SIFA03	89.4	88.7	87.5	94.0	92.4	90.7
SWL03	95.8	93.6	95.1	98.1	95.5	96.3
SWA03	100.5	99.2	101.1	100.6	99.3	100.8
SWA03Light	104.2	103.9	105.9	102.4	102.3	104.5
SWA03Heavy	93.8	91.5	92.9	97.0	94.1	94.5
SPML03	93.1	92.3	92.6	96.0	94.7	94.2
SPMA03	100.0	100.0	100.0	100.0	100.0	100.0
SPMA03Light	105.1	107.2	107.1	102.5	104.8	105.5
SPMA03Heavy	91.7	92.5	93.5	94.8	94.8	95.0
SNMA03	101.6	100.5	100.0	101.2	100.4	100.0
SNMA03Light	106.3	107.3	107.1	103.4	104.9	105.5
SNMA03Heavy	95.2	93.1	93.5	97.7	95.3	95.0
SIMA03	82.1	82.0	86.2	88.9	86.8	89.1

Note: Expectations of life have been calculated using the approximation $a(x,0\%) + 0.5 - \mu_x/12$

Appendix C: List of questions on which feedback is sought

Q1. Feedback on alternative names or abbreviations to use for Light and Heavy tables is requested.

Q2. It would be possible to graduate the "Light" tables based on the top 12.5% of pension amounts rather than on the top 25%. Feedback is requested as to whether this should be done and a further round of consultation embarked on.

Q3. The Committee would welcome feedback on the retention of Light and Heavy graduations for both "All Pensioner" and "Normal Health Retirees" and, more generally, on which tables should be dropped if the number of proposed tables is thought to be too high.

Q4. The question of which graduations to continue down to a lower age of, say 20, is one on which the Committee would particularly value feedback.

Q5. The Committee would value feedback on whether the "All Pensioner" table should stop at a lowest age of 50

Q6. For tables that are extended downwards, would a starting age of 16 or 17 be preferable to 20?

Q7. The Committee would value feedback on the proposal for older ages.

Q8. The Committee would value feedback as to whether the rates chosen for younger ages are the most suitable.

Q9. Feedback on the suggested table names is requested.