Continuous Mortality Investigation

Mortality Committee

Working Paper 22

The Graduation of the CMI 1999-2002 Mortality Experience: Final "00" Series Mortality Tables – Annuitants and Pensioners

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CMI Mortality Graduation Working Party
Working Paper 22
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The Graduation of the CMI 1999-2002 Mortality Experience:
Final "00" Series Mortality Tables – Annuitants and Pensioners

Introduction

In 2003 the Mortality Committee set up a Working Party to carry out the graduation of a new set of mortality tables, to be based on the 1999-2002 experience. The members of the Mortality Graduation Working Party ("MGWP") are Angus Macdonald (Chairman), John Ellam, Adrian Gallop, Simon Spencer, Joanne Wells, David Wilkie and Richard Willets.

The previous work has been exposed to the Profession in a series of Working Papers:

- Working Paper 8, first published in draft form in May 2004 with the final version made available in August 2004, contained initial findings of the Working Party and proposals on which tables to graduate.
- Working Paper 12, published in April 2005, contained proposed graduations for the assured lives tables.
- Working Paper 16, published in September 2005, contained proposed graduations for the annuitant and pensioner tables.

These were widely publicised, for example via the Profession's e-bulletins, and presentations on the draft tables have been given to numerous seminars, including 'Current Issues in Life Assurance' (CILA) and 'Current Issues in Pensions'.

The MGWP would like to thank all respondents for the valuable comments made. The MGWP has considered the feedback received on both these Working Papers, and has pleasure in presenting the final "00" Series base tables of mortality. This Working Paper contains the final tables for annuitants and pensioners, whilst the final tables for assured lives are contained in Working Paper 21.

These tables have now been approved by the Faculty and Institute Management Committee (FIMC) for adoption by the Actuarial Profession with an effective date of 1 September 2006. **It is the responsibility of any actuary or other person using a base table to ensure that it is appropriate for the particular purpose to which it is put.**

In due course a CMI Report containing the final "00" Series tables will be published. This Report will take account of comments received, up to the time of drafting, should any further explanation or clarification be required.

Any comments on this Working Paper should be submitted to:

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or via email to newtables@cmib.org.uk. In particular, feedback is requested on whether it would be helpful to actuaries for the Life Office Pensioner tables for Early and Combined retirements to be extended below age 50 and, if so, how they would be used in practice (see Page 4 for more details). Please note that if extended rates are subsequently developed, the CMI would not seek approval for these rates from the Profession.

Annuitants and Pensioners tables – feedback on Working Paper 16

The Working Party received two written responses to Working Paper 16 and additional informal feedback.

Select rates

One respondent queried the production of 'all duration' mortality tables for pensioners, and suggested that there was insufficient information on the select durations to form an opinion on whether select tables would have any practical use.

Given the lack of clear evidence, the Working Party does not intend to produce select tables in this instance, but alerts readers to the fact that some select effects may exist. Some information on this was provided in Working Paper 16.

Extension to younger ages

The Working Party received feedback that it would be useful for the pensioner tables to be extended down to younger ages.

The Working Party has revised the Life Office Pensioner tables for Normal retirements so that they now start at age 20. As a result the draft rates between ages 50 and 65 have been changed to reflect assumptions regarding the experience of "healthy" lives rather than the actual experience, using assured lives data. More details of how this was done, together with a comparison of the final rates and those contained in Working Paper 16, are given in the section on page 9 below.

The tables for those retiring early and the combined tables have not been extended below age 50, in the absence of any clear data from this or other CMI investigations. Feedback is requested on whether it would be helpful to actuaries for the Life Office Pensioner tables for Early and Combined retirements to be extended below age 50 and, if so, how they would be used in practice. Please note that if extended rates are subsequently developed, they would necessarily be of an arbitrary nature and the CMI would not seek approval for these rates from the Profession. Please submit feedback via email to newtables@cmib.org.uk.

Calculation of q_x from μ_x

It was suggested for the proposed assured lives tables in Working Paper 12 that the method for deriving values of q_x from the graduated formulae for μ_x was not sufficiently accurate. The Working Party considers this comment equally applicable to the annuitant and pensioner tables proposed in Working Paper 16.

For the original proposals, values of q_x were derived from μ_x by using the formula:

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

using Simpson's rule to evaluate the integral as follows:

$$\int_0^1 \mu_{x+t}\,dt \approx [\mu_x + 3\mu_{x+1/3} + 3\mu_{x+2/3} + \mu_{x+1}] / 8.$$

The following more accurate approximation is now used:

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

This has affected a number of values of q_x in the fifth or sixth decimal place.

Derivation of final Annuitants and Pensioners tables

The following tables have been produced.

Immediate Annuitants

Table	Investigation	Sex	Lives/Amounts	Select Period
IML00	Immediate Annuitants	Male	Lives	0
IFL00	Immediate Annuitants	Female	Lives	1

Life Office Pensioners

Table	Investigation	Sex	Lives/Amounts	Select Period
PNML00	Pensioners, Normal	Male	Lives	0
PNMA00	Pensioners, Normal	Male	Amounts	0
PNFL00	Pensioners, Normal	Female	Lives	0
PNFA00	Pensioners, Normal	Female	Amounts	0
PEML00	Pensioners, Early	Male	Lives	0
PEMA00	Pensioners, Early	Male	Amounts	0
PEFL00	Pensioners, Early	Female	Lives	0
PEFA00	Pensioners, Early	Female	Amounts	0
PCML00	Pensioners, Combined	Male	Lives	0
PCMA00	Pensioners, Combined	Male	Amounts	0
PCFL00	Pensioners, Combined	Female	Lives	0
PCFA00	Pensioners, Combined	Female	Amounts	0
WL00	Widows	Female	Lives	0
WA00	Widows	Female	Amounts	0

After consideration, the Working Party has decided to make a small change to the naming of the tables since the publication of Working Paper 16. The Normal tables will now contain the letter "N" (e.g. PNML00 instead of PML00) to maintain consistency with the new Early and Combined tables, and to remove possible ambiguity.

Retirement Annuitants / Personal Pensioners

Table	Investigation	Sex	Lives/Amounts	Select Period
RMD00	Retirement Annuitants, Deferred	Male	Lives	0
RMV00	Retirement Annuitants, Vested	Male	Lives	0
RMC00	Retirement Annuitants, Combined	Male	Lives	0
RFD00	Retirement Annuitants, Deferred	Female	Lives	0
RFV00	Retirement Annuitants, Vested	Female	Lives	0
RFC00	Retirement Annuitants, Combined	Female	Lives	0
PPMD00	Personal Pensioners, Deferred	Male	Lives	0
PPMV00	Personal Pensioners, Vested	Male	Lives	0
PPMC00	Personal Pensioners, Combined	Male	Lives	0
PPFD00	Personal Pensioners, Deferred	Female	Lives	0
PPFV00	Personal Pensioners, Vested	Female	Lives	0
PPFC00	Personal Pensioners, Combined	Female	Lives	0

Full details of the methodology used, and the thinking behind it, are given in Working Paper 16 and will not be repeated here. However, for ease of reference a brief summary is provided below.

It should additionally be noted that the ultimate values of μ_x in all the tables described below are those originally graduated; this marks a change of approach from the "80" and "92" Series where the published values of μ_x were recalculated from the published values of q_x.

Immediate Annuitants

Ultimate rates

Tables have only been produced for the lives experience. Ultimate rates have been produced for males at durations 0+ and for females at durations 1+. Separate graduations of values of μ_x were produced using the Gompertz-Makeham ("GM") formulae described in Forfar, McCutcheon and Wilkie (1988). Due to a lack of data at younger ages, the proposed tables start at age 60.

At the oldest ages, values of μ_x for $x >$ a were blended into an arbitrary μ_{120} equal to 1 using the formula:

$$\mu_x = \frac{(120-x)^c}{(120-a)^c} \times \mu_a + \left(1 - \frac{(120-x)^c}{(120-a)^c}\right) \times \mu_{120}$$

where the "run-in" age, a, was set at 100 and the "curvature" parameter, c, was set at 1.25 for these tables.

A summary of the key statistics for the unadjusted ultimate graduations is given in Table 1 below. In this table, and equivalent tables throughout this Working Paper for the other experiences, the statistics shown relate to the GM formula fitted to the data before any

adjustments are made to the final graduated rates (e.g. to ensure consistency between sections and at the extremes of age). They are therefore referred to as the "unadjusted" graduations.

Table 1. Unadjusted graduations of the immediate annuitant ultimate experience: key statistics.

Sex	Males	Females
GM formula	GM(1,3)	GM(1,3)
Age range fitted	60-100	60-100
Optimised parameters:		
$100\times a_1$	0.494978	0.275363
T-ratio	1.8	2.0
b_1	–6.069074	–8.233861
T-ratio	–5.6	–9.3
b_2	8.266671	10.673350
T-ratio	6.3	9.7
b_3	–1.514280	–2.908070
T-ratio	–1.8	–4.4
–Log likelihood	8,021.8	12,632.6
Sign test: p(pos)	0.3714	0.3038
Runs test: p(runs)	0.7604	0.9798
K-S test: $p(KS)$	1.0000	0.9771
Serial correlation test:		
T-ratio 1	–0.92	–0.78
T-ratio 2	–1.99	–1.25
T-ratio 3	–2.03	–0.83
χ^2 test:		
χ^2	55.80	56.47
Degrees of freedom	33	30
$p(\chi^2)$	0.0078	0.0024

Values of q_x were derived from the resulting values of μ_x using the method described on page 4 above and then rounded to six decimal places. The value of q_{120} was set equal to 1.

Select rates

Select rates for females at duration 0 have been calculated from the graduated ultimate (i.e. durations 1+) rates over the age range 60-100 as follows:

$$\mu_{\{x\}} = 0.84\times\mu_x.$$

These select rates of μ are for exact age x but an average over the year of duration 0 to 1, so we have decided to use the notation $\mu_{\{x\}}$ in order to differentiate this from the standard notation $\mu_{[x]}$ which may be assumed to relate to exact duration 0. Values of $q_{[x]}$ were then derived from the resulting values of $\mu_{\{x\}}$ using the method described on pages 4 and 5 above but substituting $\mu_{\{x+k\}}$ for μ_{x+k}. Theoretically the integration should vary by both age and duration, but the Working Party believes the method adopted of varying by age only will be sufficiently accurate.

Final tables

The final immediate annuitant base mortality tables are set out in Tables A1 to A3 in the Appendix.

Life Office Pensioners

Ultimate rates only (at durations 0+) were produced using GM formulae for the various sections of the data. In Working Paper 16, the resulting rates were published from age 50 onwards. At younger ages, below about 60, the experience appeared to be flattening out, or even increasing, as age fell. The Working Party's initial preference was to publish rates that reflected the experience, and because the extrapolations of the GM formulae used behaved arbitrarily badly below age 50, did not publish any rates at these ages. However, the Working Party received strong feedback that such rates would be helpful in practice.

The Working Party suspects that the observed mortality at the younger ages of the Normal experience contains a proportion of ill-health retirements. The revised rates proposed in this Working Paper may therefore be considered a 'healthy' extension. This feature was also apparent in the "80" and "92" Series tables, which also did not closely reflect the data at the younger ages.

The Working Party has therefore revised the tables for normal retirements to start at age 20 by taking the value of μ_{20} to be equal to that from the proposed AMC00 (for males) or AFC00 (for females) table as appropriate and then blending it into the value of μ_{65} arising from the original Working Paper 16 pensioner graduations (see the description on page 9 below for further details). This has resulted in significant changes to the rates originally proposed for ages below 65. Changes to the rates of q_x for sample ages 50, 55 and 60 are given below.

Age x	WP16 q_x	WP22 q_x	% Change
PNML00			
50	0.007398	0.001910	–74%
55	0.007734	0.003460	–55%
60	0.009129	0.006647	–27%
PNMA00			
50	0.005583	0.001723	–69%
55	0.006085	0.003002	–51%
60	0.007442	0.005556	–25%
PNFL00			
50	0.003473	0.001520	–56%
55	0.003947	0.002536	–36%
60	0.004579	0.004302	–6%

Age x	WP16 q_x	WP22 q_x	% Change
PNFA00			
50	0.002910	0.001418	–51%
55	0.003310	0.002321	–30%
60	0.003984	0.003862	–3%

The tables for those retiring early and the combined tables have not been extended below age 50, in the absence of any clear data. Feedback is requested on whether it would be helpful to actuaries for the Life Office Pensioner tables for Early and Combined retirements to be extended below age 50 and, if so, how they would be used in practice (see page 3). The MGWP will then consider whether a sensible extension of the tables for Early and Combined retirements to younger ages can be produced. It is not intended that any such extension will form part of the "00" Series tables adopted by the Actuarial Profession, however.

One effect of the approach adopted is that the Combined experience between ages 50 and 65 reflects the underlying data, and can not simply be regarded as a blend of the experience of those retiring early and the rates for Normal retirements contained in these tables.

Specifically, the method adopted for the extension of the Normal experience to younger ages was to find a GM(1,2) formula that satisfied the following:

- $\mu_{20} = \mu_{20}$ from AMC00 (males) or AFC00 (females)
- $D\mu_{20} = D\mu_{20}$ from AMC00 (males) or AFC00 (females)
- $\mu_{65} = \mu_{65}$ from graduated pensioner table for Normals

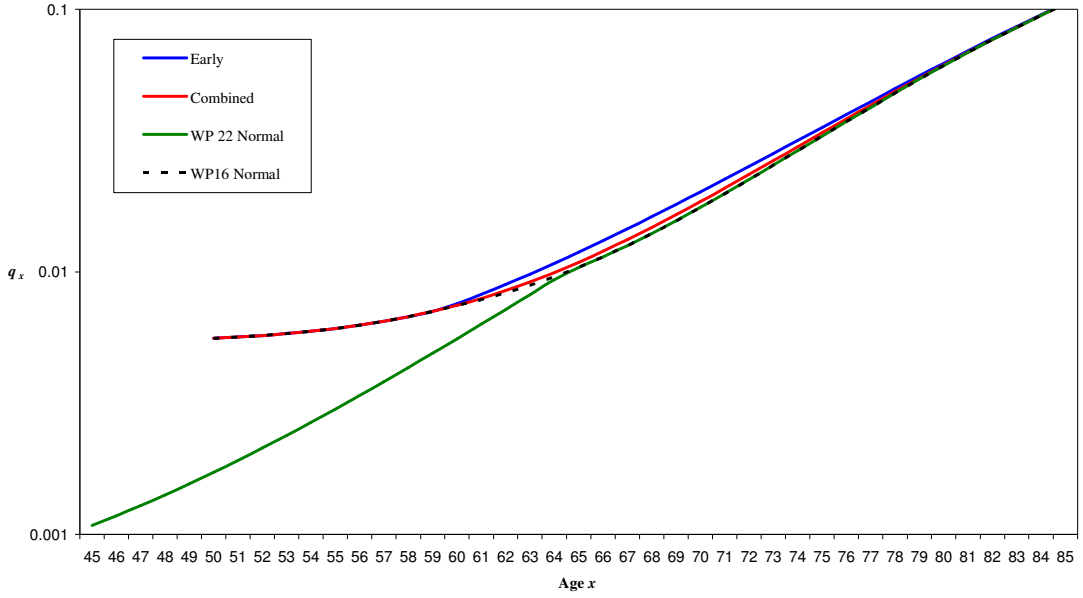
where $D\mu_{20}$ represents the derivative of the curve at age 20.

Optimal parameters for the GM(1,2) function were found using the Excel 'Solver' tool. It is recognised that this results in a discontinuity in the derivative at age 65. The choice of a GM(1,2) function was arbitrary in order to generate the appropriate shape.

Summaries of the key statistics for all the unadjusted Life Office Pensioner graduations are given in Tables 2 to 4 below. In Table 2, full statistics are given only for the GM curves originally fitted to the data, though these curves were eventually only used for ages 65 and above. Only the parameters of the GM(1,2) curves used to extend the Normals to younger ages are shown in this table. There are no further statistics, as the formula is being used arbitrarily without underlying data.

The relative values of the Life Office Pensioner tables at the key ages are illustrated in Figure 1, for males on an amounts basis:

Figure 1. Pensioners, Males, Amounts - values of q_x



The dotted line illustrates the rates for "Normals" proposed in Working Paper 16 and closely reflects actual CMI experience. The solid line for "Normals" illustrates the final rates contained in this paper and is intended to reflect the experience of "healthy lives".

Figure 2 shows the corresponding graph for females:

Figure 2. Pensioners, Females, Amounts - values of q_x

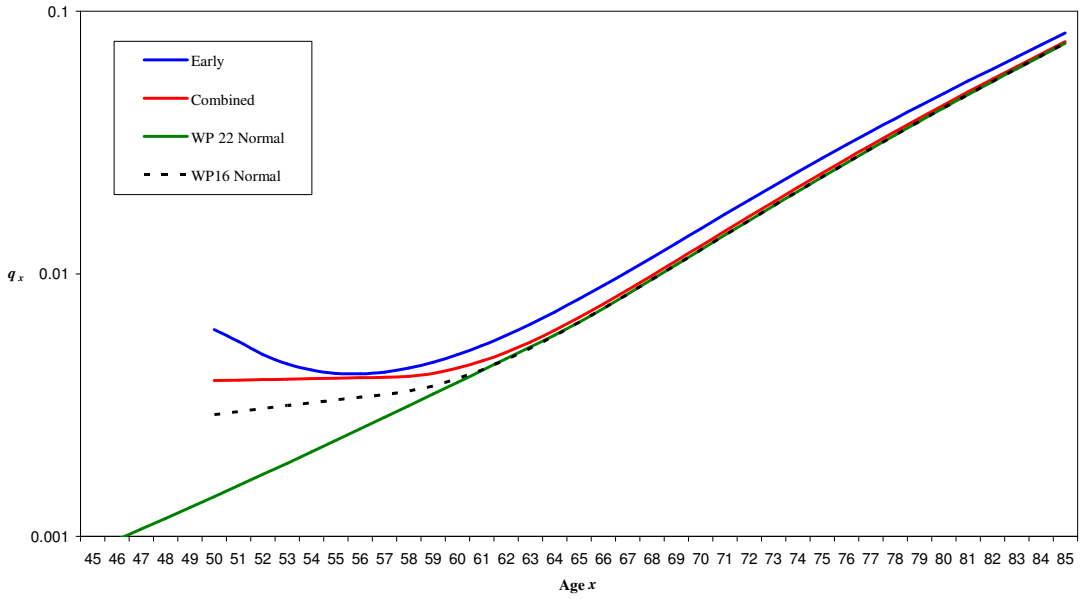


Table 2. Unadjusted graduations of the Normal life office pensioner experience: key statistics.

Sex	Males	Males	Females	Females
Category	Normal	Normal	Normal	Normal
Lives / Amounts	Lives	Amounts	Lives	Amounts
For ages 65 and over				
GM formula	GM(1,4)	GM(1,3)	GM(2,2)	GM(2,2)
Age range fitted	45-97	45-97	45-97	45-97
Optimised parameters:				
$100\times a_1$	0.802951	0.592331	–1.407288	–0.873144
T-ratio	18.3	17.1	–5.5	–4.0
$100\times a_2$			–3.778481	–2.532105
T-ratio			–6.5	–4.9
b_1	–10.196636	–7.397703	–3.602183	–3.894701
T-ratio	–12.9	–27.5	–38.8	–36.3
b_2	15.407579	9.134072	4.552974	4.973934
T-ratio	8.9	34.2	26.8	22.2
b_3	–5.859048	–2.868544		
T-ratio	–7.7	–12.3		
b_4	1.872415			
T-ratio	4.2			
b_5				
T-ratio				
–Log likelihood	192,032.5	144,335.5	54,657.2	41,343.3
Sign test: p(pos)	0.1013	0.2354	0.4439	0.5000
Runs test: p(runs)	0.5000	0.7104	0.0315	0.5000
K-S test: $p(KS)$	0.9951	0.5672	0.6048	0.1325
Serial correlation test:				
T-ratio 1	0.33	–0.72	1.93	0.11
T-ratio 2	–1.83	–1.19	–0.06	–0.96
T-ratio 3	–0.64	0.16	1.31	–0.82
χ^2 test:				
χ^2	88.59	276.59	89.09	332.61
Degrees of freedom	45	44	46	45
$p(\chi^2)$	0.0001	0.0000	0.0001	0.0000
For ages below 65:				
GM formula	GM(1,2)	GM(1,2)	GM(1,2)	GM(1,2)
Optimised parameters:				
$100\times a_1$	0.044516	0.044442	0.014382	0.014225
b_1	–3.706861	–3.955698	–4.429354	–4.574768
b_2	7.228252	6.938504	5.535225	5.357102

Table 3. Unadjusted graduations of the Early life office pensioner experience: key statistics.

Sex	Males	Males	Females	Females
Category	Early	Early	Early	Early
Lives / Amounts	Lives	Amounts	Lives	Amounts
GM formula	GM(1,4)	GM(1,4)	GM(2,2)	GM(0,5)
Age range fitted	45-97	45-97	45-97	45-97
Optimised parameters:				
$100\times a_1$	0.673320	–0.136071	–3.047197	
T-ratio	15.8	–0.5	–3.2	
$100\times a_2$			–6.446960	
T-ratio			–4.2	
b_1	–8.903854	–2.410636	–3.065582	7.065115
T-ratio	–10.6	–3.9	–14.9	4.1
b_2	13.353462	0.481060	3.595655	–5.594119
T-ratio	6.4	0.6	10.0	–5.3
b_3	–4.913046	1.470896		15.031700
T-ratio	–6.0	3.1		6.2
b_4	1.645541	–1.565250		–3.988009
T-ratio	2.7	–6.0		–10.0
b_5				3.700078
T-ratio				5.0
–Log likelihood	78,330.7	59,273.8	16,016.2	12,428.2
Sign test: *p*(pos)	0.3359	0.4427	0.5561	0.1264
Runs test: *p*(runs)	0.8534	0.3341	0.4466	0.5969
K-S test: *p*(*KS*)	1.0000	0.8208	1.0000	1.0000
Serial correlation test:				
T-ratio 1	–1.76	–0.36	0.10	–2.06
T-ratio 2	–0.11	–0.86	–1.32	–1.30
T-ratio 3	0.72	–1.82	–0.83	1.20
χ^2 test:				
χ^2	45.27	189.76	54.09	193.39
Degrees of freedom	45	43	46	44
$p(\chi^2)$	0.4607	0.0000	0.1929	0.0000

Table 4. Unadjusted graduations of the Combined life office pensioner experience: key statistics.

Sex	Males	Males	Females	Females
Category	Combined	Combined	Combined	Combined
Lives / Amounts	Lives	Amounts	Lives	Amounts
GM formula	GM(1,4)	GM(1,3)	GM(2,2)	GM(2,2)
Age range fitted	45-97	45-97	45-97	45-97
Optimised parameters:				
$100\times a_1$	0.735863	0.536403	–1.594305	–1.286105
T-ratio	24.8	19.7	–6.6	–5.3
$100\times a_2$			–4.144155	–3.607197
T-ratio			–8.1	–6.9
b_1	–9.258547	–6.688640	–3.511518	–3.693170
T-ratio	–16.8	–31.9	–43.3	–37.7
b_2	13.714773	8.359170	4.377971	4.602553
T-ratio	11.0	41.5	29.3	23.1
b_3	–5.064792	–2.286393		
T-ratio	–9.6	–12.3		
b_4	1.565239			
T-ratio	4.6			
b_5				
T-ratio				
–Log likelihood	270,457.6	202,873.3	70,699.7	54,383.3
Sign test: p(pos)	0.3389	0.5000	0.5000	0.5000
Runs test: p(runs)	0.5720	0.6646	0.1334	0.1981
K-S test: $p(KS)$	1.0000	0.2983	0.4407	0.1156
Serial correlation test:				
T-ratio 1	0.33	–1.13	1.40	0.04
T-ratio 2	–0.56	0.09	0.11	–1.38
T-ratio 3	0.75	–0.16	0.76	0.90
χ^2 test:				
χ^2	80.48	259.21	95.90	330.33
Degrees of freedom	47	46	49	47
$p(\chi^2)$	0.0017	0.0000	0.0001	0.0000

Adjustments

At older ages, rates were again blended into the arbitrary target of $\mu_{120} = 1$ using the method described on page 6 for the Immediate Annuitants. However, in this case, instead of using a "run-in" age, a, of 100 and a "curvature" parameter, c, of 1.25, different values were used for the different sections of the data to reduce, as far as possible, the resulting kink in the curve when this method is applied. These are summarised in the table below.

Table	"Run-in" Age, a	"Curvature" parameter, c
Male, Normal, Lives	96	0.75
Male, Early, Lives	96	0.75
Male, Combined, Lives	97	0.80
Male, Normal, Amounts	97	0.70
Male, Early, Amounts	94	070
Male, Combined, Amounts	97	0.80
Female, Normal, Lives	97	0.85
Female, Early, Lives	95	0.80
Female, Combined, Lives	97	0.90
Female, Normal, Amounts	97	0.90
Female, Early, Amounts	95	0.70
Female, Combined, Amounts	97	0.90

A number of constraints were then used to ensure that the resulting curves did not cross over in undesirable ways. This is described fully in Working Paper 16, pages 22-24, and will not be repeated here, though comments relating to ages below 65 for Normal retirements are now no longer relevant given the revised method for deriving rates for these ages described on page 9 above. The effect of these contraints was to produce consistency between Combined, Normal and Early rates, between lives and amounts and between males and females.

Final tables

The final life office pensioner base mortality tables are set out in Tables A4 to A19 in the Appendix.

Widows

No comments were received on the Widows tables and so, other than the more accurate derivation of q_x from μ_x, these are unchanged from the proposals set out in Working Paper 16. Summaries of the key statistics for the unadjusted graduations are given in the table below.

Table 5. Unadjusted graduations of the Widows experience: key statistics.

Sex	Females	Females
Category	Widows	Widows
Lives / Amounts	Lives	Amounts
GM formula	GM(1,2)	GM(1,2)
Age range fitted	55-98	55-98
Optimised parameters:		
$100\times a_1$	0.307161	0.269451
T-ratio	3.6	4.3
b_1	–4.235211	–4.468221
T-ratio	–74.6	–81.0
b_2	5.258961	5.839618
T-ratio	36.1	38.1
–Log likelihood	39,792.7	32,130.4
Sign test: p(pos)	0.6742	0.4402
Runs test: p(runs)	0.9254	0.6825
K-S test: $p(KS)$	1.0000	0.0560
Serial correlation test:		
T-ratio 1	–1.41	0.06
T-ratio 2	–0.51	–1.86
T-ratio 3	0.53	–1.03
χ^2 test:		
χ^2	49.30	259.08
Degrees of freedom	41	41
$p(\chi^2)$	0.1752	0.0000

Adjustments

Again, rates were blended into $\mu_{120} = 1$ using the method set on page 6 for the Immediate Annuitants. The blending used a "run-in" age, a, of 98, and the "curvature" parameter, c, was 0.90 for lives and 1.10 for amounts.

This method was also used to produce rates at younger ages. In this case, arbitrary values of μ_{16} were blended into the graduated rates of μ_{55}. The starting values of μ_{16} were 0.000200 for lives and 0.000150 for amounts, and the "curvature" parameter was 1.15 in both cases.

Final tables

The final widows base mortality tables are set out in Tables A20 to A23 in the Appendix.

Retirement Annuitants and Personal Pensioners

No comments were received on these tables. Other than the more accurate derivation of q_x from μ_x and a typographical correction to the value of q_{71} in the PPMC00 table, they remain unchanged from those proposed in Working Paper 16. Summaries of the key statistics for the unadjusted graduations are given in the tables below.

Table 6. Unadjusted graduations of the Retirement Annuitant experience, males: key statistics.

Sex	Males	Males	Males
Category	Deferred	Vested	Combined
Lives / Amounts	Lives	Lives	Lives
GM formula	GM(1,3)	GM(2,2)	GM(1,3)
Age range fitted	30-75	45-95	30-95
Optimised parameters:			
$100\times a_1$	0.041244	–1.881491	0.037871
T-ratio	5.1	–4.3	6.8
$100\times a_2$		–6.446652	
T-ratio		–6.6	
b_1	–5.954870	–3.260284	–4.289179
T-ratio	–15.0	–29.0	–59.8
b_2	3.983058	4.292047	5.834998
T-ratio	16.3	21.1	129.3
b_3	–1.616713		–0.286044
T-ratio	–4.3		–3.9
b_4			
T-ratio			
–Log likelihood	85,239.8	121,161.3	206,997.7
Sign test: p(pos)	0.3258	0.9703	0.7388
Runs test: p(runs)	0.3417	0.2137	0.4779
K-S test: $p(KS)$	0.9907	0.6256	0.7164
Serial correlation test:			
T-ratio 1	0.62	0.55	0.40
T-ratio 2	–0.75	1.31	1.74
T-ratio 3	–0.18	–0.56	–0.48
χ^2 test:			
χ^2	66.42	136.29	139.71
Degrees of freedom	40	44	60
$p(\chi^2)$	0.0054	0.0000	0.0000

Table 7. Unadjusted graduations of the Retirement Annuitant experience, females: key statistics.

Sex	Females	Females	Females
Category	Deferred	Vested	Combined
Lives / Amounts	Lives	Lives	Lives
GM formula	GM(0,2)	GM(2,2)	GM(1,3)
Age range fitted	30-75	45-95	30-95
Optimised parameters:			
$100\times a_1$		–0.617486	–0.005052
T-ratio		–2.2	–0.1
$100\times a_2$		–2.807680	
T-ratio		–3.6	
b_1	–4.787615	–4.152614	–3.512802
T-ratio	–95.7	–23.8	–9.5
b_2	4.035249	5.410052	5.364421
T-ratio	24.1	14.6	16.4
b_3			1.068144
T-ratio			3.2
b_4			
T-ratio			
–Log likelihood	11,180.2	21,669.5	32,926.5
Sign test: p(pos)	0.5000	0.7743	0.1528
Runs test: p(runs)	0.4381	0.7229	0.4637
K-S test: $p(KS)$	0.9261	1.0000	0.7171
Serial correlation test:			
T-ratio 1	0.02	0.17	1.05
T-ratio 2	–2.15	–0.69	–0.67
T-ratio 3	0.25	–1.38	1.26
χ^2 test:			
χ^2	79.44	53.08	98.07
Degrees of freedom	38	40	57
$p(\chi^2)$	0.0001	0.0806	0.0006

Table 8. Unadjusted graduations of the Personal Pensioner experience, males: key statistics.

Sex	Males	Males	Males
Category	Deferred	Vested	Combined
Lives / Amounts	Lives	Lives	Lives
GM formula	GM(1,3)	GM(0,4)	GM(1,4)
Age range fitted	20-75	30-85	30-80
Optimised parameters:			
$100\times a_1$	0.042022		0.042428
T-ratio	15.3		16.1
$100\times a_2$			
T-ratio			
b_1	–5.894375	–1.805621	–4.527817
T-ratio	–23.1	–12.5	–34.5
b_2	3.659673	1.817239	6.335509
T-ratio	16.1	22.2	76.5
b_3	–1.542952	2.323129	–0.359870
T-ratio	–6.6	15.6	–2.8
b_4		†–0.750000	†0.600000
T-ratio		0.0	0.0
–Log likelihood	113,501.6	49,863.9	159,443.0
Sign test: p(pos)	0.5000	0.4402	0.6101
Runs test: p(runs)	0.5000	0.3273	0.8089
K-S test: $p(KS)$	0.9871	0.9431	1.0000
Serial correlation test:			
T-ratio 1	–0.60	0.93	–1.04
T-ratio 2	1.13	–0.06	0.29
T-ratio 3	–1.30	–0.51	–0.72
χ^2 test:			
χ^2	98.21	99.06	93.30
Degrees of freedom	51	40	46
$p(\chi^2)$	0.0001	0.0000	0.0000

† Fixed Parameter.

Table 9. Unadjusted graduations of the Personal Pensioner experience, females: key statistics.

Sex	Females	Females	Females
Category	Deferred	Vested	Combined
Lives / Amounts	Lives	Lives	Lives
GM formula	GM(0,3)	GM(1,3)	GM(1,4)
Age range fitted	25-75	40-86	25-85
Optimised parameters:			
$100\times a_1$		0.410381	†0.010000
T-ratio		17.4	0.0
$100\times a_2$			
T-ratio			
b_1	–5.619389	–6.745098	–4.845442
T-ratio	–24.9	–58.6	–39.7
b_2	3.099457	9.343251	4.792242
T-ratio	10.1	13.9	32.8
b_3	–0.684653	†–1.200000	–0.107757
T-ratio	–4.0	0.0	–1.0
b_4			†0.250000
T-ratio			0.0
–Log likelihood	33,674.4	10,852.5	44,599.7
Sign test: p(pos)	0.5561	0.2664	0.7405
Runs test: p(runs)	0.4466	0.5376	0.1349
K-S test: $p(KS)$	1.0000	0.9130	0.6695
Serial correlation test:			
T-ratio 1	0.22	0.05	2.45
T-ratio 2	–1.05	0.21	1.20
T-ratio 3	–1.04	–2.13	–0.90
χ^2 test:			
χ^2	66.32	63.31	115.54
Degrees of freedom	47	37	55
$p(\chi^2)$	0.0331	0.0045	0.0000

† Fixed parameter.

Adjustments

Vested tables cover the age range 50-120. Deferred tables cover the age range 17-75.

The Vested tables have been adjusted at the older ages to target $\mu_{120} = 1$ in the same way as the Immediate Annuitants as described on page 6. Furthermore, Combined rates have been set equal to Vested rates above certain ages and equal to Deferred rates below certain ages, as summarised in the table below. The ages represent the point (to the nearest 0.01) at which the graduated curves would cross, or the nearest point in the event that they do not cross.

Category	Lower age up to which Combined = Deferred	Upper age from which Combined = Vested
Retirement Annuitants, Male	53.46	86.62
Retirement Annuitants, Female	58.65	74.35
Personal Pensioners, Male	39.99	71.67
Personal Pensioners, Female	49.52	73.93

Final tables

The final retirement annuitant base mortality tables are set out in Tables A24 to A31 in the Appendix. The final personal pensioner base mortality tables are set out in Tables A32 to A39 in the Appendix.

References

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.

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Final values of mortality rates for the "00" Series annuitant and pensioner mortality tables.

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Table A1. Immediate Annuitants, males, lives – IML00 ultimate: values of q_x and μ_x

Age x	q_x	μ_x	Age x	q_x	μ_x
60	0.006889	0.006733	90	0.175045	0.181757
61	0.007290	0.007103	91	0.193583	0.203437
62	0.007766	0.007543	92	0.213426	0.227236
63	0.008331	0.008065	93	0.234556	0.253287
64	0.008998	0.008683	94	0.256937	0.281719
65	0.009784	0.009414	95	0.280516	0.312659
66	0.010708	0.010274	96	0.305218	0.346231
67	0.011791	0.011285	97	0.330948	0.382550
68	0.013057	0.012469	98	0.357594	0.421722
69	0.014533	0.013853	99	0.385022	0.463845
70	0.016248	0.015466	100	0.408020	0.509003
71	0.018235	0.017342	101	0.425685	0.539496
72	0.020531	0.019517	102	0.442596	0.569591
73	0.023176	0.022032	103	0.458780	0.599270
74	0.026214	0.024933	104	0.474261	0.628515
75	0.029692	0.028271	105	0.489061	0.657307
76	0.033661	0.032099	106	0.503202	0.685623
77	0.038177	0.036480	107	0.516703	0.713437
78	0.043297	0.041478	108	0.529580	0.740721
79	0.049083	0.047167	109	0.541848	0.767442
80	0.055598	0.053624	110	0.553517	0.793561
81	0.062909	0.060933	111	0.564597	0.819035
82	0.071083	0.069183	112	0.575092	0.843810
83	0.080187	0.078470	113	0.585000	0.867821
84	0.090286	0.088897	114	0.594315	0.890987
85	0.101447	0.100571	115	0.603018	0.913203
86	0.113728	0.113604	116	0.611074	0.934330
87	0.127185	0.128115	117	0.618418	0.954165
88	0.141867	0.144226	118	0.624920	0.972389
89	0.157811	0.162064	119	0.630216	0.988391
			120	1.000000	1.000000

Table A2. Immediate Annuitants, females, lives – IFL00 select and ultimate: values of $q_{[x]}$ and q_x

Age x	Duration 0	Durations 1+	Age x	Duration 0	Durations 1+
60	0.002746	0.003269	90	0.117151	0.137857
61	0.002873	0.003419	91	0.130296	0.153117
62	0.003033	0.003610	92	0.144208	0.169221
63	0.003235	0.003850	93	0.158823	0.186083
64	0.003487	0.004150	94	0.174059	0.203602
65	0.003801	0.004523	95	0.189819	0.221660
66	0.004189	0.004985	96	0.205993	0.240123
67	0.004668	0.005555	97	0.222459	0.258846
68	0.005256	0.006254	98	0.239087	0.277676
69	0.005972	0.007105	99	0.255737	0.296453
70	0.006841	0.008139	100	0.276136	0.319348
71	0.007890	0.009385	101		0.345503
72	0.009148	0.010881	102		0.370321
73	0.010651	0.012667	103		0.393866
74	0.012436	0.014787	104		0.416195
75	0.014543	0.017289	105		0.437364
76	0.017017	0.020226	106		0.457423
77	0.019907	0.023653	107		0.476418
78	0.023261	0.027630	108		0.494390
79	0.027132	0.032215	109		0.511378
80	0.031573	0.037472	110		0.527415
81	0.036637	0.043461	111		0.542528
82	0.042376	0.050241	112		0.556739
83	0.048839	0.057868	113		0.570063
84	0.056072	0.066390	114		0.582503
85	0.064113	0.075850	115		0.594050
86	0.072993	0.086280	116		0.604673
87	0.082733	0.097698	117		0.614302
88	0.093344	0.110110	118		0.622781
89	0.104823	0.123506	119		0.629655
			120		1.000000

Table A3. Immediate Annuitants, females, lives – IFL00 select and ultimate: values of $\mu_{[x]}$ and μ_x

Age x	Duration 0	Durations 1+	Age x	Duration 0	Durations 1+
60	0.002696	0.003210	90	0.117478	0.139855
61	0.002809	0.003344	91	0.131913	0.157039
62	0.002951	0.003513	92	0.147479	0.175571
63	0.003131	0.003728	93	0.164161	0.195430
64	0.003357	0.003996	94	0.181922	0.216573
65	0.003639	0.004332	95	0.200706	0.238936
66	0.003989	0.004749	96	0.220438	0.262426
67	0.004422	0.005264	97	0.241019	0.286928
68	0.004955	0.005898	98	0.262330	0.312297
69	0.005606	0.006674	99	0.284228	0.338366
70	0.006399	0.007618	100	0.306551	0.364942
71	0.007360	0.008762	101		0.404382
72	0.008517	0.010140	102		0.443306
73	0.009905	0.011792	103		0.481693
74	0.011560	0.013761	104		0.519519
75	0.013523	0.016099	105		0.556759
76	0.015840	0.018857	106		0.593382
77	0.018560	0.022095	107		0.629357
78	0.021736	0.025876	108		0.664647
79	0.025425	0.030268	109		0.699208
80	0.029688	0.035343	110		0.732991
81	0.034587	0.041174	111		0.765939
82	0.040185	0.047839	112		0.797983
83	0.046548	0.055414	113		0.829038
84	0.053740	0.063976	114		0.859001
85	0.061824	0.073600	115		0.887737
86	0.070859	0.084356	116		0.915062
87	0.080900	0.096309	117		0.940717
88	0.091993	0.109515	118		0.964288
89	0.104177	0.124020	119		0.984985
			120		1.000000

Table A4. Pensioners, males, Normal, lives – PNML00: values of q_x

Age x	q_x	Age x	q_x	Age x	q_x
20	0.000464	55	0.003460	90	0.164961
21	0.000467	56	0.003928	91	0.178655
22	0.000471	57	0.004469	92	0.192770
23	0.000475	58	0.005093	93	0.207228
24	0.000479	59	0.005814	94	0.221944
25	0.000485	60	0.006647	95	0.236827
26	0.000491	61	0.007608	96	0.251782
27	0.000498	62	0.008718	97	0.268234
28	0.000506	63	0.009998	98	0.285990
29	0.000515	64	0.011476	99	0.303475
30	0.000526	65	0.012853	100	0.320697
31	0.000539	66	0.014141	101	0.337664
32	0.000554	67	0.015689	102	0.354385
33	0.000571	68	0.017526	103	0.370869
34	0.000590	69	0.019684	104	0.387125
35	0.000613	70	0.022191	105	0.403165
36	0.000639	71	0.025076	106	0.418999
37	0.000669	72	0.028363	107	0.434641
38	0.000704	73	0.032072	108	0.450104
39	0.000744	74	0.036220	109	0.465405
40	0.000790	75	0.040819	110	0.480562
41	0.000844	76	0.045878	111	0.495600
42	0.000906	77	0.051400	112	0.510546
43	0.000978	78	0.057382	113	0.525437
44	0.001061	79	0.063822	114	0.540323
45	0.001156	80	0.070710	115	0.555271
46	0.001267	81	0.078038	116	0.570389
47	0.001395	82	0.085793	117	0.585858
48	0.001542	83	0.093964	118	0.602053
49	0.001713	84	0.102542	119	0.620322
50	0.001910	85	0.111517	120	1.000000
51	0.002137	86	0.120886		
52	0.002400	87	0.130647		
53	0.002704	88	0.140805		
54	0.003055	89	0.151866		

Table A5. Pensioners, males, Normal, lives – PNML00: values of μ_x

Age x	μ_x	Age x	μ_x	Age x	μ_x
20	0.000463	55	0.003253	90	0.172287
21	0.000466	56	0.003690	91	0.188407
22	0.000469	57	0.004194	92	0.205351
23	0.000473	58	0.004778	93	0.223066
24	0.000477	59	0.005451	94	0.241484
25	0.000482	60	0.006230	95	0.260526
26	0.000488	61	0.007130	96	0.280096
27	0.000494	62	0.008169	97	0.300087
28	0.000502	63	0.009371	98	0.324539
29	0.000511	64	0.010759	99	0.349215
30	0.000521	65	0.012363	100	0.374128
31	0.000533	66	0.013548	101	0.399290
32	0.000546	67	0.014981	102	0.424719
33	0.000562	68	0.016695	103	0.450433
34	0.000580	69	0.018723	104	0.476450
35	0.000601	70	0.021098	105	0.502796
36	0.000625	71	0.023851	106	0.529495
37	0.000653	72	0.027012	107	0.556579
38	0.000686	73	0.030609	108	0.584083
39	0.000723	74	0.034665	109	0.612050
40	0.000766	75	0.039201	110	0.640531
41	0.000816	76	0.044235	111	0.669588
42	0.000874	77	0.049779	112	0.699300
43	0.000941	78	0.055843	113	0.729766
44	0.001018	79	0.062434	114	0.761118
45	0.001107	80	0.069554	115	0.793539
46	0.001210	81	0.077204	116	0.827293
47	0.001328	82	0.085386	117	0.862799
48	0.001466	83	0.094098	118	0.900806
49	0.001625	84	0.103343	119	0.943028
50	0.001808	85	0.113124	120	1.000000
51	0.002020	86	0.123448		
52	0.002265	87	0.134327		
53	0.002548	88	0.145782		
54	0.002875	89	0.157840		

Table A6. Pensioners, males, Normal, amounts – PNMA00: values of q_x

Age x	q_x	Age x	q_x	Age x	q_x
20	0.000464	55	0.003002	90	0.164961
21	0.000467	56	0.003382	91	0.178655
22	0.000471	57	0.003818	92	0.192770
23	0.000475	58	0.004320	93	0.207228
24	0.000479	59	0.004895	94	0.221944
25	0.000484	60	0.005556	95	0.236827
26	0.000490	61	0.006315	96	0.251782
27	0.000497	62	0.007186	97	0.268234
28	0.000505	63	0.008185	98	0.285990
29	0.000514	64	0.009332	99	0.303475
30	0.000524	65	0.010403	100	0.320697
31	0.000536	66	0.011401	101	0.337664
32	0.000550	67	0.012589	102	0.354385
33	0.000565	68	0.013996	103	0.370869
34	0.000583	69	0.015654	104	0.387125
35	0.000604	70	0.017595	105	0.403165
36	0.000628	71	0.019857	106	0.418999
37	0.000655	72	0.022477	107	0.434641
38	0.000686	73	0.025495	108	0.450104
39	0.000722	74	0.028951	109	0.465405
40	0.000764	75	0.032886	110	0.480562
41	0.000811	76	0.037340	111	0.495600
42	0.000866	77	0.042351	112	0.510546
43	0.000929	78	0.047953	113	0.525437
44	0.001001	79	0.054179	114	0.540323
45	0.001083	80	0.061052	115	0.555271
46	0.001178	81	0.068592	116	0.570389
47	0.001288	82	0.076701	117	0.585858
48	0.001413	83	0.085390	118	0.602053
49	0.001557	84	0.094774	119	0.620322
50	0.001723	85	0.104850	120	1.000000
51	0.001913	86	0.115610		
52	0.002132	87	0.127035		
53	0.002382	88	0.139096		
54	0.002671	89	0.151755		

Table A7. Pensioners, males, Normal, amounts – PNMA00: values of μ_x

Age x	μ_x	Age x	μ_x	Age x	μ_x
20	0.000463	55	0.002833	90	0.172287
21	0.000466	56	0.003188	91	0.188407
22	0.000469	57	0.003596	92	0.205351
23	0.000473	58	0.004066	93	0.223066
24	0.000477	59	0.004605	94	0.241484
25	0.000482	60	0.005224	95	0.260526
26	0.000487	61	0.005936	96	0.280096
27	0.000493	62	0.006753	97	0.300087
28	0.000501	63	0.007692	98	0.324539
29	0.000509	64	0.008771	99	0.349215
30	0.000519	65	0.010010	100	0.374128
31	0.000530	66	0.010932	101	0.399290
32	0.000543	67	0.012033	102	0.424719
33	0.000557	68	0.013342	103	0.450433
34	0.000574	69	0.014891	104	0.476450
35	0.000593	70	0.016713	105	0.502796
36	0.000615	71	0.018846	106	0.529495
37	0.000641	72	0.021330	107	0.556579
38	0.000670	73	0.024207	108	0.584083
39	0.000704	74	0.027521	109	0.612050
40	0.000742	75	0.031320	110	0.640531
41	0.000787	76	0.035651	111	0.669588
42	0.000838	77	0.040560	112	0.699300
43	0.000896	78	0.046096	113	0.729766
44	0.000963	79	0.052302	114	0.761118
45	0.001041	80	0.059223	115	0.793539
46	0.001129	81	0.066895	116	0.827293
47	0.001231	82	0.075352	117	0.862799
48	0.001348	83	0.084390	118	0.900806
49	0.001483	84	0.094269	119	0.943028
50	0.001638	85	0.105018	120	1.000000
51	0.001815	86	0.116660		
52	0.002019	87	0.129207		
53	0.002254	88	0.142665		
54	0.002523	89	0.157030		

Table A8. Pensioners, males, Early, lives and amounts – PEML00 and PEMA00: values of q_x

Age x	Lives	Amounts	Age x	Lives	Amounts
50	0.007398	0.005583	85	0.118047	0.105652
51	0.007429	0.005646	86	0.127076	0.116516
52	0.007473	0.005724	87	0.136461	0.128085
53	0.007535	0.005820	88	0.146216	0.140314
54	0.007620	0.005939	89	0.156362	0.153136
55	0.007734	0.006085	90	0.167078	0.166464
56	0.007888	0.006265	91	0.180188	0.180188
57	0.008090	0.006484	92	0.194176	0.194176
58	0.008355	0.006750	93	0.208276	0.208276
59	0.008695	0.007074	94	0.223303	0.223303
60	0.009201	0.007565	95	0.239168	0.239168
61	0.009912	0.008211	96	0.254898	0.254898
62	0.010783	0.008954	97	0.270499	0.270499
63	0.011838	0.009805	98	0.286266	0.286266
64	0.013102	0.010778	99	0.303475	0.303475
65	0.014602	0.011887	100	0.320697	0.320697
66	0.016361	0.013150	101	0.337664	0.337664
67	0.018406	0.014587	102	0.354385	0.354385
68	0.020760	0.016219	103	0.370869	0.370869
69	0.023445	0.018069	104	0.387125	0.387125
70	0.026481	0.020166	105	0.403165	0.403165
71	0.029884	0.022538	106	0.418999	0.418999
72	0.033667	0.025218	107	0.434641	0.434641
73	0.037841	0.028240	108	0.450104	0.450104
74	0.042412	0.031642	109	0.465405	0.465405
75	0.047383	0.035463	110	0.480562	0.480562
76	0.052753	0.039746	111	0.495600	0.495600
77	0.058519	0.044532	112	0.510546	0.510546
78	0.064676	0.049866	113	0.525437	0.525437
79	0.071215	0.055789	114	0.540323	0.540323
80	0.078129	0.062343	115	0.555271	0.555271
81	0.085408	0.069565	116	0.570389	0.570389
82	0.093045	0.077487	117	0.585858	0.585858
83	0.101033	0.086134	118	0.602053	0.602053
84	0.109367	0.095521	119	0.620322	0.620322
			120	1.000000	1.000000

Table A9. Pensioners, males, Early, lives and amounts – PEML00 and PEMA00: values of μ_x

Age x	Lives	Amounts	Age x	Lives	Amounts
50	0.007413	0.005572	85	0.120639	0.105870
51	0.007439	0.005628	86	0.130677	0.117611
52	0.007477	0.005698	87	0.141222	0.130313
53	0.007529	0.005785	88	0.152301	0.143971
54	0.007602	0.005893	89	0.163951	0.158556
55	0.007701	0.006025	90	0.176219	0.174015
56	0.007834	0.006188	91	0.190266	0.190266
57	0.008012	0.006387	92	0.207197	0.207197
58	0.008245	0.006630	93	0.224658	0.224658
59	0.008547	0.006925	94	0.242468	0.242468
60	0.008935	0.007298	95	0.262982	0.262982
61	0.009577	0.007904	96	0.283745	0.283745
62	0.010372	0.008602	97	0.304769	0.304769
63	0.011342	0.009404	98	0.326069	0.326069
64	0.012511	0.010323	99	0.349215	0.349215
65	0.013907	0.011373	100	0.374128	0.374128
66	0.015556	0.012570	101	0.399290	0.399290
67	0.017486	0.013935	102	0.424719	0.424719
68	0.019723	0.015488	103	0.450433	0.450433
69	0.022292	0.017253	104	0.476450	0.476450
70	0.025218	0.019259	105	0.502796	0.502796
71	0.028522	0.021534	106	0.529495	0.529495
72	0.032224	0.024112	107	0.556579	0.556579
73	0.036340	0.027030	108	0.584083	0.584083
74	0.040884	0.030329	109	0.612050	0.612050
75	0.045866	0.034052	110	0.640531	0.640531
76	0.051294	0.038245	111	0.669588	0.669588
77	0.057173	0.042960	112	0.699300	0.699300
78	0.063506	0.048249	113	0.729766	0.729766
79	0.070294	0.054165	114	0.761118	0.761118
80	0.077538	0.060766	115	0.793539	0.793539
81	0.085238	0.068105	116	0.827293	0.827293
82	0.093394	0.076238	117	0.862799	0.862799
83	0.102008	0.085215	118	0.900806	0.900806
84	0.111087	0.095080	119	0.943028	0.943028
			120	1.000000	1.000000

Table A10. Pensioners, males, Combined, lives and amounts – PCML00 and PCMA00: values of q_x

Age x	Lives	Amounts	Age x	Lives	Amounts
50	0.007398	0.005583	85	0.112976	0.104850
51	0.007429	0.005646	86	0.122239	0.115610
52	0.007473	0.005724	87	0.131889	0.127035
53	0.007535	0.005820	88	0.141929	0.139096
54	0.007620	0.005939	89	0.152411	0.151755
55	0.007734	0.006085	90	0.164961	0.164961
56	0.007888	0.006265	91	0.178655	0.178655
57	0.008090	0.006484	92	0.192770	0.192770
58	0.008355	0.006750	93	0.207228	0.207228
59	0.008695	0.007072	94	0.221944	0.221944
60	0.009129	0.007461	95	0.236827	0.236827
61	0.009674	0.007928	96	0.251782	0.251782
62	0.010352	0.008487	97	0.268234	0.268234
63	0.011186	0.009152	98	0.285990	0.285990
64	0.012201	0.009942	99	0.303475	0.303475
65	0.013423	0.010874	100	0.320697	0.320697
66	0.014879	0.011972	101	0.337664	0.337664
67	0.016596	0.013258	102	0.354385	0.354385
68	0.018603	0.014758	103	0.370869	0.370869
69	0.020925	0.016500	104	0.387125	0.387125
70	0.023589	0.018515	105	0.403165	0.403165
71	0.026617	0.020835	106	0.418999	0.418999
72	0.030030	0.023494	107	0.434641	0.434641
73	0.033846	0.026528	108	0.450104	0.450104
74	0.038079	0.029974	109	0.465405	0.465405
75	0.042740	0.033868	110	0.480562	0.480562
76	0.047836	0.038250	111	0.495600	0.495600
77	0.053371	0.043156	112	0.510546	0.510546
78	0.059345	0.048622	113	0.525437	0.525437
79	0.065754	0.054681	114	0.540323	0.540323
80	0.072594	0.061364	115	0.555271	0.555271
81	0.079857	0.068697	116	0.570389	0.570389
82	0.087535	0.076701	117	0.585858	0.585858
83	0.095619	0.085390	118	0.602053	0.602053
84	0.104102	0.094774	119	0.620322	0.620322
			120	1.000000	1.000000

Table A11. Pensioners, males, Combined, lives and amounts – PCML00 and PCMA00: values of μ_x

Age x	Lives	Amounts	Age x	Lives	Amounts
50	0.007413	0.005572	85	0.114817	0.105018
51	0.007439	0.005628	86	0.125041	0.116660
52	0.007477	0.005698	87	0.135814	0.129207
53	0.007529	0.005785	88	0.147154	0.142665
54	0.007602	0.005893	89	0.159085	0.157030
55	0.007701	0.006025	90	0.172287	0.172287
56	0.007834	0.006188	91	0.188407	0.188407
57	0.008012	0.006387	92	0.205351	0.205351
58	0.008245	0.006630	93	0.223066	0.223066
59	0.008547	0.006925	94	0.241484	0.241484
60	0.008935	0.007281	95	0.260526	0.260526
61	0.009425	0.007710	96	0.280096	0.280096
62	0.010039	0.008224	97	0.300087	0.300087
63	0.010799	0.008839	98	0.324539	0.324539
64	0.011730	0.009570	99	0.349215	0.349215
65	0.012857	0.010437	100	0.374128	0.374128
66	0.014210	0.011459	101	0.399290	0.399290
67	0.015816	0.012661	102	0.424719	0.424719
68	0.017705	0.014068	103	0.450433	0.450433
69	0.019906	0.015709	104	0.476450	0.476450
70	0.022448	0.017614	105	0.502796	0.502796
71	0.025359	0.019816	106	0.529495	0.529495
72	0.028664	0.022353	107	0.556579	0.556579
73	0.032387	0.025262	108	0.584083	0.584083
74	0.036551	0.028583	109	0.612050	0.612050
75	0.041172	0.032360	110	0.640531	0.640531
76	0.046268	0.036637	111	0.669588	0.669588
77	0.051851	0.041459	112	0.699300	0.699300
78	0.057930	0.046873	113	0.729766	0.729766
79	0.064512	0.052924	114	0.761118	0.761118
80	0.071604	0.059659	115	0.793539	0.793539
81	0.079209	0.067121	116	0.827293	0.827293
82	0.087329	0.075352	117	0.862799	0.862799
83	0.095968	0.084390	118	0.900806	0.900806
84	0.105129	0.094269	119	0.943028	0.943028
			120	1.000000	1.000000

Table A12. Pensioners, females, Normal, lives – PNFL00: values of q_x

Age x	q_x	Age x	q_x	Age x	q_x
20	0.000194	55	0.002536	90	0.136499
21	0.000199	56	0.002816	91	0.149922
22	0.000206	57	0.003128	92	0.164355
23	0.000213	58	0.003477	93	0.179891
24	0.000221	59	0.003867	94	0.196580
25	0.000230	60	0.004302	95	0.214469
26	0.000240	61	0.004787	96	0.233598
27	0.000252	62	0.005329	97	0.254172
28	0.000264	63	0.005935	98	0.275007
29	0.000278	64	0.006610	99	0.295354
30	0.000294	65	0.007405	100	0.315225
31	0.000312	66	0.008367	101	0.334634
32	0.000332	67	0.009492	102	0.353573
33	0.000354	68	0.010793	103	0.370869
34	0.000378	69	0.012288	104	0.387125
35	0.000405	70	0.013994	105	0.403165
36	0.000436	71	0.015931	106	0.418999
37	0.000470	72	0.018118	107	0.434641
38	0.000509	73	0.020578	108	0.450104
39	0.000551	74	0.023337	109	0.465405
40	0.000599	75	0.026419	110	0.480562
41	0.000652	76	0.029854	111	0.495600
42	0.000712	77	0.033673	112	0.510546
43	0.000778	78	0.037907	113	0.525437
44	0.000852	79	0.042593	114	0.540323
45	0.000935	80	0.047768	115	0.555271
46	0.001028	81	0.053473	116	0.570389
47	0.001131	82	0.059750	117	0.585858
48	0.001247	83	0.066645	118	0.602053
49	0.001376	84	0.074205	119	0.620322
50	0.001520	85	0.082483	120	1.000000
51	0.001681	86	0.091530		
52	0.001861	87	0.101402		
53	0.002062	88	0.112156		
54	0.002286	89	0.123851		

Table A13. Pensioners, females, Normal, lives – PNFL00: values of μ_x

Age x	μ_x	Age x	μ_x	Age x	μ_x
20	0.000191	55	0.002409	90	0.139284
21	0.000196	56	0.002675	91	0.154378
22	0.000203	57	0.002971	92	0.170727
23	0.000209	58	0.003302	93	0.188649
24	0.000217	59	0.003672	94	0.208286
25	0.000226	60	0.004085	95	0.229796
26	0.000235	61	0.004546	96	0.253350
27	0.000246	62	0.005061	97	0.279135
28	0.000258	63	0.005637	98	0.307405
29	0.000271	64	0.006280	99	0.335804
30	0.000286	65	0.006998	100	0.364339
31	0.000303	66	0.007891	101	0.393016
32	0.000321	67	0.008941	102	0.421845
33	0.000342	68	0.010163	103	0.450433
34	0.000365	69	0.011574	104	0.476450
35	0.000391	70	0.013191	105	0.502796
36	0.000420	71	0.015035	106	0.529495
37	0.000453	72	0.017126	107	0.556579
38	0.000489	73	0.019489	108	0.584083
39	0.000529	74	0.022149	109	0.612050
40	0.000574	75	0.025134	110	0.640531
41	0.000625	76	0.028477	111	0.669588
42	0.000681	77	0.032210	112	0.699300
43	0.000744	78	0.036371	113	0.729766
44	0.000814	79	0.041000	114	0.761118
45	0.000893	80	0.046143	115	0.793539
46	0.000980	81	0.051849	116	0.827293
47	0.001078	82	0.058170	117	0.862799
48	0.001188	83	0.065166	118	0.900806
49	0.001310	84	0.072901	119	0.943028
50	0.001446	85	0.081446	120	1.000000
51	0.001599	86	0.090877		
52	0.001769	87	0.101279		
53	0.001959	88	0.112745		
54	0.002172	89	0.125376		

Table A14. Pensioners, females, Normal, amounts – PNFA00: values of q_x

Age x	q_x	Age x	q_x	Age x	q_x
20	0.000194	55	0.002321	90	0.127766
21	0.000199	56	0.002567	91	0.140859
22	0.000206	57	0.002841	92	0.155048
23	0.000213	58	0.003145	93	0.170393
24	0.000221	59	0.003485	94	0.186955
25	0.000230	60	0.003862	95	0.204789
26	0.000240	61	0.004282	96	0.223947
27	0.000251	62	0.004749	97	0.244887
28	0.000263	63	0.005268	98	0.266347
29	0.000277	64	0.005846	99	0.287292
30	0.000292	65	0.006537	100	0.307737
31	0.000309	66	0.007386	101	0.327696
32	0.000328	67	0.008375	102	0.347184
33	0.000349	68	0.009518	103	0.366213
34	0.000372	69	0.010833	104	0.384799
35	0.000398	70	0.012335	105	0.402790
36	0.000427	71	0.014043	106	0.418999
37	0.000459	72	0.015979	107	0.434641
38	0.000495	73	0.018166	108	0.450104
39	0.000535	74	0.020627	109	0.465405
40	0.000579	75	0.023390	110	0.480562
41	0.000629	76	0.026484	111	0.495600
42	0.000684	77	0.029942	112	0.510546
43	0.000745	78	0.033799	113	0.525437
44	0.000813	79	0.038093	114	0.540323
45	0.000889	80	0.042863	115	0.555271
46	0.000973	81	0.048156	116	0.570389
47	0.001067	82	0.054019	117	0.585858
48	0.001172	83	0.060502	118	0.602053
49	0.001288	84	0.067662	119	0.620322
50	0.001418	85	0.075556	120	1.000000
51	0.001562	86	0.084246		
52	0.001722	87	0.093799		
53	0.001901	88	0.104282		
54	0.002100	89	0.115676		

Table A15. Pensioners, females, Normal, amounts – PNFA00: values of μ_x

Age x	μ_x	Age x	μ_x	Age x	μ_x
20	0.000191	55	0.002209	90	0.129610
21	0.000196	56	0.002442	91	0.144017
22	0.000202	57	0.002703	92	0.159882
23	0.000209	58	0.002992	93	0.177347
24	0.000217	59	0.003314	94	0.196566
25	0.000225	60	0.003673	95	0.217707
26	0.000235	61	0.004073	96	0.240956
27	0.000245	62	0.004517	97	0.266517
28	0.000257	63	0.005012	98	0.295282
29	0.000270	64	0.005562	99	0.324178
30	0.000284	65	0.006175	100	0.353212
31	0.000300	66	0.006963	101	0.382391
32	0.000318	67	0.007887	102	0.411725
33	0.000338	68	0.008960	103	0.441222
34	0.000360	69	0.010198	104	0.470893
35	0.000385	70	0.011618	105	0.500751
36	0.000412	71	0.013240	106	0.529495
37	0.000443	72	0.015085	107	0.556579
38	0.000477	73	0.017175	108	0.584083
39	0.000514	74	0.019537	109	0.612050
40	0.000557	75	0.022200	110	0.640531
41	0.000603	76	0.025193	111	0.669588
42	0.000656	77	0.028553	112	0.699300
43	0.000714	78	0.032317	113	0.729766
44	0.000778	79	0.036528	114	0.761118
45	0.000850	80	0.041232	115	0.793539
46	0.000930	81	0.046482	116	0.827293
47	0.001019	82	0.052333	117	0.862799
48	0.001118	83	0.058849	118	0.900806
49	0.001229	84	0.066100	119	0.943028
50	0.001352	85	0.074162	120	1.000000
51	0.001488	86	0.083120		
52	0.001641	87	0.093068		
53	0.001810	88	0.104110		
54	0.001999	89	0.116360		

Table A16. Pensioners, females, Early, lives and amounts – PEFL00 and PEFA00: values of q_x

Age x	Lives	Amounts	Age x	Lives	Amounts
50	0.006126	0.006126	85	0.087635	0.082785
51	0.005695	0.005527	86	0.096091	0.092220
52	0.005327	0.004932	87	0.105176	0.102984
53	0.005027	0.004540	88	0.114922	0.114713
54	0.004800	0.004300	89	0.125360	0.125360
55	0.004652	0.004180	90	0.136703	0.136703
56	0.004589	0.004159	91	0.149922	0.149922
57	0.004616	0.004226	92	0.164355	0.164355
58	0.004742	0.004376	93	0.179891	0.179891
59	0.004972	0.004608	94	0.196580	0.196580
60	0.005315	0.004923	95	0.214469	0.214469
61	0.005779	0.005328	96	0.233598	0.233598
62	0.006373	0.005829	97	0.254172	0.254172
63	0.007107	0.006437	98	0.275007	0.275007
64	0.007989	0.007163	99	0.295354	0.295354
65	0.009032	0.008021	100	0.315225	0.315225
66	0.010247	0.009025	101	0.334634	0.334634
67	0.011646	0.010193	102	0.353573	0.353573
68	0.013242	0.011542	103	0.370869	0.370869
69	0.015048	0.013089	104	0.387125	0.387125
70	0.017080	0.014853	105	0.403165	0.403165
71	0.019353	0.016853	106	0.418999	0.418999
72	0.021884	0.019107	107	0.434641	0.434641
73	0.024690	0.021635	108	0.450104	0.450104
74	0.027789	0.024454	109	0.465405	0.465405
75	0.031202	0.027583	110	0.480562	0.480562
76	0.034949	0.031042	111	0.495600	0.495600
77	0.039051	0.034851	112	0.510546	0.510546
78	0.043532	0.039036	113	0.525437	0.525437
79	0.048415	0.043625	114	0.540323	0.540323
80	0.053726	0.048657	115	0.555271	0.555271
81	0.059490	0.054179	116	0.570389	0.570389
82	0.065734	0.060256	117	0.585858	0.585858
83	0.072487	0.066970	118	0.602053	0.602053
84	0.079777	0.074431	119	0.620322	0.620322
			120	1.000000	1.000000

Table A17. Pensioners, females, Early, lives and amounts – PEFL00 and PEFA00: values of μ_x

Age x	Lives	Amounts	Age x	Lives	Amounts
50	0.006382	0.006382	85	0.087309	0.081690
51	0.005918	0.005918	86	0.096244	0.091348
52	0.005515	0.005204	87	0.105941	0.102422
53	0.005179	0.004719	88	0.116457	0.115274
54	0.004913	0.004408	89	0.127853	0.127853
55	0.004724	0.004231	90	0.140196	0.140196
56	0.004617	0.004162	91	0.154378	0.154378
57	0.004597	0.004187	92	0.170727	0.170727
58	0.004673	0.004297	93	0.188649	0.188649
59	0.004851	0.004488	94	0.208286	0.208286
60	0.005137	0.004762	95	0.229796	0.229796
61	0.005542	0.005123	96	0.253350	0.253350
62	0.006072	0.005577	97	0.279135	0.279135
63	0.006739	0.006133	98	0.307405	0.307405
64	0.007551	0.006802	99	0.335804	0.335804
65	0.008519	0.007597	100	0.364339	0.364339
66	0.009657	0.008533	101	0.393016	0.393016
67	0.010975	0.009627	102	0.421845	0.421845
68	0.012487	0.010895	103	0.450433	0.450433
69	0.014209	0.012356	104	0.476450	0.476450
70	0.016155	0.014031	105	0.502796	0.502796
71	0.018342	0.015938	106	0.529495	0.529495
72	0.020788	0.018099	107	0.556579	0.556579
73	0.023513	0.020533	108	0.584083	0.584083
74	0.026538	0.023263	109	0.612050	0.612050
75	0.029883	0.026308	110	0.640531	0.640531
76	0.033575	0.029692	111	0.669588	0.669588
77	0.037638	0.033438	112	0.699300	0.699300
78	0.042100	0.037575	113	0.729766	0.729766
79	0.046991	0.042135	114	0.761118	0.761118
80	0.052342	0.047157	115	0.793539	0.793539
81	0.058189	0.052694	116	0.827293	0.827293
82	0.064568	0.058813	117	0.862799	0.862799
83	0.071519	0.065602	118	0.900806	0.900806
84	0.079084	0.073176	119	0.943028	0.943028
			120	1.000000	1.000000

Table A18. Pensioners, females, Combined, lives and amounts – PCFL00 and PCFA00: values of q_x

Age x	Lives	Amounts	Age x	Lives	Amounts
50	0.004552	0.003920	85	0.083530	0.076588
51	0.004583	0.003937	86	0.092456	0.085118
52	0.004615	0.003954	87	0.102168	0.094442
53	0.004646	0.003972	88	0.112717	0.104618
54	0.004579	0.003989	89	0.124157	0.115706
55	0.004454	0.004006	90	0.136541	0.127766
56	0.004393	0.004024	91	0.149922	0.140859
57	0.004402	0.004029	92	0.164355	0.155048
58	0.004488	0.004067	93	0.179891	0.170393
59	0.004656	0.004178	94	0.196580	0.186955
60	0.004916	0.004369	95	0.214469	0.204789
61	0.005275	0.004648	96	0.233598	0.223947
62	0.005741	0.005022	97	0.254172	0.244887
63	0.006326	0.005502	98	0.275007	0.266347
64	0.007039	0.006097	99	0.295354	0.287292
65	0.007892	0.006818	100	0.315225	0.307737
66	0.008897	0.007677	101	0.334634	0.327696
67	0.010069	0.008687	102	0.353573	0.347184
68	0.011420	0.009862	103	0.370869	0.366213
69	0.012969	0.011218	104	0.387125	0.384799
70	0.014730	0.012771	105	0.403165	0.402790
71	0.016725	0.014539	106	0.418999	0.418999
72	0.018971	0.016542	107	0.434641	0.434641
73	0.021491	0.018803	108	0.450104	0.450104
74	0.024309	0.021343	109	0.465405	0.465405
75	0.027449	0.024188	110	0.480562	0.480562
76	0.030938	0.027366	111	0.495600	0.495600
77	0.034805	0.030907	112	0.510546	0.510546
78	0.039082	0.034840	113	0.525437	0.525437
79	0.043800	0.039202	114	0.540323	0.540323
80	0.048996	0.044028	115	0.555271	0.555271
81	0.054708	0.049357	116	0.570389	0.570389
82	0.060974	0.055232	117	0.585858	0.585858
83	0.067836	0.061697	118	0.602053	0.602053
84	0.075339	0.068799	119	0.620322	0.620322
			120	1.000000	1.000000

Table A19. Pensioners, females, Combined, lives and amounts – PCFL00 and PCFA00: values of μ_x

Age x	Lives	Amounts	Age x	Lives	Amounts
50	0.004547	0.003919	85	0.082635	0.075340
51	0.004578	0.003936	86	0.091965	0.084167
52	0.004610	0.003954	87	0.102224	0.093914
53	0.004641	0.003971	88	0.113498	0.104670
54	0.004673	0.003988	89	0.125879	0.116533
55	0.004517	0.004006	90	0.139468	0.129610
56	0.004422	0.004023	91	0.154378	0.144017
57	0.004395	0.004040	92	0.170727	0.159882
58	0.004442	0.004044	93	0.188649	0.177347
59	0.004568	0.004118	94	0.208286	0.196566
60	0.004782	0.004269	95	0.229796	0.217707
61	0.005091	0.004503	96	0.253350	0.240956
62	0.005504	0.004830	97	0.279135	0.266517
63	0.006031	0.005258	98	0.307405	0.295282
64	0.006682	0.005796	99	0.335804	0.324178
65	0.007469	0.006457	100	0.364339	0.353212
66	0.008403	0.007250	101	0.393016	0.382391
67	0.009499	0.008189	102	0.421845	0.411725
68	0.010771	0.009289	103	0.450433	0.441222
69	0.012235	0.010564	104	0.476450	0.470893
70	0.013909	0.012032	105	0.502796	0.500751
71	0.015811	0.013711	106	0.529495	0.529495
72	0.017964	0.015621	107	0.556579	0.556579
73	0.020390	0.017785	108	0.584083	0.584083
74	0.023113	0.020227	109	0.612050	0.612050
75	0.026162	0.022974	110	0.640531	0.640531
76	0.029565	0.026056	111	0.669588	0.669588
77	0.033355	0.029504	112	0.699300	0.699300
78	0.037569	0.033354	113	0.729766	0.729766
79	0.042243	0.037646	114	0.761118	0.761118
80	0.047421	0.042420	115	0.793539	0.793539
81	0.053149	0.047725	116	0.827293	0.827293
82	0.059477	0.053610	117	0.862799	0.862799
83	0.066460	0.060133	118	0.900806	0.900806
84	0.074158	0.067353	119	0.943028	0.943028
			120	1.000000	1.000000

Table A20. Widows, lives – WL00: values of q_x

Age x	q_x	Age x	q_x	Age x	q_x
		50	0.005556	85	0.074123
		51	0.005678	86	0.081685
17	0.000458	52	0.005794	87	0.090013
18	0.000630	53	0.005904	88	0.099177
19	0.000800	54	0.006002	89	0.109248
20	0.000970	55	0.006204	90	0.120611
21	0.001139	56	0.006551	91	0.134138
22	0.001308	57	0.006937	92	0.149167
23	0.001475	58	0.007365	93	0.165747
24	0.001642	59	0.007841	94	0.183995
25	0.001808	60	0.008369	95	0.204028
26	0.001973	61	0.008955	96	0.225957
27	0.002137	62	0.009606	97	0.249882
28	0.002300	63	0.010329	98	0.275188
29	0.002462	64	0.011131	99	0.299847
30	0.002623	65	0.012021	100	0.323553
31	0.002784	66	0.013009	101	0.346342
32	0.002943	67	0.014106	102	0.368246
33	0.003101	68	0.015323	103	0.389297
34	0.003258	69	0.016672	104	0.409526
35	0.003414	70	0.018170	105	0.428961
36	0.003568	71	0.019831	106	0.447629
37	0.003722	72	0.021673	107	0.465556
38	0.003874	73	0.023715	108	0.482765
39	0.004024	74	0.025978	109	0.499277
40	0.004173	75	0.028487	110	0.515113
41	0.004321	76	0.031266	111	0.530290
42	0.004467	77	0.034344	112	0.544821
43	0.004611	78	0.037752	113	0.558719
44	0.004753	79	0.041524	114	0.571989
45	0.004893	80	0.045696	115	0.584629
46	0.005031	81	0.050311	116	0.596628
47	0.005167	82	0.055410	117	0.607950
48	0.005300	83	0.061044	118	0.618511
49	0.005429	84	0.067263	119	0.628030
				120	1.000000

Table A21. Widows, lives – WL00: values of μ_x

Age x	μ_x	Age x	μ_x	Age x	μ_x
		50	0.005508	85	0.073193
		51	0.005633	86	0.080971
17	0.000372	52	0.005754	87	0.089610
18	0.000544	53	0.005868	88	0.099208
19	0.000715	54	0.005974	89	0.109871
20	0.000886	55	0.006060	90	0.121716
21	0.001055	56	0.006392	91	0.135937
22	0.001224	57	0.006760	92	0.152444
23	0.001392	58	0.007169	93	0.170996
24	0.001560	59	0.007624	94	0.191847
25	0.001726	60	0.008129	95	0.215280
26	0.001892	61	0.008689	96	0.241616
27	0.002057	62	0.009312	97	0.271215
28	0.002221	63	0.010005	98	0.304481
29	0.002384	64	0.010774	99	0.339177
30	0.002546	65	0.011628	100	0.373708
31	0.002707	66	0.012577	101	0.408067
32	0.002867	67	0.013631	102	0.442245
33	0.003027	68	0.014802	103	0.476233
34	0.003185	69	0.016103	104	0.510023
35	0.003342	70	0.017548	105	0.543601
36	0.003497	71	0.019154	106	0.576957
37	0.003652	72	0.020938	107	0.610075
38	0.003805	73	0.022919	108	0.642938
39	0.003957	74	0.025120	109	0.675529
40	0.004107	75	0.027566	110	0.707824
41	0.004256	76	0.030283	111	0.739798
42	0.004404	77	0.033301	112	0.771418
43	0.004549	78	0.036653	113	0.802643
44	0.004693	79	0.040378	114	0.833425
45	0.004835	80	0.044515	115	0.863695
46	0.004975	81	0.049112	116	0.893363
47	0.005112	82	0.054218	117	0.922290
48	0.005247	83	0.059891	118	0.950252
49	0.005379	84	0.066193	119	0.976792
				120	1.000000

Table A22. Widows, amounts – WA00: values of q_x

Age x	q_x	Age x	q_x	Age x	q_x
		50	0.004296	85	0.070238
		51	0.004390	86	0.078281
17	0.000350	52	0.004481	87	0.087238
18	0.000482	53	0.004566	88	0.097200
19	0.000614	54	0.004642	89	0.108267
20	0.000746	55	0.004793	90	0.120543
21	0.000877	56	0.005053	91	0.134138
22	0.001007	57	0.005345	92	0.149167
23	0.001137	58	0.005673	93	0.165747
24	0.001266	59	0.006042	94	0.183995
25	0.001394	60	0.006457	95	0.204028
26	0.001522	61	0.006922	96	0.225957
27	0.001649	62	0.007445	97	0.249882
28	0.001775	63	0.008033	98	0.275188
29	0.001900	64	0.008693	99	0.299847
30	0.002025	65	0.009434	100	0.323553
31	0.002149	66	0.010266	101	0.346342
32	0.002273	67	0.011200	102	0.368246
33	0.002395	68	0.012249	103	0.389297
34	0.002516	69	0.013427	104	0.409526
35	0.002637	70	0.014749	105	0.428961
36	0.002757	71	0.016233	106	0.447629
37	0.002875	72	0.017897	107	0.465556
38	0.002993	73	0.019765	108	0.482765
39	0.003110	74	0.021860	109	0.499277
40	0.003225	75	0.024209	110	0.515113
41	0.003339	76	0.026842	111	0.530290
42	0.003452	77	0.029793	112	0.544821
43	0.003564	78	0.033099	113	0.558719
44	0.003674	79	0.036801	114	0.571989
45	0.003783	80	0.040944	115	0.584629
46	0.003890	81	0.045580	116	0.596628
47	0.003995	82	0.050764	117	0.607950
48	0.004098	83	0.056555	118	0.618511
49	0.004198	84	0.063023	119	0.628030
				120	1.000000

Table A23. Widows, amounts – WA00: values of μ_x

Age x	μ_x	Age x	μ_x	Age x	μ_x
		50	0.004256	85	0.068811
		51	0.004353	86	0.077002
17	0.000283	52	0.004446	87	0.086208
18	0.000416	53	0.004535	88	0.096554
19	0.000549	54	0.004616	89	0.108182
20	0.000680	55	0.004684	90	0.121250
21	0.000812	56	0.004930	91	0.135937
22	0.000942	57	0.005207	92	0.152444
23	0.001072	58	0.005518	93	0.170996
24	0.001202	59	0.005868	94	0.191847
25	0.001331	60	0.006261	95	0.215280
26	0.001459	61	0.006703	96	0.241616
27	0.001587	62	0.007200	97	0.271215
28	0.001713	63	0.007758	98	0.304481
29	0.001840	64	0.008385	99	0.339177
30	0.001965	65	0.009090	100	0.373708
31	0.002090	66	0.009882	101	0.408067
32	0.002214	67	0.010773	102	0.442245
33	0.002337	68	0.011773	103	0.476233
34	0.002459	69	0.012898	104	0.510023
35	0.002580	70	0.014162	105	0.543601
36	0.002701	71	0.015583	106	0.576957
37	0.002820	72	0.017180	107	0.610075
38	0.002939	73	0.018974	108	0.642938
39	0.003056	74	0.020991	109	0.675529
40	0.003173	75	0.023258	110	0.707824
41	0.003288	76	0.025805	111	0.739798
42	0.003402	77	0.028668	112	0.771418
43	0.003515	78	0.031886	113	0.802643
44	0.003626	79	0.035502	114	0.833425
45	0.003736	80	0.039567	115	0.863695
46	0.003844	81	0.044135	116	0.893363
47	0.003950	82	0.049269	117	0.922290
48	0.004055	83	0.055038	118	0.950252
49	0.004157	84	0.061523	119	0.976792
				120	1.000000

Table A24. Retirement Annuitants, males, deferred – RMD00: values of q_x and μ_x

Age x	q_x	μ_x	Age x	q_x	μ_x
			45	0.001266	0.001207
			46	0.001396	0.001329
17	0.000418	0.000418	47	0.001542	0.001467
18	0.000419	0.000419	48	0.001707	0.001623
19	0.000421	0.000420	49	0.001893	0.001798
20	0.000423	0.000422	50	0.002101	0.001995
21	0.000425	0.000424	51	0.002333	0.002215
22	0.000428	0.000427	52	0.002590	0.002460
23	0.000432	0.000430	53	0.002877	0.002732
24	0.000436	0.000434	54	0.003193	0.003034
25	0.000441	0.000439	55	0.003542	0.003368
26	0.000448	0.000445	56	0.003926	0.003735
27	0.000455	0.000451	57	0.004347	0.004139
28	0.000464	0.000459	58	0.004806	0.004580
29	0.000475	0.000469	59	0.005307	0.005062
30	0.000487	0.000481	60	0.005850	0.005586
31	0.000502	0.000494	61	0.006437	0.006155
32	0.000519	0.000510	62	0.007071	0.006769
33	0.000540	0.000529	63	0.007752	0.007431
34	0.000564	0.000551	64	0.008482	0.008142
35	0.000592	0.000577	65	0.009261	0.008903
36	0.000625	0.000608	66	0.010091	0.009715
37	0.000663	0.000643	67	0.010970	0.010578
38	0.000707	0.000684	68	0.011899	0.011492
39	0.000758	0.000731	69	0.012877	0.012457
40	0.000817	0.000786	70	0.013904	0.013473
41	0.000884	0.000849	71	0.014977	0.014538
42	0.000962	0.000922	72	0.016094	0.015650
43	0.001050	0.001005	73	0.017253	0.016807
44	0.001151	0.001099	74	0.018450	0.018006
			75	0.019682	0.019245

Table A25. Retirement Annuitants, males, vested – RMV00: values of q_x and μ_x

Age x	q_x	μ_x	Age x	q_x	μ_x
50	0.013435	0.013866	85	0.100962	0.100930
51	0.012799	0.013194	86	0.111444	0.112107
52	0.012220	0.012578	87	0.122828	0.124402
53	0.011703	0.012023	88	0.135167	0.137914
54	0.011254	0.011533	89	0.148512	0.152753
55	0.010878	0.011114	90	0.162916	0.169038
56	0.010583	0.010774	91	0.178429	0.186898
57	0.010376	0.010519	92	0.195098	0.206474
58	0.010264	0.010357	93	0.212967	0.227920
59	0.010257	0.010295	94	0.232076	0.251405
60	0.010364	0.010344	95	0.252456	0.277110
61	0.010595	0.010513	96	0.274131	0.305234
62	0.010960	0.010812	97	0.297115	0.335995
63	0.011472	0.011254	98	0.321410	0.369629
64	0.012145	0.011851	99	0.347003	0.406393
65	0.012990	0.012617	100	0.371104	0.446567
66	0.014025	0.013567	101	0.392217	0.480938
67	0.015266	0.014718	102	0.412351	0.514859
68	0.016729	0.016087	103	0.431547	0.548312
69	0.018434	0.017695	104	0.449840	0.581277
70	0.020402	0.019563	105	0.467266	0.613730
71	0.022655	0.021713	106	0.483856	0.645646
72	0.025217	0.024172	107	0.499639	0.676997
73	0.028113	0.026967	108	0.514640	0.707750
74	0.031370	0.030128	109	0.528883	0.737869
75	0.035019	0.033688	110	0.542386	0.767310
76	0.039090	0.037682	111	0.555166	0.796023
77	0.043618	0.042150	112	0.567233	0.823948
78	0.048636	0.047134	113	0.578591	0.851012
79	0.054184	0.052681	114	0.589237	0.877124
80	0.060301	0.058840	115	0.599156	0.902166
81	0.067028	0.065667	116	0.608313	0.925979
82	0.074411	0.073221	117	0.616640	0.948337
83	0.082496	0.081568	118	0.623995	0.968878
84	0.091329	0.090778	119	0.629973	0.986915
			120	1.000000	1.000000

Table A26. Retirement Annuitants, males, combined – RMC00: values of q_x

Age x	q_x	Age x	q_x	Age x	q_x
		50	0.002101	85	0.100491
		51	0.002333	86	0.111353
17	0.000418	52	0.002590	87	0.122828
18	0.000419	53	0.002878	88	0.135167
19	0.000421	54	0.003207	89	0.148512
20	0.000423	55	0.003578	90	0.162916
21	0.000425	56	0.003997	91	0.178429
22	0.000428	57	0.004468	92	0.195098
23	0.000432	58	0.004998	93	0.212967
24	0.000436	59	0.005594	94	0.232076
25	0.000441	60	0.006265	95	0.252456
26	0.000448	61	0.007018	96	0.274131
27	0.000455	62	0.007864	97	0.297115
28	0.000464	63	0.008813	98	0.321410
29	0.000475	64	0.009878	99	0.347003
30	0.000487	65	0.011072	100	0.371104
31	0.000502	66	0.012410	101	0.392217
32	0.000519	67	0.013907	102	0.412351
33	0.000540	68	0.015583	103	0.431547
34	0.000564	69	0.017456	104	0.449840
35	0.000592	70	0.019550	105	0.467266
36	0.000625	71	0.021887	106	0.483856
37	0.000663	72	0.024496	107	0.499639
38	0.000707	73	0.027403	108	0.514640
39	0.000758	74	0.030642	109	0.528883
40	0.000817	75	0.034248	110	0.542386
41	0.000884	76	0.038257	111	0.555166
42	0.000962	77	0.042712	112	0.567233
43	0.001050	78	0.047656	113	0.578591
44	0.001151	79	0.053139	114	0.589237
45	0.001266	80	0.059211	115	0.599156
46	0.001396	81	0.065928	116	0.608313
47	0.001542	82	0.073350	117	0.616640
48	0.001707	83	0.081540	118	0.623995
49	0.001893	84	0.090563	119	0.629973
				120	1.000000

Table A27. Retirement Annuitants, males, combined – RMC00: values of μ_x

Age x	μ_x	Age x	μ_x	Age x	μ_x
		50	0.001995	85	0.100225
		51	0.002215	86	0.111791
17	0.000418	52	0.002460	87	0.124402
18	0.000419	53	0.002732	88	0.137914
19	0.000420	54	0.003040	89	0.152753
20	0.000422	55	0.003391	90	0.169038
21	0.000424	56	0.003786	91	0.186898
22	0.000427	57	0.004232	92	0.206474
23	0.000430	58	0.004733	93	0.227920
24	0.000434	59	0.005298	94	0.251405
25	0.000439	60	0.005934	95	0.277110
26	0.000445	61	0.006649	96	0.305234
27	0.000451	62	0.007452	97	0.335995
28	0.000459	63	0.008355	98	0.369629
29	0.000469	64	0.009369	99	0.406393
30	0.000481	65	0.010508	100	0.446567
31	0.000494	66	0.011785	101	0.480938
32	0.000510	67	0.013217	102	0.514859
33	0.000529	68	0.014823	103	0.548312
34	0.000551	69	0.016622	104	0.581277
35	0.000577	70	0.018637	105	0.613730
36	0.000608	71	0.020892	106	0.645646
37	0.000643	72	0.023416	107	0.676997
38	0.000684	73	0.026238	108	0.707750
39	0.000731	74	0.029392	109	0.737869
40	0.000786	75	0.032916	110	0.767310
41	0.000849	76	0.036852	111	0.796023
42	0.000922	77	0.041245	112	0.823948
43	0.001005	78	0.046146	113	0.851012
44	0.001099	79	0.051612	114	0.877124
45	0.001207	80	0.057704	115	0.902166
46	0.001329	81	0.064491	116	0.925979
47	0.001467	82	0.072048	117	0.948337
48	0.001623	83	0.080460	118	0.968878
49	0.001798	84	0.089819	119	0.986915
				120	1.000000

Table A28. Retirement Annuitants, females, deferred – RFD00: values of q_x and μ_x

Age x	q_x	μ_x	Age x	q_x	μ_x
			45	0.001153	0.001108
			46	0.001250	0.001201
17	0.000120	0.000116	47	0.001355	0.001302
18	0.000131	0.000125	48	0.001469	0.001411
19	0.000142	0.000136	49	0.001592	0.001530
20	0.000153	0.000147	50	0.001726	0.001659
21	0.000166	0.000160	51	0.001871	0.001798
22	0.000180	0.000173	52	0.002028	0.001949
23	0.000195	0.000188	53	0.002198	0.002113
24	0.000212	0.000203	54	0.002383	0.002291
25	0.000230	0.000221	55	0.002583	0.002483
26	0.000249	0.000239	56	0.002800	0.002692
27	0.000270	0.000259	57	0.003035	0.002918
28	0.000293	0.000281	58	0.003289	0.003164
29	0.000317	0.000305	59	0.003565	0.003429
30	0.000344	0.000330	60	0.003864	0.003718
31	0.000373	0.000358	61	0.004188	0.004030
32	0.000404	0.000388	62	0.004540	0.004369
33	0.000438	0.000421	63	0.004920	0.004736
34	0.000475	0.000456	64	0.005333	0.005134
35	0.000515	0.000494	65	0.005780	0.005566
36	0.000558	0.000536	66	0.006264	0.006033
37	0.000605	0.000581	67	0.006789	0.006541
38	0.000656	0.000630	68	0.007357	0.007090
39	0.000711	0.000683	69	0.007973	0.007686
40	0.000770	0.000740	70	0.008640	0.008332
41	0.000835	0.000802	71	0.009363	0.009033
42	0.000905	0.000870	72	0.010146	0.009792
43	0.000981	0.000943	73	0.010994	0.010615
44	0.001064	0.001022	74	0.011913	0.011507
			75	0.012907	0.012474

Table A29. Retirement Annuitants, females, vested – RFV00: values of q_x and μ_x

Age x	q_x	μ_x	Age x	q_x	μ_x
50	0.006660	0.006862	85	0.066938	0.065093
51	0.006319	0.006507	86	0.075349	0.073638
52	0.006002	0.006175	87	0.084691	0.083224
53	0.005713	0.005870	88	0.095048	0.093969
54	0.005454	0.005594	89	0.106508	0.106006
55	0.005230	0.005350	90	0.119162	0.119482
56	0.005044	0.005143	91	0.133107	0.134563
57	0.004900	0.004977	92	0.148441	0.151432
58	0.004804	0.004855	93	0.165261	0.170292
59	0.004761	0.004784	94	0.183665	0.191371
60	0.004776	0.004769	95	0.203745	0.214923
61	0.004857	0.004817	96	0.225588	0.241231
62	0.005012	0.004934	97	0.249270	0.270610
63	0.005247	0.005128	98	0.274853	0.303409
64	0.005574	0.005409	99	0.302378	0.340021
65	0.006001	0.005786	100	0.329779	0.380881
66	0.006541	0.006271	101	0.354898	0.419331
67	0.007206	0.006875	102	0.378758	0.457278
68	0.008009	0.007612	103	0.401415	0.494702
69	0.008968	0.008497	104	0.422923	0.531579
70	0.010098	0.009548	105	0.443333	0.567884
71	0.011420	0.010784	106	0.462689	0.603588
72	0.012954	0.012224	107	0.481035	0.638660
73	0.014724	0.013893	108	0.498410	0.673064
74	0.016755	0.015818	109	0.514847	0.706757
75	0.019076	0.018026	110	0.530376	0.739693
76	0.021719	0.020551	111	0.545024	0.771814
77	0.024718	0.023428	112	0.558808	0.803053
78	0.028111	0.026698	113	0.571742	0.833329
79	0.031941	0.030407	114	0.583827	0.862540
80	0.036252	0.034603	115	0.595052	0.890554
81	0.041094	0.039343	116	0.605387	0.917194
82	0.046523	0.044689	117	0.614760	0.942205
83	0.052596	0.050709	118	0.623018	0.965184
84	0.059378	0.057482	119	0.629717	0.985362
			120	1.000000	1.000000

Table A30. Retirement Annuitants, females, combined – RFC00: values of q_x

Age x	q_x	Age x	q_x	Age x	q_x
		50	0.001726	85	0.066938
		51	0.001871	86	0.075349
17	0.000120	52	0.002028	87	0.084691
18	0.000131	53	0.002198	88	0.095048
19	0.000142	54	0.002383	89	0.106508
20	0.000153	55	0.002583	90	0.119162
21	0.000166	56	0.002800	91	0.133107
22	0.000180	57	0.003035	92	0.148441
23	0.000195	58	0.003291	93	0.165261
24	0.000212	59	0.003594	94	0.183665
25	0.000230	60	0.003937	95	0.203745
26	0.000249	61	0.004320	96	0.225588
27	0.000270	62	0.004748	97	0.249270
28	0.000293	63	0.005227	98	0.274853
29	0.000317	64	0.005763	99	0.302378
30	0.000344	65	0.006364	100	0.329779
31	0.000373	66	0.007040	101	0.354898
32	0.000404	67	0.007800	102	0.378758
33	0.000438	68	0.008655	103	0.401415
34	0.000475	69	0.009620	104	0.422923
35	0.000515	70	0.010710	105	0.443333
36	0.000558	71	0.011942	106	0.462689
37	0.000605	72	0.013336	107	0.481035
38	0.000656	73	0.014917	108	0.498410
39	0.000711	74	0.016769	109	0.514847
40	0.000770	75	0.019076	110	0.530376
41	0.000835	76	0.021719	111	0.545024
42	0.000905	77	0.024718	112	0.558808
43	0.000981	78	0.028111	113	0.571742
44	0.001064	79	0.031941	114	0.583827
45	0.001153	80	0.036252	115	0.595052
46	0.001250	81	0.041094	116	0.605387
47	0.001355	82	0.046523	117	0.614760
48	0.001469	83	0.052596	118	0.623018
49	0.001592	84	0.059378	119	0.629717
				120	1.000000

Table A31. Retirement Annuitants, females, combined – RFC00: values of μ_x

Age x	μ_x	Age x	μ_x	Age x	μ_x
		50	0.001659	85	0.065093
		51	0.001798	86	0.073638
17	0.000116	52	0.001949	87	0.083224
18	0.000125	53	0.002113	88	0.093969
19	0.000136	54	0.002291	89	0.106006
20	0.000147	55	0.002483	90	0.119482
21	0.000160	56	0.002692	91	0.134563
22	0.000173	57	0.002918	92	0.151432
23	0.000188	58	0.003164	93	0.170292
24	0.000203	59	0.003440	94	0.191371
25	0.000221	60	0.003766	95	0.214923
26	0.000239	61	0.004130	96	0.241231
27	0.000259	62	0.004536	97	0.270610
28	0.000281	63	0.004991	98	0.303409
29	0.000305	64	0.005500	99	0.340021
30	0.000330	65	0.006071	100	0.380881
31	0.000358	66	0.006712	101	0.419331
32	0.000388	67	0.007432	102	0.457278
33	0.000421	68	0.008244	103	0.494702
34	0.000456	69	0.009160	104	0.531579
35	0.000494	70	0.010195	105	0.567884
36	0.000536	71	0.011365	106	0.603588
37	0.000581	72	0.012690	107	0.638660
38	0.000630	73	0.014194	108	0.673064
39	0.000683	74	0.015902	109	0.706757
40	0.000740	75	0.018026	110	0.739693
41	0.000802	76	0.020551	111	0.771814
42	0.000870	77	0.023428	112	0.803053
43	0.000943	78	0.026698	113	0.833329
44	0.001022	79	0.030407	114	0.862540
45	0.001108	80	0.034603	115	0.890554
46	0.001201	81	0.039343	116	0.917194
47	0.001302	82	0.044689	117	0.942205
48	0.001411	83	0.050709	118	0.965184
49	0.001530	84	0.057482	119	0.985362
				120	1.000000

Table A32. Personal Pensioners, males, deferred – PPMD00: values of q_x and μ_x

Age x	q_x	μ_x	Age x	q_x	μ_x
			45	0.001442	0.001376
			46	0.001587	0.001513
17	0.000429	0.000429	47	0.001749	0.001666
18	0.000431	0.000430	48	0.001929	0.001837
19	0.000434	0.000433	49	0.002130	0.002028
20	0.000437	0.000435	50	0.002353	0.002240
21	0.000440	0.000439	51	0.002599	0.002475
22	0.000445	0.000443	52	0.002870	0.002734
23	0.000450	0.000447	53	0.003169	0.003020
24	0.000456	0.000453	54	0.003496	0.003333
25	0.000463	0.000460	55	0.003854	0.003677
26	0.000472	0.000467	56	0.004244	0.004052
27	0.000482	0.000477	57	0.004668	0.004460
28	0.000494	0.000488	58	0.005126	0.004903
29	0.000508	0.000501	59	0.005622	0.005382
30	0.000524	0.000516	60	0.006155	0.005899
31	0.000544	0.000534	61	0.006727	0.006455
32	0.000566	0.000555	62	0.007339	0.007051
33	0.000592	0.000579	63	0.007992	0.007688
34	0.000623	0.000607	64	0.008685	0.008367
35	0.000658	0.000639	65	0.009420	0.009087
36	0.000698	0.000677	66	0.010196	0.009849
37	0.000744	0.000720	67	0.011012	0.010653
38	0.000798	0.000770	68	0.011867	0.011499
39	0.000859	0.000827	69	0.012761	0.012384
40	0.000928	0.000892	70	0.013692	0.013309
41	0.001007	0.000967	71	0.014657	0.014270
42	0.001097	0.001051	72	0.015655	0.015267
43	0.001199	0.001147	73	0.016682	0.016296
44	0.001313	0.001255	74	0.017736	0.017355
			75	0.018812	0.018439

Table A33. Personal Pensioners, males, vested – PPMV00: values of q_x and μ_x

Age x	q_x	μ_x	Age x	q_x	μ_x
50	0.007954	0.008065	85	0.078047	0.076427
51	0.007834	0.007917	86	0.087749	0.086314
52	0.007765	0.007822	87	0.098717	0.097618
53	0.007744	0.007777	88	0.111096	0.110542
54	0.007771	0.007780	89	0.125039	0.125319
55	0.007844	0.007830	90	0.140708	0.142210
56	0.007963	0.007927	91	0.158268	0.161512
57	0.008131	0.008071	92	0.177883	0.183562
58	0.008347	0.008264	93	0.199712	0.208737
59	0.008615	0.008508	94	0.223903	0.237461
60	0.008938	0.008806	95	0.250578	0.270207
61	0.009320	0.009161	96	0.279832	0.307506
62	0.009767	0.009578	97	0.311710	0.349943
63	0.010283	0.010063	98	0.346205	0.398169
64	0.010877	0.010623	99	0.383234	0.452899
65	0.011557	0.011265	100	0.411401	0.514915
66	0.012333	0.012000	101	0.428757	0.545041
67	0.013215	0.012837	102	0.445378	0.574773
68	0.014218	0.013790	103	0.461290	0.604094
69	0.015356	0.014873	104	0.476516	0.632988
70	0.016646	0.016103	105	0.491078	0.661433
71	0.018110	0.017500	106	0.504996	0.689408
72	0.019769	0.019086	107	0.518288	0.716887
73	0.021650	0.020887	108	0.530971	0.743843
74	0.023784	0.022933	109	0.543056	0.770242
75	0.026204	0.025259	110	0.554557	0.796047
76	0.028950	0.027905	111	0.565480	0.821214
77	0.032067	0.030915	112	0.575828	0.845690
78	0.035605	0.034344	113	0.585602	0.869412
79	0.039622	0.038250	114	0.594793	0.892299
80	0.044184	0.042704	115	0.603382	0.914248
81	0.049362	0.047786	116	0.611334	0.935121
82	0.055241	0.053586	117	0.618586	0.954717
83	0.061911	0.060210	118	0.625008	0.972722
84	0.069475	0.067778	119	0.630239	0.988531
			120	1.000000	1.000000

Table A34. Personal Pensioners, males, combined – PPMC00: values of q_x

Age x	q_x	Age x	q_x	Age x	q_x
		50	0.002475	85	0.078047
		51	0.002742	86	0.087749
17	0.000429	52	0.003036	87	0.098717
18	0.000431	53	0.003360	88	0.111096
19	0.000434	54	0.003716	89	0.125039
20	0.000437	55	0.004107	90	0.140708
21	0.000440	56	0.004534	91	0.158268
22	0.000445	57	0.005002	92	0.177883
23	0.000450	58	0.005512	93	0.199712
24	0.000456	59	0.006068	94	0.223903
25	0.000463	60	0.006673	95	0.250578
26	0.000472	61	0.007332	96	0.279832
27	0.000482	62	0.008048	97	0.311710
28	0.000494	63	0.008826	98	0.346205
29	0.000508	64	0.009671	99	0.383234
30	0.000524	65	0.010588	100	0.411401
31	0.000544	66	0.011583	101	0.428757
32	0.000566	67	0.012664	102	0.445378
33	0.000592	68	0.013837	103	0.461290
34	0.000623	69	0.015110	104	0.476516
35	0.000658	70	0.016493	105	0.491078
36	0.000698	71	0.018045	106	0.504996
37	0.000744	72	0.019769	107	0.518288
38	0.000798	73	0.021650	108	0.530971
39	0.000859	74	0.023784	109	0.543056
40	0.000931	75	0.026204	110	0.554557
41	0.001017	76	0.028950	111	0.565480
42	0.001114	77	0.032067	112	0.575828
43	0.001224	78	0.035605	113	0.585602
44	0.001348	79	0.039622	114	0.594793
45	0.001488	80	0.044184	115	0.603382
46	0.001645	81	0.049362	116	0.611334
47	0.001821	82	0.055241	117	0.618586
48	0.002016	83	0.061911	118	0.625008
49	0.002234	84	0.069475	119	0.630239
				120	1.000000

Table A35. Personal Pensioners, males, combined – PPMC00: values of μ_x

Age x	μ_x	Age x	μ_x	Age x	μ_x
		50	0.002353	85	0.076427
		51	0.002607	86	0.086314
17	0.000429	52	0.002888	87	0.097618
18	0.000430	53	0.003198	88	0.110542
19	0.000433	54	0.003539	89	0.125319
20	0.000435	55	0.003913	90	0.142210
21	0.000439	56	0.004323	91	0.161512
22	0.000443	57	0.004772	92	0.183562
23	0.000447	58	0.005263	93	0.208737
24	0.000453	59	0.005798	94	0.237461
25	0.000460	60	0.006382	95	0.270207
26	0.000467	61	0.007018	96	0.307506
27	0.000477	62	0.007710	97	0.349943
28	0.000488	63	0.008462	98	0.398169
29	0.000501	64	0.009280	99	0.452899
30	0.000516	65	0.010168	100	0.514915
31	0.000534	66	0.011134	101	0.545041
32	0.000555	67	0.012183	102	0.574773
33	0.000579	68	0.013322	103	0.604094
34	0.000607	69	0.014561	104	0.632988
35	0.000639	70	0.015908	105	0.661433
36	0.000677	71	0.017374	106	0.689408
37	0.000720	72	0.019086	107	0.716887
38	0.000770	73	0.020887	108	0.743843
39	0.000827	74	0.022933	109	0.770242
40	0.000892	75	0.025259	110	0.796047
41	0.000972	76	0.027905	111	0.821214
42	0.001064	77	0.030915	112	0.845690
43	0.001167	78	0.034344	113	0.869412
44	0.001284	79	0.038250	114	0.892299
45	0.001416	80	0.042704	115	0.914248
46	0.001565	81	0.047786	116	0.935121
47	0.001731	82	0.053586	117	0.954717
48	0.001917	83	0.060210	118	0.972722
49	0.002123	84	0.067778	119	0.988531
				120	1.000000

Table A36. Personal Pensioners, females, deferred – PPFD00: values of q_x and μ_x

Age x	q_x	μ_x	Age x	q_x	μ_x
			45	0.001133	0.001084
			46	0.001238	0.001185
17	0.000061	0.000058	47	0.001351	0.001294
18	0.000069	0.000065	48	0.001472	0.001411
19	0.000078	0.000073	49	0.001602	0.001537
20	0.000087	0.000082	50	0.001743	0.001672
21	0.000098	0.000093	51	0.001893	0.001818
22	0.000110	0.000104	52	0.002054	0.001973
23	0.000123	0.000116	53	0.002226	0.002140
24	0.000138	0.000130	54	0.002410	0.002319
25	0.000154	0.000146	55	0.002606	0.002509
26	0.000172	0.000163	56	0.002815	0.002712
27	0.000192	0.000182	57	0.003038	0.002929
28	0.000214	0.000203	58	0.003275	0.003159
29	0.000238	0.000226	59	0.003526	0.003404
30	0.000265	0.000251	60	0.003792	0.003663
31	0.000294	0.000279	61	0.004074	0.003938
32	0.000326	0.000309	62	0.004372	0.004229
33	0.000361	0.000343	63	0.004687	0.004537
34	0.000399	0.000380	64	0.005019	0.004862
35	0.000442	0.000420	65	0.005368	0.005204
36	0.000488	0.000464	66	0.005735	0.005564
37	0.000538	0.000512	67	0.006121	0.005942
38	0.000593	0.000565	68	0.006525	0.006340
39	0.000652	0.000622	69	0.006948	0.006756
40	0.000717	0.000684	70	0.007391	0.007192
41	0.000788	0.000752	71	0.007853	0.007648
42	0.000864	0.000825	72	0.008335	0.008124
43	0.000947	0.000905	73	0.008837	0.008620
44	0.001037	0.000991	74	0.009358	0.009136
			75	0.009900	0.009672

Table A37. Personal Pensioners, females, vested – PPFV00: values of q_x and μ_x

Age x	q_x	μ_x	Age x	q_x	μ_x
50	0.004166	0.004167	85	0.058546	0.056020
51	0.004184	0.004183	86	0.067447	0.064852
52	0.004206	0.004203	87	0.077611	0.075050
53	0.004233	0.004227	88	0.089172	0.086801
54	0.004266	0.004257	89	0.102274	0.100314
55	0.004307	0.004295	90	0.117061	0.115820
56	0.004358	0.004340	91	0.133677	0.133576
57	0.004420	0.004396	92	0.152262	0.153866
58	0.004496	0.004465	93	0.172948	0.177004
59	0.004588	0.004549	94	0.195849	0.203333
60	0.004701	0.004652	95	0.221061	0.233232
61	0.004838	0.004776	96	0.248647	0.267113
62	0.005004	0.004928	97	0.278633	0.305424
63	0.005205	0.005111	98	0.311000	0.348653
64	0.005449	0.005334	99	0.345673	0.397329
65	0.005742	0.005602	100	0.374418	0.452021
66	0.006096	0.005926	101	0.395216	0.486053
67	0.006520	0.006315	102	0.415057	0.519640
68	0.007028	0.006782	103	0.433979	0.552763
69	0.007637	0.007341	104	0.452018	0.585403
70	0.008363	0.008010	105	0.469207	0.617536
71	0.009227	0.008809	106	0.485576	0.649138
72	0.010254	0.009759	107	0.501153	0.680180
73	0.011472	0.010888	108	0.515964	0.710630
74	0.012913	0.012227	109	0.530030	0.740452
75	0.014614	0.013812	110	0.543369	0.769603
76	0.016617	0.015684	111	0.555998	0.798033
77	0.018970	0.017890	112	0.567925	0.825683
78	0.021728	0.020485	113	0.579155	0.852481
79	0.024952	0.023531	114	0.589684	0.878335
80	0.028711	0.027100	115	0.599495	0.903130
81	0.033083	0.031271	116	0.608555	0.926709
82	0.038153	0.036138	117	0.616795	0.948846
83	0.044016	0.041804	118	0.624076	0.969185
84	0.050776	0.048387	119	0.629994	0.987044
			120	1.000000	1.000000

Table A38. Personal Pensioners, females, combined – PPFC00: values of q_x

Age x	q_x	Age x	q_x	Age x	q_x
		50	0.001750	85	0.058546
		51	0.001910	86	0.067447
17	0.000061	52	0.002084	87	0.077611
18	0.000069	53	0.002272	88	0.089172
19	0.000078	54	0.002476	89	0.102274
20	0.000087	55	0.002697	90	0.117061
21	0.000098	56	0.002935	91	0.133677
22	0.000110	57	0.003193	92	0.152262
23	0.000123	58	0.003471	93	0.172948
24	0.000138	59	0.003772	94	0.195849
25	0.000154	60	0.004097	95	0.221061
26	0.000172	61	0.004448	96	0.248647
27	0.000192	62	0.004827	97	0.278633
28	0.000214	63	0.005236	98	0.311000
29	0.000238	64	0.005678	99	0.345673
30	0.000265	65	0.006155	100	0.374418
31	0.000294	66	0.006670	101	0.395216
32	0.000326	67	0.007227	102	0.415057
33	0.000361	68	0.007828	103	0.433979
34	0.000399	69	0.008478	104	0.452018
35	0.000442	70	0.009180	105	0.469207
36	0.000488	71	0.009939	106	0.485576
37	0.000538	72	0.010761	107	0.501153
38	0.000593	73	0.011653	108	0.515964
39	0.000652	74	0.012913	109	0.530030
40	0.000717	75	0.014614	110	0.543369
41	0.000788	76	0.016617	111	0.555998
42	0.000864	77	0.018970	112	0.567925
43	0.000947	78	0.021728	113	0.579155
44	0.001037	79	0.024952	114	0.589684
45	0.001133	80	0.028711	115	0.599495
46	0.001238	81	0.033083	116	0.608555
47	0.001351	82	0.038153	117	0.616795
48	0.001472	83	0.044016	118	0.624076
49	0.001603	84	0.050776	119	0.629994
				120	1.000000

Table A39. Personal Pensioners, females, combined – PPFC00: values of μ_x

Age x	μ_x	Age x	μ_x	Age x	μ_x
		50	0.001676	85	0.056020
		51	0.001830	86	0.064852
17	0.000058	52	0.001997	87	0.075050
18	0.000065	53	0.002178	88	0.086801
19	0.000073	54	0.002374	89	0.100314
20	0.000082	55	0.002587	90	0.115820
21	0.000093	56	0.002817	91	0.133576
22	0.000104	57	0.003065	92	0.153866
23	0.000116	58	0.003334	93	0.177004
24	0.000130	59	0.003624	94	0.203333
25	0.000146	60	0.003938	95	0.233232
26	0.000163	61	0.004277	96	0.267113
27	0.000182	62	0.004644	97	0.305424
28	0.000203	63	0.005039	98	0.348653
29	0.000226	64	0.005466	99	0.397329
30	0.000251	65	0.005928	100	0.452021
31	0.000279	66	0.006427	101	0.486053
32	0.000309	67	0.006966	102	0.519640
33	0.000343	68	0.007548	103	0.552763
34	0.000380	69	0.008178	104	0.585403
35	0.000420	70	0.008859	105	0.617536
36	0.000464	71	0.009596	106	0.649138
37	0.000512	72	0.010393	107	0.680180
38	0.000565	73	0.011257	108	0.710630
39	0.000622	74	0.012227	109	0.740452
40	0.000684	75	0.013812	110	0.769603
41	0.000752	76	0.015684	111	0.798033
42	0.000825	77	0.017890	112	0.825683
43	0.000905	78	0.020485	113	0.852481
44	0.000991	79	0.023531	114	0.878335
45	0.001084	80	0.027100	115	0.903130
46	0.001185	81	0.031271	116	0.926709
47	0.001294	82	0.036138	117	0.948846
48	0.001411	83	0.041804	118	0.969185
49	0.001537	84	0.048387	119	0.987044
				120	1.000000