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Compiled by the
Continuous Mortality Investigation
of the Institute of Actuaries and the Faculty of Actuaries

INTRODUCTION

The Executive Committee of the Continuous Mortality Investigation (CMI) of the Institute of Actuaries and Faculty of Actuaries has pleasure in presenting this, its twenty-first report.

It has been three years since the publication of the last C.M.I. Report. However, the CMI has been far from inactive during that time. A major new development has been the introduction of Working Papers. These are a means of reporting new research, consultations and work-in-progress to the Actuarial Profession more quickly than would be possible via C.M.I. Reports. Papers published in this format may or may not subsequently assume full C.M.I. Report status, though any work carried out for a Working Paper will be of the same standard as for a C.M.I. Report, and will have been closely supervised by the relevant sponsoring sub-committee. Eight Working Papers have been published in the last eighteen months, with more in the pipeline.

There is an increasing public and professional interest in longevity and its implications, and a major piece of research, published as a Working Paper late in 2002, was a report highlighting the “cohort effect”. This work has provided new insights into the development of mortality, and led to a revision of the projection bases first published with the “92” Series tables of mortality. It would not have been possible without the CMI’s long-standing base of data.

The profession has had an opportunity in 2004 to consider mortality trends with sessional meetings to discuss the paper *Longevity in the 21st Century*. Work is also in progress on constructing a new set of standard mortality tables to be based on the 1999-2002 experience and a new methodology for projecting future mortality. Results from these two strands of work are expected to be published in the second half of 2004 and the first half of 2005 respectively.

Instrumental in guiding the CMI into this new era was my predecessor, Peter Nowell. During his five-year tenure as Chairman of the Executive Committee, major advances have been made in improving timescales for data collection and developing the understanding of factors that affect longevity in the UK. I thank Peter for his hard work, and hope to build on the foundations he has laid during my term of office.

I would also like to pay special mention to Chris Daykin who has recently retired from the CMI Executive Committee after twenty years’ service. Chris, who was also a member of the Mortality Sub-Committee, has played a very full and active role in the CMI. His expertise and enthusiasm will be missed, and I wish him well for the future.

This report was published on the Actuarial Profession’s website in September 2004, and this is intended to be the principal means of transmission of C.M.I. Reports to interested readers. For the first time, the C.M.I. Report will not be printed in the traditional “blue book” and despatched to all members of the Actuarial Profession as a matter of course. This decision was not taken lightly. The Executive Committee recognises that many actuaries rely on the “blue books” to keep themselves informed of the work of the CMI. However, printing costs are high and, in an increasingly technological age, the internet is fast becoming the preferred means of receiving information for many people. The CMI must move with the times, and the Executive Committee feels that it can no longer justify the cost involved with a full print run that would have to be borne by the member offices.

The papers contained in this report are devoted entirely to the mortality experience of the 1999-2002 quadrennium.

The first four papers record the mortality experience of assured lives, annuitants and pensioners for that quadrennium. These papers follow the style established in *C.M.I.R. 16* and *C.M.I.R. 19* (which reported on the 1991-1994 and 1995-1998 quadrennia respectively), whereby the tables are placed at the end of the relevant section. The naming of the tables also

follows the convention set in those earlier reports for ease of comparison. The comparison bases used in these papers are the appropriate “92” Series mortality tables.

The fifth paper details the 1999-2002 experience of smokers and non-smokers. This experience is growing steadily as a proportion of the total available data, and it is clear from these analyses that there is a wide differential in the mortality experience of these two classes of lives.

For those with only a passing interest in the rich source of information in this C.M.I. Report, I would draw attention to the following main conclusions that have arisen:

Assured Lives

- Male mortality has continued to improve significantly, across virtually all age groups. This is a long established trend.
- The actual experience in 1999-2002 is around 80% of that expected according to the AM92 and TM92 mortality tables for permanent assurances and temporary assurances respectively; in 1995-1998 the equivalent proportion was around 90%.
- For females, the overall level of mortality for permanent assurances is little changed in 1999-2002 compared with 1995-1998, at around 95% of that expected according to the AF92 table. Relatively modest improvements arose between ages 30 to 70, with mixed results outside this range.
- Improvements in the mortality of female temporary assurances have occurred, but at a slower pace than for the male experience. In the 35 to 65 age range, where most of the data lies, mortality in 1999-2002 was around 85% of that expected according to the TF92 table.
- The mortality of smokers is about twice the level of that for non-smokers, a similar result to that seen in the previous quadrennium. The greatest differential is in the 50 to 80 age range.

Annuitytants and Pensioners

- For immediate (i.e. purchased life) annuitytants, the male and female lives and male amounts experience in 1999-2002 is little changed from 1995-1998, and is around 10% lighter than the relevant base “92” Series tables. Applying the “92” Series projections leads to a reasonably close fit to the experience. For female amounts, however, the mortality experience has worsened since 1995-1998, and remains at a similar level to 1991-1994.
- The experience varies by age, with the greatest mortality improvements occurring in the 70 to 85 age range.
- The mortality experience of self-employed retirement annuitytants has improved significantly. For all sections – males and females, in deferment and in payment separately – overall mortality is around 10% lighter than in 1995-1998. The greatest improvements have occurred for the younger ages, i.e. those below about 85.
- For holders of personal pension policies, which were first issued in 1988, there have been relatively modest improvements in mortality since 1995-1998. Compared with the retirement annuitytants, mortality is now slightly heavier in the in deferment section. Mortality in the in payment section remains lighter than for retirement annuitytants, but the differential has narrowed.
- The mortality experience of life office pensioners, which traditionally has been the most important experience for pension schemes, has continued to improve significantly, being about 10% lighter than in 1995-1998 and some 20% lighter than the relevant base “92” Series tables.

Introduction

- The original “92” Series projections have tended to understate the actual improvements, whereas overall the experience since 1992 has followed the medium cohort adjusted projections, published in 2002, reasonably closely. However, the pattern by age is more varied with the cohort projections tending to underestimate mortality at the younger ages and overestimate it at the older ages.

Finally it remains for me to thank all those involved with the work of the CMI – the member offices that provide the data and financial support, the Secretariat for carrying out the processing and administrative work, and the members of the Executive Committee, Sub-Committees and Working Parties who give so much of their time, on a voluntary basis, to the service of the profession and its stakeholders.

September 2004

Brian Ridsdale
Chairman, Executive Committee

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THE MORTALITY OF HOLDERS OF PERMANENT (WHOLE LIFE AND ENDOWMENT) POLICIES OF ASSURANCE 1999-2002

This report follows the format of part 1 of *C.M.I.R.* 19, which reported on the experience of 1995-1998. In particular, in order to allow easy cross referencing to that report, most table, section and paragraph numbers follow the numbering used in *C.M.I.R.* 19. As with that report, this report contains commentaries on three sets of data. Section 1 covers the male holders of permanent (whole life and endowment) policies issued in the United Kingdom. The policies are divided into six sub-sets relating to the type of product, the degree of underwriting and whether they were issued on a single or a joint life basis. Section 2 covers female policyholders, similarly subdivided into six sub-sets. Section 3 relates to policies written in the Republic of Ireland, subdivided by sex.

The exposed to risk and deaths over the last four quadrennia are shown for each sub-group in Table ASS 0.1. This, and subsequent tables relating to the text, will be found on pp 8 to 29. The effect of smoking on mortality for this class of business is covered in a separate report on pp 95 to 120.

The term “standard medical evidence” relates to policies where the life assured has undergone a full medical examination or has completed a comprehensive health questionnaire, with or without a Medical Attendant’s Report. “Minimum medical evidence” relates to policies issued after the completion of a short proposal form containing a small number of questions. “Guaranteed acceptance” relates to policies issued with no medical evidence at all. All policies are accepted at standard premium rates. Instructions on the submission of data are provided to contributing offices in a document entitled *Consolidated Rules of the CMI Bureau*.

1. MALE LIVES COVERED BY POLICIES ISSUED IN THE UNITED KINGDOM

The six experiences included in this section are:

- 1.1 Non-linked assurances on single lives, based on standard medical evidence.
- 1.2 Unit-linked assurances on single lives, based on standard medical evidence.
- 1.3 Joint life first death assurances, based on standard medical evidence.
- 1.4 Assurances on single lives based on minimum medical evidence.
- 1.5 Assurances on joint lives based on minimum medical evidence.
- 1.6 Guaranteed acceptance assurances on single lives.

Each of the experiences is compared against the AM92 table. Using a standard comparison basis throughout the report helps demonstrate the differences between the experiences. In the report in *C.M.I.R.* 19 the 1995-1998 experience was compared against both the AM92 and AM80 tables in order to provide a ‘bridge’ to past comparisons. The resulting ‘bridging factors’ have been applied to the 100A/Es for 1991-1994 in that report to estimate the equivalent 100A/Es had the AM92 table been used as the comparison basis.

The summary table, ASS 1.0.1, shows for each investigation the number of actual deaths at durations 2 and over as a percentage of the number expected according to the AM92 table. The experience of the guaranteed acceptance group is very different to the other groups, being very much higher at ages over 50 and substantially worse than the experience in the 1995-1998 quadrennium. In part, this could reflect different products and different drivers for cover between the under 50s and over 50s. The other groups exhibit broadly similar experiences to each other, except for the minimum medical evidence single life policies where mortality is higher. Furthermore, mortality has improved at nearly all age groups compared to the previous quadrennium (see Table ASS 1.0.1 in *C.M.I.R.* 19) for these

groups. The markedly higher level of mortality for the linked standard medical evidence group witnessed four years ago can no longer be seen.

As well as the detailed reports covering recent experience, Section 1.1 also contains a note showing a longer term perspective detailing trends back to the quadrennium 1959-1962.

1.1 *Non-linked assurances on single lives, based on standard medical evidence*

This investigation (together with that into the mortality of immediate annuitants) is the longest running of those carried out by the CMI. It is also, in terms of the number of policies covered, one of the largest. As can be seen from Table ASS 0.1, the long term fall in the exposed to risk, noted in *C.M.I.R.* 14, *C.M.I.R.* 16, and *C.M.I.R.* 19, has continued into the quadrennium 1999-2002. The total exposed to risk is now little more than half of the level of only two quadrennia earlier.

In the main the decline is due to insufficient new business to replace that going out of the experience through deaths, maturities, surrenders and lapses, as can be seen by the particularly low volumes at the earlier durations. The number of offices contributing to the experience over the years has been generally stable, with around 25-30 offices contributing data in any one year over the last two quadrennia. This does mask a certain fluidity of contributions as offices join or leave the investigation (or both!) over time. It is interesting to note that only 11 offices have contributed data to each of the last eight years. The decline in volumes is a source of concern and a detailed survey of the contributing offices has been carried out to investigate this issue. There appears to be some evidence to support the reasons suggested in *C.M.I.R.* 19, namely a decline in market share of the offices that contribute data to the investigations and a continued shift away from traditional with profits business towards newer style critical illness and term assurance contracts.

In addition to the decline in the exposed to risk the global crude mortality rate has increased during a period that mortality rates have been improving. This shows that the experience is ageing as it declines.

Quadrennium	Crude Mortality Rate
1987-1990	0.004196
1991-1994	0.004248
1995-1998	0.004519
1999-2002	0.005189

Table ASS 1.1.1 shows for the whole data the actual deaths in 1999-2002 and the ratio of the actual deaths to those expected using the AM92 table. Corresponding ratios for 1995-1998 and 1991-1994 are also shown. At durations 2 and over it can be seen from the table that the mortality experienced by policyholders has continued to fall at all ages over 25. This is now a long established trend. In most age groups the number of actual deaths is around 80% of the number expected according to the AM92 table; this compares with a figure of around 90% only four years ago.

At durations 0 and 1 the ratios of actual to expected deaths vary by age group. This is not surprising given the low data volumes at these durations. Overall, though, there has been an improvement in the experience when compared with the previous quadrennium. As with the experience at durations 2 and over, the number of actual deaths observed is around 80% of the number expected according to the AM92 table.

Table ASS 1.1.2 shows, by age group, percentage ratios of actual deaths to those which would be expected using as a comparison basis the AM92 table for each quadrennium going back to 1959-1962. For 1991-1994 and earlier, these have been calculated by using 'bridging

factors' derived from previous reports. The report for the 1995-1998 quadrennium (*C.M.I.R.* **19**) showed 100A/E ratios using both the AM92 and AM80 mortality tables as comparison bases. Similarly the report for the 1983-1986 quadrennium (*C.M.I.R.* **11**) showed 100A/E ratios using both the AM80 and A1967-70 mortality tables as comparison bases, and the report for the 1971-1974 quadrennium (*C.M.I.R.* **3**) showed 100A/E ratios using both the A1967-70 and the A1949-52 mortality tables as comparison bases. Although there is necessarily an element of approximation in these calculations, it is likely that the errors are small. The results at very high ages should obviously be interpreted with caution.

From the table the steady improvement in mortality can be clearly seen. Between ages 45 and 70 the observed mortality rates in 1999-2002 are only about 40% of those observed in 1959-1962. Outside these ages the improvement is not quite so pronounced, but is still substantial. Looking at the trend for all ages it can be seen that the improvements in mortality since 1979-1982 have been greater than in previous quadrennia. Prior to 1979-1982 the 100A/E ratio improved by about 6% between each quadrennium but has improved by about 10% between quadrennia since that time, with the greatest improvement being experienced in the most recent quadrennium. The 100A/E values for the 96-100 age group remain very low suggesting that the AM92 table is too heavy or, possibly, that there is under-recording of deaths at these very old ages.

1.2 *Unit-linked assurances on single lives, based on standard medical evidence*

Table ASS 1.2.1 shows, for the whole data, the deaths in 1999-2002 and the ratios of actual deaths to those expected using the AM92 table. Corresponding ratios for 1995-1998 and 1991-1994 are also shown.

For duration 0, the overall level of mortality recorded in 1999-2002 was a little higher than that recorded in 1995-1998. It was much higher for the lower age groups and mixed at the higher end. The erratic experience reflects the low data volumes, particularly in 1995-1998. For duration 1, there was an overall decrease in the value of the 100A/E compared with the previous quadrennium. However, there was an increase for ages below 45. It is notable that at duration 0 the number of deaths in 1999-2002 (187) has risen sharply since 1995-1998 (61). A similar but less rapid increase in the number of deaths has occurred at duration 1. For both of these durations the total exposure has actually fallen (duration 0 marginally and duration 1 by about 10%) but at the same time has "aged", suggesting that new policyholders tended to be older in 1999-2002 than they were in 1995-1998. For durations 2 and over, the value of the ratio of actual to expected deaths in 1999-2002 for all ages is significantly lower than for 1995-98, and there was a fall for all ages between 35 and 85.

For 1995-1998, *C.M.I.R.* **19** noted that the mortality of this group was higher than that of the non-linked section of the data whereas for 1999-2002 the mortality of these two experiences is similar. This accords with the 1991-1994 experience, as noted in *C.M.I.R.* **16**.

1.3 *Joint life first death assurances, based on standard medical evidence*

The policies included in this investigation are those where payment is made on the occurrence of the first death only. It is also limited to policies set up on one male and one female life. As time has passed, in some cases, one of the lives has been deleted from the policy, the other life remaining in the experience on a single life basis.

Table ASS 1.3.1 shows the analyses for this group. As in the non-linked experience, the changes in the level of mortality recorded vary according to age and over time. In general there is a continuing fall in the mortality recorded over the three most recent quadrennia. The overall level of mortality of those in the joint life investigation in 1999-2002 was similar to both the non-linked investigation and the linked investigation. However, the pattern of mortality was slightly different, being generally lighter at younger ages and heavier at older ages. This investigation demonstrates much lighter mortality than that of the AM92 table.

At durations 0 and 1, and as noted in *C.M.I.R. 19* and *C.M.I.R. 16*, the rates of mortality for males in the joint life experience in 1999-2002 were well below those experienced in either the linked or the non-linked single life experience. However, volumes are very low and it is difficult to draw firm conclusions.

1.4 Assurances on single lives, based on minimum medical evidence

The analyses for this group are shown in Table ASS 1.4.1. Data volumes are substantially greater than in the previous quadrennium. Overall the level of mortality experienced by this group at durations 2 and over has, over time, been consistently above that observed in the fully underwritten, single life experience, and this feature continues to hold true in the 1999-2002 quadrennium. This difference has varied by age but in all age groups, above 40, the mortality experience of 1999-2002 was above that of the fully underwritten group. The greatest difference observed was between the ages 66 to 70. While there are fluctuations by age, the overall experience is little changed from 1995-1998.

At durations 0 and 1 the mortality experience is substantially heavier than that found in the single life, fully medically underwritten group. This feature was noted in previous quadrennia, albeit based on very low data volumes.

1.5 Assurances on joint lives, based on minimum medical evidence

The experience for this group is to be found in Table ASS 1.5.1.

At durations 2 and over the mortality recorded in this group is broadly similar in pattern to that recorded in the joint life fully underwritten group, though at a slightly higher level. The level of mortality is below that found in the corresponding single life investigations, particularly above age 40.

1.6 Guaranteed acceptance assurances written on single lives

The experience for this group is shown in Table ASS 1.6.1. A notable feature is the extremely large increase in the amount of data recorded during 1999-2002 compared with 1995-1998. For all duration groups the increases have occurred in all age groups over 50. The increases are due to a small number of offices joining this investigation and contributing large volumes of data at all durations. In view of the significant change in the data set, direct comparisons with previous quadrennia should be treated with caution.

At duration 0, overall the ratio of actual to expected deaths in 1999-2002 is at much the same level as in the previous quadrennium. The pattern of mortality across age groups is also similar for the two quadrennia.

At duration 1, the overall level of mortality is much higher than in the previous quadrennium, though the pattern of mortality by age group is broadly similar.

At durations 2 and over, at ages above 50 the experience is much higher than in the previous quadrennium for every age group. Below age 50 there is insufficient data to draw firm conclusions. Overall the experience is much heavier than in the previous quadrennium.

For ages above 50, the level of mortality observed in 1999-2002 is well above that recorded in both the fully medically underwritten and the minimum evidence investigations.

2. FEMALE LIVES COVERED BY POLICIES ISSUED IN THE UNITED KINGDOM

This section covers six different experiences, corresponding to those for male lives reviewed in Section 1.

The experiences are:

- 2.1 Non-linked assurances on single lives, based on standard medical evidence.
- 2.2 Unit-linked assurances on single lives, based on standard medical evidence.
- 2.3 Joint life first death assurances, based on standard medical evidence.
- 2.4 Assurances on single lives, based on minimum medical evidence.
- 2.5 Assurances on joint lives, based on minimum medical evidence.
- 2.6 Guaranteed acceptance assurances on single lives.

Each of the experiences is compared against the AF92 table. As with the males, ‘bridging factors’ derived from the 1995-1998 experience in *C.M.I.R.* **19** have been used to estimate the 100A/Es for 1991-1994 using the AF92 table.

The summary table, ASS 2.0.1, shows for each investigation the number of actual deaths at durations 2 and over as a percentage of the number expected according to the AF92 table. The non-linked and linked standard medical evidence groups display similar experience overall, but the pattern across age groups is different. For these two groups, overall experience is heavier than the joint life standard medical evidence group. The experience of the single life minimum medical evidence group is similar to that of the linked group at the lower ages but is much higher above age 60. The joint life minimum medical evidence group’s experience is similar to that of the non-linked standard medical evidence. As with males, the guaranteed acceptance group above age 50 exhibits much higher mortality than the other groups.

As well as the detailed reports covering recent experience, Section 2.1 also contains a note showing a longer term perspective detailing trends back to the quadrennium 1975-1978, the first quadrennium for which data on female policyholders are available.

2.1 *Non-linked assurances on single lives, based on standard medical evidence*

In contrast to the male experience, the amount of exposed to risk has been reasonably stable over recent quadrennia. However, the same feature of an increasing global crude mortality rate, and hence ageing experience, has been observed.

Quadrennium	Crude Mortality Rate
1987-1990	0.002085
1991-1994	0.002156
1995-1998	0.002488
1999-2002	0.003268

Table ASS 2.1.1 shows for the whole data the actual deaths in 1999-2002 and the ratio of the actual deaths to those expected using the AF92 table. Corresponding ratios for 1995-1998 and 1991-1994 are also shown.

From the table it can be seen that, at durations 2 and over, the overall mortality recorded in this investigation has remained at a similar level to the previous quadrennium. Closer inspection shows relatively modest improvements between ages 30 and 70, with mixed results outside this range. At the extremes of the age range, in particular, mortality has worsened. The comparison with the AF92 table shows that this mortality table understates the number of expected deaths at ages above 75.

At duration 1, the overall level of mortality is similar to that of the previous quadrennium. Comparisons by age group are, however, mixed. In contrast, the mortality at duration 0 has improved significantly since the last quadrennium. This more than reverses the deterioration witnessed between 1991-1994 and 1995-1998. The numbers of deaths at these durations are low and so these results may be spurious.

Table ASS 2.1.2 shows, by age group, percentage ratios of actual deaths to those that would be expected using the AF92 table as a comparison basis for each quadrennium from 1975-1978.

Overall observed mortality over the seven quadrennia shown continues to improve, however the rate of improvement has slowed. Mortality in 1999-2002 was around two-thirds of the level observed in 1975-1978. Improvements are generally greater below age 65 than they are above that age.

Comparing table ASS 2.1.2 with table ASS 1.1.2, it can be seen that female mortality has not improved as quickly as male mortality. This feature is particularly apparent over the last two quadrennia.

2.2 Unit-linked assurances on single lives, standard medical evidence

The experience for 1999-2002 is shown in Table ASS 2.2.1. At durations 2 and over the overall level of mortality observed is similar to that of the non-linked experience, as was also the case in 1991-1994. The heavier mortality seen in 1995-1998 is no longer apparent. However the pattern across age groups differs. The non-linked experience is heavier at ages 55 to 85 and below age 35, while the unit-linked experience is heavier between ages 35 and 55 and above age 85.

At duration 1 the level of mortality observed in the linked experience is lighter than that found in the non-linked experience. This is a reversal of a feature seen in previous quadrennia. At duration 0 there is too little data for meaningful conclusions to be drawn.

2.3 Joint life assurances, standard medical evidence

As was noted in Section 1.3, the commentary on the corresponding experience of male lives, the policies included in this investigation are those where payment is made on the occurrence of the first death only and are restricted to policies set up on one male and one female life.

The experience for 1999-2002 is shown in Table ASS 2.3.1. At durations 2 and over the mortality observed has fallen after a long period of stability. The greater improvements have been seen in younger ages, below about age 50. In the three quadrennia shown, mortality is well below that observed in both the linked and the non-linked single life investigations.

At durations 0 and 1 the joint life experience has almost always been well below that of the corresponding single life experiences. However, data volumes are very low so it is difficult to draw firm conclusions.

2.4 Assurances on single lives, based on minimum medical evidence

The experience for this group is shown in Table ASS 2.4.1.

The level of mortality recorded in the minimum evidence experience for 1999-2002 at durations 2 and over is, for all age groups, above that found in the standard experience. It is what would logically be expected and the same feature is observed in the other quadrennia shown. The experience has also worsened since 1995-1998. It is now noticeably higher than the corresponding male experience, which was not the case previously.

At durations 0 and 1 the numbers of deaths are too small for any reliable conclusions to be drawn.

2.5 Assurances on joint lives, based on minimum medical evidence

The experience is shown in Table ASS 2.5.1.

At durations 2 and over the joint life experience is lighter than the corresponding single life experience. This is true virtually throughout the age range, and is similar to the experience in the previous quadrennium.

There were no deaths recorded at durations 0 and 1, as in the corresponding male experience.

2.6 *Guaranteed acceptance assurances issued on single lives*

As was noted for the male experience in Section 1.6, there were substantial changes in the data submitted to this investigation with submissions from offices new to this investigation making up the bulk of the data. Care is therefore required when interpreting the results, particularly when comparing them with previous quadrennia. Table ASS 2.6.1 gives the experience available. At durations 0, 1 and 2 and over, for all ages combined, mortality is much heavier than in the previous quadrennium. The mortality suffered by this group is, overall, substantially heavier than that suffered by other female policyholders in the investigations conducted by the CMI, notably at short durations.

3. POLICIES OF ASSURANCE ISSUED IN THE REPUBLIC OF IRELAND

This section contains commentary on the experience of holders of non-linked, standard medical evidence policies of assurance written in the Republic of Ireland. As was reported in *C.M.I.R. 19*, the number of offices contributing to the Irish experiences in recent years has declined and the exposed to risk has been falling steadily. The situation is exacerbated by the fact that most business written in Ireland is now on a unit-linked basis for which the CMI does not currently run an investigation. The viability of this investigation is now questionable. The female investigation is small, but is included for completeness.

3.1 *Assurances on male lives*

This long established investigation is now a mature experience, with very little new business coming in. Table ASS 3.1.1 shows the analysis for 1999-2002, together with results for the two previous quadrennia. The improvement in mortality between quadrennia, noted in the last report (*C.M.I.R. 19*) has continued. At durations 2 and over the improvement can be seen in most age groups. The mortality experience for policies written in Ireland was very similar to that for policies written in the UK in the two most recent quadrennia.

3.2 *Assurances on female lives*

This experience is very small with only 50,000 policies in the exposed to risk and a total of 35 deaths. The analyses are shown in Table ASS 3.2.1.

4. CONCLUSION

The reports on the permanent assurance investigations cover a wide range of experiences. Each has its own peculiarities and, sometimes, oddities. From time to time it is suggested that an investigation be closed or certain investigations be amalgamated. However, with the exception of one or two very small investigations, each provides useful information on a particular facet of the insurance market. The Executive Committee hopes that this continues to be of value to those involved in the day-to-day operation of the business.

Table ASS 0.1. Permanent (whole life and endowment) assurances, combined, all durations: exposed to risk and deaths.

Investigation	1999-2002		1995-1998		1991-1994		1987-1990	
	Exposed to risk (000)	Actual deaths	Exposed to risk (000)	Actual deaths	Exposed to risk (000)	Actual deaths	Exposed to risk (000)	Actual deaths
<i>Males, UK</i>								
Non-linked, standard evidence	8,316	43,155	11,394	51,487	15,191	64,536	18,568	77,906
Linked, standard evidence	1,764	7,321	1,624	5,889	1,771	7,184	1,109	3,736
Joint life first death, standard evidence	2,324	5,111	3,019	5,303	2,810	4,292	1,743	2,434
Minimum evidence	2,903	24,986	2,096	4,101	2,126	2,920	1,810	1,865
Joint life first death, minimum evidence	1,750	3,524	2,023	3,142	1,664	1,877	1,883	1,546
Guaranteed acceptance business	1,033	41,240	136	1,125	177	431	307	606
Total	18,090	125,337	20,292	71,047	23,739	81,240	25,420	88,093
<i>Females, UK</i>								
Non-linked, standard evidence	4,393	14,357	5,208	12,956	5,587	12,047	5,102	10,639
Linked, standard evidence	1,263	4,470	1,155	3,011	1,077	2,964	497	1,382
Joint life first death, standard evidence	2,304	2,665	2,994	2,883	2,766	2,139	1,707	1,072
Minimum evidence	1,981	13,473	765	1,147	665	612	551	292
Joint life first death, minimum evidence	1,751	2,101	2,021	1,687	1,657	999	1,850	726
Guaranteed acceptance business	1,078	26,601	61	467	60	100	101	132
Total	12,770	63,667	12,204	22,151	11,812	18,861	9,808	14,243
<i>Males, Republic of Ireland</i>								
Non-linked, standard evidence	93	300	151	629	308	1,320	536	2,126
<i>Females, Republic of Ireland</i>								
Non-linked, standard evidence	50	35	47	82	65	87	91	105

Table ASS 1.0.1. Permanent assurances, males, 1999-2002, combined, durations 2 and over: actual deaths as a percentage of those expected using the AM92 table.

Age group (nearest ages)	Standard medical evidence			Minimum medical evidence		Guaranteed acceptance
	Non-linked	Linked	Joint life	Single life	Joint life	
26-30	81	42	105	81	67*	} 16 *
31-35	87	97	76	77	76	
36-40	87	81	76	86	83	
41-45	89	91	74	99	80	68
46-50	81	101	79	102	81	87
51-55	77	82	85	96	87	281
56-60	78	83	77	92	89	259
61-65	74	81	76	110	83	219
66-70	75	78	86	114	90	187

* Ratio based on fewer than 10 actual deaths.

Table ASS 1.1.1. Permanent assurances (non-linked), males, 1999-2002, standard medical evidence, all data: actual deaths and ratios of actual deaths to those expected using the AM92 table, together with comparisons of 1995-1998 and 1991-1994.

Age group (nearest ages)	Actual deaths 1999-2002	100A/E 1999-2002 (using AM92)	100A/E 1995-1998 (using AM92)	100A/E 1991-1994 (using AM92)
Duration 0				
21-30	10	88	143	113
31-40	11	58	103	104
41-45	9	83 *	98	88
46-50	11	74	85	103
51-55	19	79	121	99
56-60	19	82	94	93
61-65	25	83	86	111
66-70	22	65	97	100
71-75	21	85	88	98
76-80	15	115	97	112
21-80	162	79	98	99
Duration 1				
16-25	7	80 *	78	105
26-30	16	118	97	90
31-35	11	67	128	89
36-40	16	92	64	106
41-45	21	109	91	92
46-50	20	73	79	126
51-55	41	85	94	102
56-60	37	76	107	99
61-65	38	65	83	99
66-70	64	76	95	88
71-75	42	80	94	97
76-80	31	98	92	101
16-80	344	81	93	95

Table ASS 1.1.1. (continued)

Age group (nearest ages)	Actual deaths 1999-2002	100A/E 1999-2002 (using AM92)	100A/E 1995-1998 (using AM92)	100A/E 1991-1994 (using AM92)
Durations 2+				
16-20	12	186	87	159
21-25	51	112	113	107
26-30	125	81	90	92
31-35	297	87	91	105
36-40	528	87	94	106
41-45	947	89	94	99
46-50	1,838	81	91	102
51-55	4,084	77	90	101
56-60	5,915	78	89	97
61-65	6,270	74	88	104
66-70	4,060	75	91	99
71-75	4,638	79	92	100
76-80	5,028	83	92	100
81-85	4,198	88	96	103
86-90	3,013	85	95	97
91-95	1,387	70	83	91
16-95	42,391	79	91	101

* Ratio based on fewer than 10 actual deaths.

Table ASS 1.1.2. Permanent assurances (non-linked), males, standard medical evidence, all data, durations 2 and over: actual deaths 1959-2002 as a percentage of those expected using the AM92 table.

Age group (nearest ages)	Quadrennium										
	1959-1962	1963-1966	1967-1970	1971-1974	1975-1978	1979-1982	1983-1986	1987-1990	1991-1994	1995-1998	1999-2002
21-25	174	150	141	126	118	121	103	113	107	113	112
26-30	122	128	114	116	101	98	101	88	92	90	81
31-35	135	129	115	110	104	100	98	101	105	91	87
36-40	158	158	142	134	130	114	108	100	106	94	87
41-45	182	186	174	159	146	133	121	108	99	94	89
46-50	196	196	191	179	161	148	134	118	101	91	81
51-55	203	198	189	182	171	155	132	114	100	90	77
56-60	202	196	185	170	158	150	133	114	97	89	78
61-65	198	195	178	165	155	144	136	118	104	88	74
66-70	175	173	164	150	140	129	118	107	99	91	75
71-75	161	162	159	151	139	132	114	108	100	92	79
76-80	161	156	148	144	143	134	119	110	100	92	83
81-85	153	146	139	136	130	128	119	108	103	96	88
86-90	145	142	130	130	127	115	112	103	98	95	85
91-95	134	128	118	112	119	104	99	88	91	83	70
96-100	115	101	111	101	89	65	68	55	43	46	31
All ages ⁺	186	182	172	161	151	141	127	113	100	90	78
Number of deaths ⁺	91,257	96,973	94,271	93,008	91,884	90,941	88,442	75,095	61,806	50,069	42,644

⁺ Figures contain a small number of deaths recorded at ages under 21 or over 100.

Table ASS 1.2.1. Linked contracts of life assurance, males, 1999-2002, standard medical evidence, all data: actual deaths and ratios of actual deaths to those expected using the AM92 table, together with comparisons of 1995-1998 and 1991-1994.

Age group (nearest ages)	Actual deaths 1999-2002	100A/E 1999-2002 (using AM92)	100A/E 1995-1998 (using AM92)	100A/E 1991-1994 (using AM92)
Duration 0				
16-30	9	152 *	102	161
31-45	23	81	55	114
46-60	57	88	86	172
61-75	54	56	17 *	138
76-90	44	79	222 *	179
16-90	187	74	71	150
Duration 1				
16-30	7	99 *	89	128
31-45	26	73	53	110
46-60	83	83	115	120
61-75	117	61	81	120
76-90	91	90	152 *	161
16-90	324	74	89	120
Durations 2+				
16-25	11	123	102	98
26-30	14	42	86	109
31-35	99	97	83	116
36-40	144	81	111	100
41-45	237	91	132	123
46-50	436	101	119	122
51-55	672	82	121	118
56-60	882	83	114	111
61-65	972	81	106	109
66-70	905	78	100	105
71-75	788	68	94	93
76-80	693	72	83	103
81-85	528	85	94	79
86-90	305	91	71	96
91-95	93	96	90	117
16-95	6,779	80	106	107

* Ratio based on fewer than 10 actual deaths.

Table ASS 1.3.1. Joint life first death assurances, males, 1999-2002, standard medical evidence, all data: actual deaths and ratios of actual deaths to those expected using the AM92 table, together with comparisons of 1995-1998 and 1991-1994.

Age group (nearest ages)	Actual deaths 1999-2002	100A/E 1999-2002 (using AM92)	100A/E 1995-1998 (using AM92)	100A/E 1991-1994 (using AM92)
Duration 0				
21-35	9	48 *	59	72
36-40	10	65	45	86
41-45	12	70	43	83
46-50	13	68	47	75
51-55	10	48	89	109
56-60	12	77	67	85
21-60	66	62	57	82
Duration 1				
21-35	13	69	84	87
36-40	11	66	74	66
41-45	13	67	50	124
46-50	13	56	71	100
51-55	15	53	62	101
56-60	15	57	47	90
21-60	80	60	66	94
Durations 2+				
21-30	26	103	75	66
31-35	84	76	69	79
36-40	215	76	78	79
41-45	377	74	85	90
46-50	632	79	86	107
51-55	988	85	90	109
56-60	878	77	93	104
61-65	912	76	92	99
66-70	565	86	83	86
71-75	178	83	71	80
76-80	56	84	76	85
21-80	4,911	80	87	98

* Ratio based on fewer than 10 actual deaths.

Table ASS 1.4.1. Minimum evidence assurances written on one life only, males, 1999-2002, all data: actual deaths and ratios of actual deaths to those expected using the AM92 table, together with comparisons of 1995-1998 and 1991-1994.

Age group (nearest ages)	Actual deaths 1999-2002	100A/E 1999-2002 (using AM92)	100A/E 1995-1998 (using AM92)	100A/E 1991-1994 (using AM92)
Duration 0				
21-35	14	56		
36-40	14	94		
41-45	18	97		
46-50	19	77		
51-55	24	100		
56-60	20	118		
61-65	30	149		
66-70	10	116		
21-70	149	98	76 *	144
Duration 1				
21-35	21	81		
36-40	16	103		
41-45	16	79		
46-50	33	118		
51-55	36	107		
56-60	26	126		
61-65	28	124		
66-70	19	142		
21-70	195	108	127	129

Table ASS 1.4.1. (continued)

Age group (nearest ages)	Actual deaths 1999-2002	100A/E 1999-2002 (using AM92)	100A/E 1995-1998 (using AM92)	100A/E 1991-1994 (using AM92)
Durations 2+				
21-25	4	62 *	73 *	101
26-30	32	81	90	90
31-35	147	77	87	120
36-40	372	86	103	133
41-45	528	99	117	118
46-50	678	102	105	107
51-55	1,029	96	100	109
56-60	1,052	92	97	105
61-65	1,106	110	92	104
66-70	1,182	114	96	93
71-75	2,577	111	108	125
76-80	4,808	102	105	111
81-85	5,449	98	103	115
86-90	4,375	100	111	
91-95	1,227	90		
21-95	24,566	100	101	116

* Ratio based on fewer than 10 actual deaths.

Table ASS 1.5.1. Minimum evidence assurances written on one male life and one female life, males, 1999-2002, all data: actual deaths and ratios of actual deaths to those expected using the AM92 table, together with comparisons of 1995-1998 and 1991-1994.

Age group (nearest ages)	Actual deaths 1999-2002	100A/E 1999-2002 (using AM92)	100A/E 1995-1998 (using AM92)	100A/E 1991-1994 (using AM92)
Duration 0				
All ages	0	0 *	141 *	118
Duration 1				
All ages	0	0 *	86	104
Durations 2+				
21-30	4	66 *	67	66
31-35	56	76	87	82
36-40	218	83	81	92
41-45	365	80	98	99
46-50	560	81	98	115
51-55	916	87	104	106
56-60	878	89	96	99
61-65	454	83	84	102 *
66-70	61	90	106 *	144 *
21-70	3,512	84	96	104

* Ratio based on fewer than 10 actual deaths.

Table 1.6.1. Guaranteed acceptance assurances, males, 1999-2002, all data: actual deaths and ratios of actual deaths to those expected using the AM92 table, together with comparisons of 1995-1998 and 1991-1994.

Age group (nearest ages)	Actual deaths 1999-2002	100A/E 1999-2002 (using AM92)	100A/E 1995-1998 (using AM92)	100A/E 1991-1994 (using AM92)
Duration 0				
51-55	269	480	} 433	-
56-60	343	346		-
61-65	530	271	295	63 *
66-70	716	227	222	118
71-75	692	191	176	103
76-80	737	166	193	69
81-85	100	137	130 *	461 *
51-85	3,387	219	207	93
Duration 1				
51-55	220	373	} 333 *	-
56-60	335	292		-
61-65	584	244	265	-
66-70	812	191	164	-
71-75	770	161	119	-
76-80	901	157	113	-
81-85	260	125	94 *	-
51-85	3,882	185	138	-
Durations 2+				
36-40	3	21 *	167	142
41-45	21	68	112	157
46-50	36	87	87	132
51-55	440	281	89	136
56-60	1,362	259	120	118
61-65	2,716	219	111	105
66-70	4,783	187	155	100 *
71-75	6,966	156	139	188 *
76-80	8,720	135	117	-
81-85	6,698	115	103	-
86-90	2,151	113		
36-90	33,896	146	119	126

* Ratio based on fewer than 10 actual deaths.

Table ASS 2.0.1. Permanent assurances, females, 1999-2002, combined, durations 2 and over: actual deaths as a percentage of those expected using the AF92 table.

Age group (nearest ages)	Standard medical evidence			Minimum medical evidence		Guaranteed acceptance
	Non-linked	Linked	Joint life	Single life	Joint life	
26-30	97	67	51	98	77*	} 46 *
31-35	76	71	72	91	79	
36-40	74	86	64	82	84	
41-45	87	111	68	108	79	81
46-50	93	103	76	102	91	49 *
51-55	90	97	87	99	90	275
56-60	86	85	75	93	84	261
61-65	82	78	85	112	68	213
66-70	87	72	80	125	107	199

* Ratio based on fewer than 10 actual deaths.

Table ASS 2.1.1. Permanent assurances (non-linked), females, 1999-2002, standard medical evidence, all data: actual deaths and ratios of actual deaths to those expected using the AF92 table, together with comparisons of 1995-1998 and 1991-1994.

Age group (nearest ages)	Actual deaths 1999-2002	100A/E 1999-2002 (using AF92)	100A/E 1995-1998 (using AF92)	100A/E 1991-1994 (using AF92)
Duration 0				
16-45	13	68	72	98
46-55	22	101	111	98
56-65	18	64	132	105
66-75	26	93	124	120
76-85	8	97 *	194	72
16-85	87	83	121	100
Duration 1				
16-45	18	48	73	87
46-55	50	110	109	106
56-65	55	96	112	112
66-75	95	165	129	95
76-85	26	126	149	109
16-85	244	112	113	103
Durations 2+				
16-25	11	69	64	96
26-30	62	97	88	89
31-35	127	76	85	99
36-40	242	74	91	104
41-45	459	87	92	105
46-50	825	93	96	108
51-55	1,395	90	94	102
56-60	1,593	86	90	98
61-65	1,459	82	89	97
66-70	1,466	87	87	93
71-75	1,695	100	95	101
76-80	1,703	102	103	98
81-85	1,319	107	112	107
86-90	1,045	115	114	101
91-95	512	121	110	103
16-95	13,913	94	95	100

* Ratio based on fewer than 10 actual deaths.

ASS 2.1.2. Permanent assurances (non-linked), females, standard medical evidence, all data, durations 2 and over: actual deaths 1975-2002 as a percentage of those expected using the AF92 table.

Age group (nearest ages)	Quadrennium						
	1975-1978	1979-1982	1983-1986	1987-1990	1991-1994	1995-1998	1999-2002
21-25	132	116	107	106	88	64	57
26-30	138	108	95	100	89	88	97
31-35	117	107	96	100	99	85	76
36-40	131	102	102	112	103	91	74
41-45	151	116	113	117	105	92	87
46-50	156	128	128	116	107	96	93
51-55	146	138	115	107	101	94	90
56-60	134	129	112	112	98	90	86
61-65	132	117	117	104	95	89	82
66-70	122	113	99	104	94	87	87
71-75	133	116	101	99	102	95	100
76-80	155	118	106	106	98	103	102
81-85	152	169	137	115	107	112	107
86-90	148	143	165	116	100	114	115
91-95				102	104	110	121
All	141	125	115	109	100	95	94
Number deaths ⁺	4,666	6,368	8,571	9,610	10,830	12,066	14,023

⁺ Figures contain a small number of deaths recorded at ages under 21 or over 95.

ASS 2.2.1. Linked contracts of life assurance, females, 1999-2002, standard medical evidence, all data: actual deaths and ratios of actual deaths to those expected using the AF92 table, together with comparisons of 1995-1998 and 1991-1994.

Age group (nearest ages)	Actual deaths 1999-2002	100A/E 1999-2002 (using AF92)	100A/E 1995-1998 (using AF92)	100A/E 1991-1994 (using AF92)
Duration 0				
16-45	13	98	76	141
46-60	19	68	96	169
61-75	28	53	75 *	91
76-90	69	123	158 *	144
16-90	129	86	88	143
Duration 1				
16-45	9	46 *	100	165
46-60	47	103	161	105
61-75	76	81	115	143
76-90	131	144	103 *	192
16-90	263	105	126	132
Durations 2+				
16-30	12	68	64	154
31-35	37	71	101	96
36-40	90	86	144	98
41-45	170	111	144	145
46-50	228	103	148	105
51-55	328	97	136	99
56-60	336	85	103	98
61-65	331	78	84	94
66-70	356	72	86	91
71-75	445	84	95	90
76-80	503	95	96	106
81-85	493	106	127	98
86-90	436	119	148	142
91-95	226	138	144	129
16-95	3,991	94	108	100

* Ratio based on fewer than 10 actual deaths.

ASS 2.3.1. Joint life first death assurances, females, 1999-2002, standard medical evidence, all data: actual deaths and ratios of actual deaths to those expected using the AF92 table, together with comparisons of 1995-1998 and 1991-1994.

Age group (nearest ages)	Actual deaths 1999-2002	100A/E 1999-2002 (using AF92)	100A/E 1995-1998 (using AF92)	100A/E 1991-1994 (using AF92)
Duration 0				
All ages	28	56	51	92
Duration 1				
All ages	33	47	91	103
Durations 2+				
21-30	12	52	83	66
31-35	73	72	84	74
36-40	162	64	85	83
41-45	290	68	84	83
46-50	433	76	87	100
51-55	606	87	86	96
56-60	426	75	77	81
61-65	371	85	90	82
66-70	161	80	92	59
71-75	52	88	62	111
21-75	2,586	78	85	86

ASS 2.4.1. Minimum evidence assurances written on one life only, females, 1999-2002, all data: actual deaths and ratios of actual deaths to those expected using the AF92 table, together with comparisons of 1995-1998 and 1991-1994.

Age group (nearest ages)	Actual deaths 1999-2002	100A/E 1999-2002 (using AF92)	100A/E 1995-1998 (using AF92)	100A/E 1991-1994 (using AF92)
Duration 0				
21-35	18	115		
36-40	12	105		
41-45	12	80		
46-50	17	90		
51-55	17	115		
56-60	10	101		
61-65	11	96		
66-80	9	98*		
21-80	106	100	72*	154
Duration 1				
21-35	17	92		
36-40	10	67		
41-45	16	79		
46-50	31	120		
51-55	29	124		
56-60	8	65*		
61-65	10	76		
66-80	6	76*		
21-80	127	93	139*	114

ASS 2.4.1. (continued)

Age group (nearest ages)	Actual deaths 1999-2002	100A/E 1999-2002 (using AF92)	100A/E 1995-1998 (using AF92)	100A/E 1991-1994 (using AF92)
Durations 2+				
21-30	24	97	102	127
31-35	69	91	88	106
36-40	135	82	103	119
41-45	248	108	107	95
46-50	317	102	99	111
51-55	441	99	100	113
56-60	360	93	83	82
61-65	419	112	97	166
66-70	747	125	97	71
71-75	1,526	125	95	64
76-80	2,390	114	110	68
81-85	2,786	117	143	147
86-90	2,578	119	94	-
91-95	1,098	128		
21-95	13,138	116	100	110

* Ratio based on fewer than 10 actual deaths.

ASS 2.5.1. Minimum evidence assurances written on one male life and one female life, females, 1999-2002, all data: actual deaths and ratios of actual deaths to those expected using the AF92 table, together with comparisons of 1995-1998 and 1991-1994.

Age group (nearest ages)	Actual deaths 1999-2002	100A/E 1999-2002 (using AF92)	100A/E 1995-1998 (using AF92)	100A/E 1991-1994 (using AF92)
Duration 0				
All ages	0	-	97 *	111
Duration 1				
All ages	0	-	28 *	73
Durations 2+				
26-30	6	77 *	62	72
31-35	63	79	67	89
36-40	201	84	88	82
41-45	294	79	80	96
46-50	457	91	85	95
51-55	570	90	90	84
56-60	374	84	83	88
61-65	109	68	107	159 *
26-65	2,074	85	83	89

* Ratio based on fewer than 10 actual deaths.

ASS 2.6.1. Guaranteed acceptance assurances, females, 1999-2002, all data: actual deaths and ratios of actual deaths to those expected using the AF92 table, together with comparisons of 1995-1998 and 1991-1994.

Age group (nearest ages)	Actual deaths 1999-2002	100A/E 1999-2002 (using AF92)	100A/E 1995-1998 (using AF92)	100A/E 1991-1994 (using AF92)
Duration 0				
51-55	165	443	} 311	
56-60	246	404		
61-65	292	305		
66-70	369	295		212
71-75	432	261		211
76-80	431	208		
81-85	66	198		179
51-85	2,001	276		215
				99
Duration 1				
51-55	186	466	} 261	
56-60	254	369		
61-65	357	307		
66-70	447	301		313
71-75	486	243		228
76-80	547	213		
81-85	163	168		123
51-85	2,440	263		206
				-
Durations 2+				
36-50	24	60	135	119
51-55	316	275	115	116
56-60	1,099	261	138	115
61-65	1,928	213	150	60 *
66-70	3,010	199	144	321 *
71-75	4,158	178	126	-
76-80	5,314	155	93	-
81-85	4,625	139	85	-
86-90	1,639	136		
36-90	22,113	166	118	118

* Ratio based on fewer than 10 actual deaths.

ASS 3.1.1. Permanent assurances (non-linked), policies issued in the Republic of Ireland, males, 1999-2002, standard medical evidence, all data: actual deaths and ratios of actual deaths to those expected using the AM92 table, together with comparisons of 1995-1998 and 1991-1994.

Age group (nearest ages)	Actual deaths 1999-2002	100A/E 1999-2002 (using AM92)	100A/E 1995-1998 (using AM92)	100A/E 1991-1994 (using AM92)
Duration 0				
All ages	12	64	24 *	89
Duration 1				
All ages	14	55	93 *	94
Durations 2+				
21-45	7	44 *	83	85
46-50	10	58	72	81
51-55	32	82	86	98
56-60	44	77	91	105
61-65	46	70	90	115
66-70	31	98	97	115
71-75	29	99	109	112
76-80	21	65	84	145
81-85	29	137	96	135
86-90	18	106	113	142
91-95	7	117 *	126	76
21-95	274	82	91	109

* Ratio based on fewer than 10 actual deaths.

ASS 3.2.1. Permanent assurances (non-linked), policies issued in the Republic of Ireland, females, 1999-2002, standard medical evidence, all data: actual deaths and ratios of actual deaths to those expected using the AF92 table, together with comparisons of 1995-1998 and 1991-1994.

Age group (nearest ages)	Actual deaths 1999-2002	100A/E 1999-2002 (using AF92)	100A/E 1995-1998 (using AF92)	100A/E 1991-1994 (using AF92)
Duration 0 All ages	2	30 *	34 *	157 *
Duration 1 All ages	5	51 *	61 *	121 *
Durations 2+ All ages	28	63	103	86

* Ratio based on fewer than 10 actual deaths.

THE MORTALITY OF HOLDERS OF TEMPORARY ASSURANCES ISSUED IN THE UNITED KINGDOM, 1999-2002

This report contains commentaries on the mortality experiences of holders of traditional, standalone temporary assurance policies for both males and females. It includes brief reports on the mortality of holders of temporary assurance policies effected in conjunction with personal pension policies under Section 637(1) of the ICTA 1988.

The exposed to risk and deaths over the last four quadrennia are shown for each subgroup in Table TEMP 0.1. This, and subsequent tables relating to the text, will be found on pp 33 to 39. The effect of smoking on mortality for this class of business is covered in a separate report on pp 95 to 120.

1. TEMPORARY ASSURANCES ON MALE LIVES

1.1 *Traditional standalone policies written on standard medical evidence*

The policies included in this group are those issued after a full medical examination and those issued after the completion of a comprehensive medical questionnaire, with or without a medical attendant's report. The analyses for this group are shown in table TEMP 1.1.1. The comparison basis is the TM92 table. As with the permanent assurances, 'bridging factors' have been applied to estimate the 100A/Es for 1991-1994.

Looking at the duration 0 experience detailed in TEMP 1.1.1, overall there has been an improvement in the level of mortality recorded over the three quadrennia shown. Looking at each age group individually, there were no instances where experience deteriorated between 1995-1998 and 1999-2002. In *C.M.I.R.* 19 it was noted that the mortality experience of the age group 46-60 in 1995-1998 was very low when compared with previous quadrennia. For 1999-2002, it appears that the other age groups have followed suit.

At durations 1 to 4 there has been an improvement in the mortality recorded at nearly all ages over the three quadrennia shown. Only ages 31-40 have experienced a deterioration since 1995-1998. The overall fall in the value of 100A/E between 1995-1998 and 1999-2002 is of broadly similar magnitude to the value of the fall seen between 1991-1994 and 1995-1998.

At durations 5 and over there has also been an improvement in mortality at nearly all ages over the three quadrennia shown. Higher mortality was recorded in 1999-2002 than in 1995-1998 for ages below 30 and, to a lesser extent, for the 46-50 age group. Again, the overall fall in the value of 100A/E between 1995-1998 and 1999-2002 was similar to the value of the fall seen between 1991-1994 and 1995-1998.

For each of the duration groups the recorded mortality is well below that expected on the TM92 table of mortality in 1999-2002. The improvement is greatest at duration 0 and then at durations 1 to 4.

The comparison basis used in table TEMP 1.1.2 is AM92. From this table it can be seen that at durations 0 and 1 temporary assurance mortality experience is well below that of standard evidence permanent assurances.

At durations 2 and over, the temporary assurance 100A/E ratios are below those for the permanent assurance experience at all ages. The differences are greatest for ages below 45 and also for the 66-70 age group. It is likely that the younger ages will also tend to be the more select business (i.e. shorter durations).

1.2 *Assurances effected in conjunction with personal pensions under Section 637(1) of the ICTA 1988*

The experience is shown in table TEMP 1.2.1. In the 1999-2002 experience the greater number of deaths at durations 5 and over shows the growing maturity of the investigation. For duration 0 and durations 1 to 4 the total number of deaths is still relatively small, indicating a lack of new business being recorded for this investigation, and does not allow firm conclusions to be drawn. However, when compared with the standalone category the mortality at these durations is higher, and in relative terms appears to have worsened since 1995-1998. At durations 5 and over the experience remains lower than that of the standalone category, though not to the same extent as that observed in 1995-1998.

2. TEMPORARY ASSURANCES ON FEMALE LIVES

2.1 *Traditional standalone policies written on standard medical evidence*

The experience is shown in table TEMP 2.1.1.

At duration 0 a consistent overall improvement in the level of mortality experienced has been recorded. However, the number of deaths is small and too much should not be read into this.

At durations 1 to 4 the 1999-2002 experience shows an improvement in mortality in all age groups except for 56-65. Except for ages 61-65, the 1999-2002 experience is much lighter than the TF92 mortality table and particularly so at ages below 45 and above 70.

At durations 5 and over there has been an improvement in mortality over the three quadrennia. Between ages 35 and 65 (where most of the deaths are recorded), the 1999-2002 experience follows a similar pattern to the TF92 table but the actual number of deaths recorded is some 15% lower than expected from this table. Below age 35 the experience is significantly lower than this level and above age 65 it is significantly higher. In particular, the TF92 table understated mortality in 1999-2002 for ages 66-75.

Table TEMP 2.1.2 compares the experience of the temporary assurance data with that of the permanent assurances. As for males, at durations 0 and 1 the temporary assurance mortality experience is well below that of standard evidence permanent assurances.

At durations 2 and over the temporary assurance mortality experience is generally lower at all ages except 66-75, and overall the experience is significantly lower.

2.2 *Assurances effected in conjunction with personal pensions under Section 637(1) of the ICTA 1988*

The experience is shown in table TEMP 2.2.1. The number of deaths is too small for any significant conclusions to be drawn. However for all duration groups the experience recorded was lower than that of the TF92 table and, as with the male experience, the mortality at durations 5 and over was heavier than in 1995-1998.

Table TEMP 0.1 Temporary assurances, combined, all durations: exposed to risks and deaths.

Investigation	1999-2002		1995-1998		1991-1994		1987-1990	
	Exposed to risk (000)	Actual deaths	Exposed to risk (000)	Actual deaths	Exposed to risk (000)	Actual deaths	Exposed to risk (000)	Actual deaths
<i>Males</i>								
Temporary assurances	3,289	6,564	3,099	6,654	3,901	8,664	4,392	9,117
Temporary assurances – 637(1) of ICTA 1988	712	1,224	495	550	253	275	188	88
Total	4,001	7,788	3,594	7,204	4,155	8,939	4,580	9,205
<i>Females</i>								
Temporary assurances	2,555	2,616	1,970	2,020	1,940	1,928	1,559	1,255
Temporary assurances – 637(1) of ICTA 1988	216	205	167	124	88	39	55	9
Total	2,771	2,821	2,138	2,144	2,028	1,967	1,614	1,264

Table TEMP 1.1.1. Temporary assurances, males, 1999-2002, all data: actual deaths and ratios of actual deaths to those expected using the TM92 table, together with comparisons of 1995-1998 and 1991-1994.

Age group (nearest ages)	Actual deaths 1999-2002	100A/E 1999-2002 (using TM92)	100A/E 1995-1998 (using TM92)	100A/E 1991-1994 (using TM92)
Duration 0				
16-30	17	47	71	68
31-45	79	50	77	97
46-60	143	57	57	102
61-75	55	48	77	104
16-75	294	53	67	99
Durations 1-4				
21-30	36	58	70	103
31-35	76	69	58	84
36-40	115	74	67	95
41-45	124	64	84	111
46-50	157	63	87	102
51-55	264	70	81	95
56-60	263	72	84	95
61-65	179	62	82	103
66-70	120	59	92	109
71-75	82	72	110	116
76-80	40	67	84	60
21-80	1,456	67	82	100
Durations 5+				
26-30	15	91	71	82
31-35	50	76	77	98
36-40	127	83	86	96
41-45	272	83	92	104
46-50	563	84	82	106
51-55	958	77	93	99
56-60	1,071	78	85	94
61-65	840	79	85	99
66-70	364	73	88	106
71-75	320	87	108	98
76-80	188	88	96	106
26-80	4,768	80	88	99

Table TEMP 1.1.2. Temporary assurances, males, 1999-2002, all data: comparison of temporary assurance mortality with that for permanent assurances using the AM92 tables for both data sets, together with the 1995-1998 equivalent.

Age group (nearest ages)	1999-2002 100A/E (AM92)		1995-1998 100A/E (AM92)	
	Temporary	Permanent	Temporary	Permanent
Duration 0				
21-80	46	79	60	98
Duration 1				
21-80	47	81	63	92
Duration 2+				
21-25	49 *	112	89 *	113
26-30	71	81	69	90
31-35	75	87	72	91
36-40	77	87	80	94
41-45	75	89	88	94
46-50	77	81	81	91
51-55	73	77	88	90
56-60	73	78	82	89
61-65	71	74	80	88
66-70	63	75	83	91
71-75	77	79	100	92
76-80	78	83	89	92
21-80	73	78	84	90

* Ratio based on fewer than 10 actual deaths.

Table TEMP 1.2.1. Temporary assurances effected under section 637(1) of the ICTA 1988 (i.e. in conjunction with personal pensions), males, 1999-2002, all data: actual deaths and ratios of actual deaths to those expected using the TM92 table, together with comparisons of 1995-1998 and 1991-1994.

Age group (nearest ages)	Actual deaths 1999-2002	100A/E 1999-2002 (using TM92)	100A/E 1995-1998 (using TM92)	100A/E 1991-1994 (using TM92)
Duration 0				
All ages	32	80	72	98
Durations 1-4				
21-35	17	61	66	77
36-40	21	81	102	108
41-45	34	103	92	101
46-50	38	88	87	111
51-55	41	67	87	131
56-60	39	77	80	102
61-65	24	90	68	158
21-65	214	80	83	110
Durations 5+				
21-35	18	58	69	
36-40	43	71	77	
41-45	88	81	57	
46-50	156	85	76	
51-55	230	74	59	
56-60	249	75	70	
61-65	167	71	60	
21-65	951	75	67	78

Table TEMP 2.1.1. Temporary assurances, females, 1999-2002, all data: actual deaths and ratios of actual deaths to those expected using the TF92 table, together with comparisons of 1995-1998 and 1991-1994.

Age group (nearest ages)	Actual deaths 1999-2002	100A/E 1999-2002 (using TF92)	100A/E 1995-1998 (using TF92)	100A/E 1991-1994 (using TF92)
Duration 0				
All ages	103	71	84	98
Durations 1-4				
21-30	10	31	56	70
31-35	34	52	54	100
36-40	49	50	73	94
41-45	63	57	72	109
46-50	83	71	93	111
51-55	87	71	95	108
56-60	74	87	87	73
61-65	58	110	102	113
66-70	29	83	117	143
71-75	15	57	93	64
76-80	8	30 *	66	123
21-80	510	66	83	100
Durations 5+				
26-35	45	59	93	89
36-40	141	86	87	92
41-45	252	88	81	101
46-50	334	85	95	94
51-55	359	82	100	116
56-60	274	88	102	99
61-65	142	81	107	108
66-70	140	105	123	97
71-75	177	111	94	108
76-80	103	95	111	70
26-80	1,967	88	96	100

* Ratio based on fewer than 10 actual deaths.

Table TEMP 2.1.2. Temporary assurances, females, 1999-2002, all data: comparison of temporary assurance mortality with that for permanent assurances using the AF92 tables, together with the 1995-1998 equivalent.

Age group (nearest ages)	1999-2002 100A/E (AF92)		1995-1998 100A/E (AF92)	
	Temporary	Permanent	Temporary	Permanent
Duration 0				
21-80	57	82	67	120
Duration 1				
21-80	62	110	91	113
Duration 2+				
21-25	-	57 *	45 *	64
26-30	23 *	97	73	88
31-35	58	76	75	85
36-40	75	74	80	91
41-45	77	87	74	92
46-50	78	93	88	96
51-55	76	90	92	94
56-60	84	86	93	90
61-65	81	82	97	89
66-70	100	87	116	87
71-75	104	100	84	95
76-80	83	102	101	103
21-80	80	90	88	92

* Ratio based on fewer than 10 actual deaths.

Table TEMP 2.2.1. Temporary assurances effected under section 637(1) of the ICTA 1988 (i.e. in conjunction with personal pensions), females, 1999-2002, all data: actual deaths and ratios of actual deaths to those expected using the TF92 table, together with comparisons of 1995-1998 and 1991-1994.

Age group (nearest ages)	Actual deaths 1999-2002	100A/E 1999-2002 (using TF92)	100A/E 1995-1998 (using TF92)	100A/E 1991-1994 (using TF92)
Duration 0				
All ages	3	46 *	114	102 *
Durations 1-4				
All ages	47	83	107	72
Durations 5+				
All ages	155	82	72	110 *

* Ratio based on fewer than 10 actual deaths.

THE MORTALITY OF IMMEDIATE ANNUITANTS, HOLDERS OF RETIREMENT ANNUITY POLICIES, AND HOLDERS OF PERSONAL PENSION PLANS 1999-2002

The first part of this report contains analyses of the mortality of immediate annuitants over the quadrennium 1999-2002. This is followed by commentaries on the experience of holders of retirement annuity contracts now written under Chapter III of Part XIV of the ICTA 1988 and of personal pension policies issued under Chapter IV of Part XIV of the same Act. The final part of the report, on pp 46 to 69, contains all the tables referred to in the earlier parts.

Table ANN 0.1 shows the development of these investigations over recent quadrennia for all ages and durations combined. It should be noted that the number of offices contributing data over this period has not been stable. In particular, the number of offices contributing to the immediate and retirement annuitant investigations has steadily fallen over recent quadrennia, while the personal pension investigations have witnessed a gently increasing number of contributors.

While in total these features are not surprising, they do mask some significant changes in the mix of offices in any one year, as offices join and leave the investigations. This is particularly the case in recent quadrennia. For example, of the nineteen offices that have contributed to the immediate annuitant investigation at some point over the eight years from 1995 to 2002, only five have contributed data for the entire period. Similar patterns are apparent from the other investigations in this section.

The size of the personal pensions investigation is growing rapidly. Measured by amount of exposed to risk, it is now significantly larger than the immediate annuitant investigation – nearly twenty times for males. The in deferment section has now grown to be of a similar size to the permanent assurances investigation.

1. MALE IMMEDIATE ANNUITANTS

Table ANN 1.1a shows the experience for 1999-2002, 1995-1998 and 1991-1994, on the basis of lives, using the projected rates for calendar year 2020 from the IML92 mortality table. Table ANN 1.1b shows similar information but for the mortality experiences measured by amounts. The comparison table is IMA92 projected to calendar year 2020. Again, ‘bridging factors’ have been used to estimate the 100A/Es for 1991-1994.

At durations 1 and over, overall mortality in 1999-2002 was similar to that of 1995-1998 for both lives and amounts. Previously, improvements had been seen stretching back several quadrennia. Table ANN 1.1a shows the experience recorded for 1999-2002, based on lives, was lighter than that for 1995-1998 for all ages below 85 and heavier for ages above 85. Table ANN 1.1b shows the experience recorded for 1999-2002, based on amounts, was generally lighter than that for 1995-1998 for ages below 90 and heavier for ages above 90.

Table ANN 1.2a compares the experience measured on a lives basis in each year from 1983 to 2002 at durations 1 and over with that expected according to the base (1992) rates of the IML92 table. This shows a downward trend in the level of mortality recorded over the years 1990 to 2002, following a number of years of relatively stable experience. 1994, 1998 and 2000 are the only years in that thirteen-year period when there is not a year on year decrease in the overall level of mortality. The rate of mortality in 2002 is around 15% lower than that in 1990.

Table ANN 1.2b shows, for amounts, similar information to Table ANN 1.2a but the comparison basis is the base (1992) rates of the IMA92 table. These results show a fairly level pattern of mortality over the past twelve years, albeit with a greater fluctuation around the trend.

Table ANN 1.2c shows the lives experience between 1992 and 2002 compared with the IML92 table projected to the relevant calendar year. This shows how this experience compares with the projected mortality improvement factors underlying IML92 table. Table ANN 1.2d shows similar information for the amounts experience. For both data sets the projected rates reflect the actual experience reasonably well. Notable exceptions are 1997, where the lives experience shows relatively light mortality, and 2001, where the amounts experience shows relatively high mortality.

2. FEMALE IMMEDIATE ANNUITANTS

The experience recorded for female annuitants is shown in Tables ANN 2.1a and ANN 2.1b (lives and amounts respectively) using as a comparison basis the projected rates for calendar year 2020 from the IFL92 or IFA92 tables as appropriate.

At durations 1 and over a comparison of the levels of mortality between 1995-1998 and 1999-2002 on a lives basis shows that the experience has been relatively stable. Over the three quadrennia shown there has been an overall gradual improvement in mortality. On an amounts basis mortality has deteriorated overall between 1995-1998 and 1999-2002. This feature is observed for most age groups above age 75, where the majority of deaths have been recorded.

At duration 0 it is difficult to discern any real patterns. Overall there has been a deterioration in mortality between 1995-1998 and 1999-2002 on both a lives and an amounts basis. This is a reversal of the improvements between 1991-1994 and 1995-1998. The deterioration has been sharper on the amounts basis than the lives basis.

Table ANN 2.2a compares the experience at durations 1 and over on a lives basis for each year from 1983 to 2002 with that expected according to the base (1992) rates of the IFL92 table. The table shows a general improvement in mortality over the period although this feature varies year by year and between age groups. Table ANN 2.2b shows similar information for the amounts experience. While this experience is more volatile, similar improvements in mortality to that seen in Table ANN 2.2a had been observed up to the end of the 1995-1998 quadrennium. However, there has been a deterioration in mortality in the period 1999-2002. The rise in ratios of actual deaths to those expected is particularly noticeable at ages over 85. The all ages ratios are especially high for years 1999 and 2000.

Table ANN 2.2c is similar to ANN 2.2a but compares the experience at durations 1 and over on a lives basis with that expected according to the projected rates for each calendar year from the IFL92 table. Across the whole age range the projections look reasonable, but there are wide variations by age. Table ANN 2.2d shows the same information for the amounts experience. The deterioration in mortality in the period 1999-2002, noted in Table ANN 2.2b, is more noticeable in this table.

3. MALE HOLDERS OF RETIREMENT ANNUITY CONTRACTS

The experience of male holders of retirement annuity contracts in 1999-2002 is shown in Tables ANN 3.1a and ANN 3.1b for policies in deferment and in payment respectively. The 'in deferment' mortality is compared against the ultimate rates from the AM92 table. The 'in payment' mortality is compared against the projected ultimate rates for the calendar year 2020 from the RMV92 table. The 1995-1998 and 1991-1994 experiences are also shown using these comparison bases.

The combined experience of policies in deferment and policies in payment, compared with the projected ultimate rates for calendar year 2020 from the IML92 table, is shown in Table ANN 3.2a. Comparative figures for 1991-1994 and 1995-1998 are also shown. In

addition, for 1999-2002 only, there is a comparison against the projected rates for 2000 from the IML92 table. Similar information is shown in Table ANN 3.2b but here the comparison basis is the RMV92 table projected to 2020 and 2000 respectively.

From Table ANN 3.1a a steady improvement in mortality between 1995-1998 and 1999-2002 can be seen at ages above 40. A similar improvement was noted between 1991-1994 and 1995-1998 at ages above 35. It can be seen that below age 65 the mortality experience is not dissimilar to that for assured lives (see Table ASS 1.1.1). However, at ages over 65 the retirement annuitant policyholders experience much lighter mortality in deferment than assured lives, indicating that the less healthy lives have almost certainly transferred to the in payment section. This feature was also noted for the 1995-1998 quadrennium.

Table ANN 3.1b shows that the mortality suffered by retirees at the younger ages is generally heavier than at the higher ages. This supports the view from the previous paragraph that at these ages there is selective retirement of the less healthy lives. This feature can also be seen in previous quadrennia where heavier mortality at younger ages is even more pronounced.

In general for the 'in payment' group there has been continued substantial improvement in the level of mortality recorded. At ages below 85 mortality has improved and at ages above 85 mortality has worsened. Overall mortality suffered by retirees is very much higher than that expected from the RMV92 table projected to 2020 and the difference is generally greater for lower ages.

The combined experience, detailed in Table ANN 3.2a, shows some interesting features. Combining the in deferment and in payment sections suppresses the effect of selective early retirement and gives a smooth progression of the 100A/E ratios through the age range. It should be noted that, below age 60, the mortality recorded was above that projected for the calendar year 2000 in the IML92 table. Above age 60 mortality only exceeded the projected table for the 86-90 age group, although generally the mortality rates were similar. Table ANN 3.2b shows the same information as ANN 3.2a but uses RMV92 projected to 2000 and 2020 respectively as the comparison basis. Table ANN 3.2b clearly shows that, at ages below 60, the combined experience is much lighter than the projected rates of this mortality table, which cannot be used to predict mortality at the youngest ages in deferment with any degree of confidence.

4. FEMALE HOLDERS OF RETIREMENT ANNUITY CONTRACTS

The experience of female holders of retirement annuity contracts in 1999-2002 is shown in Tables ANN 4.1a and ANN 4.1b for policies in deferment and in payment respectively. The in deferment mortality is compared against the ultimate rates from the AF92 table. The in payment mortality is compared against the rates for the calendar year 2020 from the RFV92 table. Corresponding ratios for 1995-1998 and 1991-1994 are also shown.

From Table ANN 4.1a it can be seen that for the in deferment section there has been a significant improvement in the mortality experienced at all ages, but improvements have not been seen in all age groups. The younger age groups have experienced heavier mortality than the older age groups, relative to the comparison basis.

From Table ANN 4.1b it can be seen that the mortality suffered by the retirees in the 56-60 age group is particularly heavy, but significantly lower than in the previous quadrennium. This is consistent with the view that those retiring early will be the less healthy lives. For each age group, except for the 56-60 age group, the rates of mortality form a similar pattern to those expected from the comparison table although at a higher level. Overall there has been significant improvement between 1995-1998 and 1999-2002 in the level of mortality

experienced in the in payment section. Inspection of the individual age groups reveals the improvements are greater at the lower ages.

The combined 1999-2002 experience of the in deferment and the in payment policies, compared with the projected rates for the calendar year 2020 from the IFL92C20 table, is shown in Table ANN 4.2a. Comparative figures for 1991-1994 and 1995-1998 are also shown. In addition, for 1999-2002 only, there is a comparison against the projected rates for 2000 from the IFL92 table. Table ANN 4.2a shows that mortality at ages below 65 is much heavier than the comparison basis, much more so than in the equivalent males experience. Above age 75 the mortality experience is lighter than that of the immediate annuitant investigation (see Table ANN 2.1a).

Table ANN 4.2b details the combined experience compared with the RFV92 table. As was the case with the males, this table is clearly not appropriate as a basis for projecting mortality rates at ages below 60. The fit is better at higher ages but still not very good.

5. MALE HOLDERS OF PERSONAL PENSION CONTRACTS

The experience of male holders of personal pension contracts is shown in Tables ANN 5.1a and ANN 5.1b for policies in deferment and in payment respectively. The in deferment mortality is compared against the ultimate rates from the AM92 table. The in payment mortality is compared against the projected rates for calendar year 2020 from the RMV92 table. Corresponding ratios for 1995-1998 and 1991-1994 are also shown.

Table ANN 5.1a shows that in deferment the mortality experienced is little changed since the last quadrennium, but has worsened relative to that found among retirement annuitants in deferment (see Table ANN 3.1a), notably in the 40 to 60 age range. The rates are generally heavier than those found among assured lives at ages up to 60. Above that age the rates compared to assured lives (see Table ASS 1.1.1) are very light. Similar observations have been made in previous reports, although in those earlier quadrennia the experiences below age 65 were noticeably closer than they are in 1999-2002.

Again, as was the case in 1995-1998 and 1991-1994, the in payment experience (Table ANN 5.1b) shows that the mortality recorded is well below that of retirement annuitants in payment (Table ANN 3.1b). The experience is lighter for each individual age group. The overall 100A/E ratio for the 1999-2002 experience remained at the same level as for the 1995-1998 experience. The ratios were also similar for each age group.

The combined experience is shown in Tables ANN 5.2a and ANN 5.2b. In Table ANN 5.2a the comparison bases are the IML92 table projected to calendar years 2000 and 2020, while the RMV92 table, projected to the same years, is used in Table ANN 5.2b. These tables show similar patterns to the combined retirement annuity experience (see Tables ANN 3.2a and ANN 3.2b). The overall level of the IML92 table projected to calendar year 2000 is quite close to this experience, although the shape is not. Mortality below age 60 is significantly heavier than the comparison basis, while above age 65 is generally much lighter. The RMV92 table is clearly a poor comparison basis for this experience, particularly at ages below 60.

6. FEMALE HOLDERS OF PERSONAL PENSION CONTRACTS

The experience of female holders of personal pension contracts is shown in Tables ANN 6.1a and ANN 6.1b for policies in deferment and in payment respectively. The in deferment mortality is compared against the ultimate rates from the AF92 table. The in payment mortality is compared against the projected rates for calendar year 2020 from the RFV92 table. Corresponding ratios for 1995-1998 and 1991-1994 are also shown.

Table ANN 6.1a shows that the in deferment mortality experienced by personal pension contract holders has improved slightly since the 1995-1998 quadrennium and has worsened slightly relative to that observed among retirement annuity contract holders (see Table ANN 4.1a). This is broadly similar to the comment made about the male experience.

The mortality recorded for personal pensions in payment (Table ANN 6.1b) is, age group for age group, lighter than that recorded among the retirement annuitants (see Table ANN 4.1b) – considerably so for all except the 61-65 age group – reflecting the pattern observed among their male counterparts. Overall there has been a slight improvement in experience compared to the previous quadrennium, though the pattern by age group is mixed.

The combined experience is shown in Tables ANN 6.2a and ANN 6.2b. In Table ANN 6.2a the comparison bases are the IFL92 table projected to calendar years 2000 and 2020, while the RFV92 table, projected to the same years, is used in Table ANN 6.2b. As was the case with males, similar patterns to the combined retirement annuity experience (see Tables ANN 4.2a and ANN 4.2b) are observed.

Table ANN 0.1. Immediate annuitants (lives), retirement annuitants and personal pensioners: all ages and durations combined: exposed to risk and deaths over recent quadrennia.

	1999-2002	1995-1998	1991-1994	1987-1990
Males				
Immediate annuitants				
Exposed to risk (000)	36	31	40	50
Deaths	2,591	2,263	2,990	4,060
Crude death rate	0.072	0.074	0.075	0.081
Retirement annuities in deferment				
Exposed to risk (000)	3,880	3,795	4,511	6,358
Deaths	13,329	12,721	14,664	18,720
Crude death rate	0.003	0.003	0.003	0.003
Retirement annuities in payment				
Exposed to risk (000)	893	638	641	648
Deaths	29,654	19,030	20,200	22,731
Crude death rate	0.033	0.030	0.032	0.035
Personal pensions in deferment*				
Exposed to risk (000)	8,563	6,043	3,831	1,332
Deaths	16,544	10,467	5,827	1,107
Crude death rate	0.002	0.002	0.002	0.001
Personal pensions in payment*				
Exposed to risk (000)	692	207	50	2
Deaths	9,775	2,420	564	25
Crude death rate	0.014	0.012	0.011	0.013

* Investigation started 1 January 1989.

Table ANN 0.1. (continued)

	1999-2002	1995-1998	1991-1994	1987-1990
Females				
Immediate annuitants				
Exposed to risk (000)	53	52	74	101
Deaths	4,340	4,475	6,009	7,752
Crude death rate	0.082	0.086	0.082	0.076
Retirement annuities in deferment				
Exposed to risk (000)	679	672	829	1,097
Deaths	1,644	1,590	1,671	2,002
Crude death rate	0.002	0.002	0.002	0.002
Retirement annuities in payment				
Exposed to risk (000)	291	156	151	134
Deaths	4,716	2,535	2,695	2,345
Crude death rate	0.016	0.016	0.018	0.018
Personal pensions in deferment*				
Exposed to risk (000)	4,327	2,998	1,883	593
Deaths	4,507	2,774	1,251	201
Crude death rate	0.001	0.001	0.001	0.000
Personal pensions in payment*				
Exposed to risk (000)	294	84	20	0.6
Deaths	1,835	459	110	2
Crude death rate	0.006	0.005	0.006	0.003

* Investigation started 1 January 1989.

Table ANN 1.1a. Immediate annuitants, males, lives, 1999-2002, all data: actual deaths and ratios of actual deaths to those expected using the projected rates for calendar year 2020 from the IML92 table, together with comparisons of 1995-1998 and 1991-1994.

Age group (nearest ages)	Actual deaths 1999-2002	100A/E 1999-2002 (using IML92C20)	100A/E 1995-1998 (using IML92C20)	100A/E 1991-1994 (using IML92C20)
Duration 0				
61-80	14	133	143	162
81-85	14	178	122	142
86-90	19	208	136	109
61-90	47	171	134	141
Durations 1+				
61-70	65	124	166	182
71-75	129	117	156	146
76-80	264	108	126	148
81-85	484	115	120	134
86-90	785	126	120	122
91-95	586	123	118	126
96-100	195	127	96	117
61-100	2,508	120	122	131

Table ANN 1.1b. Immediate annuitants, males, amounts, 1999-2002, all data: actual deaths and ratios of actual deaths to those expected using the projected rates for calendar year 2020 from the IMA92 table, together with comparisons of 1995-1998 and 1991-1994.

Age group (nearest ages)	Actual deaths 1999-2002 (£000 pa)	100A/E 1999-2002 (using IMA92C20)	100A/E 1995-1998 (using IMA92C20)	100A/E 1991-1994 (using IMA92C20)
Duration 0				
61-80	39	91	172	108
81-85	63	125	79	121
86-90	117	217	125	152
61-90	219	149	124	128
Durations 1+				
61-70	157	137	178	176
71-75	352	132	118	143
76-80	596	103	109	136
81-85	1,135	100	110	129
86-90	2,306	126	135	120
91-95	1,761	141	130	130
96-100	436	128	94	162
61-100	6,743	122	123	128

Table ANN 1.2a. Immediate annuitants, males, durations 1 and over, lives, 1983-2002: actual deaths for individual years expressed as a percentage of those expected using the base (1992) rates from the IML92 table.

Age group (nearest ages)	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
61-65	317	250	200*	194*	194*	167*	150*	100*	48*	229*
66-70	136	119	172	157	124	161	152	112	102	108
71-75	113	119	121	116	118	106	141	115	106	91
76-80	104	125	118	119	126	121	111	117	109	89
81-85	119	110	123	110	114	112	112	115	109	94
86-90	109	100	125	113	99	111	103	92	103	94
91-95	108	103	109	109	89	82	109	110	102	126
96-100	97	116	68	143	107	99	104	129	87	111
61-100	112	113	120	116	110	109	112	109	105	100

Age group (nearest ages)	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
61-65	118*	40*	32*	69*	138*	45*	-	86*	11*	119*
66-70	83	83	96	91	98	78*	68	70	73	79
71-75	69	88	90	120	61	116	67	75	73	72
76-80	101	100	104	91	75	60	72	94	62	71
81-85	87	103	101	94	73	82	76	88	96	83
86-90	94	101	87	100	101	99	108	89	106	99
91-95	104	97	108	89	85	121	111	116	102	95
96-100	108	121	84	96	71	93	109	113	112	119
61-100	94	100	97	96	84	95	93	95	93	91

* Ratio based on fewer than 10 actual deaths.

Table ANN 1.2b. Immediate annuitants, males, durations 1 and over, amounts, 1983-2002: actual deaths for individual years expressed as a percentage of those expected using the base (1992) rates from the IMA92 table.

Age group (nearest ages)	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
61-65	312	341	110*	307*	248*	198*	53*	40*	11*	100*
66-70	140	123	246	177	75	169	248	81	82	137
71-75	98	114	131	103	107	104	138	78	76	128
76-80	93	136	131	167	132	95	102	90	134	74
81-85	104	107	108	83	148	85	105	117	103	109
86-90	103	92	123	118	155	96	96	101	108	101
91-95	94	116	108	159	93	113	105	129	116	106
96-100	78	102	24	100	76	181	130	138	165	68
61-100	100	112	116	123	132	102	107	108	111	101

Age group (nearest ages)	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
61-65	252*	7*	22*	91*	98*	76*	-	27*	4*	13*
66-70	73	73	142	92	87	65*	72	66	83	140
71-75	82	69	54	90	41	112	58	90	113	64
76-80	87	62	110	73	69	38	66	102	50	65
81-85	83	88	101	90	66	67	78	65	76	81
86-90	86	89	87	113	132	99	126	84	104	91
91-95	106	113	108	107	93	132	118	129	142	94
96-100	196	127	71	128	71	66	107	80	118	150
61-100	96	90	96	101	93	91	100	91	99	88

* Ratio based on fewer than 10 actual deaths.

Table ANN 1.2c. Immediate annuitants, males, durations 1 and over, lives, 1992-2002: actual deaths for individual years expressed as a percentage of those expected using the projected rates for the relevant calendar year from the IML92 table.

Age group (nearest ages)	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
61-65	229*	121*	42*	36*	77*	160*	56*	0*	109*	14*	159*
66-70	108	85	88	103	101	111	90*	81	85	90	100
71-75	91	71	92	95	130	67	131	78	88	87	88
76-80	89	103	103	109	97	81	66	81	106	71	83
81-85	94	88	105	105	99	77	89	83	97	107	94
86-90	94	95	103	90	104	106	105	116	96	115	109
91-95	126	105	98	111	92	88	126	116	122	108	101
96-100	111	109	122	85	97	72	96	112	118	117	125
61-100	100	95	102	100	101	89	102	101	104	103	101

Table ANN 1.2d. Immediate annuitants, males, durations 1 and over, amounts, 1992-2002: actual deaths for individual years expressed as a percentage of those expected using the projected rates for the relevant calendar year from the IMA92 table.

Age group (nearest ages)	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
61-65	100*	260*	7*	24*	103*	114*	91*	0*	35*	5*	17*
66-70	137	75	77	153	101	99	76*	86	81	103	178
71-75	128	84	71	58	98	46	126	66	105	135	78
76-80	74	88	64	116	78	75	42	74	116	57	76
81-85	109	84	91	105	95	70	72	85	72	84	91
86-90	101	87	91	90	118	138	105	135	91	113	100
91-95	106	107	115	111	110	96	138	124	136	151	101
96-100	68	197	128	72	130	73	68	110	83	123	157
61-100	101	97	92	99	105	99	97	108	99	110	98

* Ratio based on fewer than 10 actual deaths.

Table ANN 2.1a. Immediate annuitants, females, lives, 1999-2002, all data: actual deaths and ratios of actual deaths to those expected using the projected rates for calendar year 2020 from the IFL92 table, together with comparisons of 1995-1998 and 1991-1994.

Age group (nearest ages)	Actual deaths 1999-2002	100A/E 1999-2002 (using IFL92C20)	100A/E 1995-1998 (using IFL92C20)	100A/E 1991-1994 (using IFL92C20)
Duration 0				
71-80	16	157	119	124
81-85	22	137	99	105
86-90	27	154	108	132
91-100	10	82	125	180
71-100	75	134	111	133
Durations 1+				
61-65	8	175 *	379	282
66-70	17	103	178	247
71-75	53	99	174	147
76-80	213	117	130	133
81-85	529	114	125	132
86-90	1,203	118	123	123
91-95	1,461	124	118	122
96-100	665	114	114	113
61-100	4,149	119	122	124

* Ratio based on fewer than 10 actual deaths.

Table ANN 2.1b. Immediate annuitants, females, amounts, 1999-2002, all data: actual deaths and ratios of actual deaths to those expected using the projected rates for calendar year 2020 from the IFA92 table, together with comparisons of 1995-1998 and 1991-1994.

Age group (nearest ages)	Actual deaths 1999-2002 (£000 pa)	100A/E 1999-2002 (using IFA92C20)	100A/E 1995-1998 (using IFA92C20)	100A/E 1991-1994 (using IFA92C20)
Duration 0				
71-80	71	186	111	119
81-85	134	160	75	109
86-90	158	145	85	134
91-100	48	58	105	138
71-100	411	131	92	129
Durations 1+				
61-65	18	353 *	390	408
66-70	23	99	176	184
71-75	110	104	268	175
76-80	589	140	127	144
81-85	1,754	126	128	133
86-90	4,154	131	116	121
91-95	4,628	134	120	125
96-100	1,904	125	105	108
61-100	13,181	131	120	123

* Ratio based on fewer than 10 actual deaths.

Table ANN 2.2a. Immediate annuitants, females, durations 1 and over, lives, 1983-2002: actual deaths for individual years expressed as a percentage of those expected using the base (1992) rates from the IFL92 table.

Age group (nearest ages)	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
61-65	200*	179*	333	207*	320*	43*	286*	269*	154*	174*
66-70	159	139	129	142	148	141	153	114	174	106*
71-75	136	125	148	113	115	108	123	129	115	96
76-80	116	111	108	98	94	120	93	103	100	93
81-85	116	112	106	118	101	104	107	105	111	86
86-90	123	99	117	109	104	100	102	108	104	111
91-95	120	104	119	105	111	99	101	93	101	100
96-100	117	107	106	108	95	106	108	99	100	108
61-100	120	107	114	110	104	103	104	103	104	101

Age group (nearest ages)	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
61-65	87*	125*	111*	188*	333*	91*	60*	60*	43*	229*
66-70	123	127*	77*	145	67*	100*	34*	69*	43*	88*
71-75	110	105	114	103	102	111	71	80	61	36*
76-80	67	97	95	95	81	78	87	85	80	70
81-85	91	107	86	112	84	90	89	91	85	78
86-90	85	93	93	98	99	108	103	91	96	91
91-95	105	110	104	101	98	97	107	99	115	103
96-100	95	107	97	109	109	94	94	107	112	97
61-100	93	103	96	103	97	98	99	95	100	92

* Ratio based on fewer than 10 actual deaths.

Table ANN 2.2b. Immediate annuitants, females, durations 1 and over, amounts, 1983-2002: actual deaths for individual years expressed as a percentage of those expected using the base (1992) rates from the IFA92 table.

Age group (nearest ages)	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
61-65	296*	219*	351	206*	452*	21*	304*	345*	56*	334*
66-70	232	175	106	183	126	309	129	176	139	52*
71-75	141	129	149	127	180	168	80	120	118	102
76-80	129	110	106	105	124	99	90	99	111	82
81-85	127	107	112	138	98	107	101	85	116	87
86-90	129	99	106	120	103	88	104	110	99	114
91-95	127	90	116	100	138	88	95	100	100	104
96-100	125	102	123	81	114	107	89	110	88	112
61-100	129	102	113	115	116	98	98	102	103	103

Age group (nearest ages)	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
61-65	251*	60*	41*	151*	460*	40*	274*	47*	10*	400*
66-70	105	117*	28*	135	99*	155*	48*	66*	19*	90*
71-75	81	134	220	79	78	311	58	66	75	59*
76-80	95	105	92	103	74	77	81	151	70	78
81-85	84	109	98	126	80	76	136	93	82	65
86-90	84	92	78	100	100	94	109	107	101	106
91-95	97	124	112	85	90	121	118	114	119	108
96-100	103	91	79	106	114	77	117	117	106	112
61-100	90	105	94	100	94	101	115	110	102	100

* Ratio based on fewer than 10 actual deaths.

Table ANN 2.2c. Immediate annuitants, females, durations 1 and over, lives, 1992-2002: actual deaths for individual years expressed as a percentage of those expected using the projected rates for the relevant calendar year from the IFL92 table.

Age group (nearest ages)	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
61-65	174*	87*	133*	118*	214*	385*	111*	73*	76*	56*	305*
66-70	106*	127	133*	83*	161	75*	118*	40*	84*	53*	112*
71-75	96	112	110	122	112	112	125	82	94	73	44*
76-80	93	68	100	99	102	88	86	97	96	92	82
81-85	86	92	109	89	118	90	97	97	100	95	88
86-90	111	86	95	96	102	104	114	110	98	104	100
91-95	100	106	112	106	104	102	101	113	105	122	109
96-100	108	95	108	99	111	112	96	97	111	117	101
61-100	101	94	105	99	107	101	104	105	102	109	100

Table ANN 2.2d. Immediate annuitants, females, durations 1 and over, amounts, 1992-2002: actual deaths for individual years expressed as a percentage of those expected using the projected rates for the relevant calendar year from the IFA92 table.

Age group (nearest ages)	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
61-65	334*	259*	64*	45*	170*	535*	47*	337*	59*	13*	535*
66-70	52*	108	123*	30*	149	112*	180*	57*	81*	23*	115*
71-75	102	83	139	234	86	86	351	67	77	89	71*
76-80	82	97	109	97	109	80	85	91	171	81	91
81-85	87	85	112	102	133	86	82	148	103	92	73
86-90	114	85	93	81	104	105	100	116	115	109	116
91-95	104	98	126	114	87	93	126	124	120	126	115
96-100	112	104	92	81	108	117	79	120	122	111	117
61-100	103	91	107	97	104	98	106	122	118	111	109

* Ratio based on fewer than 10 actual deaths.

Table ANN 3.1a. Retirement annuity policies in deferment, males, 1999-2002: actual deaths and ratios of actual deaths to those expected using the ultimate rates from the AM92 table, together with comparisons of 1995-1998 and 1991-1994.

Age group (nearest ages)	Actual deaths 1999-2002	100A/E 1999-2002 (using AM92)	100A/E 1995-1998 (using AM92)	100A/E 1991-1994 (using AM92)
26-35	40	91	95	89
36-40	194	93	91	102
41-45	456	79	107	108
46-50	1,163	87	99	110
51-55	2,632	82	92	108
56-60	3,743	76	86	98
61-65	3,622	70	81	91
66-70	993	55	66	77
71-75	445	58	62	74
26-75	13,288	74	85	98

Table ANN 3.1b. Retirement annuity policies in payment, males, 1999-2002: actual deaths and ratios of actual deaths to those expected using the rates for the calendar year 2020 from the RMV92 table, together with comparisons of 1995-1998 and 1991-1994.

Age group (nearest ages)	Actual deaths 1999-2002	100A/E 1999-2002 (using RMV92C20)	100A/E 1995-1998 (using RMV92C20)	100A/E 1991-1994 (using RMV92C20)
51-55	112	141	166	304
56-60	256	167	255	339
61-65	1,213	137	186	209
66-70	3,978	139	160	177
71-75	6,354	141	154	170
76-80	7,401	132	141	145
81-85	5,387	128	131	134
86-90	3,678	141	124	130
91-95	1,088	128	104	123
96-100	148	103	75	98
51-100	29,615	135	147	159

Table ANN 3.2a. Retirement annuity policies in deferment and in payment combined, males, 1999-2002: actual deaths and ratios of actual deaths to those expected using the ultimate rates from the IML92 table for the calendar year 2000, together with comparisons of 1999-2002, 1995-1998 and 1991-1994 for the calendar year 2000.

Age group (nearest ages)	Actual deaths ^φ 1999-2002	100A/E 1999-2002 (using IML92C00)	100A/E 1999-2002 (using IML92C20)	100A/E 1995-1998 (using IML92C20)	100A/E 1991-1994 (using IML92C20)
21-30	2	132*	244*	275	209
31-35	38	118	217	224	224
36-40	197	122	225	219	245
41-45	462	104	191	258	262
46-50	1,191	116	214	248	270
51-55	2,744	111	204	230	271
56-60	3,999	104	191	223	254
61-65	4,835	97	164	202	228
66-70	4,971	93	140	167	185
71-75	6,799	96	133	147	165
76-80	7,426	95	123	134	137
81-85	5,398	95	115	120	123
86-90	3,682	107	124	111	117
91-95	1,089	99	110	90	108
96-100	148	81	87	64	83
21-100	42,981	98	140	164	183

^φ Includes deaths among retirees at ages below 50. Note that this means that the total number of actual deaths is greater than the sum of those shown in tables ANN 3.1a and ANN 3.1b.

* Ratio based on fewer than 10 actual deaths.

Table ANN 3.2b. Retirement annuity policies in deferment and in payment combined, males, 1999-2002: actual deaths and ratios of actual deaths to those expected using the rates from the RMV92 table for the calendar year 2000, together with comparisons of 1999-2002, 1995-1998 and 1991-1994 for the calendar year 2020.

Age group (nearest ages)	Actual deaths ^φ 1999-2002	100A/E 1999-2002 (using RMV92C00)	100A/E 1999-2002 (using RMV92C20)	100A/E 1995-1998 (using RMV92C20)	100A/E 1991-1994 (using RMV92C20)
21-30	2	2*	4*	4	3
31-35	38	2	4	4	4
36-40	197	3	6	6	6
41-45	462	5	8	11	11
46-50	1,191	10	18	21	22
51-55	2,744	19	36	39	46
56-60	3,999	36	66	76	87
61-65	4,835	60	101	123	139
66-70	4,971	82	125	146	162
71-75	6,799	99	137	149	167
76-80	7,426	102	132	141	145
81-85	5,398	104	127	131	134
86-90	3,682	122	141	124	131
91-95	1,089	115	128	104	123
96-100	148	96	103	75	97
21-100	42,981	46	75	64	58

^φ Includes deaths among retirees at ages below 50. Note that this means that the total number of actual deaths is greater than the sum of those shown in tables ANN 3.1a and ANN 3.1b.

* Ratio based on fewer than 10 actual deaths.

Table ANN 4.1a. Retirement annuity policies in deferment, females, 1999-2002: actual deaths and ratios of actual deaths to those expected using the ultimate rates from the AF92 table, together with comparisons of 1995-1998 and 1991-1994.

Age group (nearest ages)	Actual deaths 1999-2002	100A/E 1999-2002 (using AF92)	100A/E 1995-1998 (using AF92)	100A/E 1991-1994 (using AF92)
31-40	44	119	74	89
41-45	76	96	99	97
46-50	153	88	120	111
51-55	391	96	90	98
56-60	479	76	93	83
61-65	309	73	70	83
66-70	117	58	80	74
71-75	66	73	71	72
31-75	1,635	80	89	92

Table ANN 4.1b. Retirement annuity policies in payment, females, 1999-2002: actual deaths and ratios of actual deaths to those expected using the rates for the calendar year 2020 from the RFV92 table, together with comparisons of 1995-1998 and 1991-1994.

Age group (nearest ages)	Actual deaths 1999-2002	100A/E 1999-2002 (using RFV92C20)	100A/E 1995-1998 (using RFV92C20)	100A/E 1991-1994 (using RFV92C20)
51-55	21	115	225	394
56-60	82	162	246	415
61-65	342	118	150	210
66-70	585	119	154	171
71-75	840	116	147	159
76-80	1,042	122	135	139
81-85	830	119	124	145
86-90	583	113	115	154
91-95	318	131	114	118
96-100	63	109	102	89
51-100	4,706	119	139	164

Table ANN 4.2a. Retirement annuity policies in deferment and in payment combined, females, 1999-2002: actual deaths and ratios of actual deaths to those expected using the ultimate rates from the IFL92 table for the calendar year 2000, together with comparisons of 1999-2002, 1995-1998 and 1991-1994 for the calendar year 2020.

Age group (nearest ages)	Actual deaths ^φ 1999-2002	100A/E 1999-2002 (using IFL92C00)	100A/E 1999-2002 (using IFL92C20)	100A/E 1995-1998 (using IFL92C20)	100A/E 1991-1994 (using IFL92C20)
21-40	44	236	434	252	287
41-45	78	239	439	458	442
46-50	160	229	421	568	523
51-55	412	225	414	399	439
56-60	561	161	297	359	348
61-65	651	120	202	220	291
66-70	702	91	138	179	192
71-75	906	85	118	146	160
76-80	1,046	88	114	126	130
81-85	831	86	105	110	129
86-90	585	85	99	100	135
91-95	319	105	116	101	105
96-100	64	94	101	95	83
21-100	6,359	102	138	178	205

^φ Includes deaths among retirees at ages below 50. Note that this means that the total number of actual deaths is greater than the sum of those shown in tables ANN 4.1a and ANN 4.1b.

Table ANN 4.2b. Retirement annuity policies in deferment and in payment combined, females, 1999-2002: actual deaths and ratios of actual deaths to those expected using the rates from the RFV92 table for the calendar year 2002, together with comparisons of 1999-2002, 1995-1998 and 1991-1994 for the calendar year 2020.

Age group (nearest ages)	Actual deaths ^φ 1999-2002	100A/E 1999-2002 (using RFV92C00)	100A/E 1999-2002 (using RFV92C20)	100A/E 1995-1998 (using RFV92C20)	100A/E 1991-1994 (using RFV92C20)
21-40	44	4	7	4	4
41-45	78	7	12	13	13
46-50	160	13	24	32	29
51-55	412	29	53	50	55
56-60	561	47	87	105	101
61-65	651	68	116	103	166
66-70	702	76	115	149	159
71-75	906	84	116	144	157
76-80	1,046	94	122	135	140
81-85	831	97	118	124	145
86-90	585	97	113	115	155
91-95	319	118	131	114	118
96-100	64	101	108	102	88
21-100	6,359	53	83	71	61

^φ Includes deaths among retirees at ages below 50. Note that this means that the total number of actual deaths is greater than the sum of those shown in tables ANN 4.1a and ANN 4.1b.

Table ANN 5.1a. Personal pension policies in deferment, males, 1999-2002: actual deaths and ratios of actual deaths to those expected using the ultimate rates from the AM92 table, together with comparisons of 1995-1998 and 1991-1994.

Age group (nearest ages)	Actual deaths 1999-2002	100A/E 1999-2002 (using AM92)	100A/E 1995-1998 (using AM92)	100A/E 1991-1994 (using AM92)
21-25	85	101	91	115
26-30	318	83	96	85
31-35	790	95	80	92
36-40	1,160	95	95	94
41-45	1,514	94	102	105
46-50	2,323	100	101	106
51-55	3,603	92	91	103
56-60	3,449	81	87	95
61-65	2,371	71	75	82
66-70	617	58	56	64
71-75	305	57	56	56
21-75	16,535	84	87	97

Table ANN 5.1b. Personal pension policies in payment, males, 1999-2002: actual deaths and ratios of actual deaths to those expected using the rates for the calendar year 2020 from the RMV92 table, together with comparisons of 1995-1998 and 1991-1994.

Age group (nearest ages)	Actual deaths 1999-2002	100A/E 1999-2002 (using RMV92C20)	100A/E 1995-1998 (using RMV92C20)	100A/E 1991-1994 (using RMV92C20)
51-55	357	82	81	80
56-60	753	121	124	123
61-65	1,745	130	123	139
66-70	2,988	116	119	131
71-75	2,255	110	101	108
76-80	1,069	96	100	81
81-85	397	109	91	-
51-85	9,564	112	112	126

Table ANN 5.2a. Personal pension policies in deferment and in payment combined, males, 1999-2002: actual deaths and ratios of actual deaths to those expected using the ultimate rates from the IML92 table for the calendar years 2000 and 2020.

Age group (nearest ages)	Actual deaths ^φ 1999-2002	100A/E 1999-2002 (using IML92C00)	100A/E 1999-2002 (using IML92C20)
21-25	85	133	242
26-30	319	109	201
31-35	796	124	228
36-40	1,170	125	229
41-45	1,535	125	229
46-50	2,392	134	246
51-55	3,960	126	232
56-60	4,202	115	211
61-65	4,116	101	172
66-70	3,605	83	126
71-75	2,560	76	105
76-80	1,071	69	90
81-85	397	80	99
86-90	98	106	124
21-90	26,306	102	167

^φ Includes deaths among retirees at ages below 50. Note that this means that the total number of actual deaths is greater than the sum of those shown in tables ANN 5.1a and ANN 5.1b.

Table ANN 5.2b. Personal pension policies in deferment and in payment combined, males, 1999-2002: actual deaths and ratios of actual deaths to those expected using the rates from the RMV92 table for the calendar years 2000 and 2020.

Age group (nearest ages)	Actual deaths ^φ 1999-2002	100A/E 1999-2002 (using RMV92C00)	100A/E 1999-2002 (using RMV92C20)
21-25	85	2	3
26-30	319	2	3
31-35	796	2	4
36-40	1,170	3	6
41-45	1,535	5	10
46-50	2,392	11	20
51-55	3,960	22	40
56-60	4,202	39	71
61-65	4,116	62	106
66-70	3,605	73	112
71-75	2,560	77	108
76-80	1,071	74	96
81-85	397	89	109
86-90	98	120	140
21-90	26,306	13	24

^φ Includes deaths among retirees at ages below 50. Note that this means that the total number of actual deaths is greater than the sum of those shown in tables ANN 5.1a and ANN 5.1b.

Table ANN 6.1a. Personal pension policies in deferment, females, 1999-2002: actual deaths and ratios of actual deaths to those expected using the ultimate rates from the AF92 table, together with comparisons of 1995-1998 and 1991-1994.

Age group (nearest ages)	Actual deaths 1999-2002	100A/E 1999-2002 (using AF92)	100A/E 1995-1998 (using AF92)	100A/E 1991-1994 (using AF92)
21-25	17	72	120	83
26-30	121	81	74	62
31-35	303	83	88	89
36-40	441	90	102	86
41-45	568	96	104	90
46-50	809	98	101	87
51-55	1,016	88	81	82
56-60	792	79	91	65
61-65	299	71	80	62
66-70	97	56	47	52
71-75	43	61	63	57 *
21-75	4,506	86	90	79

* Ratio based on fewer than 10 actual deaths.

Table ANN 6.1b. Personal pension policies in payment, females, 1999-2002: actual deaths and ratios of actual deaths to those expected using the rates for the calendar year 2020 from the RFV92 table, together with comparisons of 1995-1998 and 1991-1994.

Age group (nearest ages)	Actual deaths 1999-2002	100A/E 1999-2002 (using RFV92C20)	100A/E 1995-1998 (using RFV92C20)	100A/E 1991-1994 (using RFV92C20)
51-55	112	92	122	101
56-60	240	130	122	167
61-65	523	117	125	115
66-70	449	112	101	150
71-75	246	87	89	87 *
76-80	160	101	72	156 *
81-85	54	87	74 *	-
51-85	1,784	108	112	138

* Ratio based on fewer than 10 actual deaths.

Table ANN 6.2a. Personal pension policies in deferment and in payment combined, females, 1999-2002: actual deaths and ratios of actual deaths to those expected using the ultimate rates from the IFL92 table for the calendar years 2000 and 2020.

Age group (nearest ages)	Actual deaths ^φ 1999-2002	100A/E 1999-2002 (using IFL92C00)	100A/E 1999-2002 (using IFL92C20)
21-25	17	70	129
26-30	121	101	185
31-35	305	135	248
36-40	444	185	341
41-45	580	236	435
46-50	828	248	455
51-55	1,128	213	391
56-60	1,032	170	312
61-65	822	119	203
66-70	546	86	131
71-75	289	65	90
76-80	160	73	95
81-85	54	63	78
86-90	14	83	97
21-90	6,340	143	238

^φ Includes deaths among retirees at ages below 50. Note that this means that the total number of actual deaths is greater than the sum of those shown in tables ANN 6.1a and ANN 6.1b.

Table ANN 6.2b. Personal pension policies in deferment and in payment combined, females, 1999-2002: actual deaths and ratios of actual deaths to those expected using the rates from the RFV92 table for the calendar years 2000 and 2020.

Age group (nearest ages)	Actual deaths ^φ 1999-2002	100A/E 1999-2002 (using RFV92C00)	100A/E 1999-2002 (using RFV92C20)
21-25	17	1	1
26-30	121	1	2
31-35	305	2	3
36-40	444	3	6
41-45	580	7	12
46-50	828	14	25
51-55	1,128	26	49
56-60	1,032	48	88
61-65	822	67	114
66-70	546	71	108
71-75	289	63	88
76-80	160	78	101
81-85	54	71	87
86-90	14	95	111
21-90	6,340	9	16

^φ Includes deaths among retirees at ages below 50. Note that this means that the total number of actual deaths is greater than the sum of those shown in tables ANN 6.1a and ANN 6.1b.

THE MORTALITY OF PENSIONERS IN INSURED GROUP PENSION SCHEMES 1999-2002

This report contains commentaries on the experience recorded over 1999-2002 for male and female pensioners, and for widows and widowers of pensioners. As has always been the case in the CMI investigations, the pensioners concerned are those covered by schemes under which the benefits are insured through life offices. The tables supporting the text can be found on pp 75 to 93.

When comparing results for the quadrennium 1999-2002 with those for earlier quadrennia, it should be noted that there have been material changes in the mix of offices contributing to these investigations, particularly in more recent years. For the pensioner investigations, a total of fifteen offices contributed data at some point during the period 1995-2002; of these only seven contributed data in all eight of these years. The corresponding figures for widows/widowers are thirteen and five respectively.

The experiences are divided into those where the pensioner retired at or after the normal age (referred to for simplicity as ‘normal’ retirements) and those who retired before the normal age (referred to as ‘early’ retirements). Up until the mid-1980s this was more or less equivalent to a split between healthy retirements and ill health retirements. Since the mid-1980s, however, an increasing proportion of healthy lives have been retiring early. This could have two effects.

Firstly, the mortality experienced by early retirees would be expected to improve relative to that of normal retirees. There is some evidence that this may be happening at the younger ages (i.e. up to around 60-65) and that this phenomenon may be working up into the higher age groups.

Secondly, the fact that a number of healthy lives are now entering the early retirement group means that the normal retirement group is missing a substantial number of persons who would, in other circumstances, have been included in it. This raises the question as to whether these ‘missing’ people are typical of the group as a whole or whether, once they are removed, we are left with experience that exhibits different characteristics from those previously observed. These remarks simply highlight the fact that these are complex experiences where a number of inter-related factors are very probably operating. Due consideration should be given to all these factors when relying on the results from the experiences to select a basis for use in connection with any individual portfolio.

1. MALE PENSIONERS

Tables PEN 1.1a, PEN 1.2a and PEN 1.3a give the experience for the quadrennium 1999-2002 on the basis of lives for, respectively, normal retirements, early retirements and all retirements combined. Tables PEN 1.1b, PEN 1.2b and PEN 1.3b give the corresponding experience on the basis of amounts. Each table uses as a comparison basis the projected mortality rates for the calendar year 2020 from the PML92 or PMA92 tables, as appropriate. Once more, ‘bridging factors’ have been used to estimate the 100A/Es for 1991-1994. A comparison of the actual experience for normal retirements year by year from 1983, lives and amounts, against the rates for the calendar year 1992 from the PML92 and PMA92 mortality tables respectively, can be found in Tables PEN 1.4a and PEN 1.4b. Tables PEN 1.4c and PEN 1.4d show a comparison for each calendar year since 1992 with the projected rates for those years from, as appropriate, the PML92 or PMA92 mortality tables. Tables PEN 1.4e and PEN 1.4f show the same comparisons, except that the medium cohort adjustments to the “92” Series projections are used. Tables PEN 1.5a and PEN 1.5b show the size of the experiences together with the average pensions in payment.

From Tables PEN 1.1a and PEN 1.1b it can be seen that the fall in levels of male pensioner mortality, noted over previous quadrennia, has continued. There has been a significant overall improvement between 1995-1998 and 1999-2002, although Table PEN 1.1a shows that, on a lives basis, experience actually worsened below age 65. A similar feature appears in Table PEN 1.1b, for the amounts basis. The improvement is in contrast to the immediate annuitants investigation (see Tables ANN 1.1a and ANN 1.1b) where overall mortality rates have remained unchanged. It has previously been noted that a clear gap existed between the mortality recorded on an amounts basis compared to the lives basis, with the amounts experience being significantly lighter. This information is not readily available in Tables PEN 1.1a and PEN 1.1b for 1999-2002 since different comparison bases have been used (lives or amounts tables as appropriate), but a further inspection of the data shows that this feature continues to hold true.

Just how far the experience has improved over the period from 1983 to 2002 can be seen in Tables PEN 1.4a and PEN 1.4b, where the actual deaths year by year (on a lives and an amounts basis respectively) are compared with those expected using the 1992 calendar year base rates from PML92 or PMA92 as appropriate. A comparison with the "92" Series mortality rates projected to each year between 1992 and 2002 can be seen in Tables PEN 1.4c and PEN 1.4d, and with the medium cohort projections in Tables PEN 1.4e and PEN 1.4f.

Although the ratios do not run smoothly, the overall trend of improving mortality in the experience of pensioners who are normal retirements can be clearly seen in Tables PEN 1.4a and PEN 1.4b. The eleven-year period from 1992 to 2002 covered by Tables PEN 1.4c and PEN 1.4d shows that the 100A/E ratios are below 100 in most cases and they appear to be trending downwards; this implies that mortality is improving more quickly than expected according to the "92" Series projections. From Tables PEN 1.4e and PEN 1.4f it can be seen that the medium cohort projection basis appears to be a better estimation of overall mortality levels, apart from the two most recent years for the amounts data. The pattern by age group is more varied, with mortality improvements tending to be overestimated at the younger ages and underestimated at the older ages, especially in more recent years. However, it is not necessarily appropriate to judge the results of a projection over a short period. Furthermore, differences in the mix of offices underlying the projections and the current experience make it difficult to draw any firm conclusions about the suitability of the cohort projections.

The experience of pensioners who retired before the normal age is shown in Tables PEN 1.2a and PEN 1.2b (lives and amounts respectively). As would be expected, the overall level of mortality is considerably heavier than that of pensioners retiring at or after the normal age. This pattern has been consistent over a number of quadrennia, although the overall size of the differential has narrowed slightly in the 1999-2002 quadrennium. With an increasing number of healthy retirees in the early retirement exposed to risk, we might expect the differential to fall. Indeed the ratio of early to normal retirements has fallen significantly at ages below 70, on the basis of lives, and the size of the fall is greater at the lower ages. In fact below age 60, the experience of early retirees is lighter than that for normal retirees. The pattern for the amounts experience is less clear. The gap between the experience as measured by lives and amounts cannot clearly be observed from Tables PEN 1.2a and PEN 1.2b because of the different comparison bases used. However, further inspection of the data shows that the differential observed among normal and late retirees is present here also.

Tables PEN 1.3a and PEN 1.3b (lives and amounts respectively) give the experience for all pensioners combined.

Tables PEN 1.5a and PEN 1.5b show the size of the data, on a normal retirements and an early retirements basis respectively, together with average pensions per annum. A long-standing feature is the substantial rise in the amount of average pensions, quadrennium by quadrennium. This feature was evident in the all age normal retirement data for 1999-2002

(though not in age groups below 60) and in the early retirement data where the 1999-2002 experience shows higher average amounts for all age groups. Average pensions for normal retirees were, in almost all cases, age for age greater than those for early retirees. The exceptions are the two age groups just above age 65. Also, within each age group (except at the oldest ages, and for some isolated cases at younger ages) average pensions among the exposed to risk were greater than those for pensioners in the same group who had died. Both features have been noted before and form part of a now expected pattern.

2. FEMALE PENSIONERS

Tables PEN 2.1a, PEN 2.2a and PEN 2.3a, respectively, give the experience for the quadrennium 1999-2002 on the basis of lives for normal retirements, early retirements and all retirements combined. Tables PEN 2.1b, PEN 2.2b and PEN 2.3b give the corresponding experience on the basis of amounts. Each table uses as a comparison basis the projected mortality rates for the calendar year 2020 from the PFL92 or PFA92 tables, as appropriate. Tables PEN 2.4a and PEN 2.4b show, for normal retirements on an amounts or on a lives basis, year by year comparisons against the PFL92 or PFA92, as appropriate, mortality rates for the calendar year 1992. Tables PEN 2.4c and PEN 2.4d show the same information but, rather than using a fixed mortality rate comparison basis for each year, use "92" Series mortality rates projected to the same calendar year as used when collecting the data, while Tables PEN 2.4e and PEN 2.4f use the medium cohort projection basis. Tables PEN 2.5a and PEN 2.5b show the size of the experiences together with the average pensions in payment.

In Tables PEN 2.1a and PEN 2.1b it can be seen that the improvement in mortality among those retiring at or above the normal age, which was noted over earlier quadrennia, has continued into the current quadrennium, although the pattern by age group is variable. Further inspection of the data also shows that the gap between the level of mortality recorded on a lives basis and that recorded on an amounts basis, as noted in the male experience, is present in the female experience also. In 1999-2002 the gap was of a similar size for males and females.

The experience, on a lives and an amounts basis, measured against the projected rates year by year and shown in Tables PEN 2.4c and PEN 2.4d, indicates that, overall, the projections issued with the PFL92 and PFA92 tables have not been unreasonable. However on the lives basis the experience does now appear to be trending below the projected rates. On the amounts basis the picture is less clear as the year by year observed rates of mortality are more volatile. Looked at age group by age group the experience is more volatile than the male experience, which makes it difficult to identify persistent trends. Tables PEN 2.4e and PEN 2.4f suggest that, overall, the experience since 1992 has followed the medium cohort projection reasonably closely. However, as for the males, the experience by amounts for 2001 and 2002 was notably heavier than that predicted by the projection. Examination of the individual age groups indicates that, in general, the projection has tended to underestimate mortality at the younger ages and overestimate it at the older ages.

The mortality experience of pensioners retiring before the normal age is shown in Tables PEN 2.2a and PEN 2.2b (lives and amounts respectively). The improvement in mortality for this group, noted over previous quadrennia, has continued. Even so, the mortality level is still considerably higher than that recorded for normal retirees. In previous quadrennia it had been noted that, on an age by age basis, the difference was greatest at the younger ages then tailed off as age increased before disappearing altogether at around the mid 70s. In 1999-2002 the pattern is less clear, though it can be broadly seen that the differences tend to be larger at younger ages. Further inspection of the data shows that, as with the other pensioner experiences, the level of mortality recorded on an amounts basis is significantly lighter than

that recorded on an amounts basis. However, the gap is not quite as pronounced as for the other experiences.

The level of mortality recorded for all pensioners combined is shown in Tables PEN 2.3a and PEN 2.3b (lives and amounts respectively).

The exposed to risk and deaths, on the basis of both lives and amounts, is shown for normal retirements in Table PEN 2.5a and for early retirements in Table PEN 2.5b, both of which also give average pensions. As was seen in the male experience, average pensions have continued the rise over time, as was noted in earlier quadrennia. They are, however, lower on average than those payable to their male counterparts. This almost certainly reflects the lower average salaries earned by women and a shorter than average period of qualifying service. Following the established pattern, average pensions paid to the normal and late retirees were, in almost all cases, age for age greater than those paid to the early retirees. Also, average pensions among the exposed to risk were generally greater than those for pensioners who had died.

3. WIDOWS OF PENSIONERS

Tables PEN 3.1a and PEN 3.1b show the mortality experience of pensioners' widows over the quadrennium 1999-2002 on the basis of lives and amounts respectively. Comparisons are shown on four bases: WL92 and PFL92 for lives and WA92 and PFA92 for amounts, all projected to the calendar year 2020.

As can be seen from the tables, the mortality experienced by this group continues to improve. For all ages combined, on both a lives and an amounts basis, it is now lighter than that experienced by women drawing pensions in their own right who retired at or after their normal age (see Tables PEN 2.1a and PEN 2.1b). This reverses the feature observed in previous quadrennia. However, the difference is age-related. For ages below 75 the mortality of widows is higher than that for women drawing pensions in their own right, with the opposite generally being the case above age 75.

4. WIDOWERS OF PENSIONERS

The experience for widowers is shown in Tables PEN 4.1a and PEN 4.1b. The PML92 and PMA92 mortality rates, as appropriate, projected to the calendar year 2020 are used as a comparison basis. The experience is still very limited with only 248 deaths in total. On both the lives and amounts basis there seems to have been significant mortality improvement in almost all age groups. However the experience is still too small to allow firm conclusions to be drawn.

Table PEN 1.1a. Pensioners, males, normal retirements, lives, 1999-2002: actual deaths and ratios of actual deaths to those expected using the projected rates for calendar year 2020 from the PML92 table, together with comparisons of 1995-1998 and 1991-1994.

Age group (nearest ages)	Actual deaths 1999-2002	100A/E 1999-2002 (using PML92C20)	100A/E 1995-1998 (using PML92C20)	100A/E 1991-1994 (using PML92C20)
51-55	115	460	338	426
56-60	256	308	220	337
61-65	1,110	171	166	213
66-70	4,124	123	139	177
71-75	6,590	119	140	162
76-80	10,921	115	126	148
81-85	12,351	113	121	136
86-90	11,823	107	116	127
91-95	5,088	104	114	117
96-100	1,072	89	107	98
51-100	53,450	113	124	142

Table PEN 1.1b. Pensioners, males, normal retirements, amounts, 1999-2002: actual deaths and ratios of actual deaths to those expected using the projected rates for calendar year 2020 from the PMA92 table, together with comparisons of 1995-1998 and 1991-1994.

Age group (nearest ages)	Actual deaths 1999-2002 (£000 pa)	100A/E 1999-2002 (using PMA92C20)	100A/E 1995-1998 (using PMA92C20)	100A/E 1991-1994 (using PMA92C20)
51-55	155	627	426	316
56-60	702	553	572	321
61-65	2,541	191	182	226
66-70	8,800	140	166	184
71-75	14,185	121	144	159
76-80	23,389	114	133	145
81-85	19,067	112	117	133
86-90	12,687	114	117	145
91-95	3,585	108	110	122
96-100	568	103	116	102
51-100	85,680	119	132	147

Table PEN 1.2a. Pensioners, males, early retirements, lives, 1999-2002: actual deaths and ratios of actual deaths to those expected using the projected rates for calendar year 2020 from the PML92 table, together with comparisons of 1995-1998 and 1991-1994.

Age group (nearest ages)	Actual deaths 1999-2002	100A/E 1999-2002 (using PML92C20)	100A/E 1995-1998 (using PML92C20)	100A/E 1991-1994 (using PML92C20)	Ratio Early/ Normal ^o
51-55	195	393	470	625	0.85
56-60	507	273	287	456	0.89
61-65	1,234	178	222	284	1.04
66-70	2,069	149	183	231	1.21
71-75	3,341	137	162	191	1.15
76-80	5,056	133	141	156	1.16
81-85	4,217	121	127	131	1.07
86-90	2,580	112	119	116	1.05
91-95	861	105	113	106	1.01
96-100	121	101	125	93	1.13
51-100	20,181	132	147	170	1.17

Table PEN 1.2b. Pensioners, males, early retirements, amounts, 1999-2002: actual deaths and ratios of actual deaths to those expected using the projected rates for calendar year 2020 from the PMA92 table, together with comparisons of 1995-1998 and 1991-1994.

Age group (nearest ages)	Actual deaths 1999-2002 (£000 pa)	100A/E 1999-2002 (using PMA92C20)	100A/E 1995-1998 (using PMA92C20)	100A/E 1991-1994 (using PMA92C20)	Ratio Early/ Normal ^o
51-55	238	596	1,090	725	0.95
56-60	921	399	343	529	0.72
61-65	2,463	200	252	314	1.05
66-70	5,515	167	189	221	1.19
71-75	8,786	137	145	188	1.13
76-80	8,733	120	137	163	1.05
81-85	5,126	110	128	132	0.98
86-90	2,441	120	116	118	1.05
91-95	434	100	106	120	0.93
96-100	52	113	121	70	1.10
51-100	34,710	135	152	184	1.13

^o Ratio of 100A/E for early retirements to 100A/E for normal retirements 1999-2002 using PMA92C20 as the comparison basis.

Table PEN 1.3a. Pensioners, males, normal and early retirements combined, lives, 1999-2002: actual deaths and ratios of actual deaths to those expected using the projected rates for calendar year 2020 from the PML92 table, together with comparisons of 1995-1998 and 1991-1994.

Age group (nearest ages)	Actual deaths 1999-2002	100A/E 1999-2002 (using PML92C20)	100A/E 1995-1998 (using PML92C20)	100A/E 1991-1994 (using PML92C20)
51-55	310	416	447	574
56-60	763	283	273	423
61-65	2,344	175	199	254
66-70	6,193	131	154	196
71-75	9,931	125	148	171
76-80	15,977	120	131	149
81-85	16,568	115	122	135
86-90	14,403	108	117	126
91-95	5,949	104	114	117
96-100	1,193	90	108	98
51-100	73,631	118	130	148

Table PEN 1.3b. Pensioners, males, normal and early retirements combined, amounts, 1999-2002: actual deaths and ratios of actual deaths to those expected using the projected rates for calendar year 2020 from the PMA92 table, together with comparisons of 1995-1998 and 1991-1994.

Age group (nearest ages)	Actual deaths 1999-2002 (£000 pa)	100A/E 1999-2002 (using PMA92C20)	100A/E 1995-1998 (using PMA92C20)	100A/E 1991-1994 (using PMA92C20)
51-55	393	608	915	523
56-60	1,623	454	417	439
61-65	5,004	195	219	271
66-70	14,315	149	176	196
71-75	22,971	126	144	167
76-80	32,122	116	134	149
81-85	24,193	111	120	133
86-90	15,128	115	117	142
91-95	4,019	107	109	122
96-100	621	104	116	100
51-100	120,390	123	138	156

Table PEN 1.4a. Pensioners, males, normal retirements, lives, 1983-2002: actual deaths for individual years expressed as a percentage of those expected using the base (1992) rates from the PML92 table.

Age group (nearest ages)	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
61-65	133	122	146	122	138	124	120	114	115	96
66-70	126	120	116	112	114	109	102	101	105	99
71-75	120	117	116	109	115	114	107	100	99	103
76-80	116	112	115	111	110	108	105	104	105	99
81-85	114	116	115	110	113	105	104	103	103	103
86-90	116	107	113	112	108	105	104	100	103	102
91-95	113	103	113	100	104	107	106	98	101	99
96-100	88	115	119	111	95	102	98	101	101	78
61-100	118	115	116	110	112	109	105	102	103	101

Age group (nearest ages)	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
61-65	98	104	88	80	72	80	82	84	69	78
66-70	94	88	80	79	69	76	71	65	66	65
71-75	98	96	95	86	79	83	78	70	73	71
76-80	100	95	91	89	81	84	82	75	81	76
81-85	102	95	94	90	88	89	90	79	86	79
86-90	102	96	98	96	89	90	86	86	87	82
91-95	100	103	102	96	96	95	94	84	90	85
96-100	84	91	119	77	89	101	90	74	85	73
61-100	100	95	94	89	84	87	84	77	82	77

Table PEN 1.4b. Pensioners, males, normal retirements, amounts, 1983-2002: actual deaths for individual years expressed as a percentage of those expected using the base (1992) rates from the PMA92 table.

Age group (nearest ages)	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
61-65	155	181	172	187	123	137	133	162	107	105
66-70	139	144	135	120	114	123	120	103	116	102
71-75	123	123	125	111	121	109	114	108	98	103
76-80	126	111	110	117	109	107	104	100	108	94
81-85	122	123	115	106	107	97	104	91	110	97
86-90	121	111	114	109	115	110	104	101	135	125
91-95	111	117	127	104	104	96	119	88	113	124
96-100	122	105	154	88	108	116	113	84	120	91
61-100	128	125	123	116	114	110	111	103	109	101

Age group (nearest ages)	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
61-65	113	109	100	88	83	61	94	90	83	88
66-70	93	88	96	91	92	77	82	72	73	77
71-75	94	102	104	85	80	83	70	79	76	70
76-80	95	85	97	91	83	92	73	71	85	84
81-85	95	92	88	92	85	86	88	84	86	74
86-90	111	97	109	91	87	91	98	86	92	90
91-95	91	96	102	101	100	80	88	98	91	88
96-100	66	92	140	76	108	97	99	107	73	92
61-100	96	93	98	90	85	87	81	79	84	80

Table PEN 1.4c. Pensioners, males, normal retirements, lives, 1992-2002: actual deaths for individual years expressed as a percentage of those expected using the projected rates for the relevant calendar year from the PML92 table.

Age group (nearest ages)	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
61-65	96	101	111	96	90	83	95	101	107	90	105
66-70	99	97	92	87	87	78	88	85	79	82	83
71-75	103	100	100	101	93	88	94	90	82	88	86
76-80	99	101	99	96	95	87	92	91	85	93	89
81-85	103	104	97	97	94	94	96	98	88	96	89
86-90	102	104	98	101	100	93	96	92	93	95	90
91-95	99	101	105	105	99	99	99	98	89	96	91
96-100	78	84	92	121	79	91	104	92	76	88	77
61-100	101	102	98	98	95	90	95	93	87	93	88

Table PEN 1.4d. Pensioners, males, normal retirements, amounts, 1992-2002: actual deaths for individual years expressed as a percentage of those expected using the projected rates for the relevant calendar year from the PMA92 table.

Age group (nearest ages)	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
61-65	105	116	116	110	99	96	72	115	114	107	117
66-70	102	95	93	104	101	105	90	97	88	91	99
71-75	103	96	107	111	92	89	94	81	93	91	86
76-80	94	97	88	102	97	90	101	82	81	98	98
81-85	97	96	95	91	97	91	93	97	93	96	84
86-90	125	112	99	112	95	92	96	105	93	100	99
91-95	124	92	98	104	104	104	83	93	104	97	94
96-100	91	67	93	142	77	110	100	103	111	76	96
61-100	101	98	97	103	96	93	95	91	90	96	93

Table PEN 1.4e. Pensioners, males, normal retirements, lives, 1992-2002: actual deaths for individual years expressed as a percentage of those expected using the projected rates for the relevant calendar year from the PML92 table on the medium cohort basis.

Age group (nearest ages)	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
61-65	96	103	114	100	95	89	104	112	120	103	121
66-70	99	98	95	92	95	87	101	100	96	102	105
71-75	103	101	103	105	100	97	108	108	102	113	115
76-80	99	102	100	98	99	93	100	102	99	111	110
81-85	103	104	98	98	95	96	100	103	94	105	100
86-90	102	104	98	101	100	93	96	93	94	96	91
91-95	99	101	105	105	99	99	99	98	89	96	91
96-100	78	84	92	121	79	91	104	92	76	88	77
61-100	101	102	99	100	98	94	100	101	96	103	100

Table PEN 1.4f. Pensioners, males, normal retirements, amounts, 1992-2002: actual deaths for individual years expressed as a percentage of those expected using the projected rates for the relevant calendar year from the PMA92 table on the medium cohort basis.

Age group (nearest ages)	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
61-65	105	117	119	114	104	103	79	128	129	123	135
66-70	102	97	96	110	110	117	104	116	107	113	126
71-75	103	97	109	116	98	98	107	96	115	118	114
76-80	94	97	89	105	101	96	110	92	94	117	122
81-85	97	96	95	92	98	93	96	101	100	105	94
86-90	125	112	99	112	95	92	96	106	94	102	101
91-95	124	92	98	104	104	104	83	93	104	97	94
96-100	91	67	93	142	77	110	100	103	111	76	96
61-100	101	99	98	106	100	98	101	101	102	110	108

Table PEN 1.5a. Pensioners, males, normal retirements, 1999-2002: exposed to risk, deaths and average pensions.

Age group (nearest ages)	Exposed to risk			Deaths		
	Lives	Amounts (£000 pa)	Average Pension (£pa)	Lives	Amounts (£000 pa)	Average Pension (£pa)
51-55	15,805	28,540	1,806	115	155	1,349
56-60	27,173	70,004	2,576	256	702	2,742
61-65	94,452	301,434	3,191	1,110	2,541	2,289
66-70	255,205	665,278	2,607	4,124	8,800	2,134
71-75	212,920	580,460	2,726	6,590	14,185	2,152
76-80	201,609	520,885	2,584	10,921	23,389	2,142
81-85	137,920	245,529	1,780	12,351	19,067	1,544
86-90	89,441	97,429	1,089	11,823	12,687	1,073
91-95	27,140	19,222	708	5,088	3,585	705
96-100	4,820	2,278	473	1,072	568	530
51-100	1,066,483	2,531,060	2,373	53,450	85,680	1,603

Table PEN 1.5b. Pensioners, males, early retirements, 1999-2002: exposed to risk, deaths and average pensions.

Age group (nearest ages)	Exposed to risk			Deaths		
	Lives	Amounts (£000 pa)	Average Pension (£pa)	Lives	Amounts (£000 pa)	Average Pension (£pa)
51-55	30,468	45,139	1,482	195	238	1,221
56-60	61,248	128,910	2,105	507	921	1,817
61-65	107,173	289,638	2,703	1,234	2,463	1,996
66-70	105,489	347,727	3,296	2,069	5,515	2,666
71-75	93,997	319,886	3,403	3,341	8,786	2,630
76-80	80,950	189,296	2,338	5,056	8,733	1,727
81-85	44,864	68,270	1,522	4,217	5,126	1,216
86-90	18,781	17,973	957	2,580	2,441	946
91-95	4,596	2,518	548	861	434	504
96-100	487	193	397	121	52	433
51-100	548,049	1,409,549	2,572	20,181	34,710	1,720

Table PEN 2.1a. Pensioners, females, normal retirements, lives, 1999-2002: actual deaths and ratios of actual deaths to those expected using the projected rates for calendar year 2020 from the PFL92 table, together with comparisons of 1995-1998 and 1991-1994.

Age group (nearest ages)	Actual deaths 1999-2002	100A/E 1999-2002 (using PFL92C20)	100A/E 1995-1998 (using PFL92C20)	100A/E 1991-1994 (using PFL92C20)
51-55	58	456	333 *	652
56-60	152	276	194	381
61-65	549	140	145	235
66-70	837	126	160	190
71-75	1,470	123	130	158
76-80	2,678	118	129	140
81-85	2,873	112	124	137
86-90	2,912	117	124	124
91-95	2,038	124	119	125
96-100	657	106	108	119
51-100	14,224	120	127	142

Table PEN 2.1b. Pensioners, females, normal retirements, amounts, 1999-2002: actual deaths and ratios of actual deaths to those expected using the projected rates for calendar year 2020 from the PFA92 table, together with comparisons of 1995-1998 and 1991-1994.

Age group (nearest ages)	Actual deaths 1999-2002 (£000 pa)	100A/E 1999-2002 (using PFA92C20)	100A/E 1995-1998 (using PFA92C20)	100A/E 1991-1994 (using PFA92C20)
51-55	51	447	106 *	780
56-60	168	312	325	233
61-65	615	140	142	246
66-70	1,076	120	157	173
71-75	2,079	123	116	178
76-80	3,278	126	138	129
81-85	2,345	118	121	137
86-90	1,314	107	146	133
91-95	843	146	136	148
96-100	212	133	94	154
51-100	11,981	124	133	158

* Ratio based on fewer than 10 actual deaths.

Table PEN 2.2a. Pensioners, females, early retirements, lives, 1999-2002: actual deaths and ratios of actual deaths to those expected using the projected rates for calendar year 2020 from the PFL92 table, together with comparisons of 1995-1998 and 1991-1994.

Age group (nearest ages)	Actual deaths 1999-2002	100A/E 1999-2002 (using PFL92C20)	100A/E 1995-1998 (using PFL92C20)	100A/E 1991-1994 (using PFL92C20)	Ratio Early/ Normal ^o
51-55	89	539	483	648	1.18
56-60	174	243	332	479	0.88
61-65	346	193	202	315	1.38
66-70	378	143	193	211	1.13
71-75	610	149	172	173	1.21
76-80	801	133	129	144	1.13
81-85	583	129	125	119	1.15
86-90	377	117	124	126	1.00
91-95	183	124	119	108	1.00
96-100	37	90	92	138	0.85
51-100	3,578	143	153	168	1.19

Table PEN 2.2b. Pensioners, females, early retirements, amounts, 1999-2002: actual deaths and ratios of actual deaths to those expected using the projected rates for calendar year 2020 from the PFA92 table, together with comparisons of 1995-1998 and 1991-1994.

Age group (nearest ages)	Actual deaths 1999-2002 (£000 pa)	100A/E 1999-2002 (using PFA92C20)	100A/E 1995-1998 (using PFA92C20)	100A/E 1991-1994 (using PFA92C20)	Ratio Early/ Normal ^o
51-55	92	739	672	1261	1.65
56-60	174	270	256	585	0.87
61-65	347	179	520	336	1.28
66-70	486	157	175	197	1.31
71-75	639	154	163	162	1.25
76-80	518	130	130	174	1.03
81-85	260	138	110	111	1.17
86-90	101	127	127	142	1.19
91-95	49	172	234	89	1.18
96-100	3	84	110	128	0.63
51-100	2,670	158	200	217	1.27

^o Ratio of 100A/E for early retirements to 100A/E for normal retirements 1999-2002 using PFA92C20 as the comparison basis.

Table PEN 2.3a. Pensioners, females, normal and early retirements combined, lives, 1999-2002: actual deaths and ratios of actual deaths to those expected using the projected rates for calendar year 2020 from the PFL92 table, together with comparisons of 1995-1998 and 1991-1994.

Age group (nearest ages)	Actual deaths 1999-2002	100A/E 1999-2002 (using PFL92C20)	100A/E 1995-1998 (using PFL92C20)	100A/E 1991-1994 (using PFL92C20)
51-55	147	503	448	649
56-60	326	257	287	443
61-65	895	156	165	262
66-70	1,215	130	170	195
71-75	2,080	130	141	160
76-80	3,479	121	129	141
81-85	3,456	115	124	135
86-90	3,289	117	124	124
91-95	2,221	124	119	124
96-100	694	105	107	121
51-100	17,802	124	131	146

Table PEN 2.3b. Pensioners, females, normal and early retirements combined, amounts, 1999-2002: actual deaths and ratios of actual deaths to those expected using the projected rates for calendar year 2020 from the PFA92 table, together with comparisons of 1995-1998 and 1991-1994.

Age group (nearest ages)	Actual deaths 1999-2002 (£000 pa)	100A/E 1999-2002 (using PFA92C20)	100A/E 1995-1998 (using PFA92C20)	100A/E 1991-1994 (using PFA92C20)
51-55	144	599	480	1023
56-60	342	290	282	425
61-65	962	152	273	268
66-70	1,562	129	162	178
71-75	2,718	129	124	174
76-80	3,796	126	137	133
81-85	2,605	120	120	136
86-90	1,416	109	145	134
91-95	893	148	141	145
96-100	215	132	95	153
51-100	14,651	129	144	168

Table PEN 2.4a. Pensioners, females, normal retirements, lives, 1983-2002: actual deaths for individual years expressed as a percentage of those expected using the base (1992) rates from the PFL92 table.

Age group (nearest ages)	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
61-65	132	139	134	108	124	131	126	92	116	141
66-70	116	107	101	97	116	108	104	101	109	107
71-75	100	94	95	97	109	94	108	101	103	106
76-80	107	98	99	96	99	95	100	100	102	99
81-85	101	103	106	109	97	101	103	99	109	109
86-90	115	99	106	115	105	104	106	108	108	106
91-95	102	142	122	121	106	108	123	106	120	111
96-100	94*	92	106	115	90	123	119	106	118	101
61-100	108	104	104	104	105	102	106	102	108	107

Age group (nearest ages)	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
61-65	88	94	75	66	51	88	69	72	65	44
66-70	92	98	79	85	94	97	71	65	67	70
71-75	90	85	90	76	67	92	80	69	82	72
76-80	89	91	99	86	84	83	81	84	76	81
81-85	94	93	96	94	91	87	92	82	81	78
86-90	96	90	100	104	92	104	98	91	95	91
91-95	102	100	108	99	92	109	113	102	106	103
96-100	103	103	103	85	108	95	99	97	92	95
61-100	93	92	96	90	86	94	89	83	85	83

* Ratio based on fewer than 10 actual deaths

Table PEN 2.4b. Pensioners, females, normal retirements, amounts, 1983-2002: actual deaths for individual years expressed as a percentage of those expected using the base (1992) rates from the PFA92 table.

Age group (nearest ages)	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992
61-65	151	155	144	99	159	145	114	102	97	128
66-70	149	100	86	80	126	103	93	75	98	128
71-75	96	97	102	96	97	80	104	97	85	115
76-80	102	113	107	80	98	96	113	110	109	76
81-85	100	100	110	95	106	109	118	96	129	101
86-90	142	114	125	119	111	111	121	132	135	114
91-95	102	215	154	109	150	139	134	134	145	123
96-100	91*	218	144	113	111	139	161	101	231	151
61-100	118	114	110	92	115	105	109	99	106	109

Age group (nearest ages)	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
61-65	99	134	70	77	44	103	63	67	72	57
66-70	72	73	66	84	94	109	56	49	78	89
71-75	105	104	85	71	55	76	69	63	84	92
76-80	82	82	101	95	80	106	92	79	90	81
81-85	75	111	93	88	81	97	87	82	89	91
86-90	97	90	97	142	124	103	83	78	94	87
91-95	125	110	145	107	101	116	108	114	149	120
96-100	86	89	106	99	96	55	105	123	97	150
61-100	89	96	89	90	79	97	79	73	90	89

* Ratio based on fewer than 10 actual deaths.

Table PEN 2.4c. Pensioners, females, normal retirements, lives, 1992-2002: actual deaths for individual years expressed as a percentage of those expected using the projected rates for the relevant calendar year from the PFL92 table.

Age group (nearest ages)	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
61-65	141	91	100	83	75	59	105	86	91	85	59
66-70	107	94	103	85	94	106	112	85	79	84	90
71-75	106	92	88	96	82	74	104	92	82	98	88
76-80	99	91	95	104	92	91	92	91	95	88	95
81-85	109	95	96	100	99	97	94	100	90	91	88
86-90	106	97	91	103	108	97	110	105	98	103	100
91-95	111	103	102	110	102	95	113	118	108	112	110
96-100	101	103	104	104	87	110	98	102	100	96	100
61-100	107	95	95	100	96	92	102	98	93	96	94

Table PEN 2.4d. Pensioners, females, normal retirements, amounts, 1992-2002: actual deaths for individual years expressed as a percentage of those expected using the projected rates for the relevant calendar year from the PFA92 table.

Age group (nearest ages)	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
61-65	128	102	142	76	87	52	123	78	86	94	77
66-70	128	74	76	71	93	107	127	67	59	98	114
71-75	115	107	108	91	77	61	86	79	73	100	112
76-80	76	83	85	106	102	87	117	103	90	104	95
81-85	101	76	114	97	93	86	105	95	91	99	103
86-90	114	98	92	100	148	131	109	89	85	103	95
91-95	123	126	111	148	110	105	120	114	121	159	129
96-100	151	87	90	107	101	99	57	109	127	101	157
61-100	109	91	100	94	97	87	107	89	84	104	103

Table PEN 2.4e. Pensioners, females, normal retirements, lives, 1992-2002: actual deaths for individual years expressed as a percentage of those expected using the projected rates for the relevant calendar year from the PFL92 table on the medium cohort basis.

Age group (nearest ages)	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
61-65	141	92	103	86	79	64	114	94	101	96	67
66-70	107	96	106	90	102	119	129	101	96	104	114
71-75	106	93	90	100	88	81	119	109	101	126	117
76-80	99	91	96	106	96	97	100	102	110	105	117
81-85	109	95	96	101	100	99	97	105	97	100	98
86-90	106	97	91	103	108	97	110	106	99	105	102
91-95	111	103	102	110	102	95	113	118	108	112	110
96-100	101	103	104	104	87	110	98	102	100	96	100
61-100	107	95	96	102	98	96	107	106	102	106	105

Table PEN 2.4f. Pensioners, females, normal retirements, amounts, 1992-2002: actual deaths for individual years expressed as a percentage of those expected using the projected rates for the relevant calendar year from the PFA92 table on the medium cohort basis.

Age group (nearest ages)	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
61-65	128	103	145	79	91	55	134	86	96	106	87
66-70	128	75	79	75	101	119	146	79	72	122	145
71-75	115	108	111	95	82	67	98	94	91	129	149
76-80	76	84	86	109	106	92	127	116	104	125	118
81-85	101	76	114	97	94	88	109	100	98	109	115
86-90	114	98	92	100	148	131	109	89	85	104	97
91-95	123	126	111	148	110	105	120	114	121	159	129
96-100	151	87	90	107	101	99	57	109	127	101	157
61-100	109	91	102	97	101	92	116	99	95	120	121

Table PEN 2.5a. Pensioners, females, normal retirements, 1999-2002: exposed to risk, deaths and average pensions.

Age group (nearest ages)	Exposed to risk			Deaths		
	Lives	Amounts (£000 pa)	Average Pension (£pa)	Lives	Amounts (£000 pa)	Average Pension (£pa)
51-55	13,168	14,371	1,091	58	51	882
56-60	29,118	33,675	1,157	152	168	1,104
61-65	104,115	132,828	1,276	549	615	1,121
66-70	83,197	128,383	1,543	837	1,076	1,285
71-75	72,849	118,628	1,628	1,470	2,079	1,414
76-80	73,266	97,647	1,333	2,678	3,278	1,224
81-85	48,009	43,073	897	2,873	2,345	816
86-90	27,694	15,837	572	2,912	1,314	451
91-95	11,770	4,809	409	2,038	843	414
96-100	3,009	910	302	657	212	323
51-100	466,191	590,160	1,266	14,224	11,981	842

Table PEN 2.5b. Pensioners, females, early retirements, 1999-2002: exposed to risk, deaths and average pensions.

Age group (nearest ages)	Exposed to risk			Deaths		
	Lives	Amounts (£000 pa)	Average Pension (£pa)	Lives	Amounts (£000 pa)	Average Pension (£pa)
51-55	16,761	15,369	917	89	92	1,039
56-60	39,189	41,384	1,056	174	174	1,003
61-65	47,951	59,787	1,247	346	347	1,002
66-70	33,220	44,454	1,338	378	486	1,285
71-75	25,179	29,705	1,180	610	639	1,048
76-80	19,839	15,251	769	801	518	647
81-85	8,558	4,186	489	583	260	447
86-90	3,633	1,043	287	377	101	269
91-95	1,070	243	227	183	49	270
96-100	201	18	88	37	3	70
51-100	195,598	211,441	1,081	3,578	2,670	746

Table PEN 3.1a. Widows, lives, 1999-2002: actual deaths and ratios of actual deaths to those expected using the projected rates for calendar year 2020 from the WL92 and PFL92 tables, together with comparisons of 1995-1998 and 1991-1994.

Age group (nearest ages)	Actual deaths	100A/E WL92C20			100A/E PFL92C20		
		1999-2002	1995-1998	1991-1994	1999-2002	1995-1998	1991-1994
41-50	16	346	161	191	1,127	526	632
51-55	34	295	199	191	710	480	463
56-60	62	209	201	284	397	381	538
61-65	158	165	142	197	249	215	301
66-70	424	133	173	190	167	217	239
71-75	1,188	132	140	165	143	152	180
76-80	2,272	120	137	149	117	134	144
81-85	2,604	116	131	134	106	120	122
86-90	2,312	117	129	135	104	115	121
91-95	994	123	133	105	110	119	94
96-100	201	72	103	112	67	95	103
41-100	10,265	120	136	149	114	133	149

Table PEN 3.1b. Widows, amounts, 1999-2002: actual deaths and ratios of actual deaths to those expected using the projected rates for calendar year 2020 from the WA92 and PFA92 tables, together with comparisons of 1995-1998 and 1991-1994.

Age group (nearest ages)	Actual deaths (£000 pa)	100A/E WA92C20			100A/E PFA92C20		
		1999-2002	1995-1998	1991-1994	1999-2002	1995-1998	1991-1994
41-50	33	295	147	184	1,000	493	619
51-55	69	277	140	264	685	351	661
56-60	119	186	120	310	360	231	600
61-65	292	149	167	215	228	257	329
66-70	729	124	148	174	157	189	222
71-75	1,752	115	129	179	127	142	199
76-80	3,378	117	137	140	117	137	140
81-85	3,691	124	138	129	118	131	123
86-90	2,772	115	156	147	108	147	138
91-95	1,127	134	137	120	130	132	116
96-100	262	68	87	146	72	89	149
41-100	14,223	119	140	158	120	144	168

Table PEN 3.2. Widows, 1999-2002: exposed to risk, deaths and average pensions.

Age group (nearest ages)	Exposed to risk			Deaths		
	Lives	Amounts (£000 pa)	Average Pension (£pa)	Lives	Amounts (£000 pa)	Average Pension (£pa)
51-55	5,011	12,685	2,532	34	69	2,018
56-60	8,557	21,756	2,543	62	119	1,923
61-65	15,973	37,647	2,357	158	292	1,845
66-70	30,004	62,865	2,095	424	729	1,718
71-75	49,586	95,339	1,923	1,188	1,752	1,475
76-80	62,280	105,650	1,696	2,272	3,378	1,487
81-85	45,727	66,942	1,464	2,604	3,691	1,417
86-90	25,256	33,131	1,312	2,312	2,772	1,199
91-95	6,550	7,290	1,113	994	1,127	1,134
96-100	1,416	1,940	1,370	201	262	1,304
51-100	250,358	445,245	1,778	10,249	14,190	1,385

Table PEN 4.1a. Widowers, lives, 1999-2002: actual deaths and ratios of actual deaths to those expected using the projected rates for calendar year 2020 from the PML92 table, together with comparisons of 1995-1998 and 1991-1994.

Age group (nearest ages)	Actual deaths 1999-2002	100A/E 1999-2002 (using PML92C20)	100A/E 1995-1998 (using PML92C20)	100A/E 1991-1994 (using PML92C20)
61-65	14	267	310 *	406 *
66-70	23	149	165	267
71-75	48	124	170	202
76-80	77	99	108	156
81-85	61	70	44	96 *
86-90	25	37	80	194 *
61-90	248	85	110	187

* Ratio based on fewer than 10 actual deaths.

Table PEN 4.1b. Widowers, amounts, 1999-2002: actual deaths and ratios of actual deaths to those expected using the projected rates for calendar year 2020 from the PMA92 table, together with comparisons of 1995-1998 and 1991-1994.

Age group (nearest ages)	Actual deaths 1999-2002 (£000 pa)	100A/E 1999-2002 (using PMA92C20)	100A/E 1995-1998 (using PMA92C20)	100A/E 1991-1994 (using PMA92C20)
61-65	12	272	600 *	352 *
66-70	21	177	196	275
71-75	37	99	236	62
76-80	87	113	170	337
81-85	117	169	75	82 *
86-90	56	80	132	87 *
61-90	331	122	159	169

* Ratio based on fewer than 10 actual deaths.

Table PEN 4.2. Widowers, 1999-2002: exposed to risk, deaths and average pensions.

Age group (nearest ages)	Exposed to risk			Deaths		
	Lives	Amounts (£000 pa)	Average Pension (£pa)	Lives	Amounts (£000 pa)	Average Pension (£pa)
51-65	1,663	2,452	1,475	19	44	2,326
66-70	1,144	1,235	1,079	23	21	930
71-75	1,470	1,847	1,257	48	37	776
76-80	1,643	1,921	1,170	77	87	1,128
81-85	1,110	985	888	61	117	1,926
86-90	556	618	1,113	25	56	2,229
91-100	186	289	1,555	11	7	601
51-100	7,770	9,348	1,203	264	369	1,400

THE MORTALITY OF SMOKERS AND NON-SMOKERS 1999-2002

The investigation by the CMI into the comparative mortality of smokers and non-smokers was started on 1 January 1988 and a report on the experience for 1988-1990 was published in *C.M.I.R.* 14. The present report, for the period 1999-2002, is therefore only the third to cover data for a full quadrennium. The first was in *C.M.I.R.* 16, which reported on the experience for 1991-1994 and the second was in *C.M.I.R.* 19, which reported on the experience for 1995-1998. The offices that contribute data split by smoking status form a subset of all the contributing offices. The number of offices contributing smoker-differentiated data to the various investigations since it was first collected is shown in the table below. The proportion of offices that have been able to provide smoker differentiated data has been steadily increasing. Of course the changing mix of offices does mean that results should be treated with care.

Number of offices contributing in period ^o	Investigation			
	Permanent Assurances	Temporary Assurances	Joint Life Assurances	Linked Assurances
Smoker differentiated data				
1999-2002	15(9)	19(12)	7(3)	11(6)
1995-1998	10(6)	17(9)	5(3)	
1991-1994	9(6)	17(9)	5(3)	
1988-1990	6(4)	9(5)		
All data				
1999-2002	31(19)	27(16)	13(5)	21(10)
1995-1998	31(20)	28(18)	11(8)	
1991-1994	39(31)	35(28)	10(9)	
1988-1990	40(35)	34(31)	8(6)	

^o For each period the number in brackets is the number of offices that contributed data throughout that period.

Table SMOK 0.1 shows the development of the exposed to risk in each of the investigations. This table also demonstrates the increasing proportion of smoker-differentiated data that is being provided by the contributing offices.

The categorisation of the data into ‘smoker’ and ‘non-smoker’ is linked primarily to the terms upon which the policies were issued. ‘Non-smokers’ are those where preferential terms have been offered on account of their non-smoking status. This may be a monetary or percentage reduction against the standard premium or the use of an age deduction when determining the premium rate. ‘Smokers’ are those whose smoking habits do not conform to the criteria for non-smoking terms.

The definition of ‘non-smoker’ may vary from office to office and may be changing over time but it is likely that the majority of this business was written on the basis that the proposer has not smoked cigarettes for at least twelve months prior to the date of the proposal. At the shorter durations a stricter definition may be in use by many offices. For ‘smokers’ there is no information on the number of cigarettes smoked but very heavy smokers will probably have been rated or declined, and so fall outside this investigation.

The report includes sections, for both males and females, on the experience of holders of permanent (whole life and endowment) assurances, temporary assurances on single lives,

joint life first death assurances and, for the first time, linked assurances, where data volumes split by smoker status have now reached sufficient levels for meaningful results to be produced.

1. ASSURANCES ON MALE LIVES

1.1 *Permanent assurances*

The exposed to risk over the quadrennium was 522,757 in the smoker category and 1,855,825 in the non-smoker category, a ratio of 3.6 to 1 in favour of non-smokers compared with ratios of 3.3, 2.9 and 2.2 to 1 in 1995-1998, 1991-1994 and 1988-1990 respectively. The experiences for 1999-2002 and 1995-1998 are shown in Tables SMOK 1.1a and SMOK 1.1b respectively. In each case the comparison basis is the AM92 table.

At duration 0 and at duration 1 the 1999-2002 mortality experience is significantly lighter than that recorded in 1995-1998 for both the smoker and non-smoker sections. Relatively greater improvements occurred for non-smokers, and so the Excess Mortality Index is higher than in 1995-1998 for both these durations. Data volumes at these durations have, however, fallen to very low levels in 1999-2002.

A similar pattern emerges for durations 2 and over where the mortality experience has improved for both smokers and non-smokers, albeit not to the same extent as the earlier durations, with a comparatively greater improvement for non-smokers leading to an increase in the Excess Mortality Index. Most, but not all, age groups have seen improvements in mortality experience since 1995-1998. It is noticeable that the Excess Mortality Index falls away sharply at ages above 75, indicating a narrowing of the difference in the mortality experience of smokers and non-smokers at the older ages. Indeed, one age group, 86-90, produces a negative Excess Mortality Index. This suggests that smokers in this age group have experienced lighter mortality than non-smokers.

A further feature that should be noted is the underlying change in the amount of exposed to risk between 1995-1998 and 1999-2002. Table ASS 0.1 shows a reduction of 27% in the exposed to risk of the main males assured lives investigation whilst SMOK 0.1 shows the equivalent smoker and non-smoker experience exposed to risk decreasing by only 12% and 6% respectively. This of course reflects the increased proportion of offices that are able to submit smoker differentiated data (as noted earlier), but may also be in part due to the way in which smokers are categorised by the industry. For example, if a policyholder is a non-smoker when they effect their cover they will remain a non-smoker throughout the course of their policy. In contrast, if a policyholder is a smoker at outset and ceases smoking (for at least twelve months) then many companies will re-categorise them as a non-smoker, or the policyholder may lapse and effect new cover as a non-smoker.

1.2 *Temporary assurances*

The exposed to risk for smokers was 491,497 and for non-smokers was 1,918,613, a ratio of 3.9 to 1 compared to 4.4 and 4.7 to 1 in 1995-1998 and 1991-1994 respectively. The results for 1999-2002 and 1995-1998 are shown in Tables SMOK 1.2a and SMOK 1.2b respectively. In each case the comparison basis is the TM92 table.

At all durations the levels of mortality seen in 1999-2002 in both the smoker and non-smoker experiences have improved over the levels observed in the previous quadrennium. This feature was observed in *C.M.I.R.* 19 for the 1995-1998 experiences when compared with 1991-1994. At duration 0 the mortality differential between smokers and non-smokers, as measured by the Excess Mortality Index, is higher in 1999-2002 than in 1995-1998. At durations 1 to 4 the reverse is true with the Excess Mortality Index being lower in 1999-2002. For durations 5 and over the overall Excess Mortality Index is little changed over the two

quadrennia, though the results by age group are mixed.

1.3 *Joint life first death assurances*

This investigation comprises joint-life-first-death whole life, endowment assurance and temporary assurance policies issued upon one male and one female life. When the first death is recorded the remaining life is treated as a withdrawal from the in force and removed from the investigation. In the case of both lives dying simultaneously (e.g. in a road accident) each death should be included in the appropriate return of deaths. Contributing offices are asked to categorise each life separately according to its own declared smoking habits. In theory, therefore, the male and female combined experience should contain the same amount of in force, while smoker and non-smoker volumes may vary between the sexes.

The exposed to risk for smokers was 315,017 and for non-smokers was 957,718, a ratio of 3.0 to 1 compared to 3.3 and 3.4 to 1 in 1995-1998 and 1991-1994 respectively. The experiences for 1999-2002 and 1995-1998 are shown in Tables SMOK 1.3a and SMOK 1.3b respectively. The comparison basis is the AM92 table.

At durations 2 and over a similar pattern of results is seen in this experience to that observed in the permanent assurances. Overall mortality improvements were a little greater, but the Excess Mortality Index for 1999-2002 has remained relatively constant at its 1995-1998 level, and is at a similar level to that of the permanent assurances. Again, a negative Excess Mortality Index value occurs, but this time it is for a much younger age group, 36-40.

At duration 0 and at duration 1 the experience is small and, other than the observations that mortality rates for smokers are higher than rates for non-smokers and that the mortality experience is significantly lighter than that of the permanent assurances, little can be said.

1.4 *Linked assurances*

The exposed to risk for smokers was 158,586 and for non-smokers was 597,908, a ratio of 3.8 to 1. The experiences for 1999-2002 are shown in Table SMOK 1.4. The comparison basis is the AM92 table.

At durations 2 and over a similar pattern of results is seen in this experience to that observed in the permanent assurances, though the mortality of smokers does not appear to be as heavy, resulting in a lower Excess Mortality Index. At duration 0 and at duration 1 the experience is small and, other than the observation that mortality rates for smokers are higher than rates for non-smokers, little can be said.

1.5 *Combined experience*

Table SMOK 1.5 shows the aggregated experience for the four investigations described in 1.1 to 1.4. The comparison basis is the AM92 table. Clearly care should be taken in interpreting this table since it is comprised of differing underlying datasets, however the committee felt that it would be useful to maximise the data available to produce "composite" Excess Mortality Indexes.

2. ASSURANCES ON FEMALE LIVES

2.1 *Permanent assurances*

The exposed to risk for smokers was 414,474 and for non-smokers was 1,688,693. The ratio of exposed to risk of the non-smoker category to the smoker category is 4.1 to 1 in favour of non-smokers. The corresponding ratio was 3.9 to 1 in 1995-1998, 3.8 to 1 in 1991-1994 and 3.2 to 1 in 1988-1990. The experiences for 1999-2002 and 1995-1998 are shown in Tables SMOK 2.1a and SMOK 2.1b respectively. The comparison basis is the AF92 table.

At duration 0 the mortality experience for smokers has remained at a similar level in

1999-2002 compared with 1995-1998, whereas that for non-smokers has improved. At duration 1, in contrast, the mortality experience for non-smokers has remained at a similar level, while that for smokers has deteriorated. This has resulted in noticeable increases in the Excess Mortality Index at these durations. However, data volumes are relatively low, particularly at duration 0.

When comparing the experience of the same quadrennia at durations 2 and over a small deterioration in the smoker mortality rates can be seen, but the non-smoker rates are broadly unchanged. The Excess Mortality Index has consequently increased in 1999-2002 compared with 1995-1998. A negative Excess Mortality Index is evident for the 26-35 age group.

At all durations it can be seen that the Excess Mortality Index for females is significantly greater than for their male counterparts, and that the mortality experience is relatively higher for females (compared to AF92) than for males (compared to AM92) for both non-smokers and smokers.

2.2 *Temporary assurances*

The exposed to risk for smokers was 409,862 and for non-smokers was 1,623,528, a ratio of 4.0 to 1 compared to 4.3 to 1 in 1995-1998 and 4.0 to 1 in 1991-1994. The results are shown in Tables SMOK 2.2a and SMOK 2.2b for 1999-2002 and 1995-1998 respectively. The comparison basis is the TF92 table.

Significant improvements in mortality in 1999-2002 have arisen at all durations for both smokers and non-smokers when compared with 1995-1998. In previous reports (see *C.M.I.R.* 16 for 1991-1994 and *C.M.I.R.* 14 for 1988-1990) it had been observed that, in contrast to the male experience, the Excess Mortality Index was, at all durations, significantly lower for temporary assurances than for permanent assurances. This feature remains true in 1999-2002, reversing its disappearance at duration 0 and durations 5 and over noted in 1995-1998 (see *C.M.I.R.* 19).

In contrast to the permanent assurances, the Excess Mortality Index for females is significantly below that for the equivalent male experience (except at duration 0 where it is the same).

2.3 *Joint life first death assurances*

The exposed to risk for smokers was 236,886 and for non-smokers was 1,036,651, a ratio of 4.4 to 1 compared to 4.7 to 1 in 1995-1998 and 5.0 to 1 in 1991-1994. The results are shown in Tables SMOK 2.3a and SMOK 2.3b for 1999-2002 and 1995-1998 respectively. The comparison basis is the AF92 table.

At durations 2 and over, the 1999-2002 mortality experience is broadly similar to that of the previous two quadrennia. A negative Excess Mortality Index is evident for the 31-35 age group. At duration 0 and at duration 1 the experience is very small and the results should be treated with caution.

2.4 *Linked assurances*

The exposed to risk for smokers was 121,716 and for non-smokers was 477,249, a ratio of 3.9 to 1. The experiences for 1999-2002 are shown in Table SMOK 2.4. The comparison basis is the AF92 table.

The experience is generally lighter than that observed for the permanent assurances, with lower values of the Excess Mortality Index indicating a narrower gap between the smoker and non-smoker sections. However, data volumes are relatively small, particularly at duration 0 and at duration 1 where the results should be treated with caution. At durations 2 and over the Excess Mortality Index is negative at the lowest age group, 31-40, and tends to increase with age.

2.5 *Combined experience*

As with the males, the four investigations described in 2.1 to 2.4 have been aggregated, and the results are shown in Table SMOK 2.5. The comparison basis is the AF92 table.

3. CONCLUSION

Table SMOK 3.1 shows summary results for the 1999-2002 quadrennium and compares them with the equivalent results for the 1995-1998 and 1991-1994 periods (where available). These results are based on the whole age range of data and so in some instances values differ from the totals shown in the separate tables. The eight experiences making up this investigation are each large enough to provide statistically meaningful results. When examining these experiences and comparing them with the undifferentiated experiences the different mix of offices and the increasing average duration of the policies in force must be borne in mind. However, the conclusion to the 1988-1990 report in *C.M.I.R.* **14** “that, for this data pool at least, smoking as an indicator is linked to a very serious additional mortality risk” remains inescapable.

SMOK 0.1. Amounts of exposed to risk for the periods 1999-2002, 1995-1998 and 1991-1994 for smokers and non-smokers.

Investigation	Exposed to Risk					
	1999-2002		1995-1998		1991-1994	
<i>Males, smokers</i>		%		%		%
Permanent, single life assurances	522,757	6.3	591,936	5.2	473,454	3.1
Temporary assurances	491,497	14.9	307,271	9.9	255,221	6.5
Joint life assurances	315,017	13.6	275,078	9.1	199,916	7.1
Linked assurances	158,586	9.0				
<i>Females, smokers</i>		%		%		%
Permanent, single life assurances	414,474	9.4	467,765	9.0	284,229	5.1
Temporary assurances	409,862	16.0	245,957	12.5	175,981	9.1
Joint life assurances	236,886	10.3	209,134	7.0	146,925	5.3
Linked assurances	121,716	9.6				
<i>Males, non-smokers</i>		%		%		%
Permanent, single life assurances	1,855,825	22.3	1,969,309	17.3	1,358,771	8.9
Temporary assurances	1,918,613	58.3	1,351,892	43.6	1,057,648	27.1
Joint life assurances	957,718	41.2	908,053	30.1	680,360	24.2
Linked assurances	597,908	33.9				
<i>Females, non-smokers</i>		%		%		%
Permanent, single life assurances	1,688,693	38.4	1,823,148	35.0	1,067,012	19.1
Temporary assurances	1,623,528	63.5	1,063,271	54.0	696,428	35.9
Joint life assurances	1,036,651	45.0	975,791	32.6	735,675	26.6
Linked assurances	477,249	37.8				

The figures labelled “%” are percentages of the total exposed to risk for the relevant section of the data. The total includes data with no smoker categorisation, so the smoker and non-smoker percentages will sum to less than 100%. The difference reflects the amount of data for which the smoker status is unknown.

SMOK 1.1a. Permanent assurances (non-linked), males, full underwriting, 1999-2002: actual deaths for smokers and non-smokers and ratios of actual deaths to those expected using the AM92 table.

Age group (nearest ages)	Smokers		Non-smokers		Excess Mortality Index ^φ (per cent)
	Actual deaths	100A/E	Actual deaths	100A/E	
Duration 0					
21-50	9	126*	11	47	168
51-60	11	148	9	45*	229
61-70	15	151	18	52	190
71-80	7	153*	24	108	42
21-80	42	145	62	62	134
Duration 1					
21-50	16	144	29	78	85
51-60	23	174	19	53	228
61-70	25	117	45	63	86
71-80	18	166	38	79	110
21-80	82	145	131	68	113
Durations 2+					
21-30	27	159	71	78	104
31-35	46	141	106	75	88
36-40	58	111	163	76	46
41-45	90	123	206	74	66
46-50	178	143	271	66	117
51-55	341	133	432	57	133
56-60	521	138	634	64	116
61-65	515	120	704	60	100
66-70	465	132	686	60	120
71-75	485	137	839	64	114
76-80	326	139	813	73	90
81-85	154	136	508	84	62
86-90	55	92	256	94	-2
21-90	3,261	132	5,689	67	97

^φ The percentage by which the Standardised Mortality Ratio for smokers exceeds the corresponding ratio for non-smokers, i.e. $100 \times (100A/E \text{ Smokers} / 100A/E \text{ Non-smokers} - 1)$.

* Ratio based on fewer than 10 actual deaths.

SMOK 1.1b. Permanent assurances (non-linked), males, full underwriting, 1995-1998: actual deaths for smokers and non-smokers and ratios of actual deaths to those expected using the AM92 table.

Age group (nearest ages)	Smokers		Non-smokers		Excess Mortality Index ^φ (per cent)
	Actual deaths	100A/E	Actual deaths	100A/E	
Duration 0					
21-50	27	160	51	99	62
51-60	38	229	30	77	197
61-70	47	177	66	89	99
71-80	16	145	42	94	54
21-80	128	180	189	90	100
Duration 1					
21-50	29	137	53	72	90
51-60	51	223	50	79	182
61-70	61	150	103	85	76
71-80	29	169	72	95	78
21-80	170	167	278	83	101
Durations 2+					
21-30	31	100	135	87	15
31-35	47	125	144	94	33
36-40	71	150	134	75	100
41-45	97	133	170	71	87
46-50	206	135	312	72	88
51-55	376	146	478	74	97
56-60	494	137	592	65	111
61-65	522	132	704	67	97
66-70	434	147	658	69	113
71-75	335	142	691	73	95
76-80	181	142	451	75	89
81-85	102	118	312	93	27
86-90	47	120	95	82	46
21-90	2,943	138	4,876	73	89

^φ The percentage by which the Standardised Mortality Ratio for smokers exceeds the corresponding ratio for non-smokers, i.e. $100 \times (100A/E \text{ Smokers} / 100A/E \text{ Non-smokers} - 1)$.

SMOK 1.2a. Temporary assurances, males, full underwriting, 1999-2002: actual deaths for smokers and non-smokers and ratios of actual deaths to those expected using the TM92 table.

Age group (nearest ages)	Smokers		Non-smokers		Excess Mortality Index ^φ (per cent)
	Actual deaths	100A/E	Actual deaths	100A/E	
Duration 0					
26-40	23	78	34	40	95
41-55	37	82	93	53	55
56-70	13	63	53	37	70
26-70	73	77	180	45	71
Durations 1-4					
26-30	9	67*	19	56	20
31-35	23	88	52	71	24
36-40	29	94	65	60	57
41-45	34	101	83	60	68
46-50	53	129	91	51	153
51-55	83	150	152	54	178
56-60	72	148	160	57	160
61-65	45	147	115	50	194
66-70	27	159	87	52	206
71-75	14	156	61	65	140
26-75	389	127	885	56	127
Durations 5+					
26-35	13	84	41	76	11
36-40	33	139	65	70	99
41-45	49	125	113	68	84
46-50	92	143	177	63	127
51-55	146	141	325	66	114
56-60	153	135	348	65	108
61-65	113	132	313	71	86
66-70	51	137	117	53	158
71-75	27	133	75	59	125
26-75	677	135	1,574	65	108

^φ The percentage by which the Standardised Mortality Ratio for smokers exceeds the corresponding ratio for non-smokers, i.e. $100 \times (100A/E \text{ Smokers} / 100A/E \text{ Non-smokers} - 1)$.

* Ratio based on fewer than 10 actual deaths.

SMOK 1.2b. Temporary assurances, males, full underwriting, 1995-1998: actual deaths for smokers and non-smokers and ratios of actual deaths to those expected using the TM92 table.

Age group (nearest ages)	Smokers		Non-smokers		Excess Mortality Index ^φ (per cent)
	Actual deaths	100A/E	Actual deaths	100A/E	
Duration 0					
26-40	12	80	33	67	19
41-55	21	93	53	48	94
56-70	13	105	57	73	44
26-70	46	92	143	60	53
Durations 1-4					
26-30	13	130	19	59	120
31-35	14	94	27	51	84
36-40	14	81	48	67	21
41-45	32	145	61	61	138
46-50	72	222	96	57	289
51-55	58	159	129	63	152
56-60	54	176	115	61	189
61-65	28	131	109	77	70
66-70	35	267	53	63	324
71-75	13	220	39	91	142
26-75	333	163	696	64	155
Durations 5+					
26-35	16	158	24	64	147
36-40	25	158	52	80	98
41-45	29	106	86	73	45
46-50	59	124	158	67	85
51-55	102	165	216	69	139
56-60	83	137	234	70	96
61-65	71	146	187	65	125
66-70	33	141	99	75	88
71-75	15	170	53	79	115
26-75	433	142	1,109	70	103

^φ The percentage by which the Standardised Mortality Ratio for smokers exceeds the corresponding ratio for non-smokers, i.e. $100 \times (100A/E \text{ Smokers} / 100A/E \text{ Non-smokers} - 1)$.

SMOK 1.3a. Joint life first death assurances, males, full underwriting, 1999-2002: actual deaths for smokers and non-smokers and ratios of actual deaths to those expected using the AM92 table.

Age group (nearest ages)	Smokers		Non-smokers		Excess Mortality Index ^φ (per cent)
	Actual deaths	100A/E	Actual deaths	100A/E	
Duration 0					
21-70	15	63	35	45	40
Duration 1					
21-70	26	78	65	60	30
Durations 2+					
31-35	13	90	31	70	29
36-40	18	53	87	72	-26
41-45	60	99	127	60	65
46-50	125	132	174	59	124
51-55	201	138	263	64	116
56-60	207	125	196	48	160
61-65	213	105	283	57	84
66-70	147	124	178	63	97
31-70	984	118	1,339	59	100

^φ The percentage by which the Standardised Mortality Ratio for smokers exceeds the corresponding ratio for non-smokers, i.e. $100 \times (100A/E \text{ Smokers} / 100A/E \text{ Non-smokers} - 1)$.

SMOK 1.3b. Joint life first death assurances, males, full underwriting, 1995-1998: actual deaths for smokers and non-smokers and ratios of actual deaths to those expected using the AM92 table.

Age group (nearest ages)	Smokers		Non-smokers		Excess Mortality Index ^φ (per cent)
	Actual deaths	100A/E	Actual deaths	100A/E	
Duration 0					
21-70	23	82	44	53	55
Duration 1					
21-70	43	114	71	60	90
Durations 2+					
31-35	12	74	36	59	25
36-40	35	114	79	67	70
41-45	70	149	99	58	157
46-50	85	117	166	66	77
51-55	124	143	178	66	117
56-60	167	134	245	75	79
61-65	226	139	261	68	104
66-70	93	133	105	66	102
31-70	812	133	1,169	67	99

^φ The percentage by which the Standardised Mortality Ratio for smokers exceeds the corresponding ratio for non-smokers, i.e. $100 \times (100A/E \text{ Smokers} / 100A/E \text{ Non-smokers} - 1)$.

SMOK 1.4. Linked assurances, males, full underwriting, 1999-2002: actual deaths for smokers and non-smokers and ratios of actual deaths to those expected using the AM92 table.

Age group (nearest ages)	Smokers		Non-smokers		Excess Mortality Index ^φ (per cent)
	Actual deaths	100A/E	Actual deaths	100A/E	
Duration 0					
21-75	26	121	70	87	39
Duration 1					
21-75	29	109	76	67	63
Durations 2+					
31-35	14	117	26	65	80
36-40	18	96	47	68	41
41-45	29	116	62	64	81
46-50	40	114	129	93	23
51-55	51	97	129	58	67
56-60	60	105	144	59	78
61-65	65	126	135	59	114
66-70	51	121	126	68	78
71-75	30	85	71	56	52
31-75	358	109	869	64	70

^φ The percentage by which the Standardised Mortality Ratio for smokers exceeds the corresponding ratio for non-smokers, i.e. $100 \times (100A/E \text{ Smokers} / 100A/E \text{ Non-smokers} - 1)$.

SMOK 1.5. All investigations combined, males, full underwriting, 1999-2002: actual deaths for smokers and non-smokers and ratios of actual deaths to those expected using the AM92 table.

Age group (nearest ages)	Smokers		Non-smokers		Excess Mortality Index ^φ (per cent)
	Actual deaths	100A/E	Actual deaths	100A/E	
Duration 0					
31-35	13	80	14	31	158
36-40	17	85	28	44	93
41-45	11	51	41	55	−7
46-50	26	103	41	47	119
51-55	25	81	67	55	47
56-60	21	90	48	44	105
61-65	16	101	31	36	181
66-70	9	80*	38	51	57
71-75	12	203	26	58	250
31-75	150	88	334	47	87
Duration 1					
31-35	10	65	25	57	14
36-40	16	88	35	57	54
41-45	19	92	49	64	44
46-50	24	92	46	47	96
51-55	45	121	65	43	181
56-60	33	99	71	47	111
61-65	21	86	61	45	91
66-70	26	118	68	53	123
71-75	14	125	44	58	116
31-75	208	100	464	50	100

^φ The percentage by which the Standardised Mortality Ratio for smokers exceeds the corresponding ratio for non-smokers, i.e. $100 \times (100A/E \text{ Smokers} / 100A/E \text{ Non-smokers} - 1)$.

* Ratio based on fewer than 10 actual deaths.

SMOK 1.5. (continued)

Age group (nearest ages)	Smokers		Non-smokers		Excess Mortality Index ^φ (per cent)
	Actual deaths	100A/E	Actual deaths	100A/E	
Durations 2+					
21-25	10	180	26	85	112
26-30	32	99	81	65	52
31-35	104	116	232	73	59
36-40	150	99	405	70	41
41-45	252	113	567	66	71
46-50	473	135	820	64	111
51-55	801	132	1,267	59	124
56-60	999	131	1,446	59	122
61-65	942	117	1,526	59	98
66-70	735	129	1,170	58	122
71-75	603	132	1,090	62	113
76-80	364	135	950	72	88
81-85	167	136	555	81	68
86-90	57	93	270	92	1
21-90	5,689	126	10,405	63	100

^φ The percentage by which the Standardised Mortality Ratio for smokers exceeds the corresponding ratio for non-smokers, i.e. $100 \times (100A/E \text{ Smokers} / 100A/E \text{ Non-smokers} - 1)$.

SMOK 2.1a. Permanent assurances (non-linked), females, full underwriting, 1999-2002: actual deaths for smokers and non-smokers and ratios of actual deaths to those expected using the AF92 table.

Age group (nearest ages)	Smokers		Non-smokers		Excess Mortality Index ^φ (per cent)
	Actual deaths	100A/E	Actual deaths	100A/E	
Duration 0					
21-50	7	219*	7	58*	278
51-60	6	162*	11	89	82
61-70	11	256	16	86	198
71-80	8	348*	7	54*	544
21-80	32	234	41	74	216
Duration 1					
21-50	6	99*	10	47	111
51-60	16	217	17	74	193
61-70	27	310	41	118	163
71-80	21	417	35	130	221
21-80	70	257	103	98	162
Durations 2+					
26-35	16	71	95	92	-23
36-40	43	146	82	62	135
41-45	54	118	150	76	55
46-50	113	145	237	79	84
51-55	205	139	377	71	96
56-60	310	162	433	67	142
61-65	330	183	418	63	190
66-70	307	172	473	65	165
71-75	333	200	579	81	147
76-80	235	200	527	83	141
81-85	93	163	375	92	77
26-85	2,039	168	3,746	74	127

^φ The percentage by which the Standardised Mortality Ratio for smokers exceeds the corresponding ratio for non-smokers, i.e. $100 \times (100A/E \text{ Smokers} / 100A/E \text{ Non-smokers} - 1)$.

* Ratio based on fewer than 10 actual deaths.

SMOK 2.1b. Permanent assurances (non-linked), females, full underwriting, 1995-1998: actual deaths for smokers and non-smokers and ratios of actual deaths to those expected using the AF92 table.

Age group (nearest ages)	Smokers		Non-smokers		Excess Mortality Index ^φ (per cent)
	Actual deaths	100A/E	Actual deaths	100A/E	
Duration 0					
21-50	9	99*	22	76	30
51-60	28	280	29	107	162
61-70	34	296	46	118	151
71-80	16	302	44	159	90
21-80	87	242	141	115	110
Duration 1					
21-50	24	171	30	61	180
51-60	32	213	45	100	113
61-70	49	280	67	108	159
71-80	20	247	63	146	69
21-80	125	229	205	103	122
Durations 2+					
26-35	38	134	93	74	81
36-40	33	114	89	73	56
41-45	63	132	137	75	76
46-50	154	167	265	80	109
51-55	196	138	342	72	92
56-60	254	156	411	72	117
61-65	251	170	392	70	143
66-70	221	166	337	63	163
71-75	184	183	341	75	144
76-80	102	181	263	83	118
81-85	72	180	248	92	96
26-85	1,568	160	2,918	74	116

^φ The percentage by which the Standardised Mortality Ratio for smokers exceeds the corresponding ratio for non-smokers, i.e. $100 \times (100A/E \text{ Smokers} / 100A/E \text{ Non-smokers} - 1)$.

* Ratio based on fewer than 10 actual deaths.

SMOK 2.2a. Temporary assurances, females, full underwriting, 1999-2002: actual deaths for smokers and non-smokers and ratios of actual deaths to those expected using the TF92 table.

Age group (nearest ages)	Smokers		Non-smokers		Excess Mortality Index ^φ (per cent)
	Actual deaths	100A/E	Actual deaths	100A/E	
Duration 0					
21-65	27	99	56	58	71
Durations 1-4					
21-40	24	63	61	45	40
41-50	42	104	92	57	82
51-60	56	151	87	59	156
61-70	20	149	56	87	71
21-70	142	110	296	58	90
Durations 5+					
31-40	33	101	103	68	49
41-50	97	127	281	78	63
51-60	112	130	260	71	83
61-70	62	167	106	73	129
31-70	304	131	750	73	79

^φ The percentage by which the Standardised Mortality Ratio for smokers exceeds the corresponding ratio for non-smokers, i.e. $100 \times (100A/E \text{ Smokers} / 100A/E \text{ Non-smokers} - 1)$.

SMOK 2.2b. Temporary assurances, females, full underwriting, 1995-1998: actual deaths for smokers and non-smokers and ratios of actual deaths to those expected using the TF92 table.

Age group (nearest ages)	Smokers		Non-smokers		Excess Mortality Index ^φ (per cent)
	Actual deaths	100A/E	Actual deaths	100A/E	
Duration 0					
21-65	22	169	43	83	104
Durations 1-4					
21-40	24	89	65	56	59
41-50	39	132	94	71	86
51-60	37	138	81	75	84
61-70	22	177	45	83	113
21-70	122	127	285	70	81
Durations 5+					
31-40	27	143	71	81	77
41-50	63	159	156	81	96
51-60	65	179	119	76	136
61-70	39	225	52	77	192
31-70	194	173	398	79	119

^φ The percentage by which the Standardised Mortality Ratio for smokers exceeds the corresponding ratio for non-smokers, i.e. $100 \times (100A/E \text{ Smokers} / 100A/E \text{ Non-smokers} - 1)$.

SMOK 2.3a. Joint life first death assurances, females, full underwriting, 1999-2002: actual deaths for smokers and non-smokers and ratios of actual deaths to those expected using the AF92 table.

Age group (nearest ages)	Smokers		Non-smokers		Excess Mortality Index ^φ (per cent)
	Actual deaths	100A/E	Actual deaths	100A/E	
Duration 0					
21-70	3	37*	18	54	-31
Duration 1					
21-70	11	94	21	43	119
Durations 2+					
31-35	6	63*	29	66	-5
36-40	18	79	79	67	18
41-45	40	106	102	55	93
46-50	75	146	136	60	143
51-55	84	121	185	68	78
56-60	74	113	128	54	109
61-65	86	156	132	66	136
66-70	29	118	65	68	74
31-70	412	123	856	62	98

^φ The percentage by which the Standardised Mortality Ratio for smokers exceeds the corresponding ratio for non-smokers, i.e. $100 \times (100A/E \text{ Smokers} / 100A/E \text{ Non-smokers} - 1)$.

* Ratio based on fewer than 10 actual deaths.

SMOK 2.3b. Joint life first death assurances, females, full underwriting, 1995-1998: actual deaths for smokers and non-smokers and ratios of actual deaths to those expected using the AF92 table.

Age group (nearest ages)	Smokers		Non-smokers		Excess Mortality Index ^φ (per cent)
	Actual deaths	100A/E	Actual deaths	100A/E	
Duration 0					
21-70	12	130	17	47	177
Duration 1					
21-70	25	182	49	89	104
Durations 2+					
31-35	12	115	41	72	60
36-40	30	154	73	68	126
41-45	30	107	111	77	39
46-50	46	117	118	64	83
51-55	65	147	130	72	104
56-60	52	104	109	59	76
61-65	67	165	93	65	154
66-70	23	161	41	77	109
31-70	325	132	716	68	94

^φ The percentage by which the Standardised Mortality Ratio for smokers exceeds the corresponding ratio for non-smokers, i.e. $100 \times (100A/E \text{ Smokers} / 100A/E \text{ Non-smokers} - 1)$.

SMOK 2.4. Linked assurances, females, full underwriting, 1999-2002: actual deaths for smokers and non-smokers and ratios of actual deaths to those expected using the AF92 table.

Age group (nearest ages)	Smokers		Non-smokers		Excess Mortality Index ^φ (per cent)
	Actual deaths	100A/E	Actual deaths	100A/E	
Duration 0					
31-85	10	125	28	85	47
Duration 1					
31-85	13	117	38	83	41
Durations 2+					
31-40	8	45*	42	56	-20
41-45	17	109	46	68	60
46-50	23	116	50	63	84
51-55	38	144	62	65	122
56-60	32	129	55	64	102
61-65	23	114	40	53	115
66-70	21	112	33	42	167
71-75	32	187	46	66	183
76-80	19	133	32	54	146
81-85	12	181	27	62	192
31-85	225	124	433	59	110

^φ The percentage by which the Standardised Mortality Ratio for smokers exceeds the corresponding ratio for non-smokers, i.e. $100 \times (100A/E \text{ Smokers} / 100A/E \text{ Non-smokers} - 1)$.

* Ratio based on fewer than 10 actual deaths.

SMOK 2.5. All investigations combined, females, full underwriting, 1999-2002: actual deaths for smokers and non-smokers and ratios of actual deaths to those expected using the AF92 table.

Age group (nearest ages)	Smokers		Non-smokers		Excess Mortality Index ^φ (per cent)
	Actual deaths	100A/E	Actual deaths	100A/E	
Duration 0					
31-40	8	56*	28	56	0
41-50	16	86	29	45	91
51-60	23	137	39	64	114
61-70	16	200	27	68	194
71-80	10	285	14	55	418
31-80	73	119	137	57	109
Duration 1					
31-40	4	26*	27	48	−46
41-50	21	98	43	56	75
51-55	30	229	22	47	387
56-60	10	102	21	58	76
61-65	16	217	28	84	158
66-70	18	289	32	109	165
71-75	20	421	27	114	269
31-75	119	152	200	66	130

^φ The percentage by which the Standardised Mortality Ratio for smokers exceeds the corresponding ratio for non-smokers, i.e. $100 \times (100A/E \text{ Smokers} / 100A/E \text{ Non-smokers} - 1)$.

* Ratio based on fewer than 10 actual deaths.

SMOK 2.5. (continued)

Age group (nearest ages)	Smokers		Non-smokers		Excess Mortality Index ^φ (per cent)
	Actual deaths	100A/E	Actual deaths	100A/E	
Durations 2+					
26-30	11	64	47	68	-6
31-35	37	70	137	62	13
36-40	100	100	299	65	54
41-45	162	108	459	67	61
46-50	287	136	614	69	97
51-55	408	131	812	68	93
56-60	492	147	763	65	126
61-65	483	168	683	64	163
66-70	392	163	628	64	155
71-75	396	197	683	78	153
76-80	262	191	579	77	148
81-85	111	168	420	87	93
86-90	63	165	363	107	54
26-90	3,204	149	6,487	71	110

^φ The percentage by which the Standardised Mortality Ratio for smokers exceeds the corresponding ratio for non-smokers, i.e. $100 \times (100A/E \text{ Smokers} / 100A/E \text{ Non-smokers} - 1)$.

SMOK 3.1. Values of the Excess Mortality Index and ratios of actual deaths to those expected using the relevant “92” Series tables for the quadrennia 1999-2002, 1995-1998 and 1991-1994.

	Smokers 100A/E			Non-smokers 100A/E			Excess Mortality Index		
	1999-2002	1995-1998	1991-1994	1999-2002	1995-1998	1991-1994	1999-2002	1995-1998	1991-1994
Permanent assurances, males, all ages[*]									
Duration 0	143	180	183	61	90	75	134	100	144
Duration 1	143	166	162	68	83	71	110	100	128
Durations 2 and over	131	137	127	67	73	74	96	88	72
Permanent assurances, females, all ages^{**}									
Duration 0	232	240	210	77	117	89	201	105	136
Duration 1	255	226	163	98	102	77	160	122	112
Durations 2 and over	167	159	145	77	76	73	117	109	99
Temporary assurances, males, all ages^{***}									
Duration 0	81	90	135	45	60	79	80	50	71
Durations 1-4	126	162	174	56	64	80	125	153	118
Durations 5 and over	135	142	177	66	70	76	105	103	133
Temporary assurances, females, all ages^{****}									
Duration 0	98	157	158	58	76	81	69	107	95
Durations 1-4	109	131	140	56	69	74	95	90	89
Durations 5 and over	136	175	145	73	78	80	86	124	81

SMOK 3.1. (continued)

	Smokers 100A/E			Non-smokers 100A/E			Excess Mortality Index		
	1999-2002	1995-1998	1991-1994	1999-2002	1995-1998	1991-1994	1999-2002	1995-1998	1991-1994
Joint life first death, males, all ages[*]									
Duration 0	63	82	165	44	54	57	43	52	189
Duration 1	80	114	133	61	59	80	31	93	66
Durations 2 and over	118	132	151	59	68	75	100	94	101
Joint life first death, females, all ages^{**}									
Duration 0	37	141	243	53	50	68	-30	182	257
Duration 1	94	182	167	42	88	97	124	107	72
Durations 2 and over	123	132	122	62	69	69	98	91	77
Linked assurances, males, all ages[*]									
Duration 0	123	-	-	90	-	-	37	-	-
Duration 1	109	-	-	68	-	-	60	-	-
Durations 2 and over	109	-	-	64	-	-	70	-	-
Linked assurances, females, all ages^{**}									
Duration 0	130	-	-	102	-	-	27	-	-
Duration 1	111	-	-	93	-	-	19	-	-
Durations 2 and over	125	-	-	61	-	-	105	-	-

* Expected deaths based on the AM92 table.

** Expected deaths based on the AF92 table.

*** Expected deaths based on the TM92 table.

**** Expected deaths based on the TF92 table.

CORRIGENDA

C.M.I.R. 17, 229-230 second paragraph and Table 1.

The references to m_1/m_2 should read m_2/m_1 .

C.M.I.R. 19, 46 Table TEMP 2.2.1

The comparison bases used in this table are the female versions of the relevant mortality tables, not the male tables as stated in the column headings. Thus, TM92 should read TF92 and TM80 should read TF80.

C.M.I.R. 19, 98 Table PEN 3.1b

The comparison bases used in this table are as stated in the table description. The headings of the first two columns of values of 100A/E are therefore incorrect. WL92C20 should read WA92C20 and PFL92C20 should read PFA92C20.

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