

ELIZABETH BATTAMS OF PUNTER SOUTHALL AND CO AND JOHN HAWKINS OF INVENSYS LOOK AT THE IMPACT LONGER LIFE EXPECTANCY IS HAVING ON UK PENSIONS AND THE STEPS TREASURERS CAN TAKE TO ENSURE THEIR ORGANISATIONS' SCHEMES ARE ABLE TO DELIVER PROMISED FINAL PAYOUTS.

MORTAL COMBAT

At a time when many UK pensions schemes have high-profile deficits, treasurers are under increasing pressure to become involved in understanding the risks associated with final salary schemes. Naturally, they often focus on areas that play to their strengths, particularly the relationship between the assets and liabilities in the scheme, often involving the hedging of interest and inflation risks and asset allocation decisions.

As well as the benefits paid by a scheme and its investment experience relative to its liabilities, the other key factor in determining the cost of a pension scheme is how long members and their spouses/dependants will live and, therefore, be in receipt of a pension. Because life expectancy post-retirement is relatively low in comparison to life expectancy as a whole, small increases in it will have a disproportionately large impact on pension scheme liabilities. In recent years, more attention has been paid to investments and benefit design, and less to life expectancy issues.

Treasurers must acquire an insight into longevity issues to understand the potential scope of the problem and to be able to ask their actuarial advisers relevant questions on this subject.

THE FINANCIAL IMPACT OF INCREASING LIFE EXPECTANCY.

Recent research has shown that there have been significant improvements in life expectancy, often above levels currently assumed by pension funds. The improvements to date and in the future will, in many cases, add to pension scheme liabilities and therefore to overall costs. The findings of the recent paper *Longevity In The 21st Century*¹, presented to the Faculty and Institute of Actuaries, suggests it is highly probable that the mortality rates of the elderly in the UK will improve at faster rates in the 21st century than ever before.

The mortality tables used by actuaries are based on data for annuitants, collected from insurance companies and analysed by the Continuous Mortality Investigation (CMI) Bureau of the Institute and Faculty of Actuaries. Periodically, a consensus emerges among actuaries that a more up-to-date table needs to be adopted, which builds in assumed future improvements in longevity.

CALCULATING MFR. For the purposes of calculating minimum funding requirement (MFR) pension fund contributions, the government specifies which table should be adopted. For a typical fund, the use of more up-to-date mortality tables can increase liabilities over those calculated on the MFR basis by about 7% for current pensioners; for future pensioners liabilities may increase by around 12%. For a relatively mature fund with liabilities on an MFR mortality basis of £2bn, the average increase might be about 10%, raising the liabilities of the fund – and the company, if it has adopted FRS 17 – by perhaps £200m. If adjustments are made to these more up-to-date tables to allow for further improvements and the 'cohort effect', liabilities for members at some ages could increase by as much as 30%. It would not be an exaggeration to suggest that future longevity improvements could end up being the final nail in the coffin for defined benefit pension schemes.

The first question treasurers might wish to ask their actuary, therefore, is which mortality table, or variant, is being used and is this justifiable? It is normal, but not invariable, that the same mortality assumptions are used for the calculation of liabilities on a funding basis and an accounting basis, so this question should also be asked.

DISCLOSURE. Understanding the pension liabilities of competitors, customers and suppliers is also important. To assess the impact of changes to mortality assumptions on the funding levels of UK final salary schemes, one needs to know the current assumptions being used. The accounting standards SSAP 24, FRS 17 and IAS 19 do not include a requirement to disclose this assumption, and it is usually very difficult for outsiders to access such information.

HEDGING. The only commonly available hedging instruments for the mortality risks of a pension scheme are insurance company annuity policies. When a company buys such a policy, the insurance company effectively takes over the mortality risk, although, historically, this has seldom been the key factor in driving such purchases. Annuity policies have traditionally been viewed as being expensive to purchase, but more attention is now being paid by trustees and employers as to whether some of the liabilities relating to pensions could and/or should be hedged in this way. However, there are limitations in terms of insurance companies' capacity to write this type of business, and this is especially relevant for the larger schemes. Moreover, insurance companies need to keep their pricing of these policies under continual review in light of the trend towards continued improvement in mortality rates.

EXPERIENCE OVER THE 20TH CENTURY AND THE 'COHORT EFFECT'. Life expectancy at birth has improved by about 30 years to 76 for males and to 81 for females during the last century. The most important factor contributing to this improvement has been the fall in infectious diseases. There have been substantial improvements in mortality for both males and females in the 50 to 79 age group. Mortality in the 60 to 69 age group has also improved rapidly. This phenomenon is known as the 'cohort effect'. *Figure 1*, which is extracted from *Longevity In The 21st Century*, demonstrates the cohort effect for males.

People born during the 1930s have experienced consistently higher rates of improvements than those born before and after them, but the jury is still out as to exactly why this is the case.

IMPACT OF SMOKING BEHAVIOUR ON MORTALITY. Data for 1989–2001 shows that reduced mortality from heart disease and lung cancer were the key contributors to mortality improvements over this period for males over 40. Fewer deaths due to heart disease has been the most significant contributor for improved female mortality, although less so than for males. Reductions in deaths due to breast and cervical cancer have been more significant than those due to lung cancer for females.

In general, the most significant contribution to improved mortality is a fall in deaths from smoking. However, despite the reductions in smoking prevalence, lung cancer rates are higher now than they were in the early 1960s for females over the age of 50 and males aged over age 75. The precise effects of smoking behaviour on mortality are complex.

WIDENING SOCIAL CLASS DIFFERENTIALS. Population data shows widening differentials between socio-economic classes. This is illustrated in the *Figure 2*, also extracted from *Longevity In The 21st Century*, which shows the differentials in life expectancy between manual and non-manual social-economic classes in 1972–1999. The differentials are too complex to go into detail here but differing improvements in heart disease mortality form a

significant part, perhaps because of different smoking behaviour. It is likely that those in the higher socio-economic classes who are experiencing the greatest improvements in life expectancy will also be those in receipt of the largest pensions.

INTERNATIONAL EXPERIENCE.

- UK mortality rates for males between 60 and 80, and females between 40 and 80, are high compared with similar countries.
- US mortality rates are much higher than the UK at younger ages and lower from about age 70.
- UK mortality rates are significantly higher than the country with the lowest rates at each age. Japan has the lowest mortality rates for people aged around 70; UK rates are 50% higher than these for males aged 70.
- UK life expectancy at 65 is low compared with similar countries, for example, compared to France, it is 2.13 years lower for males and 3.09 years lower for females.

Figure 1 Cohort effect for males

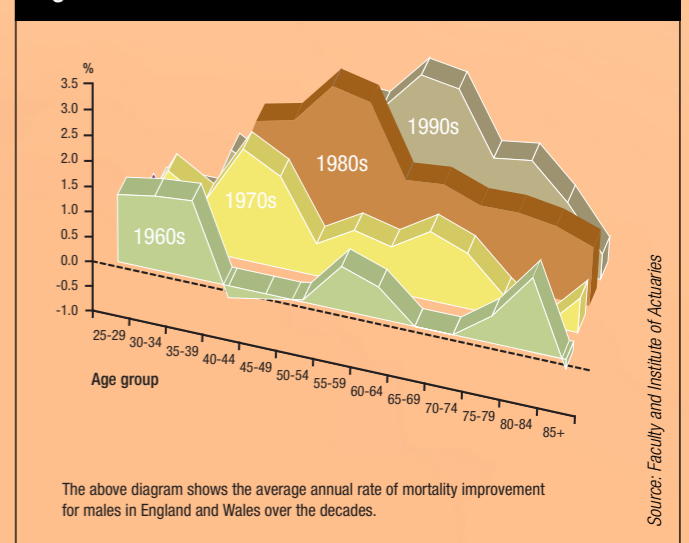
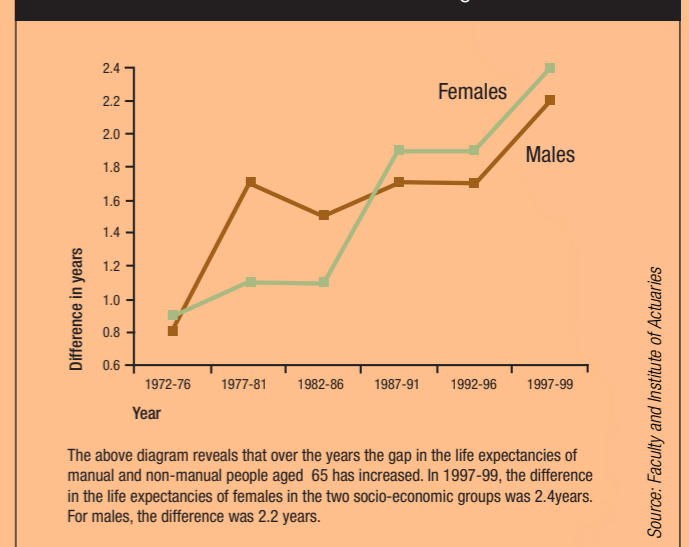


Figure 2 Differences in life expectancies (in years) between manual and non-manual classes at the age of 65



Definitions

LIFE EXPECTANCY = Expected future lifetime at given age.

LONGEVITY = Length of time a person lives for.

MORTALITY = Death.

MORTALITY TABLE = Used to derive the percentage chance of an individual dying at each age.

Average annual rates of mortality improvement England & Wales 1989-2001

	20-29	30-39	40-49	50-59	60-69	70-79	80+
Male	-0.1%	-0.1%	0.8%	2.7%	3.4%	2.2%	0.9%
Female	0.4%	0.7%	0.8%	2.1%	2.8%	1.4%	0.0%

Source: Faculty and Institute of Actuaries

- The reason for the relatively poor performance at older ages in the UK is that mortality rates from heart disease are particularly high (males 312%, and females 424% of French rates).
- Death rates for breast and cervical cancer are among the worst in western Europe.
- Survival rates for other cancers are relatively poor too.

The message here is that if UK experience converges with that of other countries, improvements in longevity are almost inevitable.

MEDICAL

ADVANCES. Advances in medicine drive a substantial part of current mortality improvements. For instance, the reduction in deaths from heart disease has been due to new treatments and surgical procedures. In terms of cancer, the incident rates have not fallen, although mortality rates have done so as a result of quicker detection and improvements in treatment.

The pace of medical development is accelerating and it seems likely that the speed of mortality improvements will also become more rapid. For example, the human genome project is expected to lead the way to significant medical progression. Cancers and heart disease account for two-thirds of all deaths, therefore, any medical advances here are likely to improve mortality rates significantly. However, the international experience shows that the UK has some way to go in this area.

'IF UK EXPERIENCE CONVERGES WITH THAT OF OTHER COUNTRIES, SIGNIFICANT IMPROVEMENTS IN LONGEVITY ARE ALMOST INEVITABLE'

Even those mortality tables that build in assumptions for continually improving longevity do not project the development of a 'magic bullet' for heart disease or cancer. Were they to do so the increase in liabilities for some pension funds would be catastrophic.

QUESTIONS FOR ACTUARIES. To assess the impact of the changing experience of mortality rates and the assumptions used for your pension scheme, an actuary needs to be asked:

- What mortality assumptions are being used for funding and accounting purposes?
- How do these compare with the current tables available to the actuarial profession?
- What would be the additional impact on the scheme if full allowance was made for the research into the cohort effect and the various estimates of future improvement in mortality rates?
 - Is the scheme's experience large enough to warrant a scheme-specific mortality investigation? How are the results of any such investigation affected by the previous question?

More generally, actuaries need to show trustees and employers information about the sensitivity of the scheme's finances to the mortality assumptions used and to future improvements in mortality. These groups also need to understand what flexibility they may have in adopting new tables, if change at some point is inevitable. For those schemes where such sensitivity is high, serious consideration may need to be given to the limited hedging opportunities available. Finally, although this article has been written from a UK perspective and trends vary throughout the world, there is clearly an international dimension to the problem.

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¹ Longevity In The 21st Century by Willets et al, presented to the Faculty/Institute of Actuaries 15 March /26 April 2004.