

# Longevity risk checklist:

questions and issues to discuss with your scheme actuary



# Longevity risk checklist:

## questions and issues to discuss with your scheme actuary

The information and questions that follow are designed to help you understand the longevity assumptions underlying your organisation's defined benefit pension obligations. They should help you in discussions with your scheme's actuary as to the reasons for the choice of assumptions and their consequences. It is advisable to read our report *Apocalyptic demography? Putting longevity risk in perspective* before going through this checklist.



# Longevity risk checklist

As a first step, you need an understanding of your plan members' life expectancy based on current, or recent, mortality experience.

## 1 Current life expectancy

**Is your actuary using scheme specific mortality data?**

**If so, what is the current life expectancy of your scheme members based on this data?**

**If not, do you have enough data for a scheme specific mortality analysis?**

Normally, you need a population of at least 1000 (with ten years of mortality data) to get meaningful statistics, so this is only sensible for larger schemes.

**If you do not have enough data for a scheme specific mortality analysis, have you considered 'benchmarking' your scheme against some key demographic discriminators? These might include:**

### Gender

The current mortality rates of males and females are sufficiently different to necessitate separate mortality tables. Based on UK mortality rates in 2004-06, 65 year old men and women have life expectancies of, respectively, 16.9 and 19.7 years (ONS, 2007b).

### Geographical location

Life expectancy currently differs by country and by region. Table A shows you the expected future lifetimes in years, based on 2004-06 UK mortality rates, of 65 year olds in the UK and its constituent countries.

**Table A UK life expectancy, 2004-06**

	At birth		At age 65	
	males	females	males	females
Scotland	74.6	79.6	15.8	18.6
Northern Ireland	76.1	81.0	16.6	19.5
Wales	76.6	80.9	16.7	19.5
England	77.2	81.5	17.1	19.9
<b>United Kingdom</b>	<b>76.9</b>	<b>81.3</b>	<b>16.9</b>	<b>19.7</b>

Source: Office for National Statistics (2007b),  
*Life expectancy continues to rise*



### Social class

Life expectancy currently differs by social class. Table B shows you the expected future lifetimes in years of 65 year olds for the different social classes, based on 2002-05 mortality rates in England and Wales.

Members of defined benefit pension schemes tend to live longer than average. So, pension actuaries tend to use special actuarial tables when estimating life expectancy. The most recent actuarial tables are the '00' series. Based on these tables, 65 year old men and women in 2000 had life expectancies of, respectively, 18.4 and 20.9 years (CMI, 2007b).

Actuaries and pension scheme consultants are increasingly interested in modelling life expectancy by reference to social class based on postcode.

### Average pension size (actual or accrued)

Life expectancy currently varies with pension size, although the effect diminishes with age. In a recent study, men who received a pension of less than £5,000 a year experienced lower than average longevity and those receiving more than £13,000 a year experienced higher than average longevity. This effect of pension size on life expectancy was also present for female pensioners, although the size of their pensions was smaller.

The current mortality experience of your pension scheme members is the starting point when estimating your scheme's obligations. Your actuary will use it as the base from which to project future reductions in mortality rates and consequent improvements in your scheme members' life expectancy.

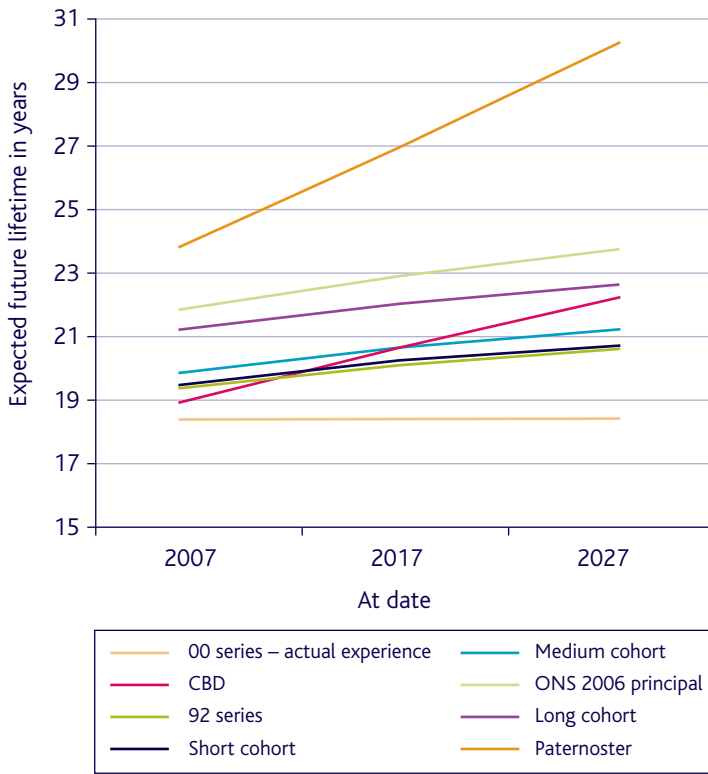
**Table B** Life expectancy in England and Wales at age 65: by social class and gender, 2002-05

Class description		males	females
<b>Non-manual</b>			
I	Professional	18.3	22.0
II	Managerial and technical/intermediate	18.0	21.0
IIIN	Skilled non-manual	17.4	19.9
<b>Manual</b>			
IIIM	Skilled manual	16.3	18.7
IV	Partly skilled	15.7	18.9
V	Unskilled	14.1	17.7
<b>All</b>		<b>16.6</b>	<b>19.4</b>

Source: Office for National Statistics (2007a), *Variations persist in life expectancy by social class*

# Longevity risk checklist

**Figure A** Some recent projections of life expectancy for 65 year old males



Sources: Pensions Institute calculations – data sources: CMI (2007b), Cairns et al. (2006) for the CBD projection, Paternoster (2007) for the Paternoster projection

## 2 Projected life expectancy

Figure A shows a range of projections for the life expectancy of UK 65 year old males. For a description of these projections see Section 3 (pg 19-29), 'Projected life expectancy' in the main body of the report.

This range of projections reflects both the uncertainty of lifetimes and the lack of an agreed forecasting method.

**Where would your pension scheme's life expectancy projection fit on Figure A?**

**How much allowance does your projection make for future improvements in longevity?**

Current estimates are that longevity is improving by around 2 to 2.5 years every decade, which suggest that the life expectancy at age 65 for non-retired members currently aged 55 should be about 2 to 2.5 years higher than that assumed for current members aged 65.

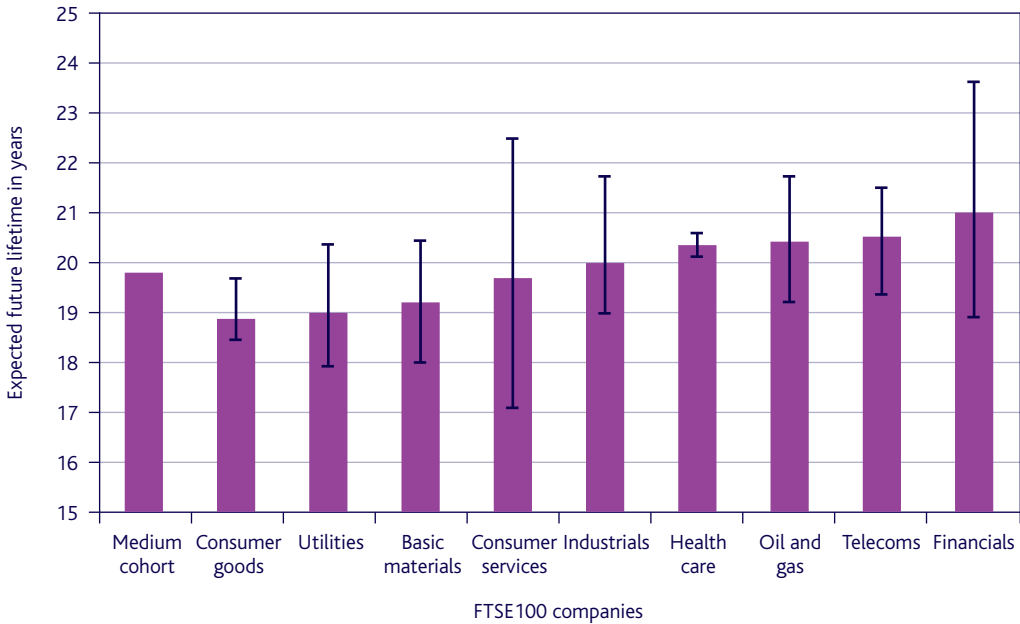
**What projection method is your actuary using to estimate your scheme members' life expectancy?**

A feature of the increase in UK life expectancy in the second half of the 20th century has been the 'cohort effect': a higher than average rate of improvement in mortality rates for generations born in the UK between 1925 and 1945, centred on the generation born in 1931 (GAD, 2001).

The short, medium and long cohort projections in Figure A are based on three sets of assumptions about how long the 'cohort effect' will continue before flattening off (to 2010, 2020 and 2040, respectively). Recent mortality data published by the CMI does not show the rapid tail-off in future rates of mortality improvement implied by the medium cohort projection (The Actuarial Profession, 2007). So, some actuaries are updating the 'interim cohort' projections to allow for the specific recent experience of the pension schemes they are advising (CMI, 2007b).

**Do your life expectancy projections assume that the cohort effect will continue? If so, for how long?**

**Figure B** Life expectancy assumptions reported in 2006 by FTSE100 companies for 65 year old males



Source: Pensions Institute calculations – data sources: CMI (2007b) and Lane, Clark and Peacock (2007).

**How do your life expectancy assumptions compare with those that other companies (particularly your competitors) are using?**

Figure B shows you how your life expectancy assumptions might vary depending on the nature of your company’s business. The extreme left hand column is the medium cohort projection for males aged 65 in year 2007 and the other columns show the different levels of life expectancy assumptions for 65 year old males as shown in the 2006 accounts of FTSE100 companies, analysed by industrial sector. The vertical lines on the other columns show the extent of the range within each sector, which in turn reflects the number of companies within the sector.

**3 Longevity risk**

**Do you understand how much uncertainty is inherent in any life expectancy projection?**

Your pension scheme faces three types of longevity risk.

First, ‘out of date assumptions’ risk. Is your actuary using an up-to-date mortality table to determine your plan’s longevity assumptions?

Secondly, ‘population basis’ risk. An up-to-date mortality table might be used but your pension plan’s membership might differ significantly from the particular population underlying this table (e.g. you might be using the short cohort tables but your plan’s membership might be largely ‘professionals’, for example, CIMA members).

# Longevity risk checklist

Thirdly, there is 'biomedical' risk; the possibility that future science – such as regenerative medicine, genetic engineering, tissue engineering and nanotechnology (Seigel, 2005) – will radically extend your pension plan's members' lifespan. It is biomedical risk that should really worry you. There are vast uncertainties as to the chances of successful scientific and medical advances and the timing of any successes but it is possible that they could significantly increase the average human lifespan.

A significant common feature of almost all projection methods in use is that they assume that the pace of life expectancy improvements will decelerate in years to come (despite the fact that we have seen accelerating improvements in recent years). You should ask your actuary why it is reasonable for your scheme's projection to make this assumption and what would be the impact of improvements continuing to accelerate.

## **When was your mortality table last updated?**

Anything more than three years should be a cause for concern. According to Willets et al (2004), '...in some cases, the mortality assumptions currently used by actuaries do not make sufficient allowance for likely future improvement. Further, when considering risk, it is likely that many actuaries do not examine the impact of using a reasonable range of such improvements'.

In its February 2008 consultation document, the Pensions Regulator explains that it expects mortality assumptions to be chosen 'prudently' which includes not assuming any future mortality improvement rates lower than are reasonable based on the most up-to-date evidence and currently accepted projection methodologies (the Pensions Regulator, 2008).

## **Is your actuary asking you to consider a range of life expectancy scenarios?**

### **Do you know what difference it would make to your total pension liabilities if you increased your life expectancy assumptions by one extra year?**

Life expectancy assumptions can have a significant impact on company balance sheets. The Pensions Regulator (2007) estimates that two years of extra life adds approximately 5% to the value of a defined benefit plan's liabilities.

### **Do you know what difference it would make to your total pension liabilities if you changed your mortality table to the medium cohort table?**

The medium cohort table assumes that the current pace of longevity improvement starts to reduce dramatically after 2020.

### **Do you know what difference it would make to your total pension liabilities if you changed your mortality table to the long cohort table?**

The long cohort tables assume that the current pace of longevity improvement tails off after 2040.

The long cohort is in line with the Pensions Regulator's February 2008 consultation document on good practice. The Regulator is suggesting that: 'For recovery plans based on valuations with effective dates from March 2007, mortality assumptions that appear to be weaker than the long cohort assumption will attract further scrutiny and dialogue with the trustees where appropriate. Furthermore, assumptions which assume that the rate of improvement tends towards zero, and do not have some form of underpin, will also attract further scrutiny' (the Pensions Regulator, 2008).

**Do you disclose your mortality assumptions to shareholders and is this done in a clear and understandable way? Are you clear on the justification for your assumptions?**

The ASB Reporting Statement *Retirement Benefits – Disclosure* (ASB, 2007) encourages companies to give enough information to enable the risks and rewards of their DB plans to be understood. The accounts should include sufficient information about the principal assumptions used to measure pension liabilities to allow users to understand their inherent uncertainties. The assumptions should include mortality rates. The reporting statement also recommends that the accounts should include a sensitivity analysis showing the effects of changes in the assumptions.

The ASB's Discussion Paper on *The Financial Reporting of Pensions* endorses the recommendations of its 2007 Reporting Statement and proposes additionally that mortality rate assumptions should be expressed as the number of years post retirement that it is anticipated pensions will be paid to scheme members (ASB, 2008).

The 2008 consultation document issued by the Pensions Regulator advises pension trustees that good practice requires assumptions to be evidenced based and clearly and transparently described (the Pensions Regulator, 2008).



**Note: This report is for general guidance and is intended to be a useful starting point to be adapted to the individual circumstances of an organisation. It should not be relied upon in any respect without seeking specialist pensions advice. Please note that CIMA, Cass Business School, Pensions Institute and the Pensions Advisory Group do not accept any responsibility to any individual or company who relies on the guidance set out in this report.**



ISBN 978-1-85971-597-0 (pdf)

April 2008

**The Chartered Institute  
of Management Accountants**

26 Chapter Street  
London SW1P 4NP  
United Kingdom

T. +44 (0)20 8849 2275

F. +44 (0)20 8849 2468

E. [innovation.development@cimaglobal.com](mailto:innovation.development@cimaglobal.com)

[www.cimaglobal.com](http://www.cimaglobal.com)



TE040V0408C