

Briefing

Choosing the right mortality table for your Fund

Longevity is a topic of significant importance to defined benefit pension schemes and their actuaries. Pensioners living for longer means pensions being paid for longer, and hence higher overall costs. So, what information might we be able to glean from the latest longevity research, what does it all mean for LGPS Funds and why on earth does it have anything to do with the last time you went shopping for shoes?

The Continuous Mortality Investigation

The Continuous Mortality Investigation (CMI), a research arm of the Institute and Faculty of Actuaries which carries out research into mortality and morbidity experience, has recently published the initial results of its study into the mortality of members of self-administered pension schemes (SAPS) over the period from 2009 to 2016.

The results will be known as the "S3 tables" and they are expected to be widely used in pension scheme valuations across the entire industry from late 2018. They were issued in draft on 5 June 2018 and are the main focus of this discussion paper.

Many of the LGPS triennial valuations carried out by us in 2016 and 2017 used the second series of SAPS mortality tables released by the CMI, the "S2 tables". These were based on SAPS mortality data over the period from 2004 to 2011. The dataset used to construct the S3 tables is significantly larger than the S2 tables with an increase in exposure of 14% males and 63% females, largely as a result of the increase in public sector data provided.

We will need to consider what table to use as part of our upcoming pre 2019 valuation discussions.

FACT:

The CMI has been conducting this investigation since 2003 and our specialist longevity team works closely with them, assisting in their research and production of tables and projection models. Most of the LGPS funds we advise are happy for their data to feed into the CMI's research and we typically submit data on an anonymised basis during each triennial valuation cycle.

What is a mortality table?

A mortality table shows the probability that an individual of a certain age will die within the next year, based on the mortality experience of a particular pool of lives. It's a bit like a bookie's odds, but based on the most unfortunate of outcomes.

Given this information, we can work out how long members of a similar population can be expected to live, in other words their life expectancy.

There are many different ways of splitting up data to construct a mortality table. Indeed, the CMI have proposed one for every occasion, with no fewer than 30 mortality tables in these latest S3 draft tables. These include tables for pensioners who have retired in normal health, in ill-health, or who are eligible dependants of former members. In addition, there are various subsets of tables which look specifically at the mortality rates of members with low, medium, high or very high pension amounts.

Choosing the right mortality table for your Fund

In many ways, choosing the right mortality table is just like shopping for shoes. There will be many shoes to choose from but there might only be one pair that fits your size and style just right!

Just like shoes, mortality tables are not a "one size fits all" affair. Life expectancies can differ significantly depending on many complex factors, including geographical location, income, socio-economic class, occupation and lifestyle.

Therefore, at each triennial valuation, as a standard we conduct a review of the recent mortality experience within your Fund. Depending on the level of detail required for the mortality review we can involve our specialist Longevity team.

As part of these reviews, we will look at how the mortality rates in your Fund compare with those of a range of standard mortality tables.

The aim is to find a table that is a similar shape to the mortality profile of the Fund (which may not necessarily be the latest set), in other words we find one that has the right "style". We then adjust this table so that the mortality rates at each age are similar in value, in other words we find one in the right "size".

In the graphs on the following page we visually set out the process of finding a table with the right fit.

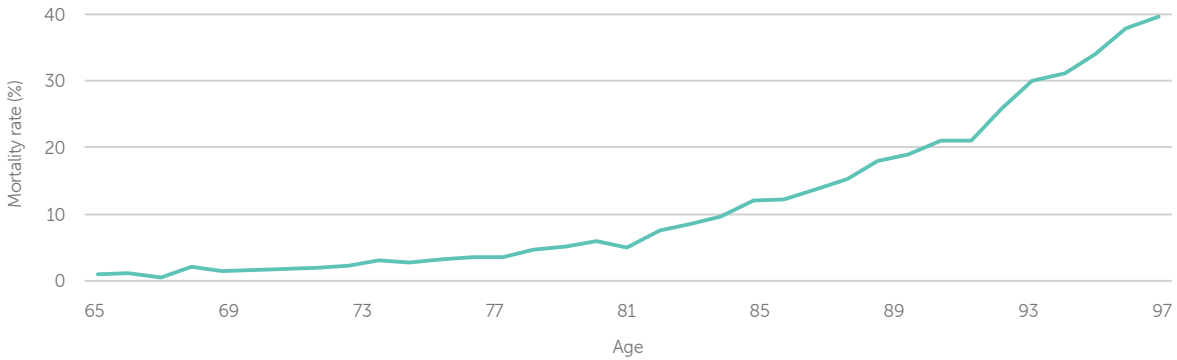
FACT:

Many of the Funds we advised at the last round of triennial valuations opted for a much more "tailored" mortality review to be conducted by our specialist Longevity team. This included the production of a bespoke report covering the findings in detail and is something that we will continue to offer in future. We will be in touch about this before the end of the year.



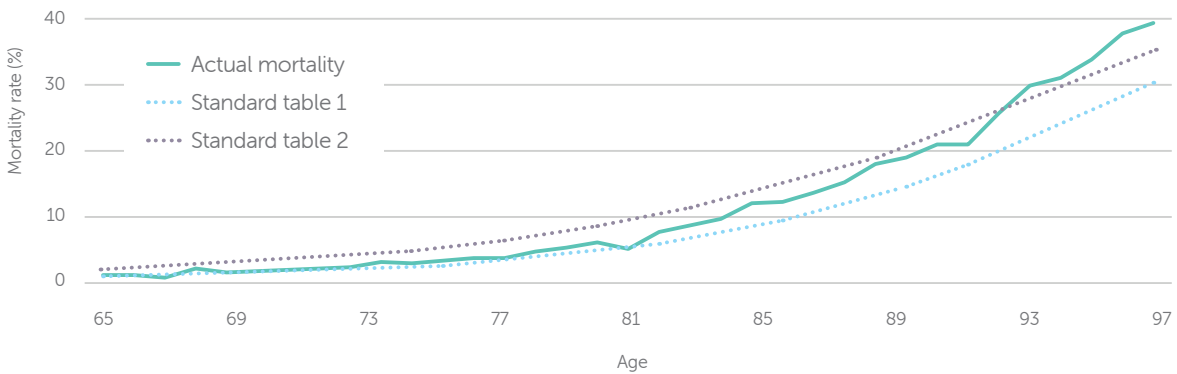
Process in pictures

STEP 1: ANALYSING YOUR FUND'S MORTALITY RATES



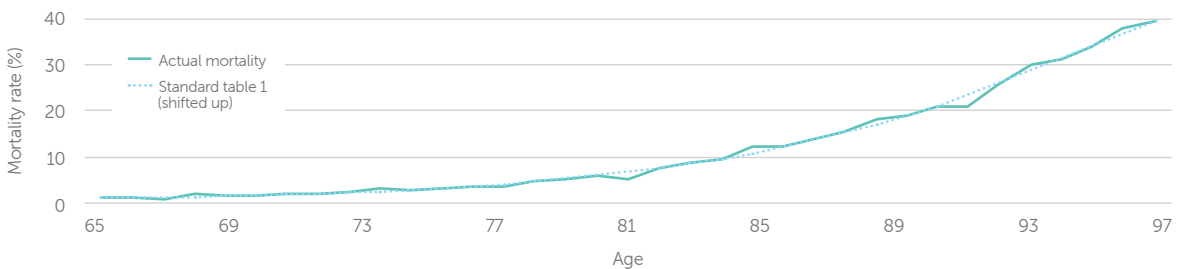
We analyse the Fund's pensioner mortality experience and calculate mortality rates at each age.

STEP 2: FINDING A SUITABLE STANDARD TABLE



The mortality rates are compared with a number of standard tables. Standard table 1 seems to have a similar shape here, although it shows consistently lower mortality rates than what we have seen from the Fund's experience.

STEP 3: SHIFTING THE STANDARD TABLE FOR A BETTER FIT



Standard table 1 is re-sized (shifted up) so that the mortality rates are similar to those that have been seen.

Longevity improvements

Just like your shoe size whilst growing up, mortality rates have not stayed the same over time. As each year has gone by, people have been living longer and longer. This represents a very real challenge when it comes to forming an opinion about future levels of mortality for members of a pension scheme. We have very credible data on how long people are living currently, but how might the current trends in mortality change further down the road?

The honest answer to this question is that no one really knows.

What we can do is look at how longevity has been improving in the recent past and, helpfully, the CMI conduct such an analysis on an annual basis, using population data published by the Office for National Statistics.

This leads to one method of bringing historical mortality tables "up to date" without conducting a new SAPS investigation. For example, we could assume that the mortality rates in the S2 tables, which relate to the year 2007, have reduced in line with improvements in the national population. Indeed, this is the general principle underlying the CMI's "projection model" which is updated annually and which has been widely used in many recent pension fund valuations.

Of course, this methodology only serves to project historical mortality rates up until today. We also need to specify a long-term rate of improvement for the future, and this is a topic of considerable debate. The long-term rate is a highly subjective assumption as it will depend on factors such as improvements in medical technology, societal behaviours and whether there is simply a biological limit to how long a human being can possibly live (and wear out their last pair of shoes).

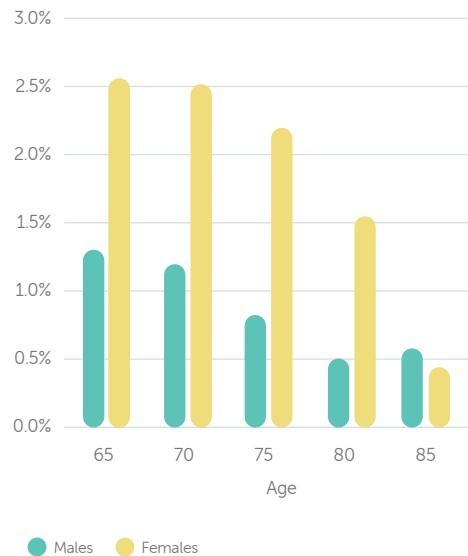
FACT: Between 2000 and 2011, the CMI found that mortality rates improved by 2.7% p.a. for males and by 2.2% p.a. for females. Since then however, average annual improvements have been notably lower.

How do the S3 tables compare with the previous series of tables?

The headline findings are that, once both sets of tables are projected to the same date using the latest CMI projection model, the S3 tables generally show higher life expectancies than the earlier S2 tables. This is illustrated below for pensioner members at some sample ages.

Life expectancies at age 65 under the standard S3 tables are around 1.5% higher for males and 2.5% higher for females compared with the standard S2 tables.

RELATIVE INCREASE IN LIFE EXPECTANCIES FROM S2 TO S3



As at 1 July 2018, using the "amounts" tables and the CMI 2017 projection model with a long term rate of 1.5% p.a.

Why has there been an increase in life expectancies?

There are two main reasons why this increase has taken place.

The first reason is rather technical in nature and is due to the fact that mortality improvements in the SAPS datasets have been higher than those built into the CMI projection model. By definition, the SAPS datasets contain data relating to members of self-administered pension schemes, whereas the CMI projection model is based on data from the national population of England and Wales.

..... In recent years, SAPS members have had higher mortality improvements compared with the general population.
.....

This could be because many members of the population are largely reliant on an insufficient state pension to see them through retirement and so the quality of life afforded to them may not be as high as someone with a claim to additional pension benefits. Nevertheless, these observations mean that life expectancies under the new S3 tables are higher than if the old S2 tables were projected forward in line with national mortality trends.

The second reason is due to the fact that a higher proportion of the data feeding into the S3 tables comes from public sector pension schemes. In the datasets submitted to the CMI, members of public sector pension schemes had higher pensions than members of private sector pension schemes and, perhaps unsurprisingly, their mortality rates were found to be lower. In other words, the public sector workers lived longer than non-public sector workers. Interestingly, there has been a large shift towards “non-local authority” data within the public sector dataset, as a result of a decision by the Government Actuary to submit data to the CMI, which may also account for the lower mortality rates.

We can explore whether the S3 tables are a better fit to your members in any Fund specific analysis that we do.

Does the change in mortality table mean pension liabilities will increase?

In short, not really. To come back to my earlier analogy, the S3 tables are a completely different make of shoe so it's possible we might need to order them in a different size. A pair of size five stilettoes wouldn't exactly be ideal if what we really need is a pair of size six flats (although in my own case those extra few inches could come in handy).

A change in mortality table does not alter the actual mortality experience of your Fund, which is ultimately what we are trying to model, and hence the impact of “re-basing” in this way is expected to be fairly minimal. Of course, the plethora of additional tables expected to be released may present opportunities for us to achieve a better “fit” than previously. The overall effect will depend on your Fund's membership profile.



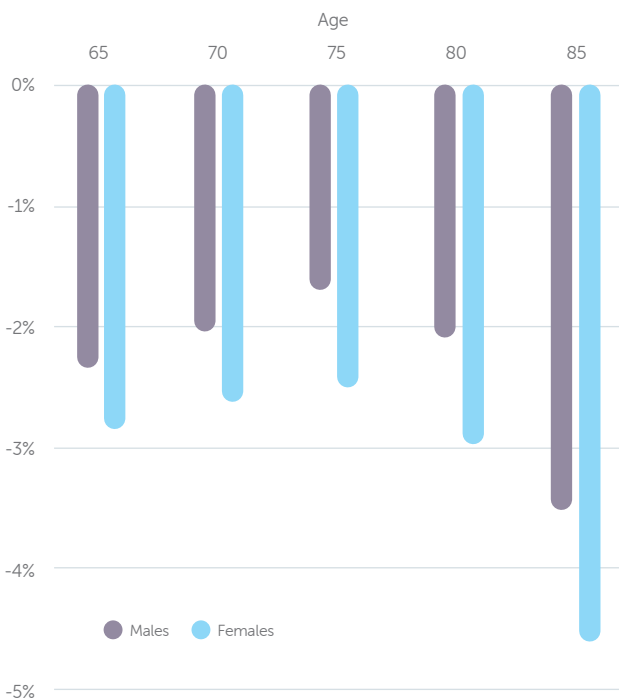
CMI 2017

Of greater significance is the assumption that is made regarding mortality improvements. Over the last couple of years, the trend of increasing mortality improvements appears to have stalled somewhat. Mortality rates in the general population have not been increasing but rather they have not been reducing by as much as they once were, nor by as much as had been built into earlier projection models. As each annual update of the CMI model takes account of current mortality improvements, all else equal, this means lower projected life expectancies.

For many Funds at the last triennial valuations, we used the S2 tables alongside the CMI 2015 projection model and a long-term rate of improvement of 1.5% p.a. The following chart shows the reduction in life expectancies, as at 1 July 2018, if the projection model were to be updated to CMI 2017 (with the same long-term rate).

Life expectancies at age 65 are about 2% lower for males and 3% lower for females. All else equal, we would expect a "typical" LGPS Fund to experience a reduction in total liabilities and future service costs of around 2% as a result of moving from CMI 2015 to CMI 2017.

RELATIVE DECREASE IN LIFE EXPECTANCIES FROM CMI 2015 TO CMI 2017



As at 1 July 2018, using the S2 "amounts" tables and a long term rate of 1.5% p.a.

Conclusion

It's important to note that the S3 tables are currently in draft form and are the subject of a technical consultation, however it is anticipated the final versions will be released towards the end of 2018.

The impact of moving to the S3 tables for the purposes of pension valuations is not in itself expected to be significant, however the tables do offer some interesting insights into how mortality has differed across different subsets of the population.

In addition, the latest version of the CMI projection model is due to be released early next year. The possible impact this will have on liabilities will depend on any changes to the model and what the latest population data is telling us about mortality improvements. Continued thought will also need to be given to the long-term rate of mortality improvements and whether the current assumption of 1.5% p.a. remains appropriate.

Next year heralds the latest round of triennial valuations for English and Welsh LGPS Funds and as part of that we will be reviewing all assumptions used in our calculations, including those relating to mortality. In the meantime, please get in touch with your usual Barnett Waddingham contact if you would like any further information regarding this latest research.

Sources

CMI working papers 105 and 107

Please contact your Barnett Waddingham consultant if you would like to discuss any of the above topics in more detail:



Matthew Paton FFA
Actuary, Public Sector Consulting

✉ matthew.paton@barnett-waddingham.co.uk

☎ 0333 11 11 222

www.barnett-waddingham.co.uk

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