

Mortality analysis for LGPS Funds

As part of the 31 March 2016 valuation process, 15 of the English Funds participating in the Local Government Pension Scheme (LGPS) advised by Barnett Waddingham agreed to take part in a project to comprehensively review their mortality assumptions.

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With assistance from Barnett Waddingham's specialist Longevity Consulting team, a detailed analysis of the mortality experience (i.e. the actual number of deaths, relative to expectations) for each Fund over the five year period to 31 December 2015 was undertaken. The socio-economic profile of each Fund was also considered as part of the analysis. As well as individual Fund results, the analysis considered results for groups of related LGPS Funds.

Main results

Barnett Waddingham's bespoke mortality analysis tool, qBW, was used to perform a mortality experience analysis to identify how actual deaths within LGPS Funds compared with implied deaths using a published mortality table by year, age and member type. Mortality assumptions resulting from the analysis were set as a percentage adjustment to the most appropriate comparison table. For example, an adjustment to the table of 105% would mean that the chance of dying at any age was increased by 5%.

Active and deferred members were combined for this analysis, as only a small number of deaths generally occur at younger ages and the credibility of results was increased by grouping these members together. Even after combining active and deferred members, there were still a relatively small number of deaths in the non-pensioner groups within each LGPS Fund (with as few as 19 deaths over the 5 year analysis period in one LGPS Fund). Therefore, results were further combined for London Boroughs and other LGPS Funds in all cases where experience was similar enough to do so.

For pensioner members, assumptions were proposed based on comparisons of experience with the Continuous Mortality Investigation's (CMI) 'S2' Series 'All Pensioner' tables; S2PMA for males and S2PFA for females. For male pensioners, adjustments ranged from 83% to 114% of S2PMA, while the range for female pensioners was 85% to 106% of S2PFA. Generally, the adjustments to tables were lower than the previous valuation, resulting in an increase in both life expectancy and liabilities for pensioners, all else being equal. However, these increases were partially or fully offset by changes in the assumption for future improvements in life expectancy.

We also separately analysed the mortality experience of dependant members relative to S2DFA; the CMI's 'S2' Series 'Dependants' table for females and S2PMA for males, as there is no equivalent male 'S2' Series 'Dependants' table. Female dependants generally form a significantly bigger group than male dependants - which was the case for all of the LGPS Funds we analysed. For female dependants, assumptions varied from 81% to 114% of S2DFA.

For male dependants, results were based on combined experience in almost all cases either for London Boroughs or other LGPS Funds, ranging from 98% to 116% of S2PMA, with a few exceptions where mortality experience implied a significantly higher adjustment. In most cases, this is the first time that we have used separate mortality assumptions for dependants in LGPS Fund valuations.

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As well as analysing mortality experience, an analysis of the socio-economic profile of each LGPS Fund was carried out using postcodes of the current membership as an indicator of socio-economic status.

Socio-economic analysis

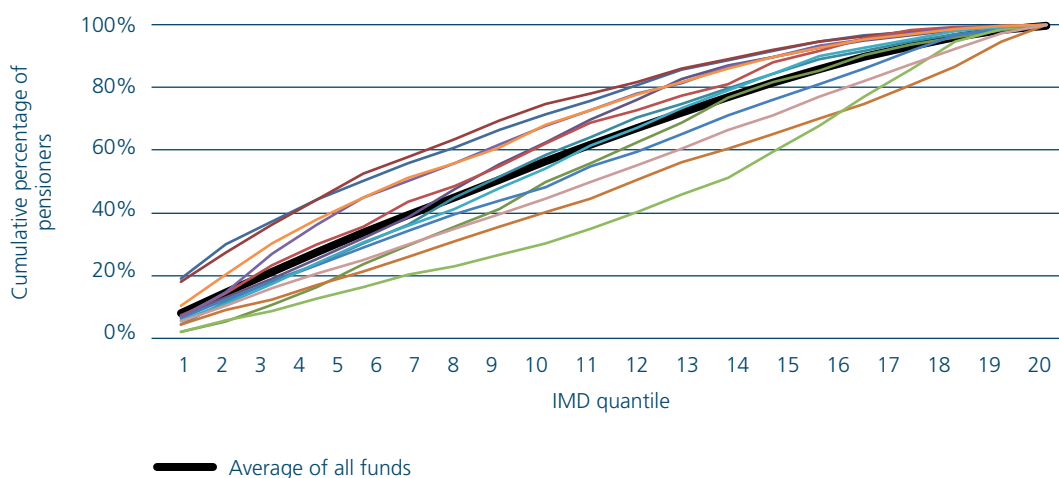
As well as analysing mortality experience, an analysis of the socio-economic profile of each LGPS Fund was carried out using postcodes of the current membership as an indicator of socio-economic status. The analysis used the 2015 rankings of postcodes according to the Index of Multiple Deprivation (IMD), published by the Department for Communities and Local Government. The IMD rankings were used to assign each member to one of twenty ranked groups, with group one representing the highest socio-economic status.

This was useful in ensuring the robustness of our recommendations by:

1. Comparing pre-retirement members with post-retirement members to judge whether our recommendations for post-retirement mortality are likely to continue to be suitable for each Fund in the future.
2. Comparing profiles between LGPS Funds to understand the appropriateness of combining the experience of certain Funds for greater accuracy where a low number of deaths affected the credibility of results.

The chart below compares the socio-economic profile of pensioner members in each of the 15 LGPS Funds who took part in our analysis, as well as the combined profile for all 15 Funds. The values shown for each group are the cumulative proportion of the pensioner membership in that group or a higher group. A straight line from bottom-left to top-right would indicate that the membership was drawn equally from each of the 20 IMD groups.

Socio-economic profile of LGPS Funds for pensioner members based on IMD rankings



Source: Barnett Waddingham calculations based on IMD 2015 rankings

Improvement models

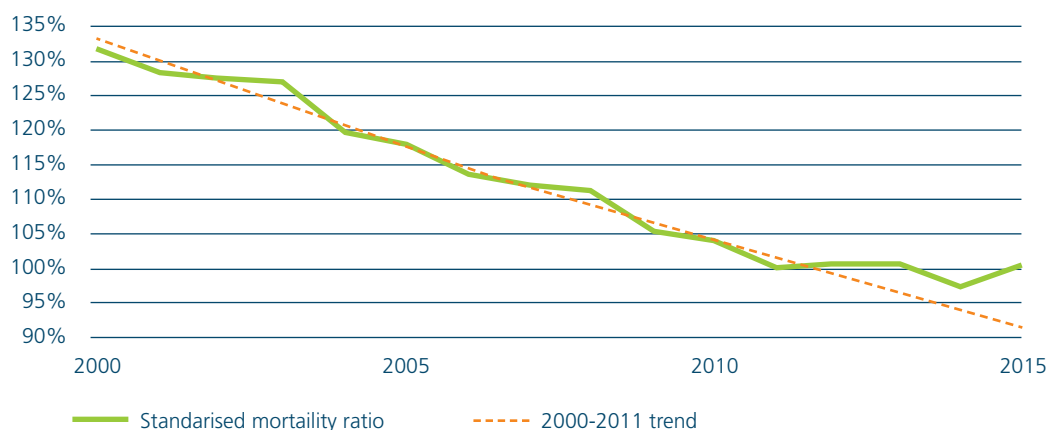
When setting mortality assumptions, an appropriate allowance also needs to be made to allow for mortality to improve in the future. The CMI Mortality Projections Model (the Model) is a model of future mortality improvements, updated annually since it was first issued in November 2009 to incorporate the latest data on improvements in population data for England and Wales. At the 2013 valuation, the majority of Funds used CMI_2012, the latest available version of the Model at that time, with a long-term improvement rate of 1.5% p.a.

At the 2016 valuation, the latest version of the Model was CMI_2015, which showed a slowdown in projected mortality improvement rates as mortality improvements were near-zero for over-65s between 2011 and 2015. The chart below shows how mortality rates have changed since 2000 using the data that was available at the time of the 2016 valuation.

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At the time of the 2016 valuation, there was still significant debate amongst actuaries about whether these emerging lower improvements represented a short-term 'blip' or the start of a new trend.

Standardised mortality ratio of population mortality data for England and Wales compared with the 2000-2011 trend



Source: Barnett Waddingham calculations based on ONS data and CMI methodology

At the time of the 2016 valuation, there was still significant debate amongst actuaries about whether these emerging lower improvements represented a short-term 'blip' or the start of a new trend. This is always the case when there is some form of distortion to a previous reasonably stable trend and we need to balance reflecting the most recent data with ensuring we don't over-react to this data before the underlying causes are understood. After discussing the model with the Fund actuaries, CMI_2015 was adopted in the 2016 valuation for the LGPS Funds advised by Barnett Waddingham, without any adjustments to the model.

Since the 2016 valuation, a further update to the Model - CMI_2016 - has been released which shows that the trend of lower improvements has continued in the latest data. We will continue to monitor rates of improvement over the inter-valuation period, reviewing mortality improvement assumptions as part of the 2019 valuation exercise to ensure that appropriate assumptions are used to reflect the interests of the Fund.

Interesting facts

As part of our data validation and analysis, we noticed some interesting trends.

Our analysis suggests that the provision of ill-health retirements (or its recording) has fallen significantly over the past 20 years. In some cases the percentage of members retiring each year in ill-health has fallen from 25-30% down to 2-4% in recent years. As such, we based our best-estimate adjustments on all pensioners, as opposed to splitting the assumption between normal health and ill-health retirees - which had been done for previous valuations.

Additionally, there has been an increasing trend of non-recording of the way in which members have retired. For example, there being no record of whether the member retired in normal-health, ill-health or was an early or late-retirement. Non-recordings consisted of up to 60% of the total retirements in recent years for some Funds. We recommend that a record of the type of retirement is maintained - both as general good practice, and to enable future analysis.

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Data quality

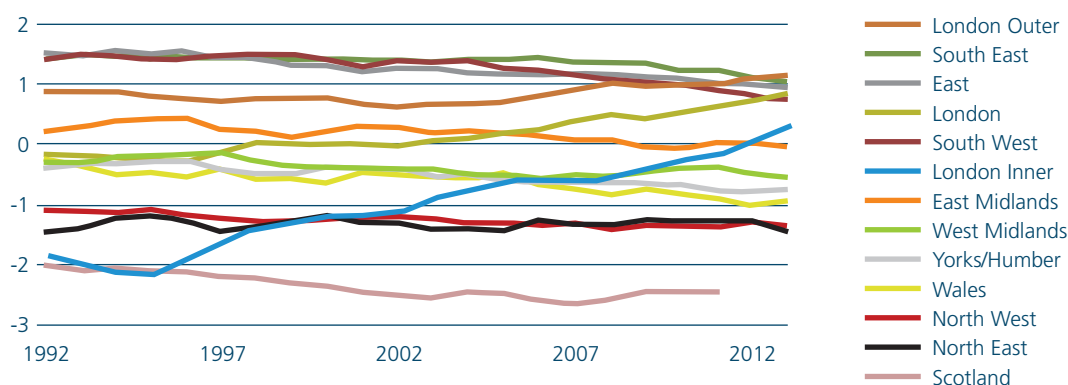
In general, we found that the data was of good quality, despite not all Funds having successfully transitioned to the universal data capture format.

In some instances, it was necessary to contact the administrative teams in order to obtain additional information, such as the type of exit from the pension scheme and verification of dates when movements took place. Furthermore, it also came to light where death events had not been accurately recorded on some administration systems. After further investigation, it was possible to identify some further deaths for Funds where this was applicable, but it is important to ensure that deaths are accurately recorded in the first instance, as otherwise it is possible that members could be erroneously included in future actuarial valuations which could leave to overstating the Fund liabilities.

UK trends in life expectancy

The mortality analyses for LGPS Funds highlighted how life expectancy varied in different areas of the country. At a wider level, the ONS publishes data on life expectancy in different regions of the United Kingdom. The chart below plots life expectancy at birth for males living in a number of regions of the United Kingdom, relative to the average for England and Wales over the period 1992 to 2012.

Life Expectancy at birth by region, relative to the average for England and Wales - males



Source: Barnett Waddingham calculations based on ONS data

As shown in the chart, there has been considerable variation in life expectancy around the UK, from Scotland - which has consistently at least two years lower than the average - to the South East of England - where life expectancy has been at least a year above the average throughout the period. There also appears to be an element of “North-South divide” in life expectancy, with the top three regions being the South East, South West and East of England, while the three regions with the lowest life expectancy for most of the period are the North East and North West of England and Scotland.

It is interesting to note that while life expectancy relative to the average has been fairly stable for most regions over the period, the inner-city boroughs of London have seen a considerable improvement in life expectancy – from around two years below average in the early 1990s to approximately half a year above the average in 2012.

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Please contact your Barnett Waddingham consultant, or Melanie Stephenson if you would like to discuss any of the above topics in more detail. Alternatively contact us via the following:

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