Dorset County Pension Fund

Analysis of LGPS mortality during the COVID-19 pandemic

Introduction

We have been asked by the Dorset County Pension Fund (the Fund) to undertake an analysis of the likely effect of the COVID-19 pandemic on pensioner mortality in the Fund and the resulting impact on pension costs. Our results focus on the period from 1 February 2020 to 31 March 2021 however we were provided with data from 1 April 2019 so we have included some comparisons with time frames outside of this range in the report.

Our analysis is based on pensioner data only (i.e. excluding active, deferred and dependant members) in respect of the Fund. Therefore the results as set out in this paper are limited to the experience of the Fund and we are unable to comment on how the effect of the COVID-19 pandemic has varied across the country.

This paper is addressed to and is provided for use by Dorset Council, as administering authority to the Fund, however it may be shared with third parties provided that it is done so in whole.

This paper complies with Technical Actuarial Standard 100: Principles for Technical Actuarial Work (TAS 100) and Technical Actuarial Standard 300: Pensions (TAS 300) as issued by the Financial Reporting Council (FRC).

Key findings

Our key findings on the Fund's mortality experience over the pandemic period are summarised below. Further details of these findings are set out in the remainder of this paper.

- Male pensioners have exhibited excess mortality which is significantly higher than that of female pensioners.
- There is no clear trend in mortality experience by pension amount, perhaps suggesting that the relative level of a member's income does not affect the likelihood of surviving an infection of the virus or death from other causes.
- There has been higher than expected mortality across all pensioner age bands analysed. Excess deaths were highest for the 80 - 85 age band.

It should be noted that our analysis looks at deaths experienced and we do not have the information to confirm the reason for death (e.g. whether COVID-related or not). Our key findings summarise that higher deaths have been experienced in the analysed period, and as they coincide with the wider experience seen across the UK, it is likely that this experience is at least in part due to the impact of the COVID-19 pandemic, however, this can not be confirmed to be the case with all deaths experienced.

Method and approach

Data

We received data from the Fund in respect of pensioner members over the period from 1 April 2019 to 31 March 2021. For the purpose of our analysis, the Fund has provided information on pensioners and leavers in various formats and we have collated this information for this analysis. Full details of our approach in analysing this data is set out in the Appendix.

Based on the information above, over the period from 1 April 2019 to 31 March 2021, there were 982 pensioner deaths distributed as follows:
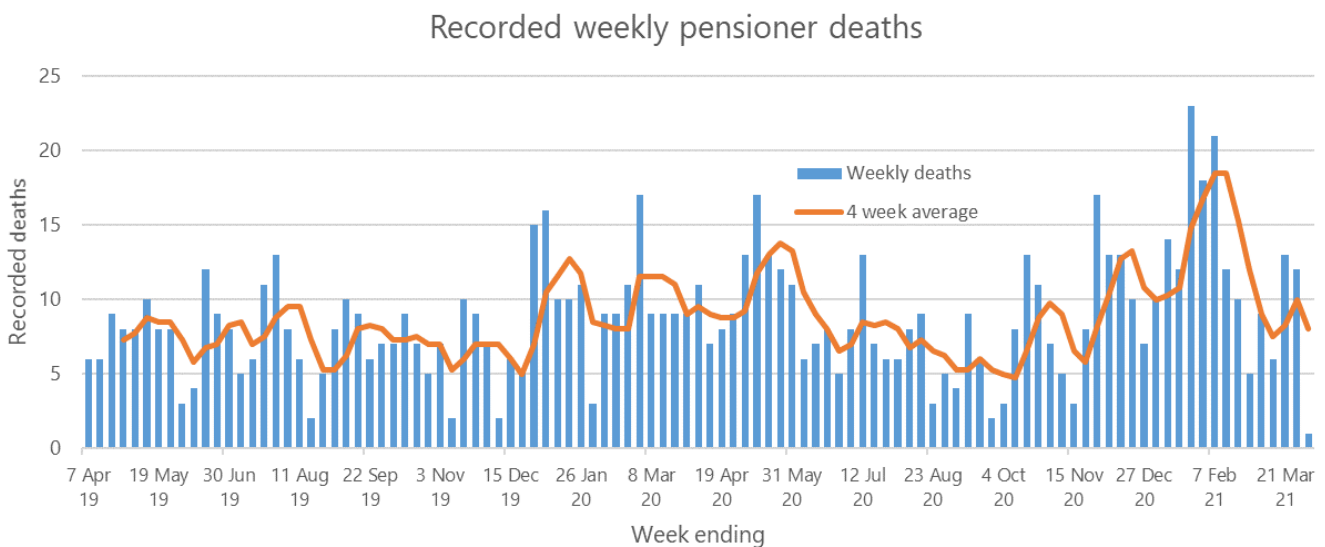
The average number of weekly deaths over the period from 1 April 2019 to 1 February 2020 (the period pre-pandemic) was 8.

The graph shows heightened mortality for a period of around 3 months beginning March 2020, with highs of 17 deaths per week being recorded in the weeks ending 1 March 2020 and 10 May 2020, more than double the previous average. Over this three month period the average weekly number of deaths was 11 per week. This pattern coincides with the first wave of infection that was observed nationally.

Mortality levels subsequently reduced for several months to levels similar to those experienced in the previous year.

A second wave of higher than average mortality was observed for another period of around three months beginning at the end of November 2020 and peaking in the week ending 24 January 2021 when 23 deaths were recorded, almost triple the average observed in the pre-pandemic period. Over this period the weekly average number of deaths was 13 per week. This coincides with the national picture over the winter months, when a new, highly transmissible strain of the virus ultimately led to higher mortality rates.

Approach to calculation of expected deaths

In calculating a figure for the excess number of deaths (i.e. the number of deaths above what we would have expected), we must first decide on a method for calculating the expected number of deaths.

We could, for instance, base expected mortality on the period immediately preceding the COVID-19 pandemic, as illustrated by the earlier months of the chart above. However, this approach introduces the risk of the analysis being distorted by short-term volatility and seasonal fluctuations.

Our favoured approach is therefore to consider observed average mortality over a longer investigation period and for the purposes of this paper we have used mortality assumptions consistent with the Fund's 2019 actuarial valuation to calculate the expected number of deaths. These in turn were based on an analysis of the mortality experience of the Fund over the five year period to 31 December 2018, carried out by our specialist longevity team. The mortality assumptions adopted for the 2019 valuation were what we refer to as "best-estimate" assumptions i.e. neither overly-prudent nor overly-optimistic, hence we consider them to be an appropriate starting point for the purposes of this analysis. This will be the main focus of our analysis over the coming sections however we will also consider whether there have been any apparent changes in the pattern of mortality during the pandemic period compared with earlier months.

The mortality assumptions adopted are summarised in the appendix.

Results

Excess deaths

We have considered the level of excess mortality over the period from 1 February 2020 to 31 March 2021 by gender, pension amount and age. We address each of these in turn.

Analysis by gender

The following graph illustrates the number of actual deaths over the pandemic period compared with the number of expected deaths, separately for male and female members, for pensioner members aged between 50 and 95 years.

For males, there were 307 deaths over the period compared with an expected number of 190. This represents an **excess number of deaths of approximately 62%**.

For females, there were 241 deaths over the period compared with an expected number of 214. This represents an **excess number of deaths of approximately 13%**.

On this measure, male pensioners have exhibited a higher rate of mortality than female pensioner members.

We can expand the above analysis to consider the actual amount of pension ceasing over the period compared with the expected amount of pension ceasing due to pensioners no longer being paid (ignoring the fact that a dependant pension may then be due). This is particularly relevant when considering the cost impact, as the cost will be driven ultimately by the amount of pension in the Fund that remains to be funded rather than the number of individual members i.e. all else being equal, the death of a member with a relatively high pension will have a more financially significant impact than the death of a member with a relatively low pension.

Analysis by pension amount ceasing is illustrated by the following graph:

For males, total pension ceasing on death over the period amounted to £2,094k compared with an expected amount of £1,508k. This represents an **excess of 39%.**

For females, total pension ceasing on death over the period amounted to £844k compared with an expected amount of £697k. This represents an **excess of 21%**.

On this measure, male pensioners also exhibit excess mortality which is significantly higher than that of female pensioners.

For reasons explained above, our analysis compares actual mortality over the period with that observed in the Fund over recent years, rather than with the period immediately preceding the pandemic, so it does not necessarily follow that these results are entirely due to the impact of COVID-19 in isolation. However, a crude comparison of the amount of pension ceasing during the investigation period with that ceasing in the preceding months suggests that excess pension ceasing has indeed been higher for male members.

Therefore, it appears from the data that the pandemic has given rise to a significantly increased mortality bias towards male pensioners.

Analysis by pension amount

Below, we consider the distribution of deaths over the period from 1 February 2020 to 31 March 2021 by pension amount. In addition, in order to investigate any differing trends due to the onset of the pandemic, we have illustrated the distribution of deaths in the period from 1 April 2019 to 31 January 2020.
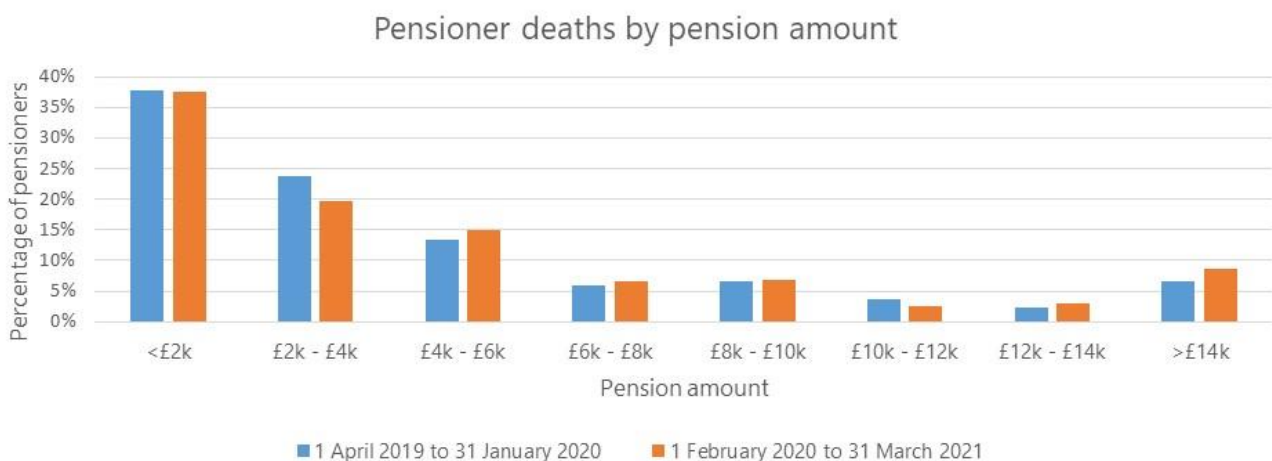
Two thirds of pensioners who died over the period from 1 February 2020 to 31 March 2021 were in receipt of a pension **lower than the Fund's average** level of pension which is £5k p.a. and **around one third** were in receipt of a pension **lower than £2k p.a**. The average pension ceasing was £5.3k p.a., which is slightly higher than the overall average pension amount for the Fund, showing that there were some large pensions ceasing in the pandemic period; however on a case by case basis it was more often smaller amounts ceasing (as two thirds had pensions of less than the average level).

The graph does not show any clear change in trend with regard to the proportion of pension ceasing in each band during the pandemic period compared with earlier months. It does however help to illustrate that even in "normal" times it is not unusual for higher mortality to be associated with lower pension amounts. Intuitively, we may expect an individual with a higher income to perhaps be able to afford a higher quality of lifestyle, thus providing relatively higher health benefits which increase the chances of survival.

Overall however, based on data for the period to 31 March 2021, there is no clear evidence that the pandemic has given rise to a differential mortality bias with respect to pension amount.

Analysis by age

The following graph shows the actual amount of pension ceasing within six different age bands (ignoring deaths outside of these ranges for the purposes of this analysis) and compares them with the expected amounts.
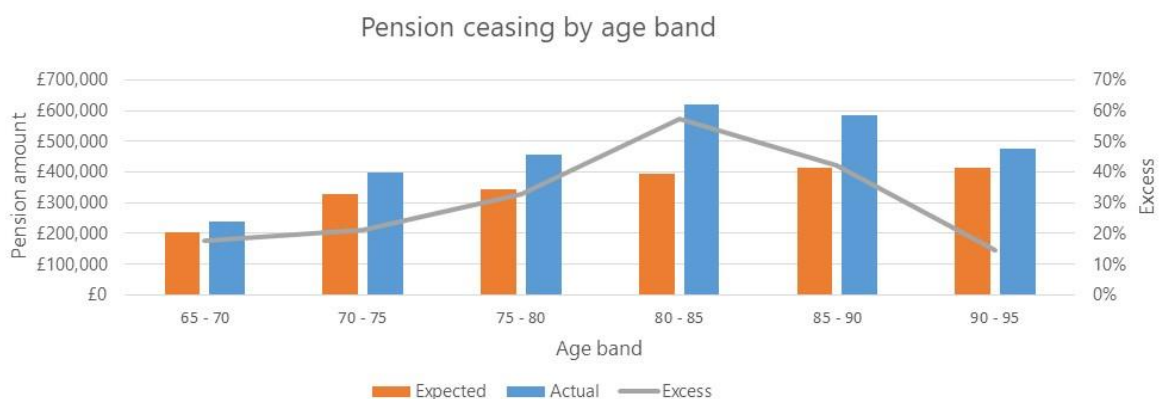
The graph shows that there has been **higher than expected mortality across all pensioner age bands analysed.** Excess deaths were highest for the 80 - 85 age band, where the amount of pension ceasing was around 60% more than expected.

We have insufficient data to break down our analysis into "reason for death", which may have produced a firmer trend more in line with the general view that deaths related to COVID-19 increase with age, although this may also produce further volatility due to the smaller data set.

The average age of pensioner death was 80, in both the period immediately prior to the pandemic and in the period following the onset of the pandemic.

Impact on costs

The excess mortality observed over the period from 1 February 2020 to 31 March 2021 is, all else being equal, expected to lead to a reduction in pension liabilities, as funding is no longer required in respect of the benefits which have ceased. We have estimated the impact on the Fund using assumptions equal to those used at the 2019 valuation, which are summarised in the appendix.

The results of our estimates are that excess mortality has led to a reduction in liabilities of **£12.6m**. To put this in context, this figure relative to the liabilities calculated at the Fund's 2019 valuation represents **0.8% of pensioner liabilities** and **0.4% of total liabilities**.

These results are sensitive to the assumptions used. For example, reducing the discount rate by 0.1% p.a. has the effect of increasing the reduction in liabilities by around 1% in relative terms.

Please note that there may be other impacts on costs not directly related to funding, for example an increase in administration costs which we have not considered here. There will also be an impact on cashflow due to the larger number of death grants required which we have also not considered here.

Conclusions and final comments

Our calculations suggest that over the 14 month period to 31 March 2021 higher mortality than expected has been observed for both male and female pensioners and across all age bands. Excess mortality was found to be higher for males than females. The highest excess mortality was observed in the 80 – 85 age band.

There was no clear evidence that the onset of the COVID-19 pandemic has led to a different pattern of mortality by pension amount, perhaps suggesting that the relative level of a member's income does not provide a significant advantage in surviving an infection of the virus.
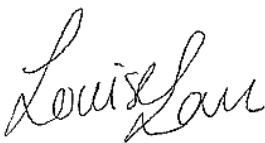
The excess mortality that has been observed will, all else being equal, lead to a reduction in liabilities, although our calculations suggest that this reduction is fairly small in the context of the total liabilities that require to be funded. Of course, there remains the possibility of future waves of viral infection which could lead to further excess mortality and hence higher cumulative savings emerging over time. We have not looked at the impact on active members or deferred members who generally have higher levels of liabilities (as they are assumed to be in the Fund for longer) and therefore changes to their mortality experience would have a comparatively high effect.

Furthermore, the long-term health impact on those individuals that have survived initial infection is unknown, as is the level and duration of immunity (if any) to future re-infection. It is possible these factors, alongside prevalence of the virus in the community and the possible emergence of new strains, could have a significant effect on excess mortality levels in future.

However, it is also possible that the number of deaths has just been brought forward in time and that over the short term, in the future, we could see lower levels of mortality, balancing out the increased mortality in recent months.

This year will see the 2022 valuations for English and Welsh LGPS Funds. Funding results will be subject to a wide range of influences, however, in relation to the impact of mortality over the triennial period, we expect this will have the effect of improving the funding position.

We hope that the above is helpful and would be happy to answer any queries you may have.

Louise Lau FFA
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Appendix   Data, methods and assumptions

Data

We were provided with the following pieces of data from the Fund:

- A pensioner Universal Data Extract (UDE) which contains the pensioner records held by the Fund, including details of deaths which have occurred during the period from 1 April 2019 to 31 March 2021.
- An additional pension payroll extract from the Fund's pensioner payroll system as at 31 March 2021 which set out the current pensions in payment to pensioner members.
- An additional withdrawals report which sets out member movements since 11 February 2019.

The data has been checked for reasonableness and we are happy that the data is sufficient for the purposes of this advice.

Our analysis is based on the current pensioner members as set out in the Fund's pensioner payroll extract. In addition, we include any pensioner records which have ceased over the period due to death. To determine these deaths, we have used the information provided in the Fund's pensioner UDE which identifies where a pensioner record has ceased due to death. In addition, we have used the withdrawals report to identify any records where a member was a pensioner at the 2019 valuation and has since died, but is not already identified through the pensioner UDE.

Please note that the withdrawals report held details of 119 records where the member was active or deferred at the 2019 valuation and they have since died in the period from 1 April 2019 to 31 March 2021. These members are not listed in the Fund's pensioner UDE and therefore we do not expect these members were pensioners prior to death. Therefore, we have excluded these records from our analysis.

Methods and assumptions

For the purposes of assessing the cost impact, we have used the 2019 valuation assumptions adopted by the Fund as set out in the valuation report and Funding Strategy Statement. Using the assumptions set out below we estimate the future cashflows paid from the Fund throughout the future lifetime of existing pensioners. We then discount these projected cashflows using the discount rate to obtain the present value of the members' benefits.

The assumptions adopted for our calculations are summarised as follows:

Key assumptions	
CPI inflation	2.6% p.a.
Discount rate	5.0% p.a.
Post retirement mortality	Male / Female
Member base tables	S3PA
Mortality multiplier	90% / 100%
Projection model	CMI 2018
Long-term rate of improvement	1.25% p.a.
Smoothing parameter	7.5
Initial addition parameter	0.5% p.a.

The discount rate assumption is set with reference to the Fund's long-term investment strategy and therefore reflects the long-term expected return on assets for the Fund. Consistent with the method adopted for the 31 March 2019 valuation, we have included in the discount rate assumption an explicit prudence allowance of 0.2%.

Full details of the demographic and other assumptions adopted as well as details of the derivation of the financial assumptions used can be found in the 2019 valuation report and the funding strategy statement, both of which are available on request.

Full details of the benefits being valued are as set out in the Regulations as amended and summarised on the LGPS website.