Government Actuary's Department

Local Government Pension Scheme: England and Wales (LGPS (E&W))

Advice on assumptions

Actuarial valuation as at 31 March 2020

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29 February 2024

Assumptions setting process

1 → **2** → **3** → **4** → **5**

Current (5)

1. GAD analyse experience data and prepare an initial set of recommended 'scheme-set' assumptions.
2. GAD discuss recommended assumptions with Department for Levelling Up, Housing and Communities.
3. GAD discuss recommended assumptions with the Local Government Pension Scheme Advisory Board - England and Wales.
4. GAD present final recommended assumptions to the Secretary of State for Levelling Up, Housing and Communities.
5. Secretary of State for Levelling Up, Housing and Communities decides on the assumptions to be used in our calculations and informs GAD.

Details of our recommended assumptions can be found in Part B of this report.

The purpose of these discussions is to:

- Go through our recommended assumptions to make sure they are reasonable and appropriately reflect scheme experience.
- Provide an opportunity for stakeholders to highlight any relevant additional information they hold which could impact our recommendations.

The Secretary of State for Levelling Up, Housing and Communities has ultimate responsibility for setting the 'scheme-set' assumptions covered in this report, after considering GAD's advice.

The Secretary of State for Levelling Up, Housing and Communities has decided to adopt all of the recommended 'scheme-set' assumptions set out in this report.

Highlights

	Scheme-set assumptions	Our recommendations	
	Importance relative to scheme-set assumptions	**Size of recommended changes**	**Impact of recommended changes on scheme costs**
Mortality after retirement	Most	Small	Lower costs
Proportion commuted	Average	Medium	Lower costs
Retirement ages	Average	Small	No impact
Rates of leaving service	Least	High	No impact
Promotional pay increases	Least	None	No impact
Rates of ill-health retirement	Least	None	No impact
Mortality before retirement	Least	None	No impact
Family statistics	Least	None	No impact

This table provides a summary of the scheme-set assumptions and their likely bearing on the valuation results. It is intended to highlight areas of potential focus to aid with the process of deciding on the scheme-set assumptions to be adopted.

These assessments are indicative, rather than precise. More information on the approach used can be found in **Section B1**.

Be aware that several of the most important valuation assumptions do not appear in this table as they will be directed by HM Treasury. The impact of these 'directed' assumptions could be much greater than that of the impact of 'scheme-set' assumptions.

Advice on assumptions

Contents

Any terms that appear in this report in underlined text are defined in the Glossary.

At the Government Actuary's Department (GAD), we seek to achieve a high standard in all our work. We are accredited under the Institute and Faculty of Actuaries' Quality Assurance Scheme. Our website describes the standards we apply.

Part A: Background

Introduction

Who is this report for?

This report is addressed to the Secretary of State for Levelling Up, Housing and Communities. The Directions require the scheme actuary to carry out a robust analysis of the demographic experience of the scheme. The purpose of this report is to provide our analysis, advice and recommendations on the ‘scheme-set’ assumptions to be adopted for the actuarial valuation of the Local Government Pension Scheme: England and Wales as at 31 March 2020 as required.

This report is intended to help the Secretary of State for Levelling Up, Housing and Communities:

- understand the key assumptions about the future that need to be made in order to carry out the valuation
- understand the impact those assumptions can have on the valuation results
- decide on the ‘scheme-set’ assumptions to be adopted.

Why are assumptions important?

Assumptions are estimates of uncertain variables needed to carry out the actuarial valuation of the LGPS (E&W) as at 31 March 2020, in accordance with HM Treasury Directions.

The results of the valuation are critically dependent on the assumptions adopted. If what actually happens in the future turns out to be significantly different to these assumptions, benefit changes could be made when they otherwise wouldn’t be.

Results

Assumptions

Assumptions about the future are used, together with data, to calculate valuation results.

Data

Types of assumptions

What assumptions are needed?

There are 2 main types of assumption:

- **Demographic assumptions.** These focus on member characteristics and help to determine when and for how long benefits are expected to be paid.
- **Financial assumptions.** These focus on financial factors and help to determine how much is expected to be paid to members.

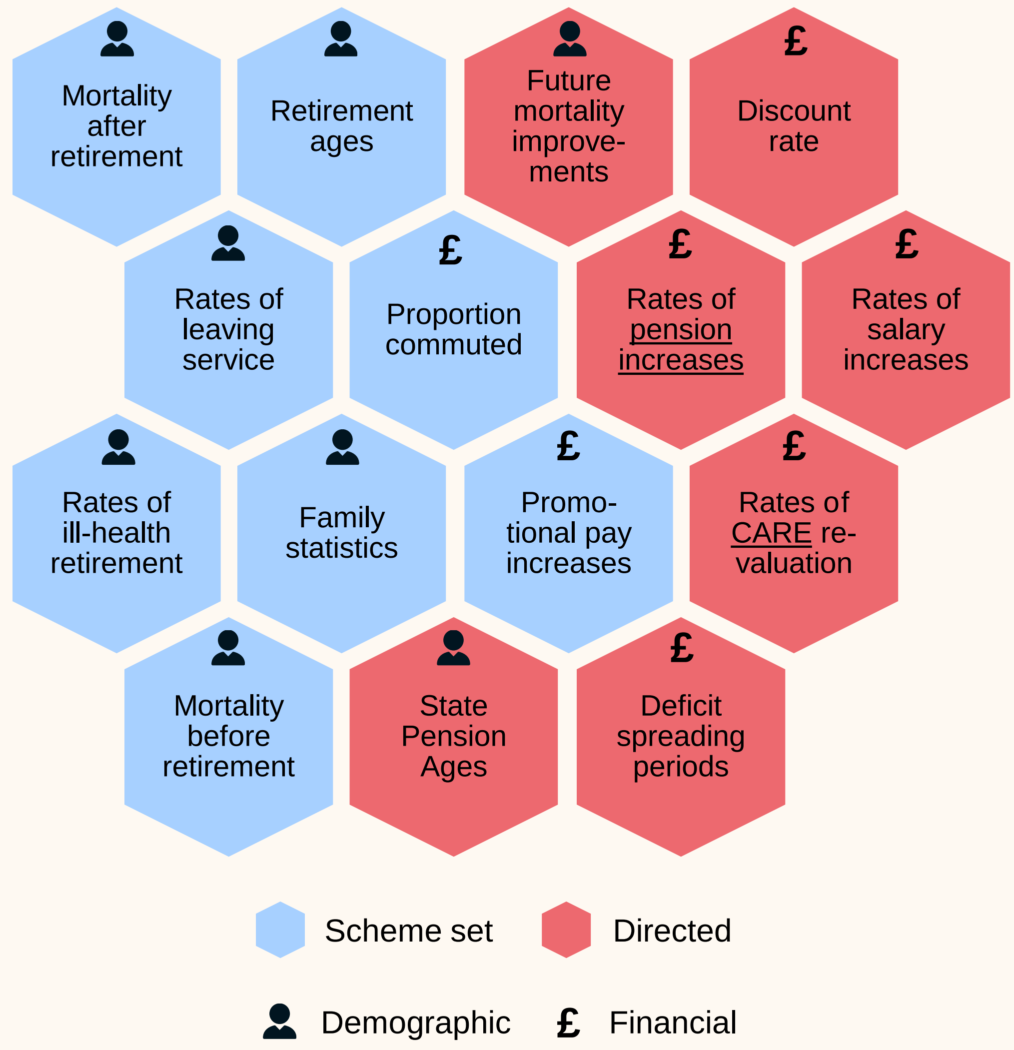
Together these assumptions determine how much needs to be set aside now, in order to meet future payments.

Who is responsible for assumptions?

There are 2 parties responsible for setting assumptions:

- The Secretary of State for Levelling Up, Housing and Communities, who is responsible for setting 'scheme-set' assumptions (after taking actuarial advice). These are usually demographic assumptions.
- HM Treasury, who are responsible for setting 'directed' assumptions through legislation. These are usually financial assumptions.

In this report we focus on scheme-set assumptions, but directed assumptions are included for context. Directed assumptions are shown in Appendix C1.



Demographic assumptions

How are the assumptions used?

Demographic assumptions are used to predict what will happen to the status of members in the future, until their liability in the scheme is extinguished.

The chart to the right shows a simplified set of paths that an active member could follow. Demographic assumptions (shown in circles) are used to determine the likelihood that the member follows any given path.

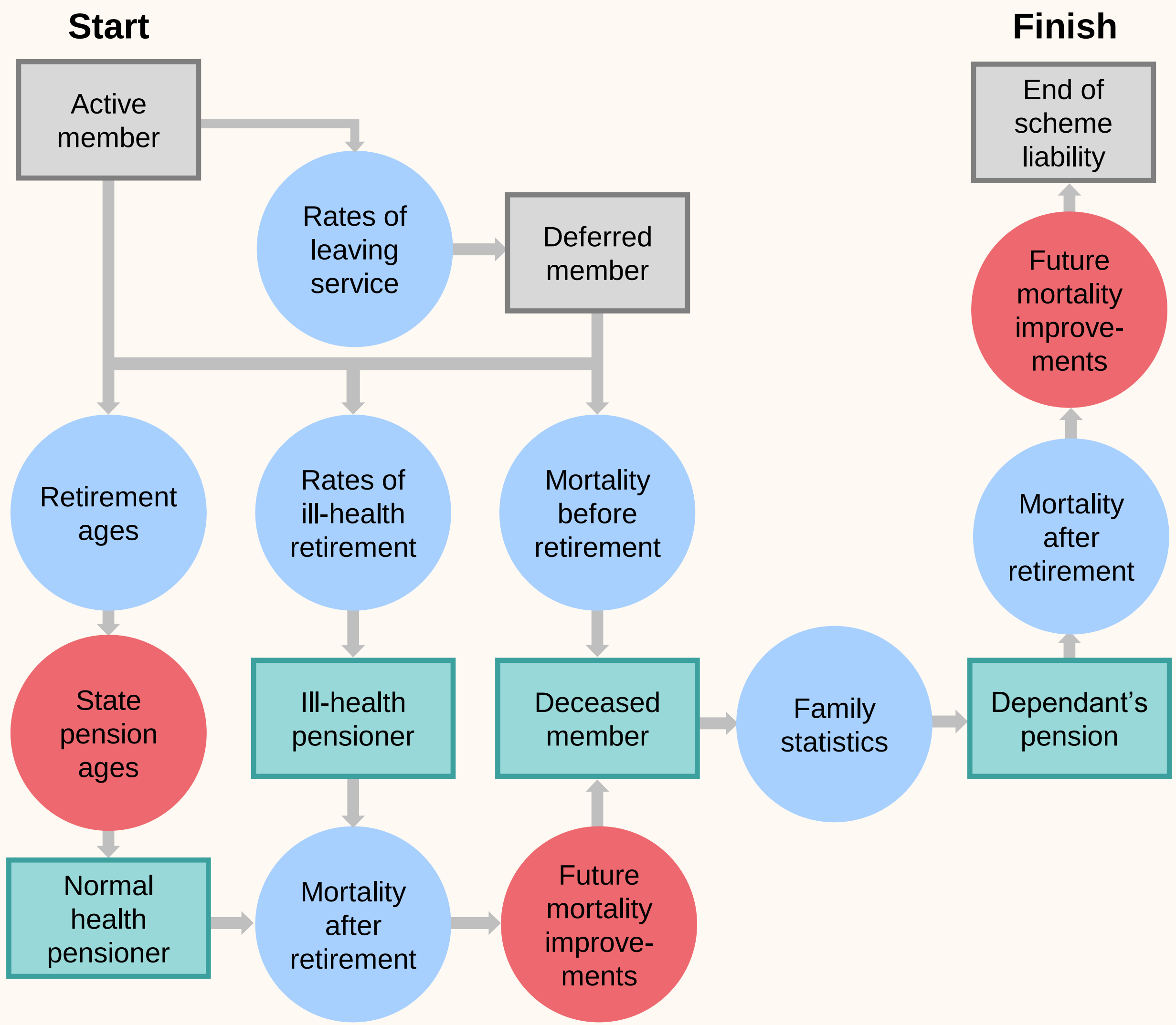
Most demographic assumptions are set by the scheme, rather than directed by HM Treasury.

Member status: **no benefits payable**

Member status: **benefits payable**

Scheme set

Directed



Financial assumptions

How are the assumptions used?

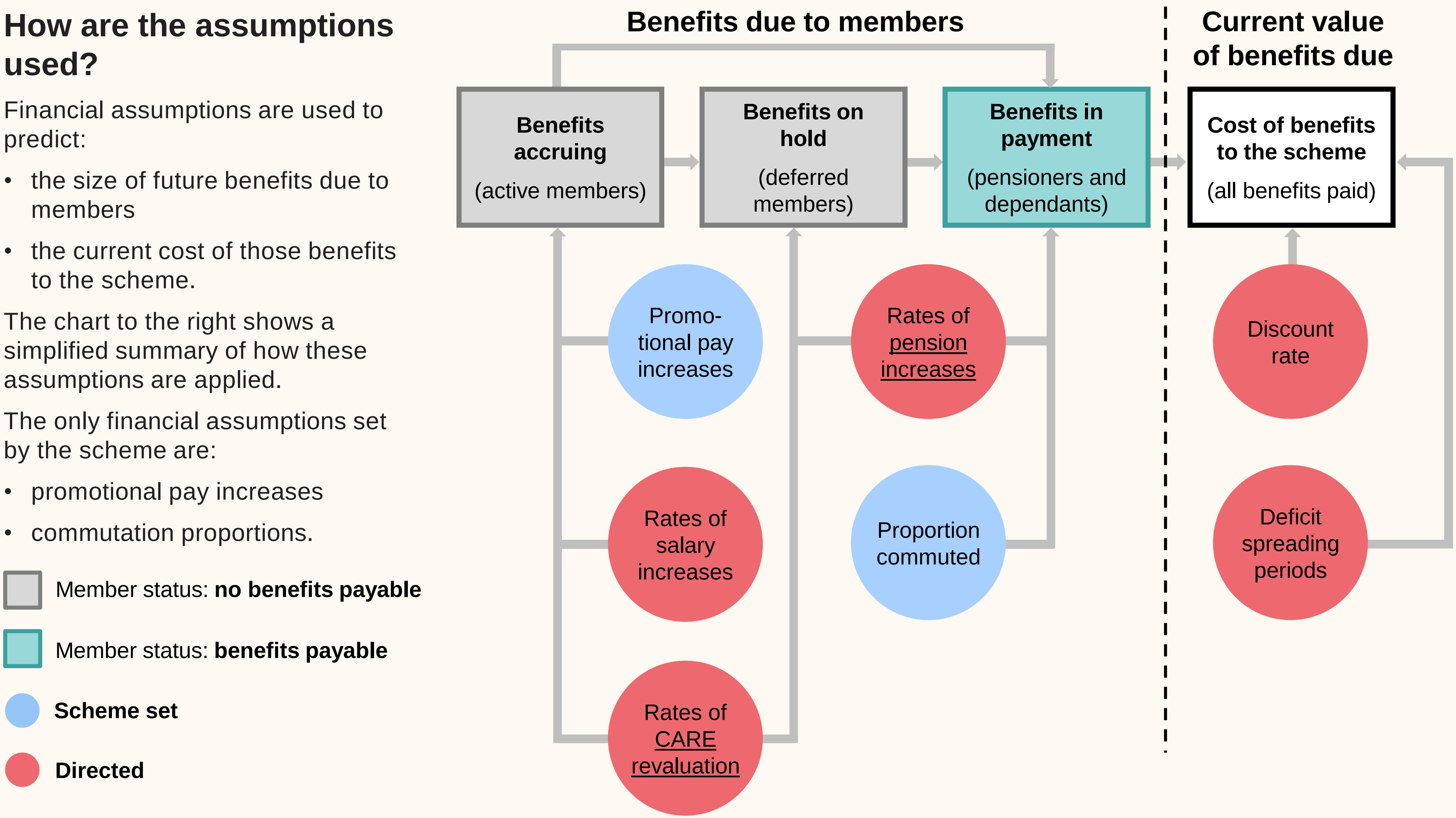
Financial assumptions are used to predict:

- the size of future benefits due to members
- the current cost of those benefits to the scheme.

The chart to the right shows a simplified summary of how these assumptions are applied.

The only financial assumptions set by the scheme are:

- promotional pay increases
- commutation proportions.



Setting assumptions

How are the assumptions decided?

We recommend 'scheme-set' assumptions after considering all relevant information. The picture to the right summarises the 3 main inputs.

The Secretary of State for Levelling Up, Housing and Communities then decides on the 'scheme-set' assumptions to be adopted, after considering GAD's advice.

What rules need to be followed?

HM Treasury Directions specify that 'scheme-set' assumptions must be the Secretary of State for Levelling Up, Housing and Communities' best estimates of future experience. This means they cannot include any margins for prudence or optimism.

The Directions also require that assumptions must consider:

- previous valuation assumptions
- an analysis of demographic experience, where there is enough data to perform such an analysis
- any other relevant data, including anything that only became available after the date of the valuation
- Any emerging evidence about historic or expected future long-term trends.

The assumptions are required to be best-estimate, including an allowance for expected future GDP growth and life expectancy progression.

In our Results report dated 29 February 2024 we also consider three future climate scenarios; their potential impact on valuation assumptions; and how these in turn might impact on the cost of future benefits payable from the scheme.

Impact on the scheme's cost cap cost

Are the same assumptions important for calculating the cost cap cost?

The significance of each assumption on the cost cap cost can be very different to the significance of the same assumption on employer contribution rates. This is because the cost cap process was designed to exclude certain costs.

The chart to the right shows the significance of each assumption on the cost cap cost of the scheme, which itself tends to be lower than the employer contribution rates. This excludes the effect of the economic check.

It's important to be aware that even a small change in an assumption with low significance could result in cost cap thresholds being breached and member benefits being adjusted.

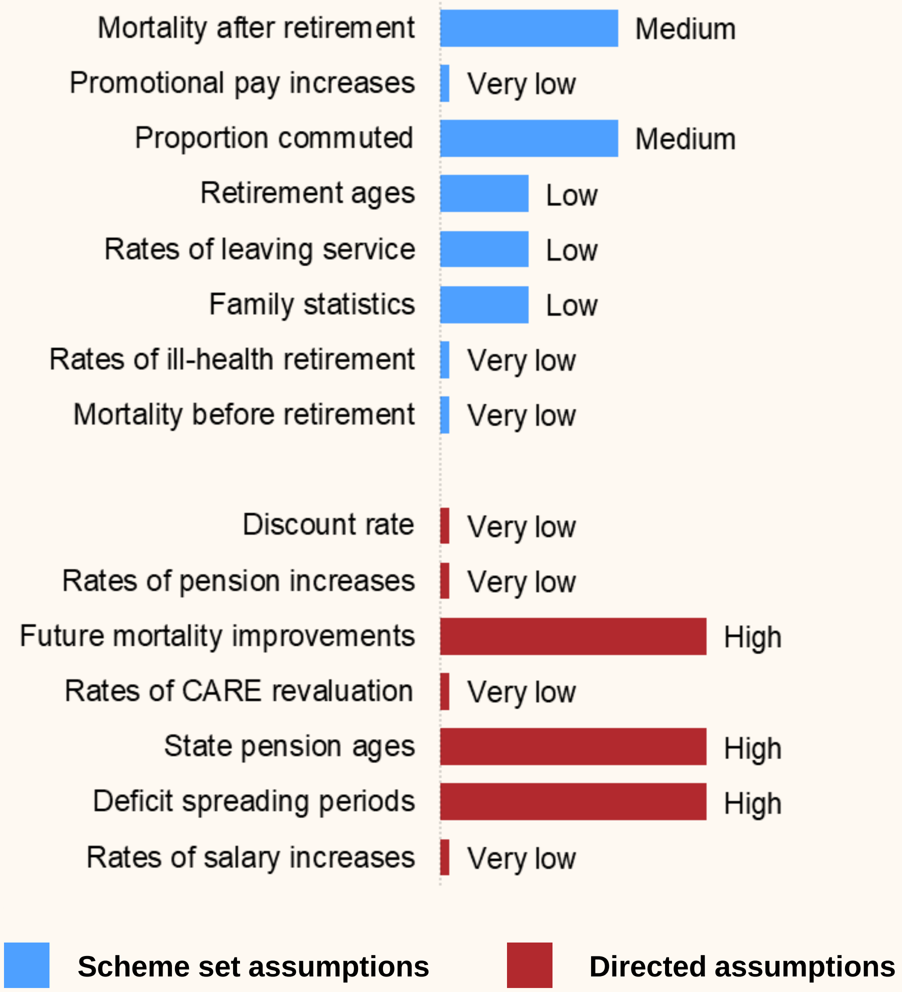
The main differences when compared to the significance of assumptions on the employer contribution rate are:

- Most financial assumptions, such as the discount rate, are not very significant to the cost cap cost
- The significance of directed assumptions (relative to scheme-set assumptions) tends to be lower for the cost cap cost than for employer contribution rates.

For context, the current target cost of the scheme is 14.6% of pensionable pay.

As before, the rankings shown are approximate and are intended as an illustration, not a prediction of potential future changes.

Importance relative to all assumptions



Impact on employer contribution rates

Which assumptions are most important for setting employer contribution rates?

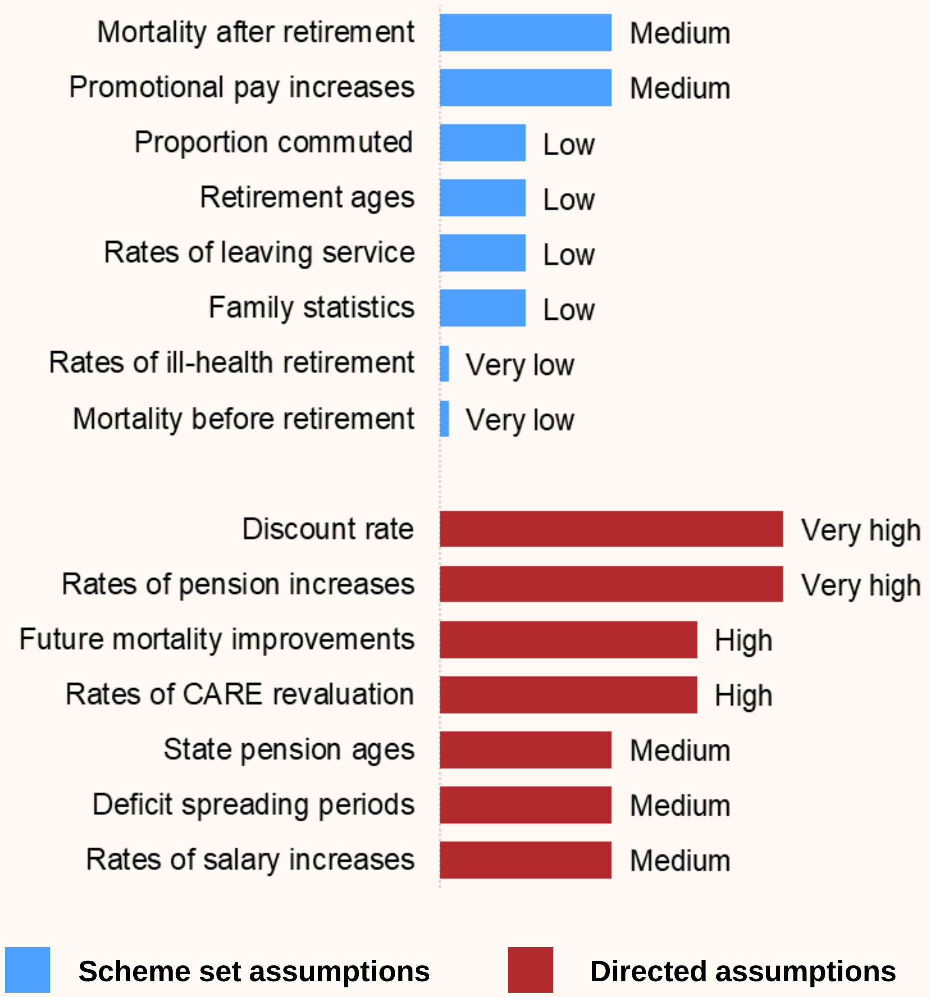
Directions require that the valuation determines a notional rate of employer contributions using the same approach used to determine employer contribution rates for unfunded public service pension schemes. This requirement does not affect actual LGPS employer contributions, which are payable in accordance with the rates and adjustments certificates issued as part of actuarial valuations carried out by an actuary appointed by each administering authority.

The chart to the right shows the importance of each assumption on the notional employer contribution rates, relative to that of other assumptions. For example, the discount rate is shown as very highly significant compared to mortality before retirement. This means that even if the discount rate changes by a small amount, the impact on employer contribution rates could be very large compared to a fairly large change in mortality before retirement.

The rankings shown are approximate and are based on the relative significance of each assumption only. They are intended as an illustration and are not a prediction of potential future changes.

This comparison considers all assumptions and therefore differs to the earlier Highlights summary and the later Summary statistics.

Importance relative to all assumptions



Limitations

Data

In preparing this report, GAD has relied on data and other information supplied by or on behalf of administering authorities, as described in our report titled 'Membership data', dated 29 February 2024. The limitations set out in that report apply equally to this report.

Unless stated otherwise, all data adjustments mentioned in that report apply equally to the data used for setting assumptions. Any additional data adjustments made solely for the purpose of setting assumptions are detailed in this report.

Assumptions

We have used the data provided to analyse the scheme experience and develop our recommended assumptions.

When considering appropriate assumptions, experience usually provides the most reliable evidence.

However, robust analysis of scheme experience will only be possible where there is both sufficient quality, and quantity, of data. The level of reliance that can be placed on assumptions derived from the analysis will also vary depending on these two factors.

Our recommended assumptions are long term and are not suitable for predicting short term future experience.

Sharing

This report has been prepared for the use of the Secretary of State for Levelling Up, Housing and Communities. This report will be published as part of completing the 2020 valuation of the scheme, and we are content for the Secretary of State for Levelling Up, Housing and Communities to release this report to third parties, provided:

- It is released in full;
- The advice is not quoted selectively or partially;
- GAD is identified as the source of the report, and;
- GAD is notified of such release.

Other than the Secretary of State for Levelling Up, Housing and Communities and the Department for Levelling Up, Housing and Communities, no person or third party is entitled to place any reliance on the contents of this report, except to any extent explicitly stated herein. GAD has no liability to any person or third party for any action taken or for any failure to act, either in whole or in part, on the basis of this report.

Compliance statement:

This report has been prepared in accordance with the applicable Technical Actuarial Standards: TAS 100 and TAS 300 issued by the Financial Reporting Council (FRC). The FRC sets technical standards for actuarial work in the UK.

Part B: Recommendations

B1. Summary

Summary statistics

Scheme-set assumptions	Assumption information		Our recommendations	
	Importance relative to scheme-set assumptions	**Volatility of experience and unreliability of data**	**Size of recommended change**	**Impact of recommended changes on scheme costs**
Mortality after retirement	Most	Low	Small	Lower costs
Proportion commuted	Average	Medium	Medium	Lower costs
Retirement ages	Average	Low	Small	No impact
Rates of leaving service	Least	Low	High	No impact
Promotional pay increases	Least	High	None	No impact
Rates of ill-health retirement	Least	Low	None	No impact
Mortality before retirement	Least	Low	None	No impact
Family statistics	Least	Medium	None	No impact

This table provides a summary of the scheme-set assumptions and their likely bearing on the valuation results. It is intended to highlight areas of potential focus to aid with the process of deciding on the scheme-set assumptions to be adopted.

These assessments are indicative, rather than precise. More information on the approach used can be found on the next page.

Be aware that several of the most important valuation assumptions do not appear in this table as they will be directed by HM Treasury. The impact of these 'directed' assumptions could be much greater than that of the impact of 'scheme-set' assumptions.

Interpretation of summary statistics

	Importance relative to scheme-set assumptions	Volatility of experience and unreliability of data	Size of recommended changes	Impact of recommended changes on scheme costs
What does it show?	The importance of this assumption on the cost cap cost (CCC) of the scheme, relative to other scheme-set assumptions	The variability of experience and unreliability of data observed in the past. This can impact the weight we place on current experience.	The size of change we recommend, relative to the assumptions used at the last valuation.	The likelihood of our recommendations leading to higher or lower cost cap cost (CCC) of the scheme
What is it based on?	Our actuarial judgement and the sensitivity analysis carried out at the last valuation.	Public service pension scheme experience at previous valuations	Assumptions recommended at this valuation and those used at the last valuation.	Our actuarial judgement and the sensitivity analysis carried out at the last valuation.
What are the possible ratings?	**Most** An assumption that could plausibly impact the CCC by more than 1%. **Average** An assumption with an impact in between most and least. **Least** An assumption that could plausibly impact the CCC by less than 0.2%.	**High** A current or previous lack of credible data, or large changes in member behaviour. **Medium** Volatility of experience or unreliability of data classified in between high and low. **Low** A large pool of credible data that doesn't tend to change much.	**Large** An average change in assumption of over 25%. **Medium** An average change in assumption of between 10% and 25%. **Small** or **None** An average change in assumption of between 0% and 10%.	**Higher** CCC likely to be higher. **Lower** CCC likely to be lower. **Uncertain** Likely impact on the CCC is still uncertain. For example, if assumptions for different categories move in different directions. **No impact** Likely to be no material impact on the CCC.

Our focus for LGPS (E&W) is on the cost cap cost of the scheme, as funds set the employer contribution rates individually.

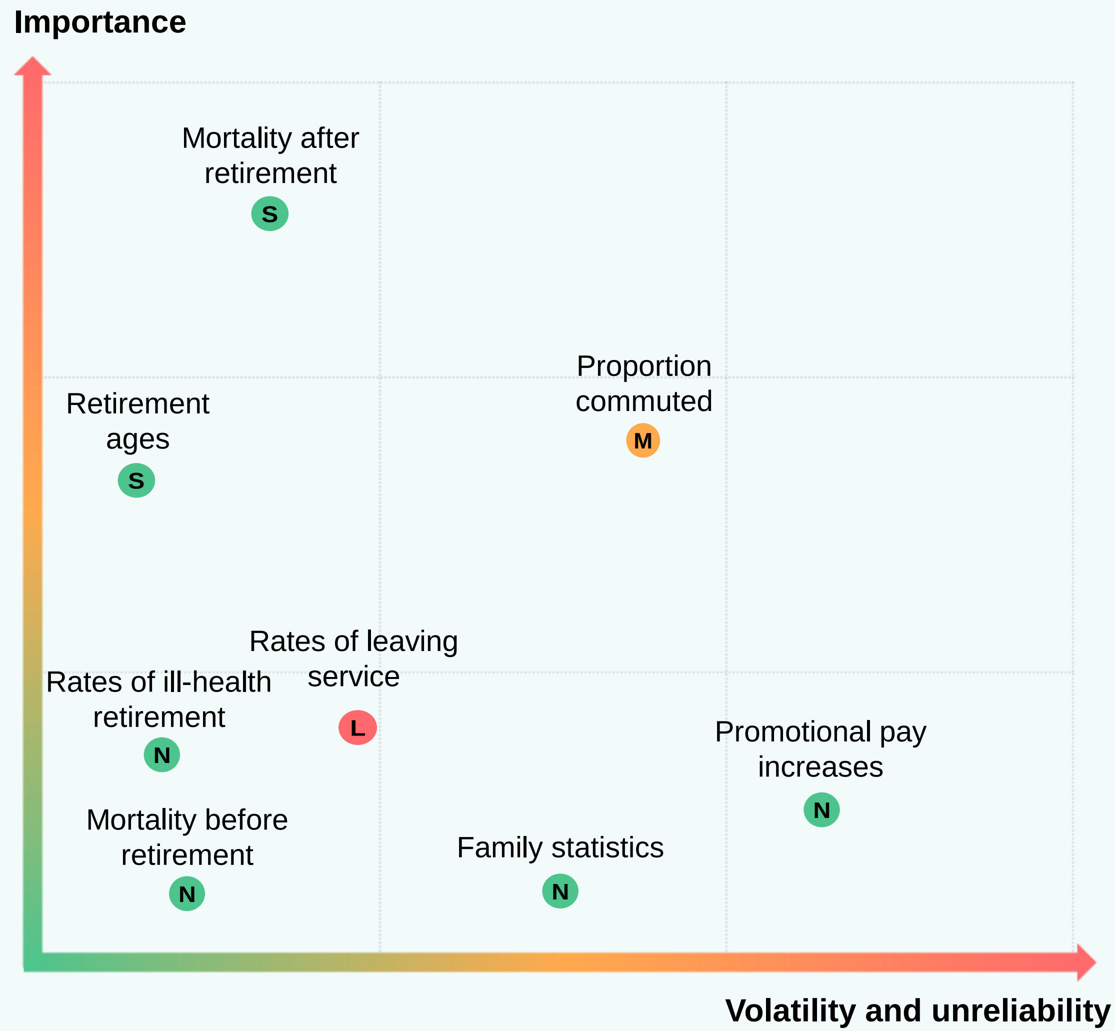
Significance, volatility and size of changes

The diagram to the right shows, for the scheme-set assumptions:

- **Relative importance of assumption.** It's important to pay regard to the more significant assumptions, as any changes can have a big impact. Assumptions placed higher up the page are those that are more significant.
- **Volatility of experience and unreliability of data.** Assumptions placed further to the right of the page are also important to consider, as they are more volatile or have uncertain experience. This means that they are more likely to change substantially.
- **Size of recommended changes.** Larger changes are key as they are more likely to have a large impact on valuation results (although this also depends on how significant the assumption is). The coloured circles signify the size of our recommended change, as specified in the key below.

Key: Size of recommended changes

L Large M Medium S Small N None



B2. Mortality after retirement

Mortality after retirement

What does this assumption represent?

Mortality assumptions are a series of probabilities which represent the likelihood of a member dying at any given age. Different assumptions usually apply to different groups, e.g., for males and females, or normal health or ill-health retirees.

Baseline mortality rates are a scheme-set assumption and are the focus of this section.

Future mortality improvements are a directed assumption, and typically act to reduce baseline mortality rates in future years. They are directed to be in line with the improvements underlying the ONS-2020 population projections, which reflect the latest views on the long-term effect of the COVID-19 pandemic. The rate of improvements can be negative.

Summary statistics

Relative importance of assumption	Volatility of experience and unreliability of data	Size of recommended change	Impact of recommended changes on scheme costs
Most	Low	Small	Lower costs

Our recommendations and rationale

We recommend updating the baseline mortality rates, using an equal allowance for recent experience and the 2016 assumption to help smooth out volatility. This is consistent with the approach used for the 2016 valuation.

The ONS-2020 population projections allow for the impact of the COVID-19 pandemic, so it would be inappropriate to adjust the baseline mortality assumptions.

Baseline mortality rates are set by adjusting the ‘S3’ standard mortality tables issued in December 2018 by the Continuous Mortality Investigation (CMI). These tables are derived from a larger amount of public service data, and so are more appropriate for the scheme than the ‘S2' tables adopted at the 2016 valuation.

There is a known issue with the unadjusted ‘S3’ standard tables over-estimating life expectancy. However, our approach of fitting the tables to the scheme’s experience negates this issue.

Practical implications

Mortality assumptions can be used to estimate the life expectancy of individual members. Higher life expectancies mean a higher cost of providing benefits, as benefits must be paid for longer periods of time.

The table below shows the impact of our recommended assumptions. For each category shown:

- The **first column** for males and females is the assumption adopted for the 2016 valuation.
- The **middle column** for males and females is the 2016 assumption, but updated to use a valuation date of 2020 and ONS-2020 improvements.
- The **last column** for males and females is the assumption we recommend for the 2020 valuation.

The changes between the first and middle columns show the impact of directed changes to future mortality improvements and the normal passage of time. The changes between the middle and last columns show the impact of our recommended changes to baseline mortality assumptions.

All numbers shown are cohort life expectancies that have been calculated allowing for future mortality improvements.

Life expectancies for normal health pensioners

	Males			**Females**		
	2016 valuation assumption	2016 assumption updated	2020 valuation recommendation	2016 valuation assumption	2016 assumption updated	2020 valuation recommendation
Current pensioners, age 65	87.6	86.8	86.7	90.0	89.3	89.1
Future pensioners, age 45	89.6	88.4	88.3	91.9	90.9	90.6

Recommendations in detail

Category		2016 Assumptions			2020 Recommendations		
		Standard table	**Adjustment**	**Based on**	**Standard table**	**Adjustment**	**Based on**
Normal health pensioners	**Male**	S2NMA	101%	Scheme experience	S3NMA_M	99%	Scheme experience
	Female	S2NFA	92%	Scheme experience	S3NFA_M	96%	Scheme experience
Current and future Ill health pensioners	**Male**	S2IMA	107%	Scheme experience	S3IMA	117%	Scheme experience
	Female	S2IFA	106%	Scheme experience	S3IFA	133%	Scheme experience
Dependants	**Male**	S2NMA	132%	Scheme experience	S3DMA	96%	Scheme experience
	Female	S2NFA	106%	Scheme experience	S3NFA_H	97%	Scheme experience

Details of our 2020 recommendations are set out in a separate document that will be published alongside this report.

Our approach

Analysis

We have analysed the scheme's mortality experience over the period 1 April 2016 to 31 March 2020.

Our analysis has been carried out on an 'amounts' basis (as opposed to a 'lives' basis).

An 'amounts' analysis gives more weight to members with larger pensions, better reflecting the impact they have on scheme costs. A 'lives' analysis on the other hand gives an equal weighting to every member being analysed.

As members with higher pensions tend to live longer, an 'amounts' analysis usually results in lighter mortality assumptions than a 'lives' analysis would, based on the same data.

Setting recommended assumptions

We recommend that all baseline mortality assumptions are based on the 'S3' series of standard tables.

Our general approach is:

- Identify groups of members we would expect to have different life expectancies, for example by gender and by health at retirement.
- Identify the most appropriate 'S3' table for each group. Where we have enough scheme experience, we carry out a series of statistical tests to find tables which best fit recent experience. This is approximate, so we apply judgement to select the most appropriate table.
- The last four years of experience may not accurately reflect the longer-term, so we generally 'smooth out' any excess volatility by setting adjustments based on an equal allowance for recent experience and the 2016 valuation assumptions, which were set using pre-2016 experience.
- Where there is not enough scheme experience, we look at assumptions from other groups of members or other schemes which may have similar experience, adjusted to allow for any available information.

Scheme experience: overall

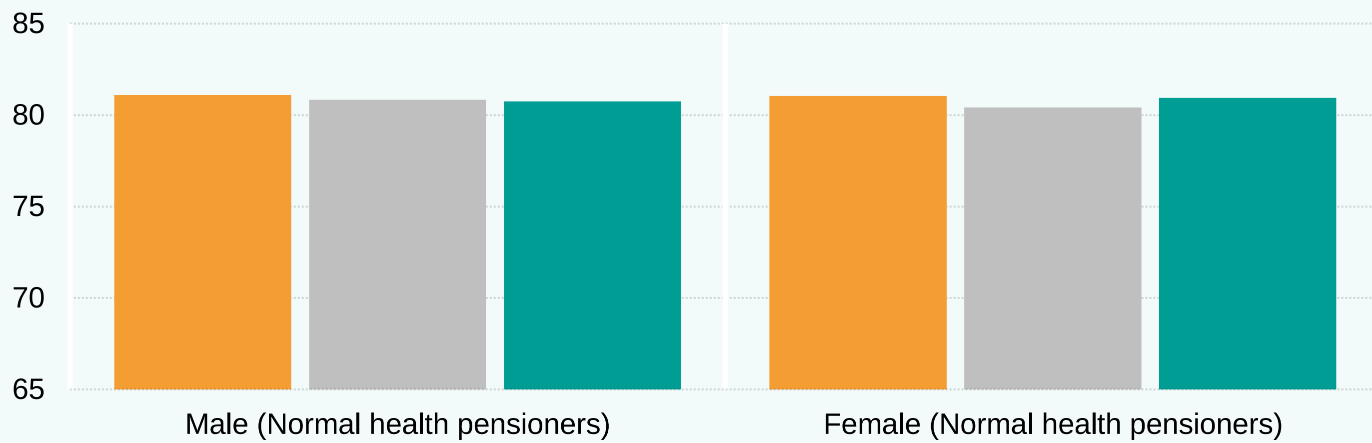
Experience versus expectations show how accurate the assumptions have been in the past and can help inform setting future assumptions.

The chart to the right and those on the following pages compare:

- **actual experience** ( ) on the left – what has happened over the last 4 years.
- **2016 assumptions** ( ) in the middle – what we thought would happen, based on the baseline mortality assumptions adopted for the 2016 valuation. Uses ONS-2020 mortality improvements.
- **2020 recommendations** ( ) on the right – what we would have expected to happen, had our recommended baseline mortality assumptions been adopted for the 2016 valuation. Uses ONS-2020 mortality improvements.

It should be noted that experience can be a very volatile measure for groups with small amounts of data, which then impacts the reliance we place on it.

Experience vs expectations: average age at death



Summary

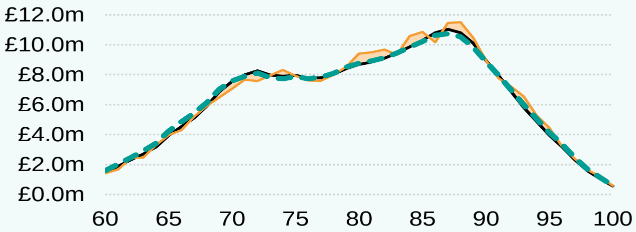
The 2016 assumptions and the 2020 recommendations are largely in line with the baseline mortality experience. This can be seen through the average age at death on the chart above and the distribution of deaths by age shown on the next page.

Updating the baseline mortality assumption has a relatively small effect on the life expectancies, shown previously, which have reduced due to directed future mortality improvements.

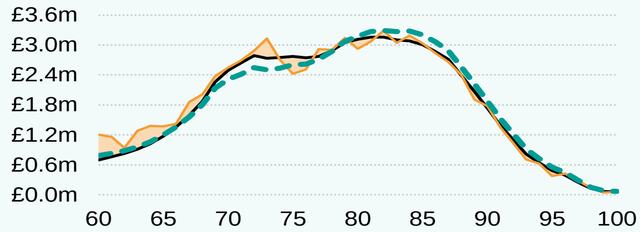
Scheme experience: in detail

Pension ceasing as a result of death by age, split by category

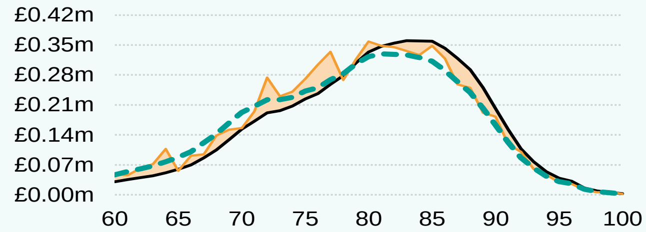
Male - Normal health pensioners



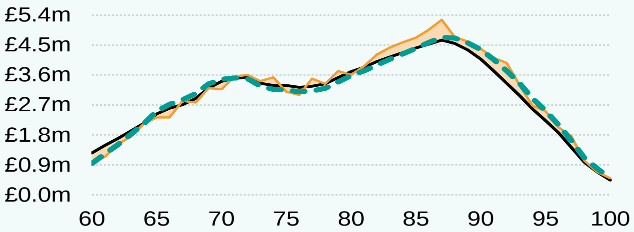
Male - Ill health pensioners



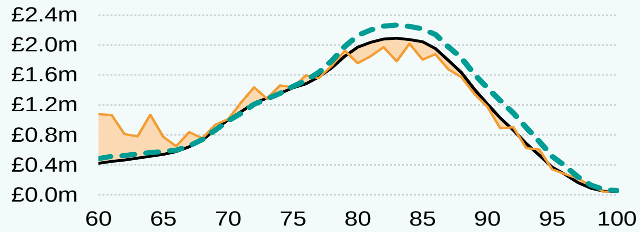
Male - Dependants



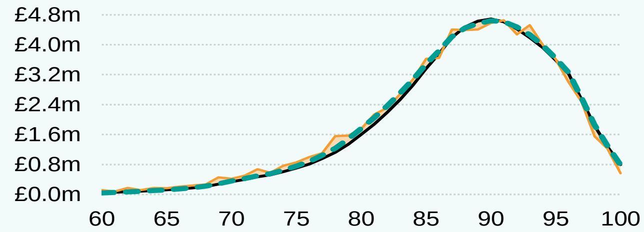
Female - Normal health pensioners



Female - Ill health pensioners



Female - Dependants



Key: **2016 assumptions** **2020 recommendations** **Experience** (line) and difference from 2016 assumptions (shaded area)

Scheme experience: in numbers

Category		**Experience** Actual pension ceasing due to death over 2016-2020	**2016 Expectations** Pension expected to cease under the 2016 assumptions	**Experience ÷ 2016 Expectations**	**2020 Expectations** Pension expected to cease under the 2020 recommendations	**Experience ÷ 2020 Expectations**
Normal health pensioners	**Males**	£270 m	£266 m	101.5%	£268 m	100.7%
	Females	£129 m	£125 m	103.0%	£126 m	102.0%
Current ill health pensioners	**Males**	£86 m	£79 m	108.9%	£81 m	106.0%
	Females	£57 m	£47 m	121.2%	£52 m	110.5%
Dependants	**Males**	£7 m	£7 m	104.0%	£7 m	103.1%
	Females	£80 m	£77 m	103.5%	£79 m	101.2%

Details of our 2020 recommendations are set out in a separate document that will be published alongside this report.

Wider environment: COVID-19

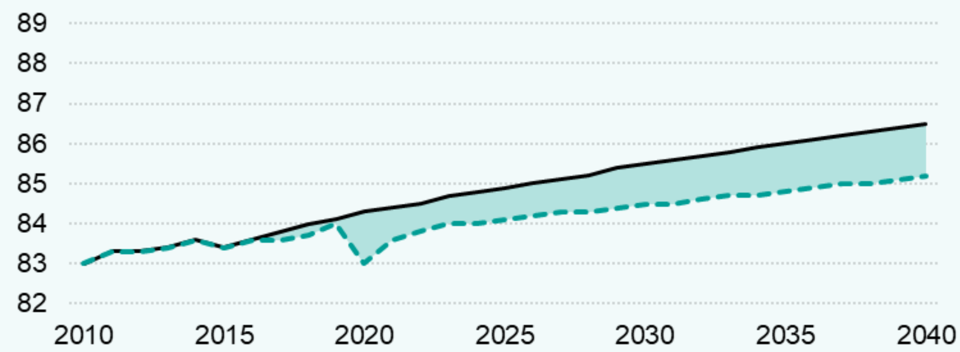
No explicit allowance has been made for the COVID-19 pandemic in our recommended assumptions for **baseline mortality rates**. Our recommendations are based on scheme experience up to 2020 so will only have included deaths from the very start of the pandemic. We do not expect these deaths to have had a material impact on our recommendations.

However, an explicit allowance is included in assumed **future mortality improvements**. These are directed to be in line with the improvements underlying the ONS-2020 population projections.

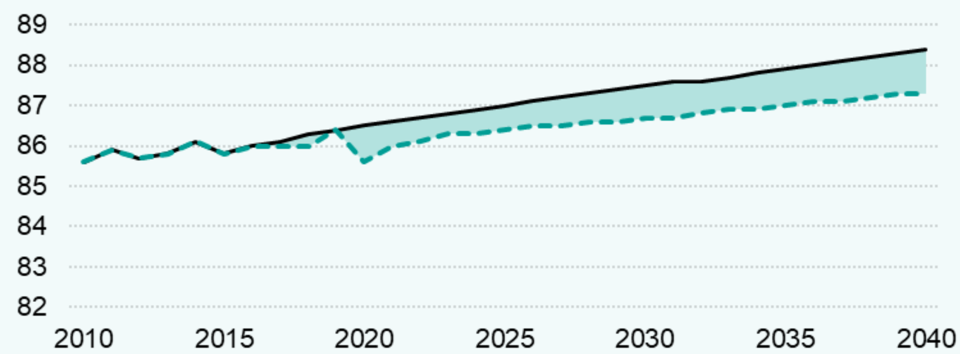
When deriving the ONS-2020 projections, a panel of mortality experts gave their views on the impact of COVID-19 pandemic on mortality rates in the short term. Based on this, short term adjustments were made to the 2019 to 2024 period to allow for estimated deaths in 2021 and an averaging of the experts' views on estimated improvements by age group over this period. Long term rates of future mortality improvement are not projected to change as a result of COVID-19.

The charts on this page show the impact of the ONS-2020 projections on future life expectancies for a typical UK male and UK female, aged 65. There is a clear drop in life expectancies in 2020 as result of the COVID-19 pandemic. In the longer term, even though mortality is expected to start improving again, the 2020 drop means we start from a lower baseline and the impact of COVID-19 will be with us long into the future.

Life expectancies for UK males, aged 65



Life expectancies for UK females, aged 65



Key:

Based on **ONS-2016 projections**, which were adopted for the 2016 valuation

Based on **ONS-2020 projections** (dotted line) and difference from the 2016 projections (shaded area)

B3. Proportion commuted

Proportion commuted

What does this assumption represent?

The proportion commuted represents the fraction of pension that members give up at retirement, in return for a single tax-free lump sum payment (subject to HMRC tax limits).

Commutation is a scheme-set assumption for this valuation. In the 2016 valuation, it was scheme-set for some groups of members and directed for other groups.

The proportion commuted is an important assumption because the value of the lump sum received is often less than the value of the pension given up. Higher proportions commuted therefore tend to lead to lower scheme costs.

The lump sum is typically calculated using a commutation rate of £12 lump sum for every £1 of annual pension given up. The commutation rate is not being reviewed in this valuation.

Summary statistics

Relative importance of assumption	Volatility of experience and unreliability of data	Size of recommended change	Impact of recommended changes on scheme costs
Average	Medium	Medium	Lower costs

Our recommendations and rationale

For pre 2008 service which attracts an automatic lump sum of three times pension, we recommend retaining the assumed commutation proportion of 10% since commutation proportions have been broadly in line with those assumed.

For post 2008 service, we recommend increasing the assumed commutation proportion to 20% for all members (compared with a HMT directed assumption of 17.5% at the 2016 valuation). This is based on the scheme's own experience, supplemented with experience from other large schemes (NHS EW, TPS EW and CS GB).

Practical implications

Commutation can drastically alter the timing and amount of benefit payments for individual members.

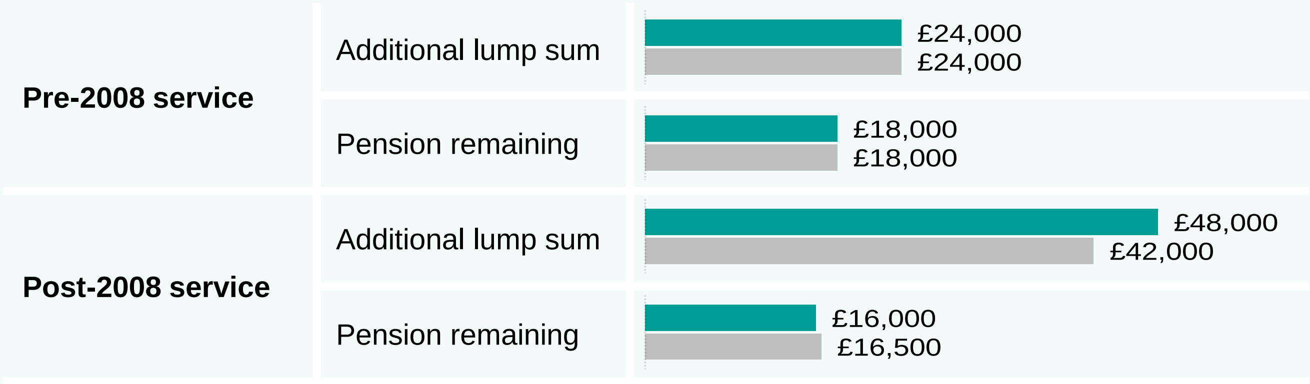
Members choose whether to commute based on their own individual circumstances. For example, their:

- Assessment of their future life expectancy
- Tax circumstances
- Preferences for higher future income vs an immediate lump sum.

The chart to the right shows the impact on assumed benefits of our recommended assumptions. For each category shown:

- The **top line** ( ) shows the impact of the assumptions we recommend for the 2020 valuation.
- The **bottom line** ( ) shows the impact of the assumptions adopted for the 2016 valuation.

Lump sum for a member starting with a £20,000 pension



The Pre-2008 service members also receive an automatic lump sum equal to three times pension before commutation (so £60,000 in the example above).

Our approach

Analysis

We have analysed the scheme's commutation experience over the period 1 April 2016 to 31 March 2020.

Our analysis considered total pension that came into payment and total pension that was commuted and was carried out separately for groups expected to behave differently.

This approach places more weight on members with larger pensions, reflecting the bigger impact they can have on scheme costs.

Setting recommended assumptions

Our general approach is:

- Identify groups of members we would expect to commute in different ways, for example by gender, pension amount and scheme section.
- Compare recent commutation experience against the 2016 valuation assumptions.
- Where there is not enough scheme experience, we look at assumptions from other groups of members or other schemes which may have similar experience, adjusted to allow for any available information
- Recommend a change to the assumption only if evidence points to a material change to the valuation results. In these cases, our recommendation is to fully align the assumption to recent experience, as there is limited evidence for in-year volatility.
- We make no explicit allowance for HMRC limits, which already influence member behaviours, or for the McCloud judgment as this is unlikely have a significant impact on members' commutation choices.

In practice, members with both pre 2008 and post 2008 pension do not choose which part of their pension to commute. In order to analyse the pre 2008 pension commuted we need to make an assumption about the amount of post 2008 pension being commuted. We have assumed that members with both pre and post 2008 service will commute the same proportion of post 2008 pension to those with only post 2008 pension. The assumption we have used is based on the 2016-20 experience for post 2008 service only.

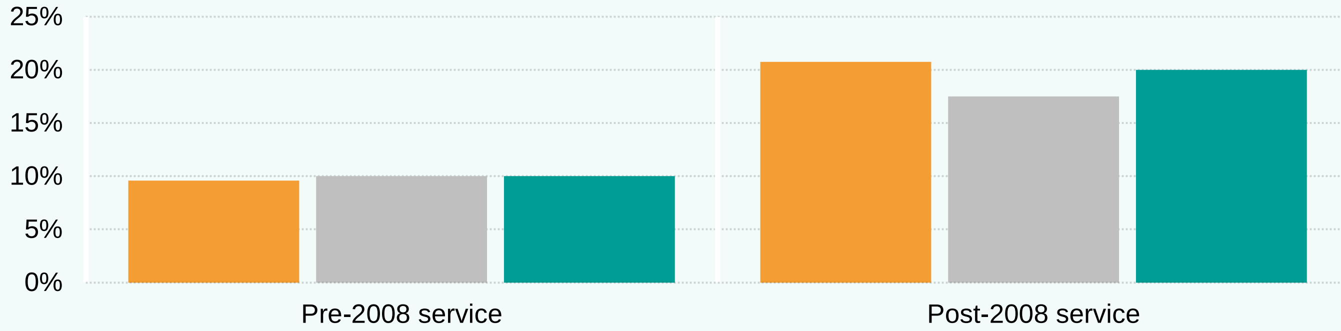
Scheme experience: overall

Experience versus expectations show how accurate the assumptions have been in the past and can help inform setting future assumptions.

- **actual experience** ( ) on the left – what has happened over the last 4 years.
- **2016 assumptions** ( ) in the middle – what we thought would happen, based on the assumptions adopted for the 2016 valuation.
- **2020 recommendations** ( ) on the right – what we would have expected to happen, had our recommended assumptions for the 2020 valuation been adopted for the 2016 valuation.

It should be noted that experience can be a very volatile measure for groups with small amounts of data, which then impacts the reliance we place on it.

Experience vs expectations



Summary

The pre 2008 service members have seen a similar proportion of commutation in recent years compared to the 2016 assumption, as shown above. Therefore, no change has been made to this assumption.

The post 2008 service members have seen a higher proportion of commutation in recent years compared to the 2016 assumption. However, this is over a small number of retirements. Considering both the post 2008 service members experience and other large schemes commutation experience the proportion of commutation has been 20% on average.

Scheme experience: in numbers

Category	Total pension coming into payment over 2016-2020 (before commutation)	Total pension commuted over 2016-2020	**Experience** Proportion of pension commuted over 2016-2020 (weighted by pension amount)	**2016 Expectations** Proportion of pension expected to be commuted under the 2016 assumptions	**2020 Expectations** Proportion of pension expected to be commuted under the 2020 assumptions
Pre-2008 service	£792 m	£76 m	9.6%	10.0%	10.0%
Post-2008 service	£88 m	£18 m	20.8%	17.5%**	20.0%
Other large public service schemes*	£167 m	£32 m	19.0%	17.5%**	20.0%

*Other large public service schemes data includes data from National Health Service Pension Scheme (England and Wales) – 2008 section, Civil Service Pension Scheme (GB) – Non-Classic schemes, Teachers' Pension Scheme (England and Wales) – NPA 65 section.

** This assumption was previously HMT directed at the 2016 valuation

Details of our 2020 recommendations are set out in a separate document that will be published alongside this report.

B4. Retirement ages

Retirement ages

What does this assumption represent?

Retirement age assumptions are a series of probabilities which represent the likelihood of a member retiring and claiming their pension at any given age.

Different assumptions usually apply to groups who are expected to behave differently, e.g., for members with different Normal Pension Ages (NPA) and Critical Retirement Age (CRA). CRA is when a member meets the Rule of 85.

Retirement age affects:

- The benefits members receive e.g. earlier retirement ages for active members means lower benefits, as members will have built up those benefits over a shorter period of time.
- The length of time benefits will be paid for – although in most schemes this impact is offset by early retirement reductions and late retirement uplifts.

Summary statistics

Relative importance of assumption	Volatility of experience and unreliability of data	Size of recommended change	Impact of recommended changes on scheme costs
Average	Low	Small	No impact

Our recommendations and rationale

Actual retirement experience for the CRA 65 category was reasonably close to the expected position at most ages, therefore, we recommend no change to the current assumptions.

However, the CRA 60 scheme expected has not been as close to experience, especially around age 60 with lower rates than expected. Therefore, we propose to update this assumption to allow for recent scheme experience by making equal allowance for recent experience and the 2016 valuation assumptions.

CRA61-64 assumptions are derived by combining CRA60 and CRA65 assumptions. Younger members with CRA 60 and CRA61-64 are assumed to retire later than their older counterparts, reflecting a greater amount of service in the 2014 scheme with later Normal Pension Age.

We recommend no change to the retirement assumptions due to the McCloud judgment. This could result in more members with post-2014 service receiving a final salary underpin (with 2008 scheme NPA) for up to 8 years' service. However, allowance for this judgment within our assumption will not have a material impact on the valuation results and would rely on spurious predictions of future behaviour of members.

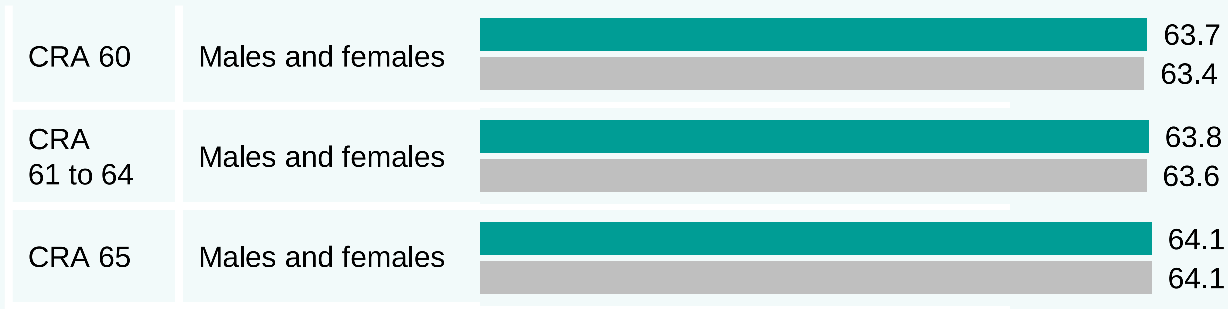
Practical implications

The chart to the right shows the impact of our recommended assumptions. For each category shown:

- The **top line** ( ) shows the impact of the assumptions we recommend for the 2020 valuation.
- The **bottom line** ( ) shows the impact of the assumptions adopted for the 2016 valuation.

The numbers shown in this example assume that members retire from active service. No allowance is made for the possibility of ill-health retirement, leaving service before retirement, or death in service. These assumptions are covered in other sections.

Expected retirement age for members now aged 45



Our approach

Analysis

We have analysed the scheme's retirement experience over the period 1 April 2016 to 31 March 2020.

This analysis is based on active members of the scheme. Deferred members are not analysed and are assumed to retire at their Normal Pension Age.

Setting recommended assumptions

Our general approach is:

- Identify groups of members we would expect to have different retirement patterns, for example by gender and scheme section.
- Compare recent retirement experience against the 2016 assumptions.
- Where there is not enough scheme experience, we look at assumptions from other groups of members or other schemes which may have similar experience, adjusted to allow for any available information.
- Recommend that the assumption is updated only if evidence points to a material change to the valuation results.
- We typically only recommend a change to the assumed number of retirements, leaving the age profile of the existing assumption unaltered. We only recommend a change to the age profile if we see evidence of a material and non-temporary step change in membership behaviour.
- The last four years of experience may not accurately reflect the longer-term, so if we recommend a change we generally 'smooth out' any excess volatility by basing our recommendation on an equal allowance for recent experience and the 2016 valuations assumptions, which were in turn set using pre-2016 experience.

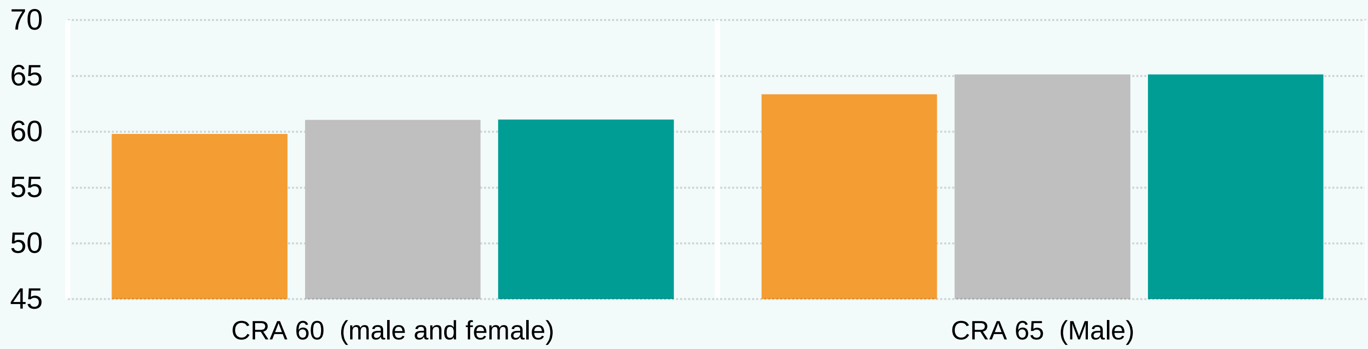
Scheme experience: overall

Experience versus expectations show how accurate the assumptions have been in the past and can help inform setting future assumptions.

- **actual experience** ( ) on the left – what has happened over the last 4 years.
- **2016 assumptions** ( ) in the middle – what we thought would happen, based on the assumptions adopted for the 2016 valuation.
- **2020 recommendations** ( ) on the right – what we would have expected to happen, had our recommended assumptions for the 2020 valuation been adopted for the 2016 valuation.

It should be noted that experience can be a very volatile measure for groups with small amounts of data, which then impacts the reliance we place on it.

Experience vs expectations: average retirement ages



Summary

Members have been retiring very much in line with rates assumed for the 2016 valuation. The average age of recent retirements are close to the 2016 assumptions, as shown above. The number of retirements are also close to the 2016 assumptions, as shown on the next page.

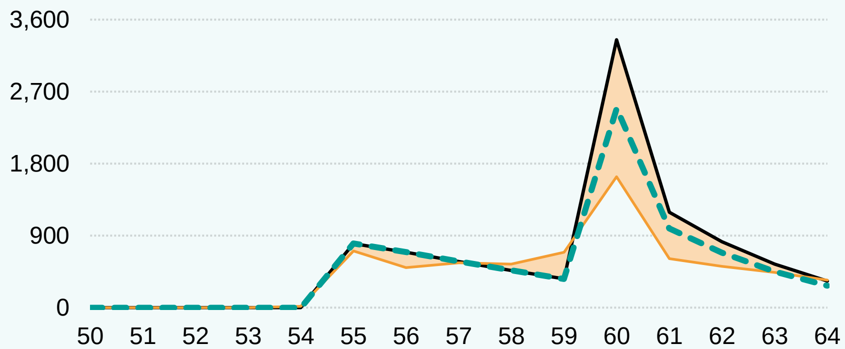
However, there have been less retirement of members in the CRA60 category at age 60 which we have proposed to update for. Although not easily visible in the chart above this has led to a very marginal increase in the average expected retirement age.

There is insufficient information to test the impact for members with post-2014 service.

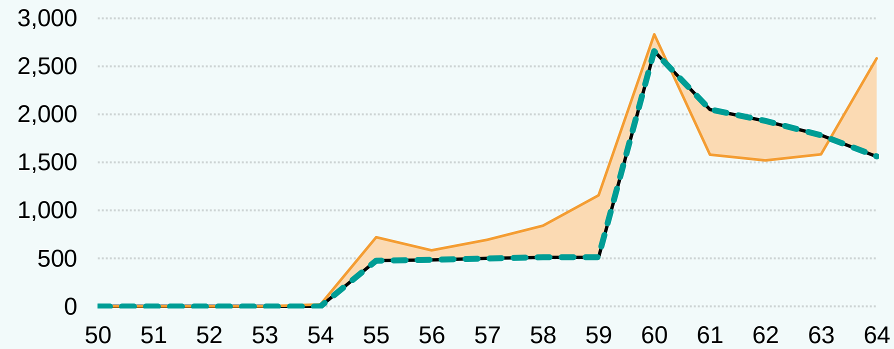
Scheme experience: in detail

Number of retirements by age, for members with accrued pension in the specified scheme, split by category

CRA 60 (men and women)



CRA 65 (men)



Key: **2016 assumptions** **2020 recommendations** **Experience** (line) and difference from 2016 assumptions (shaded area)

Scheme experience: in numbers

Category	Gender	**Data** Number of retirements over 2016-2020	**Experience** Average age at retirement for retirements over 2016-2020	**2016 Expectations** Expected average age at retirement under the 2016 assumptions	**2020 Expectations** Expected average age at retirement under the 2020 assumptions
CRA 60	**Male**	3,295	60.4	61.5	61.5
	Female	3,953	59.3	60.6	60.5
CRA 65	**Male**	25,560	63.4	65.1	65.1
	Female	50,636	62.4	64.6	64.6

Details of our 2020 recommendations are set out in a separate document that will be published alongside this report.

Wider environment: McCloud

McCloud judgment

The McCloud judgment could result in more members with post-2014 service receiving a final salary underpin (with 2008 scheme NPA) for up to 8 years' service.

We have not made any allowance for this judgment in our recommendations, in line with the decisions taken for the 2016 cost control valuations which were issued in 2022.

The additional final salary underpin (with 2008 scheme NPA) for up to 8 years' service may lead to earlier retirements than previously assumed. However, the magnitude of any change is by no means clear, if it occurs at all. There are many other factors that might be working in the other direction which may influence member behaviour, such as changes in the State Pension age.

We also analysed a hypothetical scenario for the McCloud judgment on member behaviour which suggested an immaterial impact on the 2020 valuation results.

Following consultation with the Department for Levelling Up, Housing and Communities, we do not see sufficient evidence to recommend any change to retirement ages following the McCloud judgment.

Normal Minimum Pension Age

The Finance Act 2022 sets out that the minimum age at which most members can be permitted to draw their pension benefits will rise from 55 to 57 with effect from April 2028, to coincide with the rise of State Pension age to 67.

It is too early to speculate on the effect of this increased minimum age on member behaviours and the actuarial reductions applied to early retirement mean that any later retirements will have a minimal influence on the valuation results. Therefore, we recommend no change to the age retirement assumptions for the Finance Act 2022.

The effect of the 2022 Act should be kept under review at future valuations, when assumptions could be updated to ensure they mirror prevailing legislation.

B5. Rates of leaving service

Rates of leaving service

What does this assumption represent?

Rates of leaving service (sometimes referred to as withdrawal rates) are a series of probabilities which represent the likelihood of a member voluntarily leaving service (without retiring) at any given age.

Different assumptions are usually adopted for groups who are expected to behave differently, e.g., for males and females, or members with pensions in different sections of the scheme.

Summary statistics

Relative importance of assumption	Volatility of experience and unreliability of data	Size of recommended change	Impact of recommended changes on scheme costs
Least	Low	High	No impact

Our recommendations and rationale

The actual rates of leaving service are almost double those expected based on the 2016 assumptions, so we recommend increasing the assumed rates of leaving service. We propose to update this assumption to allow for recent scheme experience by making equal allowance for recent experience and the 2016 valuation assumptions.

The valuation results show that this recommendation only marginally reduces the cost cap cost of the scheme as service and deferred revaluation are both CPI linked. However, we consider the absolute change in rates large enough to justify a change.

The data may overstate the rates of withdrawal, for example:

- The analysis is based on the number of members leaving service; an analysis weighted by the salary or pension of those leaving is likely to indicate lower withdrawal rates, as those with higher salary or pension may be less likely to leave service
- The data may be distorted by data cleansing exercises

However, we have making equal allowance for recent experience and the 2016 valuation assumptions which reduces any risk of overstating the withdrawal assumption.

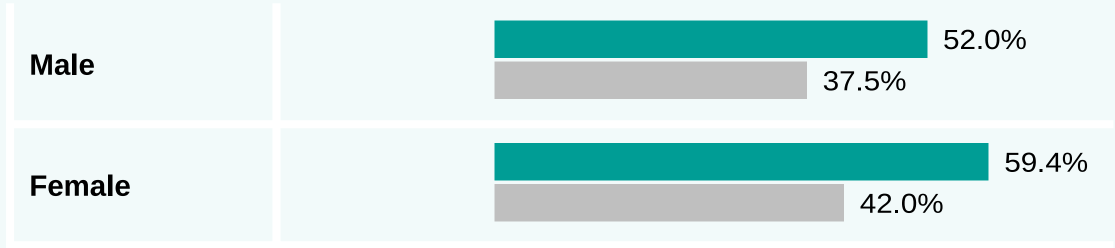
Practical implications

The chart to the right shows the likelihood of a member leaving service before retirement. For each category shown:

- The **top line** ( ) shows the likelihood under the assumptions we recommend for the 2020 valuation.
- The **bottom line** ( ) shows the likelihood under the assumptions adopted for the 2016 valuation.

The numbers shown assume that members either leave service or remain in service until age 65. No allowance is made for the possibility of early retirement, ill-health retirement, or death in service. These assumptions are covered in other sections.

Likelihood of leaving service before age 65 for member now aged 45



Our approach

Analysis

We have analysed the scheme's experience over the period 1 April 2016 to 31 March 2020.

Recent joiners are more likely to leave service but have a low financial impact. To avoid distortions, we have analysed data for members leaving service having completed two or more years' service.

Setting recommended assumptions

Our general approach is:

- Identify groups of members we would expect to have different rates of leaving service, for example by gender and scheme section.
- Compare recent withdrawal experience against the 2016 assumptions.
- Where there is not enough scheme experience, we look at assumptions from other groups of members or other schemes which may have similar experience, adjusted to allow for any available information.
- Recommend that the assumption is updated only if evidence points to a material change to the valuation results.
- We typically only recommend a change to the assumed number of withdrawals, leaving the age profile of the existing assumption unaltered. We only recommend a change to the age profile if we see evidence of a material and non-temporary step change in membership behaviour.
- The last four years of experience may not accurately reflect the longer-term, so if we recommend a change we generally 'smooth out' any excess volatility by basing our recommendation on an equal allowance for recent experience and the 2016 valuations assumptions, which were in turn set using pre-2016 experience.

Our analysis excludes leavers records who we believe to be inter-authority transfers, as these remain active members and are not genuine leavers.

Scheme experience: overall

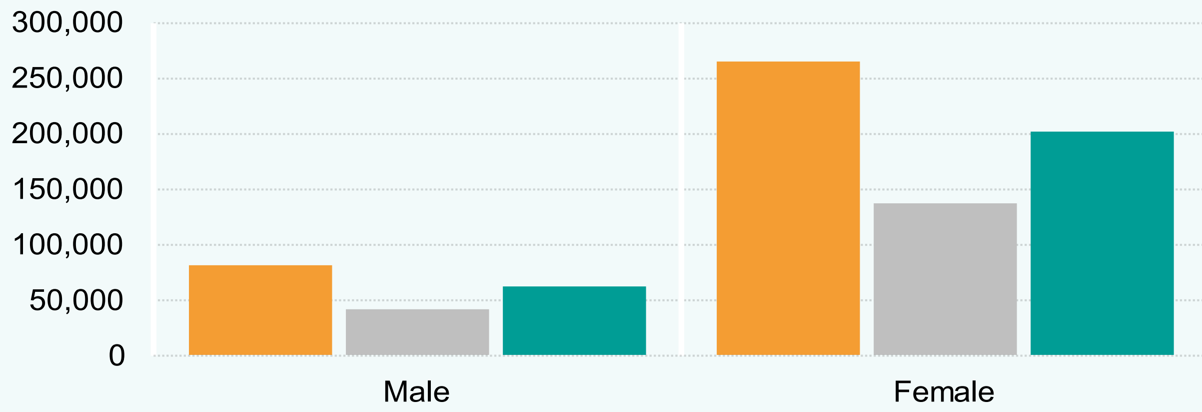
Experience versus expectations show how accurate the assumptions have been in the past and can help inform setting future assumptions.

The chart to the right and those on the following pages compare:

- **actual experience** ( ) on the left – what has happened over the last 4 years.
- **2016 assumptions** ( ) in the middle – what we thought would happen, based on the assumptions adopted for the 2016 valuation.
- **2020 recommendations** ( ) on the right – what we would have expected to happen, had our recommended assumptions been adopted for the 2016 valuation.

It should be noted that experience can be a very volatile measure for groups with small amounts of data, which then impacts the reliance we place on it.

Experience vs expectations: number of leavers



Summary

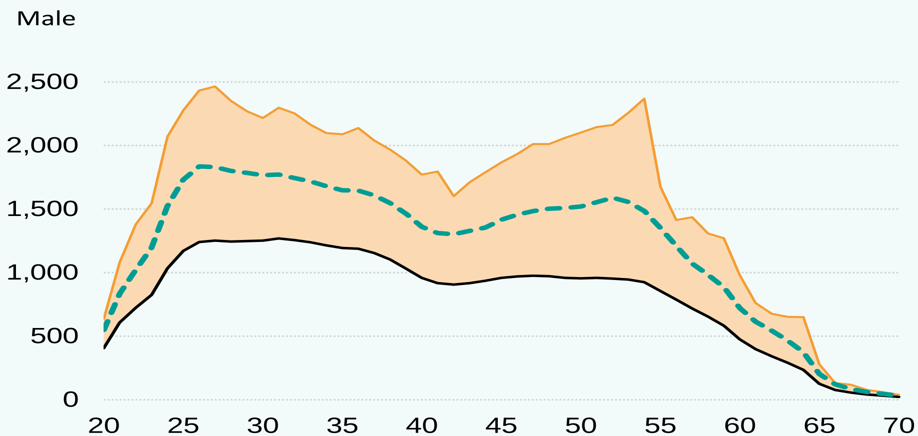
The chart above considers only members with 2 or more years' service. It shows that there has been increase in observed withdrawals compared to the 2016 assumptions. This follows a similar increase at the previous 2016 valuation. It is also in line with observations from other schemes of a general increase in withdrawals and indicative of a wider long-term trend across the public sector.

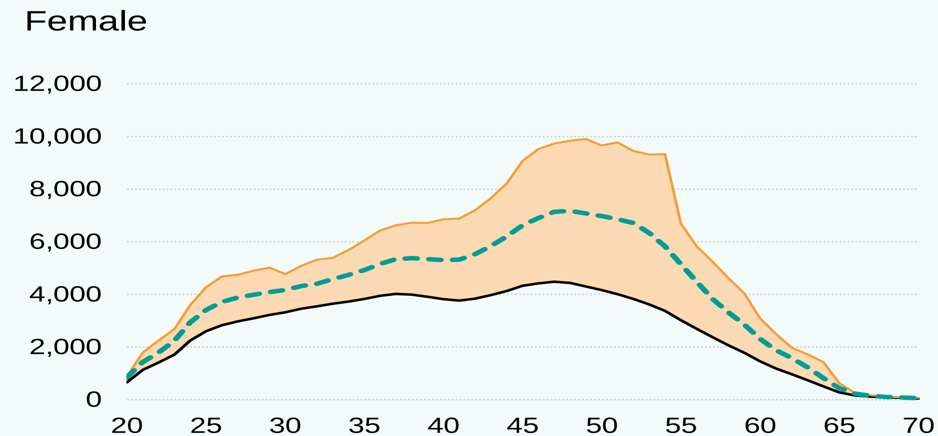
The charts on the next page show that the 2016 valuation assumed a lower level of withdrawals than emerged in experience, for both males and females at all ages.

For the 2020 valuation we propose to take equal allowance the 2016-20 experience and the 2016 valuation assumptions. We have also then smoothed the resulting rates. This results in a substantial increase in proposed decrement rates by around 20% at younger ages, increasing to around 90% at older ages.

Scheme experience: in detail

Number of leavers by age, members with 2+ years' service





Key: **2016 assumptions** **2020 recommendations** **Experience** (line) and difference from 2016 assumptions (shaded area)

Scheme experience: in numbers

Category		**Experience** Number of leavers over 2016-2020	**2016 Expectations** Expected number of leavers under the 2016 assumptions	**2020 Expectations** Expected number of leavers under the 2020 assumptions
0-2 years of service	**Male**	81,753	N/A	N/A
	Female	231,601	N/A	N/A
2+ years of service	**Male**	81,299	41,808	61,573
	Female	265,324	137,719	201,559

We have not analysed the experience of members leaving with less than 2 years of service to focus on members with more material accrued benefits.

Details of our 2020 recommendations are set out in a separate document that will be published alongside this report.

B6. Promotional pay increases

Promotional pay increases

What does this assumption represent?

Promotional pay assumptions are a series of pay increases that members are assumed to receive **in addition to** normal annual salary increases. The assumptions are usually tied to a member's age or length of service.

Promotional pay increases are a scheme-set assumption. **Salary increases** are a directed assumption and are not covered in this section.

Promotional pay increase assumptions help determine the value of 'final salary' benefits which make up a high proportion of scheme costs. These assumptions have little impact on the CARE scheme or the cost cap cost (CCC) of the scheme.

Costs of the McCloud remedy are highly sensitive to promotional pay increase assumptions.

Summary statistics

Relative importance of assumption	Volatility of experience and unreliability of data	Size of recommended change	Impact of recommended changes on scheme costs
Least	High	None	No impact

Our recommendations and rationale

We recommend that the promotional pay increases assumptions adopted for the 2016 valuation are retained for the 2020 valuation.

Experience has been higher than assumed for the 2016 valuation. The 2016-2020 analysis period coincided with reforms to the local authority National Pay Spine which resulted in higher salary increases at lower pay-points. Therefore, the recent experience is likely to be unusual and may not be replicated over the long-term.

The analysis also assumes general pay increases in line with local authority awards, but other non-local authority employers may have provided different annual salary increases.

Adjusting the assumptions for recent experience would not be expected to have a material impact on the cost cap cost (CCC) of the scheme.

Practical implications

The number and size of promotional pay increases can dramatically affect member benefits. This is especially true for final salary benefits (which are based on salary at retirement), but also true for career average benefits (which are based on earnings over a member's working lifetime in the scheme).

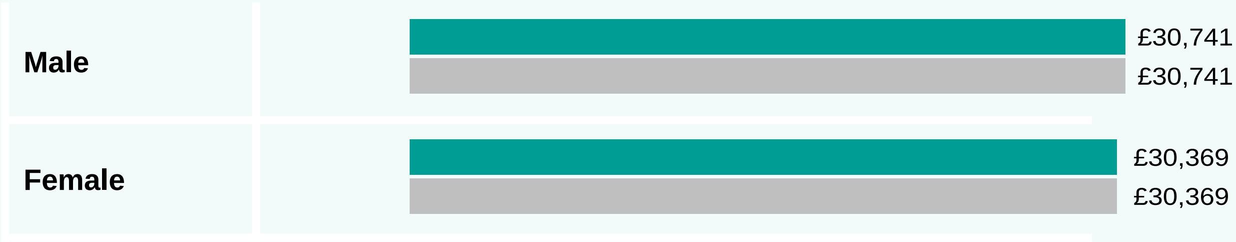
The chart to the right shows the potential salary at age 65 of a member currently aged 45 and paid £30,000 a year.

For each category shown:

- The **top line** ( ) shows the impact of the assumptions we recommend for the 2020 valuation.
- The **bottom line** ( ) shows the impact of the assumptions adopted for the 2016 valuation.

General (non-promotional) salary increases are set to be zero in the chart so that the impacts of different promotional pay assumptions can be seen more clearly.

Salary at age 65 for a member now aged 45, and paid £30,000



Our approach

Analysis

We have analysed the scheme's salary growth experience over the period 1 April 2016 to 31 March 2020 by identifying members who appear in the data used for both the 2016 and 2020 valuations and analysing their pay growth over the 2016-2020 period. This is known as an "annual increase" analysis.

We have stripped out an allowance for known general pay increases in order to isolate the promotional elements of pay changes.

We have made no allowance for members moving between categories.

Assumed Pay Awards

2016-17 – 1%

2017-18 – 1%

2018-19 – 2%

2019-20 – 2%

Setting recommended assumptions

Our general approach is:

- Identify groups of members where we see different levels of promotional increases. This has included gender in the past, and we continue to examine whether gender differences exist.
- Compare recent levels of promotional increases against the 2016 valuation assumptions
- Where there is not enough scheme experience, we look at assumptions from other groups of members or other schemes which may have similar experience, adjusted to allow for any available information.
- Recommend a change to the assumption only if evidence points to a material change to the valuation results.
- We typically only recommend an overall adjustment to the assumed promotional increases, leaving the age profile of the existing assumption unaltered. We only recommend a change to the age profile if we see evidence of a material and non-temporary change in membership behaviour.
- The last four years of experience may not accurately reflect the longer-term, so if we recommend a change we generally 'smooth out' any excess volatility by basing our recommendation on an equal allowance for recent experience and the 2016 valuations assumptions, which were in turn set using pre-2016 experience.

Scheme experience: overall

Experience versus expectations show how accurate the assumptions have been in the past and can help inform setting future assumptions.

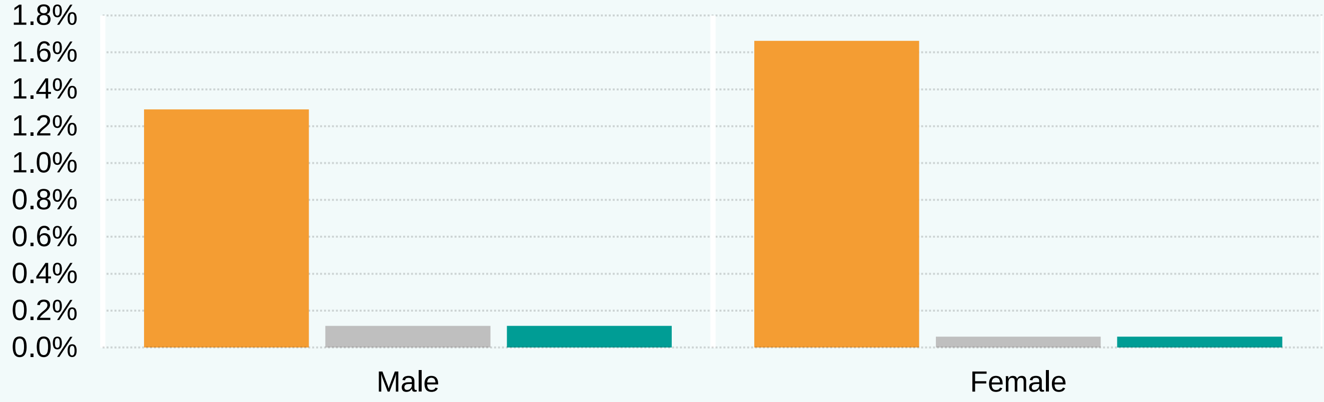
The chart to the right and those on the following pages compare:

- **actual experience** ( ) on the left – what has happened over the last 4 years.
- **2016 assumptions** ( ) in the middle – what we thought would happen, based on the assumptions adopted for the 2016 valuation.
- **2020 recommendations** ( ) on the right – what we would have expected to happen, had our recommended assumptions been adopted for the 2016 valuation.

All numbers exclude general (non-promotional) salary increases.

It should be noted that experience can be a very volatile measure for groups with small amounts of data, which then impacts the reliance we place on it.

Experience vs expectations: average annual increases from age 45 to 65



Summary

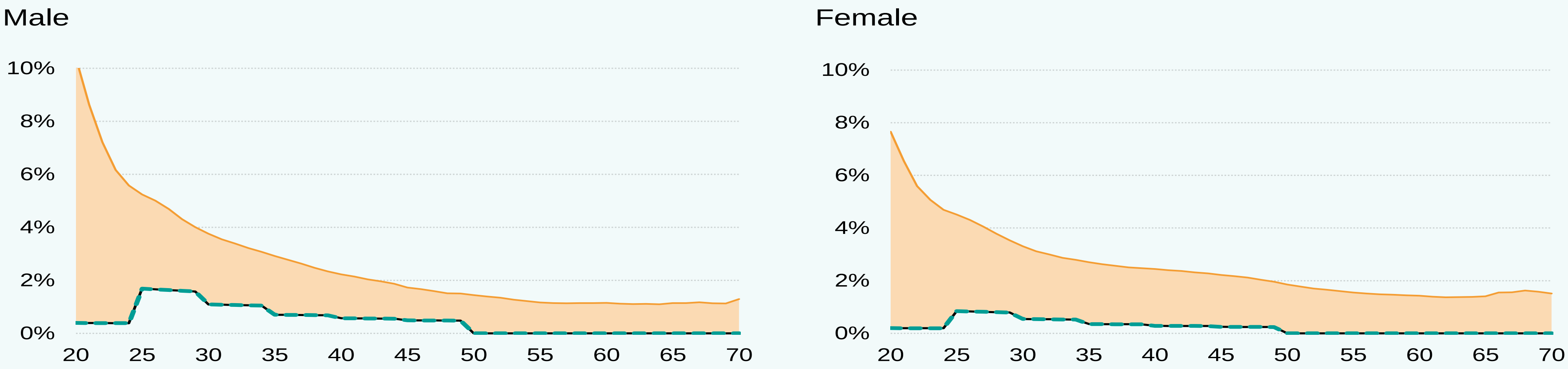
Overall, both male and female members have experienced higher promotional pay increases than expected, based on the 2016 assumptions.

The differences are larger for members at younger ages but the experience has been consistently higher across all age groups. This may be driven in part by the reforms to the local authority National Pay Spine which resulted in higher salary increases at lower pay-points.

Adjusting the assumptions for recent experience would not be expected to have a material impact on the cost cap cost (CCC) of the scheme.

Scheme experience: in detail

Annual promotional pay increases by age, split by category



Key: **2016 assumptions** **2020 recommendations** **Experience** (line) and difference from 2016 assumptions (shaded area)

Scheme experience: in numbers

Category	2016 payroll of analysed members	2020 payroll of analysed members	**Experience** Implied annual promotional pay increase, after removal of general salary increases	**2016 Expectations** Expected annual promotional pay increase under the 2016 assumptions	**2020 Expectations** Expected annual promotional pay increase under the 2020 assumptions
Male	£6 billion	£7 billion	1.3%	0.1%	0.1%
Female	£16 billion	£18 billion	1.7%	0.1%	0.1%

The 2016 payroll figures above include an allowance for known general pay increases from 2016 to 2020. The Experience and Expectations figures shown in the table above show the annual promotional pay increases to age 65 for a member now aged 45. Different rates would apply for different current age and retirement age combinations.

Details of our 2020 recommendations are set out in a separate document that will be published alongside this report.

B7. Rates of ill-health retirement

Rates of ill-health retirement

What does this assumption represent?

Rates of ill-health retirement are a series of probabilities which represent the likelihood of a member retiring in ill-health at any given age.

Members are eligible for either tier 1, 2 or 3 ill-health benefits, depending on the severity of their illness.

Summary statistics

Relative importance of assumption	Volatility of experience and unreliability of data	Size of recommended change	Impact of recommended changes on scheme costs
Least	Low	None	No impact

Our recommendations and rationale

Ill-health retirements have been lower than previously assumed, but the ages of those retirements were close to our assumptions. However, adjusting the assumption for recent experience will not make a material change to the valuation results, so we recommend that the 2016 valuations are retained.

Our experience runs to 31 March 2020, and as such misses most of the impact of COVID-19. COVID 19 might result in increase to ill health retirements in the medium term, although LGPS statistics indicate that the number of ill health retirements in 2020-21 and 2021-22 remains stable.

Considering the distribution of experience for the ill health tiers there is a slightly higher proportion of lower tier retirements than expected. As this is not significantly different, we propose to maintain the current assumption.

We would not expect the McCloud judgment to impact the number of ill-health retirements directly. However, the tier allocations could affect member choices. We would not expect this to have a material impact on future contribution rates as the legacy arrangements ceased on 1 April 2022.

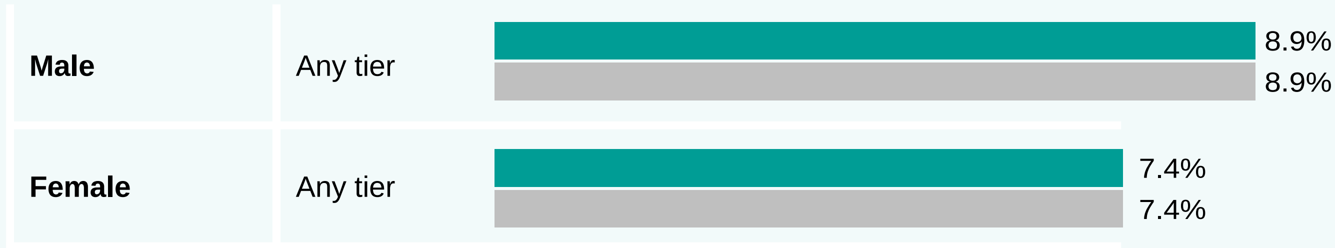
Practical implications

The chart to the right shows the likelihood of members retiring in ill-health before retirement. For each category shown:

- The **top line** ( ) shows the likelihood under the assumptions we recommend for the 2020 valuation.
- The **bottom line** ( ) shows the likelihood under the assumptions adopted for the 2016 valuation.

The numbers shown assume that members either retire in ill health or remain in service until age 65. No allowance is made for the possibility of early retirement, leaving service, or death in service. These assumptions are covered in other sections.

Likelihood of member now aged 45 retiring in ill-health before age 65



Our approach

Analysis

We have analysed the scheme's experience over the period 01 April 2016 to 31 March 2020.

Setting recommended assumptions

Our general approach is:

- Identify groups of members we would expect to have different rates of ill-health retirement, for example by gender.
- Compare recent ill-health retirement experience against the 2016 assumptions.
- Where there is not enough scheme experience, we look at assumptions from other groups of members or other schemes which may have similar experience, adjusted to allow for any available information.
- Recommend that the assumption is updated only if evidence points to a material change to the valuation results.
- We typically only recommend a change to the assumed number of ill-health retirement, leaving the age profile of the existing assumption unaltered. We only recommend a change to the age profile if we see evidence of a material and non-temporary step change in membership outcomes.
- The last four years of experience may not accurately reflect the longer-term, so if we recommend a change we generally 'smooth out' any excess volatility by basing our recommendation on an equal allowance for recent experience and the 2016 valuations assumptions, which were in turn set using pre-2016 experience.
- The same approach applies to the proportions of ill-health retirements across the different severity tiers.

Scheme experience: overall

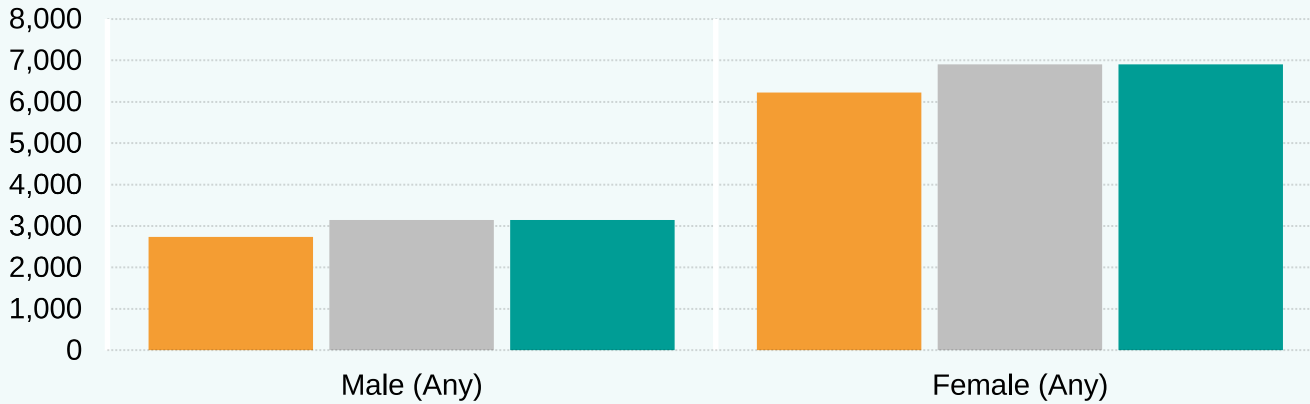
Experience versus expectations show how accurate the assumptions have been in the past and can help inform setting future assumptions.

The chart to the right and those on the following pages compare:

- **actual experience** ( ) on the left – what has happened over the last 4 years.
- **2016 assumptions** ( ) in the middle – what we thought would happen, based on the assumptions adopted for the 2016 valuation.
- **2020 recommendations** ( ) on the right – what we would have expected to happen, had our recommended assumptions been adopted for the 2016 valuation.

It should be noted that experience can be a very volatile measure for groups with small amounts of data, which then impacts the reliance we place on it.

Experience vs expectations: number of ill-health retirements



Summary

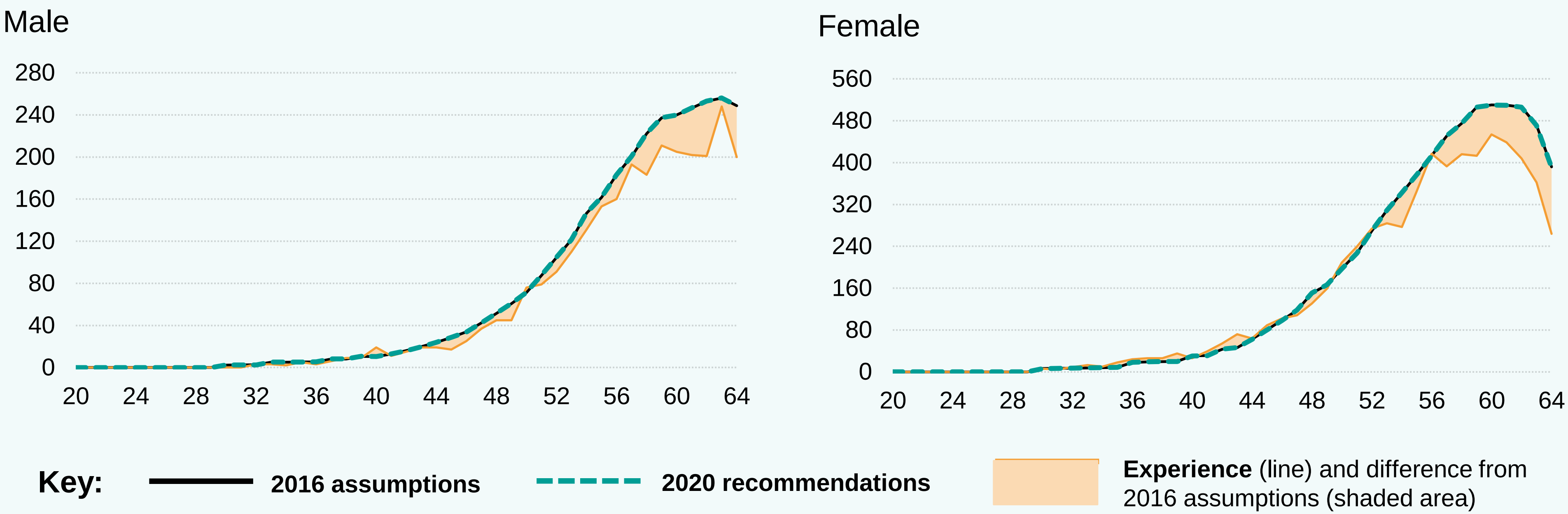
The charts above shows that there have been fewer ill-health retirements compared to the 2016 assumptions.

The charts on the next page show that the age profile of the recent retirements broadly match the 2016 assumptions, with an average age of around 56.

We separately considered the ill-health tiers. For the 2016 valuation 77% of members were assumed to retire with tier 1 benefits when leaving due to ill-health. Our analysis identified that around 80% of actual retirements were with tier 1 benefits. As this is not significantly different, we propose to maintain the current assumption.

Scheme experience: in detail

Number of ill-health retirements by age, split by category



	Experience Proportion of ill-health retirements by tier over 2016-2020	**2016 Expectations** Expected proportion of ill-health retirements by tier under the 2016 assumptions
Tier 1	81%	77%
Tier 2	11%	10%
Tier 3	9%	13%

Scheme experience: in numbers

Category		**Experience** Number of ill-health retirements over 2016-2020	**2016 Expectations** Expected number of ill-health retirements under the 2016 assumptions	**2020 Expectations** Expected number of ill-health retirements under the 2020 assumptions
Male	**Any tier**	2,739	3,147	3,147
	Tier 1	1,859	2,423	2,423
	Tier 2	210	315	315
	Tier 3	217	409	409
Female	**Any tier**	6,224	6,903	6,903
	Tier 1	4,155	5,315	5,315
	Tier 2	583	690	690
	Tier 3	442	897	897

Note that there are ill health retirements under previous rules or transitional protection that are included in the “Any tier” experience numbers, but do not appear in the tier 1,2 or 3 breakdown. Also, we have excluded ill health retirements over NPA.

Details of our 2020 recommendations are set out in a separate document that will be published alongside this report.

Wider environment: McCloud

McCloud judgment

We would not expect the McCloud judgment to impact the number of ill-health retirements directly. However, the tier allocations may affect member choices. We would not expect this to have a material impact on contribution rates.

In addition, this ceased to apply from 1 April 2022 when the final salary underpin will no longer apply.

B8. Mortality before retirement

Mortality before retirement

What does this assumption represent?

Mortality assumptions are a series of probabilities which represent the likelihood of a member dying at any given age. Different assumptions usually apply to males and females.

Mortality after retirement assumptions are used after members are assumed to retire and these and these are covered in Part B2.

Summary statistics

Relative importance of assumption	Volatility of experience and unreliability of data	Size of recommended change	Impact of recommended changes on scheme costs
Least	Low	None	No impact

Our recommendations and rationale

Deaths before retirement have been reasonably close to the 2016 assumptions, so we recommend no changes to the current assumptions.

The analysed experience runs to 31 March 2020, and as such misses most of the impact of COVID-19. There is anecdotal evidence that COVID-19 has increased the number of deaths before retirement. However, we have made no allowance for this, as it is unlikely to have any material impact on the valuation results.

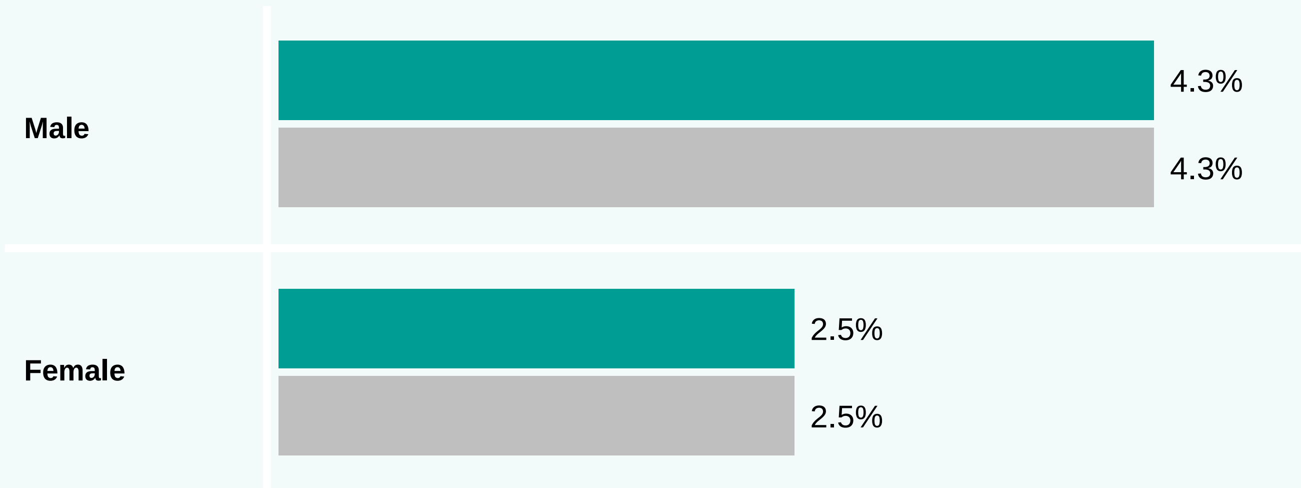
Practical implications

The chart to the right shows the likelihood of dying before retirement. For each category shown:

- The **top line** ( ) shows the likelihood under the assumptions we recommend for the 2020 valuation.
- The **bottom line** ( ) shows the likelihood under the assumptions adopted for the 2016 valuation.

The numbers shown assume that members either die or remain in service until age 65. No allowance is made for the possibility of early retirement, leaving service, or ill-health retirement. These assumptions are covered in other sections.

Likelihood of member now aged 45 dying in service before age 65



Our approach

Analysis

We have analysed the scheme's pre-retirement mortality experience over the period 01 April 2016 to 31 March 2020.

Setting recommended assumptions

Our general approach is:

- Identify groups of members we would expect to have different rates of death before retirement, for example by gender.
- Compare recent pre-retirement death experience against the 2016 assumptions.
- Where there is not enough scheme experience, we look at assumptions from other groups of members or other schemes which may have similar experience, adjusted to allow for any available information.
- Recommend that the assumption is updated only if evidence points to a material change to the valuation results.
- We typically only recommend a change to the assumed number of pre-retirement deaths, leaving the age profile of the existing assumption unaltered. We only recommend a change to the age profile if we see evidence of a material and non-temporary step change in membership outcomes.
- The last four years of experience may not accurately reflect the longer-term, so if we recommend a change we generally 'smooth out' any excess volatility by basing our recommendation on an equal allowance for recent experience and the 2016 valuations assumptions, which were in turn set using pre-2016 experience.

Scheme experience: overall

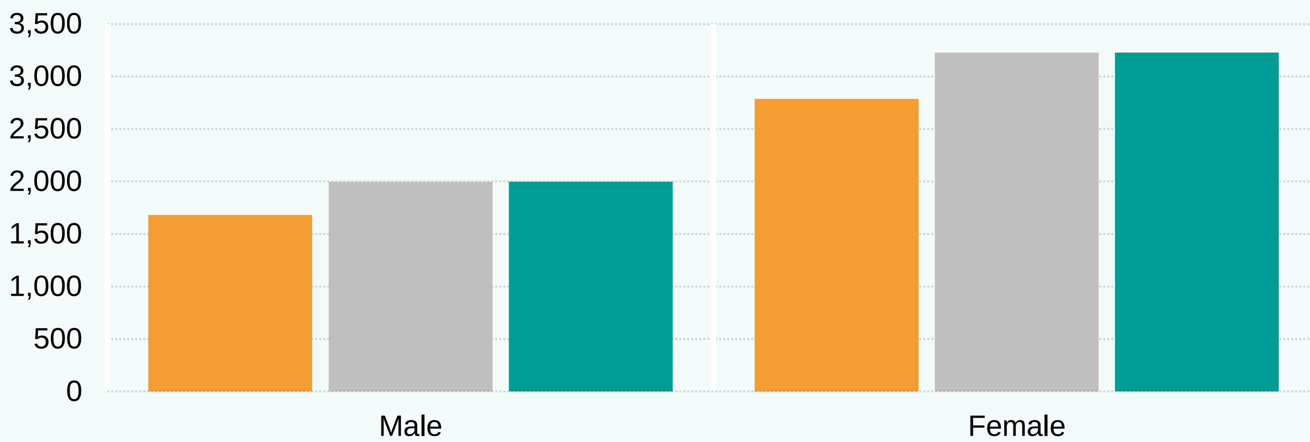
Experience versus expectations show how accurate the assumptions have been in the past and can help inform setting future assumptions.

The chart to the right and those on the following pages compare:

- **actual experience** ( ) on the left – what has happened over the last 4 years.
- **2016 assumptions** ( ) in the middle– what we thought would happen, based on the assumptions adopted for the 2016 valuation.
- **2020 recommendations** ( ) on the right – what we would have expected to happen, had our recommended assumptions been adopted for the 2016 valuation.

It should be noted that experience can be a very volatile measure for groups with small amounts of data, which then impacts the reliance we place on it.

Experience vs expectations: number of deaths before retirement



Summary

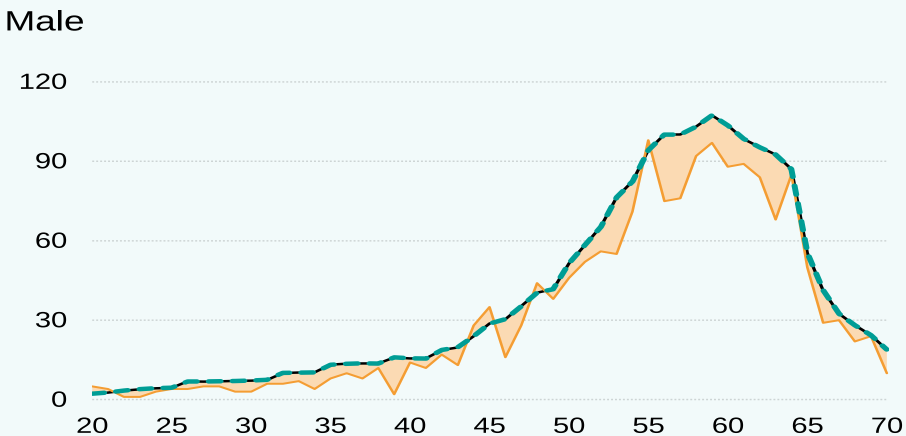
The charts above show that there have been fewer pre-retirement deaths compared to the 2016 assumptions.

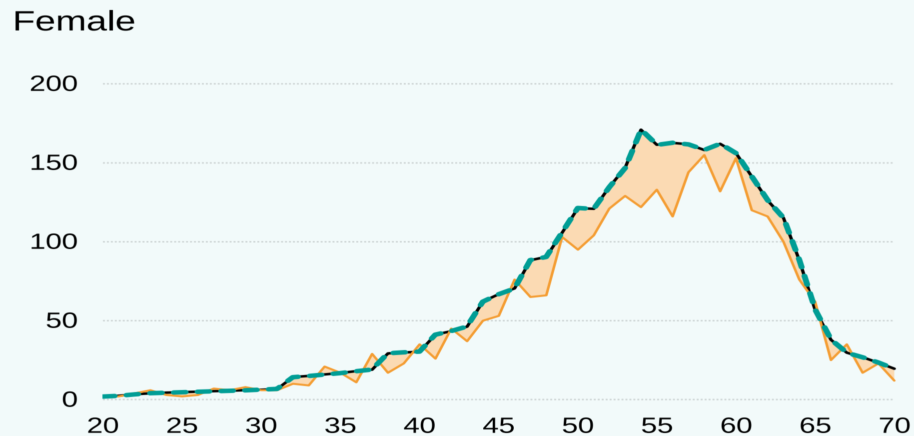
The charts on the next page show that the age profile of the recent deaths broadly match the 2016 assumptions, with average ages of death of around 52 to 53 for men and 50 for women.

The difference between the experience and the 2016 assumed number of deaths is not material to the cost cap cost of the scheme.

Scheme experience: in detail

Deaths before retirements by age, split by category





Key: **2016 assumptions** **2020 recommendations** **Experience** (line) and difference from 2016 assumptions (shaded area)

Scheme experience: in numbers

Category	**Experience** Number of deaths in service over 2016-2020	**2016 Expectations** Expected number of deaths in service under the 2016 assumptions	**2020 Expectations** Expected number of deaths in service under the 2020 assumptions
Male	1,681	1,997	1,997
Female	2,785	3,226	3,226

Details of our 2020 recommendations are set out in a separate document that will be published alongside this report.

B9. Family statistics

Family statistics

What does this assumption represent?

The term 'family statistics' covers several assumptions, including:

- the probability that an eligible partner exists
- the average age of that partner, compared to the member.

The assumptions are used to estimate the likelihood of a dependant's pension coming into payment when a member dies, and how long that pension will be paid.

For existing pensioners, we consider the likelihood of members having an eligible partner on 31 March 2020. For future pensioners, we consider the likelihood of members having an eligible partner at retirement, or earlier death.

Mortality assumptions apply independently to the member and assumed partner.

Summary statistics

Relative importance of assumption	Volatility of experience and unreliability of data	Size of recommended change	Impact of recommended changes on scheme costs
Least	Medium	None	No impact

Our recommendations and rationale

For the current pensioner proportion married/partnered assumptions (applicable to all members), we recommend no change to the 2016 assumptions. This is due to experience being broadly in line with the current 2016 assumptions. We also considered the ONS married and married/partnered assumptions to inform our recommendation.

For the future pensioner proportion married/partnered assumptions, we recommend no change to the 2016 assumptions.

For the age difference assumptions, we recommend no change to the 2016 assumptions. This is due to the experience of members being broadly in line with the current 2016 assumptions and the immateriality of the age difference assumption overall.

For the minor assumptions such as minor dependants' pensions, dependants' gender and remarriage, we recommend no change to the 2016 assumptions.

Practical implications

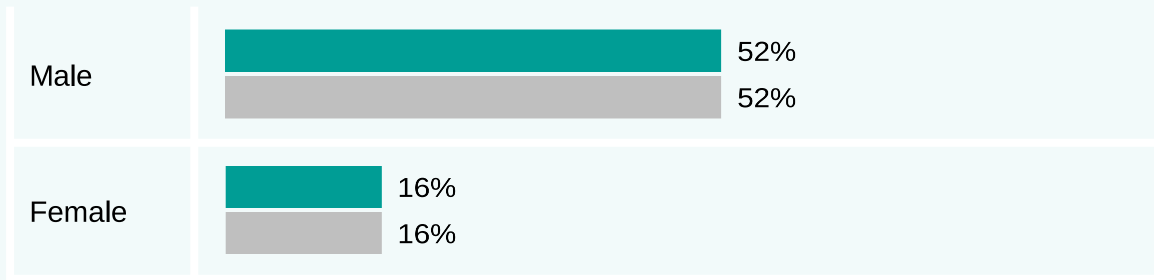
The chart to the right shows the likelihood that an eligible partner exists when a member dies. The likelihoods shown depend on:

- Assumptions about the existence of an eligible partner and that partner's age (discussed in this section)
- Assumptions about the member and partner's mortality (discussed in the mortality after retirement section).

For each category shown:

- The **top line** ( ) shows the likelihood under the assumptions we recommend for the 2020 valuation.
- The **bottom line** ( ) shows the likelihood under the assumptions adopted for the 2016 valuation.

Likelihood of an eligible partner existing at time of death*, for normal health pensioner who retired at age 65



*Assumed age at death for normal health pensioners is 87 for males and 89 for females, using the life expectancy assumptions we recommend for the 2020 valuation.

Our approach

Analysis

We have analysed the scheme's experience over the period 1 April 2016 to 31 March 2020. However, only 17 out of 86 funds are included in the analysis due to data inconsistencies, which covers 34% of member death data. This is an improvement on the previous valuation, where only a minimal analysis was possible.

Our analysis has been carried out on an 'lives' basis reflecting data available.

Setting recommended assumptions

Our general approach is:

- Identify groups of members we would expect to have different family statistics, for example by gender, and by section of the scheme, where there are differences in eligibility.
- Compare recent proportion married and age differences for members against the 2016 assumptions.
- Where there is not enough scheme experience, we look at assumptions from national statistics, other groups of members or other schemes which may have similar experience, adjusted to allow for any available information.
- Recommend that the assumption is updated only if evidence points to a material change to the valuation results.
- Recommend that the proportion married/partnered assumption remains aligned to the proportion married assumption in the absence of any experience data or evidence that would justify changing the proportion married/partnered assumption.
- We typically only recommend a change to the overall assumed proportion married or married/partnered, leaving the age profile of the existing assumption unaltered. We only recommend a change to the age difference if we see evidence of a material and non-temporary step change in membership behavior.
- The last four years of experience may not accurately reflect the longer-term, so if we recommend a change we generally 'smooth out' any excess volatility by basing our recommendation using an equal allowance for recent experience and the 2016 valuation assumptions.

Scheme experience: overall

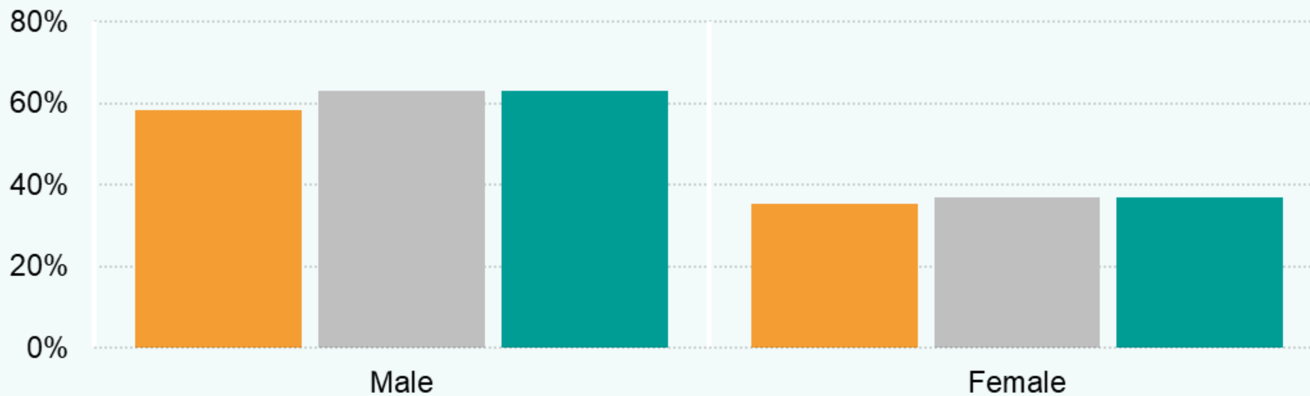
Experience versus expectations show how accurate the assumptions have been in the past and can help inform setting future assumptions.

The chart to the right and those on the following pages compare:

- **actual experience** ( ) on the left – what has happened over the last 4 years.
- **2016 assumptions** ( ) in the middle – what we thought would happen, based on the assumptions adopted for the 2016 valuation.
- **2020 recommendations** ( ) on the right – what we would have expected to happen, had our recommended assumptions been adopted for the 2016 valuation.

It should be noted that experience can be a very volatile measure for groups with small amounts of data, which then impacts the reliance we place on it.

Experience vs expectations: proportion married or married/partnered at death



Summary

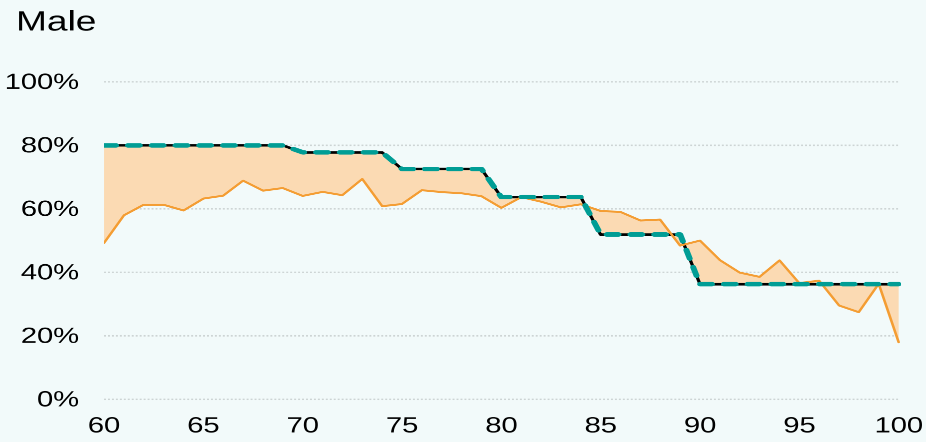
For both males and females, we have seen a similar proportion married/partnered in recent years compared to the 2016 assumption, as shown above. We note that experience for older member may understate future expected eligibility, because:

- Women who left service before 1988 may not be eligible for a contingent widower's pension (before allowing for Goodwin)
- Members who left service before 2008 may not be eligible for a contingent unmarried survivor's pension

In view of these limitations and the fact that only 17% of funds are included in the analysis it seems appropriate not to reduce the 2016 assumption to reflect experience.

Scheme experience: in detail

Proportion married or partnered at death by age, split by category



Key: 2016 assumptions | 2020 recommendations | **Experience** (line) and difference from 2016 assumptions (shaded area)

Scheme experience: in numbers

Proportion married/partnered at death, by age and category

Gender	**Experience (*)** Number of member deaths over 2016-2020	**Experience** Actual number of dependant's pension coming into payment over 2016-2020, as a percentage of how many could have come into payment if every member who died had an eligible dependant	**2016 Expectations** Expected proportion married or partnered at death under the 2016 recommendations	**2020 Expectations** Expected proportion married or partnered at death under the 2020 recommendations
Male	21,779	58%	63%	63%
Female	21,741	36%	37%	37%

* 17 out of 86 funds are included in the analysis, which covers 34% of member death data.

Details of our 2020 recommendations are set out in a separate document that will be published alongside this report.

Scheme experience: overall

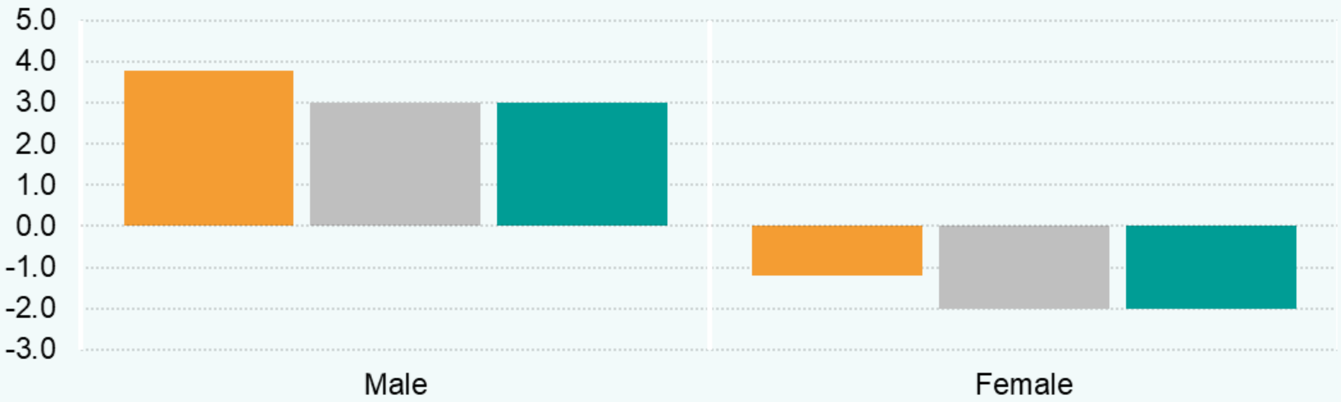
Experience versus expectations show how accurate the assumptions have been in the past and can help inform setting future assumptions.

The chart to the right and those on the following pages compare:

- **actual experience** ( ) on the left – what has happened over the last 4 years.
- **2016 assumptions** ( ) in the middle – what we thought would happen, based on the assumptions adopted for the 2016 valuation.
- **2020 recommendations** ( ) on the right – what we would have expected to happen, had our recommended assumptions been adopted for the 2016 valuation.

It should be noted that experience can be a very volatile measure for groups with small amounts of data, which then impacts the reliance we place on it.

Experience vs expectations: age difference at death



Member age minus partner's age at date of member's death

Summary

The male scheme experience, has seen a slightly higher average age difference at death in recent years compared to the 2016 assumption, as shown above.

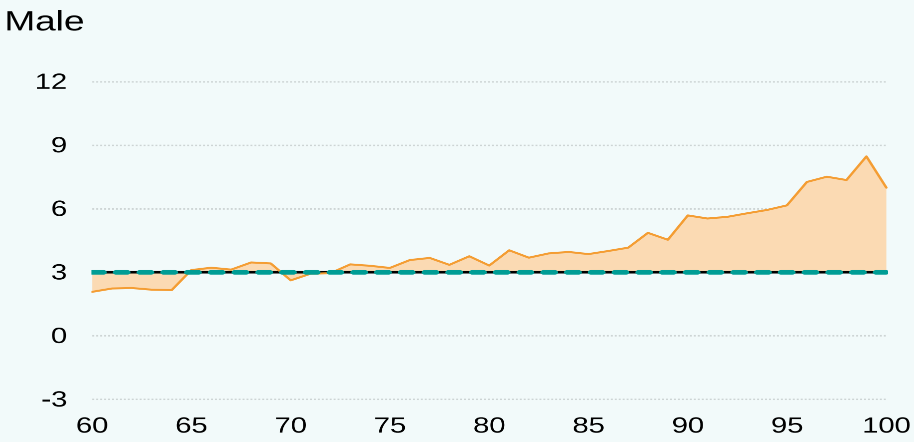
The female scheme experience, has seen a slightly lower average age difference at death in recent years compared to the 2016 assumption, as shown above.

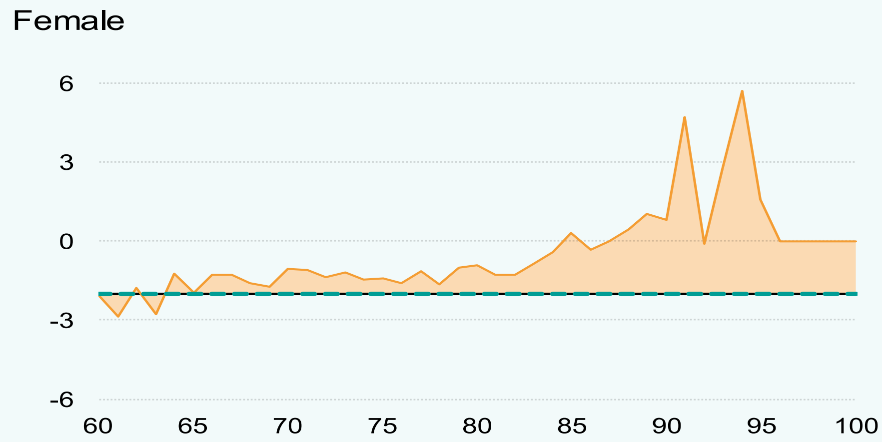
The experience continues to support a smaller age difference for female members than male members.

We do not recommend a change to this assumption on the grounds of materiality.

Scheme experience: in detail

Age difference between member and spouse or partner by age, split by category





Key: **2016 assumptions** **2020 recommendations** **Experience** (line) and difference from 2016 assumptions (shaded area)

Scheme experience: in numbers

Age difference between member and spouse or partner, by age and category

Category	**Experience** Number of member deaths over 2016-2020	**Experience** Average age difference between member and eligible spouse or partner at date of death *	**2016 Expectations** Expected age difference between member and eligible partner or spouse under the 2016 assumptions	**2020 Expectations** Expected age difference between member and eligible partner or spouse under the 2020 assumptions
Male	12,711	3.8	3	3
Female	7,721	-1.2	-2	-2

* The average age difference is weighted by total deaths resulting in an adult dependant pension.

Details of our 2020 recommendations are set out in a separate document that will be published alongside this report.

Wider environment and other assumptions

Walker & Goodwin

The Goodwin legal challenge was brought against The Department for Education (DfE) in respect of survivor’s benefits provided in the Teachers’ Pension Scheme. The Goodwin challenge follows on from the Walker case (which ruled in 2017 that to treat same-sex spouses/civil partners less favourably than their opposite-sex equivalents constituted unlawful discrimination). TPS provided survivor’s benefits to male widowers of female members based on service from 6 April 1988, whereas same-sex partners of male members were provided benefits based on service from 1 April 1972 (or 6 April 1978 if the marriage was after the last day pensionable service). Some other public service schemes have similar provisions and we previously identified that this could have a material effect for those schemes.

The Government announced in July 2020 that it had concluded that changes are required to the Teachers’ Pension Scheme (England & Wales) to address this discrimination. The government believes this difference in treatment will also need to be remedied in other UK public service pension schemes with similar provisions.

The 2016-20 experience reflects survivors pension rules before Goodwin.

Minor dependants’ pensions

No allowance has been taken for short term dependants’ pensions or childrens’ pensions (other than those already in payment), on grounds of immateriality.

Dependants’ gender

All dependants are assumed to be the opposite sex of the member, on the grounds of materiality.

Remarriage

No allowance is made for remarriage on the grounds of materiality.

In each case, the approach is the same as that adopted for the 2016 valuation.

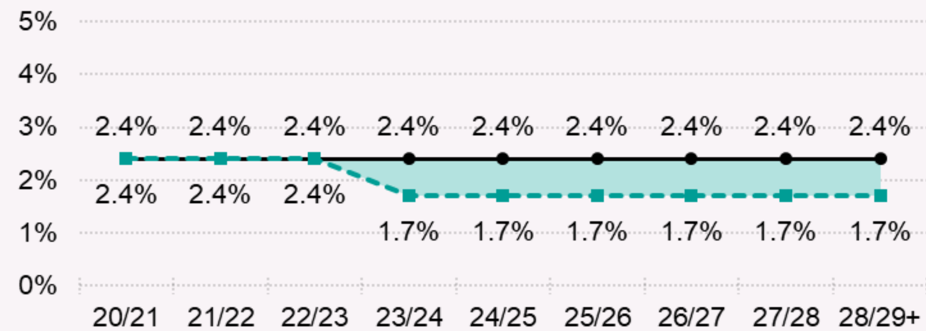
Part C: Appendices

C1. Directed assumptions 1

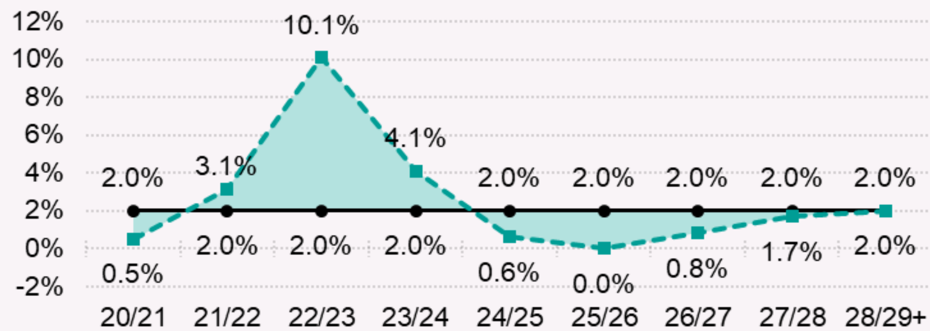
Annual financial assumptions

Taken from Directions dated 30 August 2023.

Discount rate, net of assumed pension increases

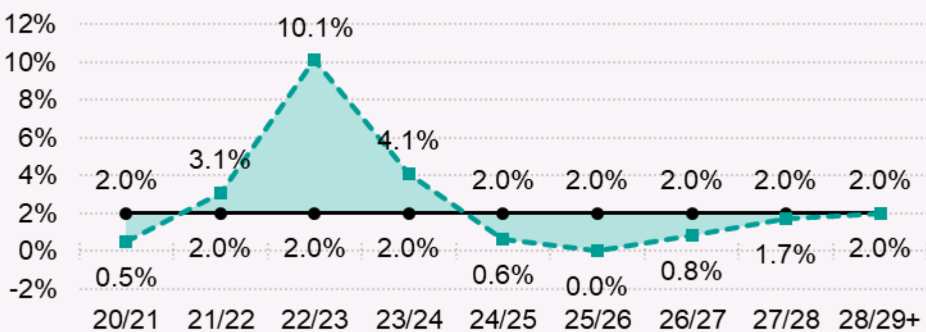


Rates of pension increases



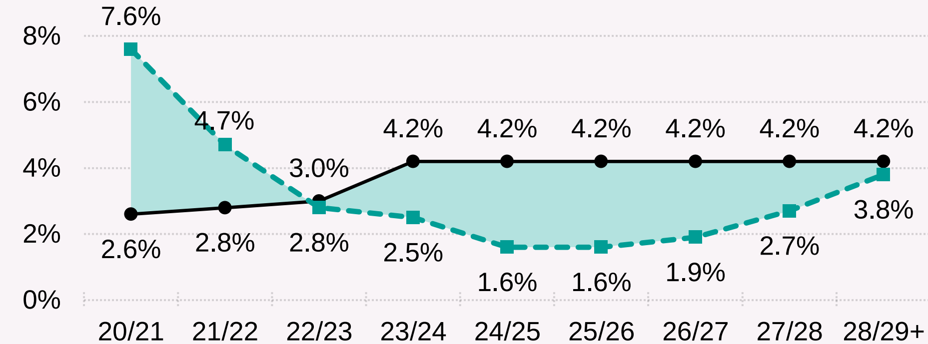
*Note: applicable from April at end of period

Rates of CARE revaluation



*Note: applicable from April at end of period

Rates of salary increases



Key: **2016 assumptions** **2020 assumptions** (dotted line) and difference from 2016 assumptions (shaded area)

C1. Directed assumptions 2

Other directed assumptions

Taken from Directions dated 30 August 2023.

Assumption name	2016 assumption	2020 assumption
Deficit spreading periods	15 years	15 years
Future mortality improvements	In line with 2016-based ONS projections	In line with 2020-based ONS projections
State Pension ages	As legislated for in the Pensions Act 1995, Pensions Act 2007, Pensions Act 2011 and Pensions Act 2014	As legislated for in the Pensions Act 1995, Pensions Act 2007, Pensions Act 2011 and Pensions Act 2014

C2. Other minor assumptions 1

Active membership projections

Direction 12 requires the actuary to use the 'projected unit methodology' to calculate the valuation results. The valuation results require the calculation of the cost of benefit accrual over periods after the effective date (31 March 2020). This implicitly requires the actuary to estimate the membership to future dates in order to determine the valuation results.

Members of the legacy sections ceased to accrue benefits in these sections at 31 March 2022 and future accrual for all members is in the reformed section from 1 April 2022.

The expected cost of accruing benefits over periods after the effective date have been determined by assuming an overall stable population (age and pay profile) to the end of implementation period.

The approach incorporates the following assumptions:

- Members with past service in the legacy sections are assumed to retire in line with recent experience. This provides for some legacy section members to remain in active service in the reformed scheme beyond 2022 due to late retirement.
- The overall profile of the membership in terms of average age and pay distribution is assumed to remain constant over the period.
- The overall active membership will be in receipt of pensionable pay for each relevant year equal to that assumed for forecasting purposes.
- The State Pension age in the projected populations is assumed to be determined by the implied dates of birth and so the State Pension age mix changes over time despite the assumed stable population. This allows for the membership accruing benefits to change over the implementation period.
- Mortality is assumed to be projected forward to the relevant year of use in all cases.

C2. Other minor assumptions 2

Grouping of individual active member records

Individual active members have been grouped together for the purposes of calculating liabilities. This grouping is necessary to accommodate the volume of data within our valuation system. The approach taken to grouping the data has been tested to ensure it does not result in any distortion of the valuation results.

Active members have been grouped by gender, age (to nearest whole year), Normal Pension Age (to nearest whole year) and Critical Retirement Age (CRA). CRA has been taken as either 60 (where that is the nearest whole year of CRA), 62 (where CRA is between 61 and 64 to the nearest whole year) or 65 (where that is the nearest whole year of CRA, or where the member does not have a CRA). The CRA groups of 60 and 65 jointly cover around 94% of the total active membership at 31 March 2020; with CRA 62 being the balance of around 6%. The CRA group of 62 is therefore relatively minor, and hence grouping a wide range of actual CRAs does not introduce a significant element of approximation to the overall results.

Payroll projection

For the purposes of spreading any past service surplus or deficit, the future payroll estimates are assumed to be projected forward (only) in line with valuation earnings assumptions.

Member contribution yield over implementation period

The average member contribution yield assumed to apply over the implementation period is 6.5% of pensionable pay.

C2. Other minor assumptions 3

McCloud calculation approach

The outcome of the remedy required to address the judgment is that the statutory underpin, which provides members with the better of the pre-2014 level of accrual and post-2014 level of accrual, is extended to in scope members (rather than being limited to members meeting a certain age criteria as was the original approach).

To allow for the McCloud remedy in our calculation methodology, we have allowed for the statutory underpin applying, where relevant.

C3. Glossary 1

CARE	CARE stands for Career Average Revalued Earnings and refers to a methodology whereby earnings over a member's working lifetime in the scheme are used in the calculation of their benefits in the reformed scheme.
CARE revaluation	The rate at which the CARE pension is revalued each year a member is an active member.
Cost cap cost (CCC)	A measure of the cost of benefits being provided from the reformed scheme, which is then compared to a 'target cost'. The LGPS (E&W) target cost is set at 14.6% of pay. If the results of the valuation show that the cost cap cost is more than 3% of pensionable pay away from the target cost, and the cost of the scheme still results in a breach once the impact of the economic check is taken into account, changes must be made to the reformed scheme (e.g., to the benefits provided) to bring the cost cap cost back to the target cost.
Critical Retirement Age	Critical Retirement Age (CRA) means the date at which the Rule of 85 would have been met, subject to a minimum of age 60 and a maximum of age 65.
Directions	A document published by HM Treasury and referred to in the Public Service Pensions Act 2013, which sets out the process and requirements for carrying out valuations, including the results which need to be disclosed. Directions were first published in 2014 and have been amended several times since then.
Employer contribution rates (ECR)	The percentage of scheme members' pensionable salaries which employers are required to pay in order to: • meet the costs of benefits currently being built up by active members • make good any shortfall in the notional amounts set aside to cover benefits already built up. The result is heavily dependent on assumptions about future financial conditions and membership changes. Funds set the employer contribution rates individually, so the focus of our assumptions report for LGPS (E&W) is on the cost cap cost of the scheme.

C3. Glossary 2

McCloud	McCloud refers to a legal judgment made in December 2018. The England and Wales Court of Appeal judgment upheld claims of age discrimination brought by some firefighters and members of the judiciary against 'transitional protection' rules. These rules determined the date on which some members would move between reformed and legacy sections of the scheme.
Normal pension age	The age at which a member in normal health is entitled to unreduced benefits. This age varies for different tranches of service: • Ages 65 to 68 for benefits in the 2014 scheme section but linked to State Pension age (but with a minimum of age 65), so could change in the future. • Age 65 for the 2008 scheme • Between age 60 and 65 based on the 'Rule of 85', for members of earlier schemes.
Pension increase	Public service pensions are increased under the provisions of the Pensions (Increase) Act 1971 and Section 59 of the Social Security Pensions Act 1975.
Professional actuarial requirements	The professional requirements that we have complied with when completing this actuarial valuation include: 1. Technical Actuarial Standards: TAS 100 and TAS 300, issued by the Financial Reporting Council (FRC) 2. The Actuaries' Code, issued by the Institute and Faculty of Actuaries (IFoA) 3. The Civil Service Code. GAD is also accredited under the IFoA's Quality Assurance Scheme. More details can be found in our terms of reference.

C3. Glossary 3

Reformed and legacy sections	As per the Public Service Pensions and Judicial Offices Act 2022 (PSPJOA 2022), the local government new scheme means a scheme under section 1 of the Public Service Pensions Act 2013 (PSPA 2013) which came into force on 1 April 2014 (referred to as the reformed/post 2014 section in this report). As per the PSPJOA 2022, the local government legacy scheme means an existing scheme mentioned in paragraphs 16 or 17 of Schedule 5 of PSPA 2013 (referred to as the legacy/pre 2014 section in this report).
Rule of 85	The Rule of 85 is used to work out whether or not a member's pension benefits (retirement pension and retirement grant) will be reduced if a member retires before their Normal Pension Age (NPA). When a member retires under certain circumstances, where the sum of their age plus the calendar length of their membership of the scheme (both in whole years) is equal to or greater than 85, then all or part of their pension will be unreduced.
Scheme Advisory Board	The Board set up in line with section 7 of the IFoA' s Public Service Pensions Act 2013, with responsibility for providing advice on potential changes to the scheme and other matters relating to the efficient administration and management of the scheme. Scheme Advisory Board is commonly shortened to 'SAB'.
Standard table	The standard tables used for the mortality after retirement assumption are the SAPS tables. These are published by the Continuous Mortality Investigation (CMI) and based on the experience of defined benefit self-administered pension schemes. The 'S2' series are based on experience over the period 2004 to 2011. The S3 series of tables were published by CMI in December 2018 and these updated mortality tables cover experience between 2009 and 2016. The S3 series include tables for pensioners retiring in normal health (S3NXA), in ill health (S3IXA) and all pensioners (S3PXA), as well as for dependants (S3DXA). The tables are also split into "Heavy", "Middle", "Light" and "Very Light" subsets according to pension amount, as well as a table covering all amounts. The "Very Light" tables reflect the highest pension amounts.