NHS Pension Schemes (Scotland) (NHSPS (Scotland))

Advice on assumptions

Actuarial valuation as at 31 March 2020

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20 October 2023

Assumptions setting process
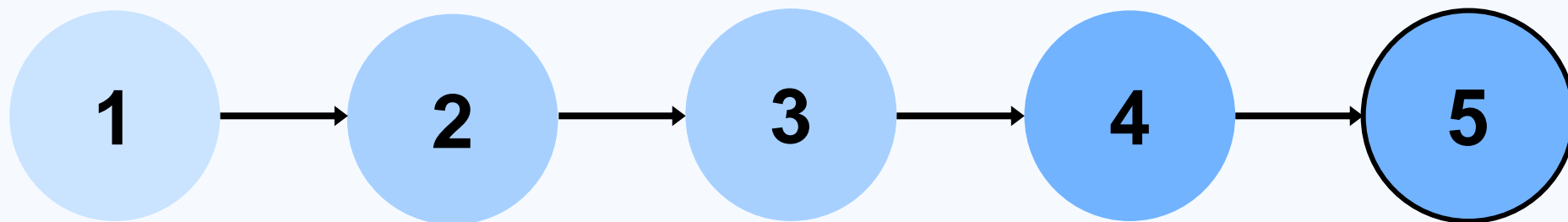
1	**2**	**3**	**4**	**5**
				Current
GAD analyse experience data and prepare an initial set of recommended 'scheme-set' assumptions.	GAD discuss recommended assumptions with the Scottish Public Pensions Agency (SPPA).	GAD discuss recommended assumptions with the NHS Pension Scheme (Scotland) Scheme Advisory Board.	GAD present final recommended assumptions to Scottish Ministers.	Scottish Ministers decide on the assumptions to be used in our calculations and inform 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.

Scottish Ministers have ultimate responsibility for setting the 'scheme-set' assumptions covered in this report, after considering GAD's advice.

Scottish Ministers have 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	🟠 Medium	⬇ Lower costs
Proportion commuted	🟠 Average	🟠 Medium	⬇ Lower costs
Retirement ages	🟠 Average	🟢 Small	🚫 No impact
Rates of leaving service	🟠 Average	🟢 Small	⬇ Lower costs
Promotional pay increases	🟠 Average	🟢 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

Part A: Background

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 B: Recommendations

Part C: Appendices

Part A: Background

Introduction

Who is this report for?

This report is addressed to Scottish Ministers.

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 NHSPS (Scotland) as at 31 March 2020, as required.

This report is intended to help Scottish Ministers:

- 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 NHSPS (Scotland) 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, employers could end up having over- or under-paid contributions, or 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:

- Scottish Ministers, who are 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.

Mortality after retirement

Retirement ages

Future mortality improvements

Discount rate

Rates of leaving service

Proportion commuted

Rates of pension increases

Rates of salary increases

Rates of ill-health retirement

Family statistics

Promotional pay increases

Rates of CARE re-valuation

Mortality before retirement

State Pension Ages

Deficit spreading periods

Scheme-set   Directed

Demographic   £ Financial

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.

Start

Finish

Active member → Rates of leaving service → Deferred member

Retirement ages → State pension ages → Normal health pensioner → Mortality after retirement → Future mortality improvements

Rates of ill-health retirement → Ill-health pensioner

Mortality before retirement → Deceased member → Family statistics → Dependant's pension

Mortality after retirement → Future mortality improvements → End of scheme liability

Legend:
- ☐ Member status: **no benefits payable**
- ☐ Member status: **benefits payable**
- ⬤ **Scheme-set**
- ⬤ **Directed**
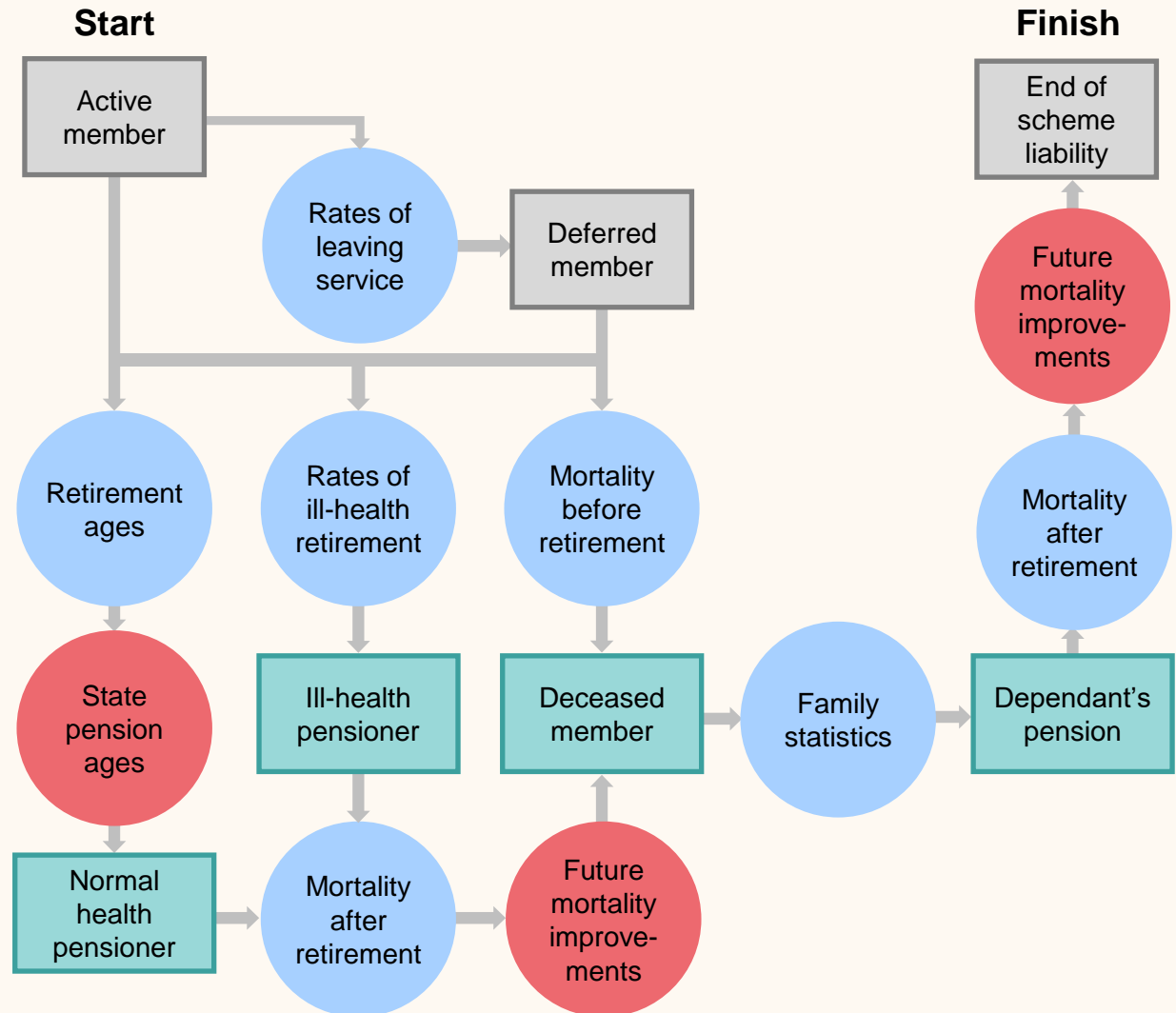
Financial assumptions

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.

☐	Member status: **no benefits payable**
☐	Member status: **benefits payable**
🔵	**Scheme-set**
🔴	**Directed**

Benefits due to members

Current value of benefits due

Benefits accruing (active members)

Benefits on hold (deferred members)

Benefits in payment (pensioners and dependants)

Cost of benefits to the scheme (all benefits paid)

Promo-tional pay increases

Rates of pension increases

Discount rate

Rates of salary increases

Proportion commuted

Deficit spreading periods

Rates of CARE revaluation
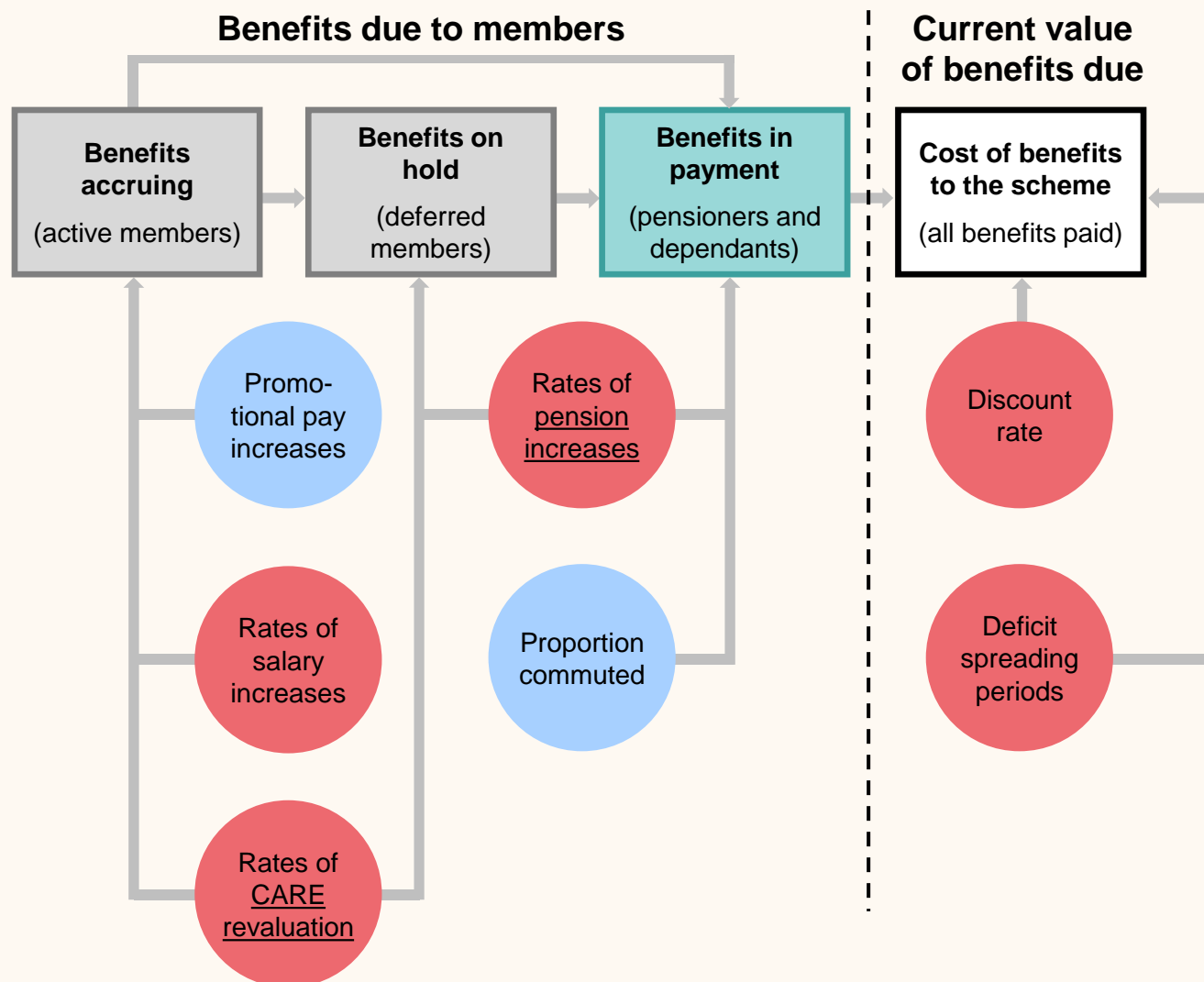
Setting assumptions

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.

Schemes in Scotland typically have smaller populations and more volatile experience compared to the larger schemes for members in England and Wales or Great Britain. In setting assumptions, we have considered the experience in the larger scheme of the same workforce.

Scottish Ministers then decide 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 Scottish Ministers' 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.

Our formal assumptions advice to Scottish Ministers

Analysis of scheme data and comparison of experience with current assumptions.

Consideration of the wider environment and any other relevant data that exists.

Liaison with stakeholders who may hold other relevant information, such as SABs.

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 20 October 2023, 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 employer contribution rates

Which assumptions are most important for setting employer contribution rates?

The chart to the right shows the importance of each assumption on employer contribution rates, relative to that of other assumptions. This shows that:

- there is a large degree of variation in the significance of each assumption

- the more significant assumptions tend to be directed by HM Treasury.

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.

For context, the employer contribution rate is currently 20.9% of pensionable pay. In monetary terms, this was equivalent to employer contributions of £1.4 billion in the financial year 2021-22.

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

Assumption	Importance
Mortality after retirement	Medium
Promotional pay increases	Medium
Proportion commuted	Low
Retirement ages	Low
Rates of leaving service	Low
Family statistics	Low
Rates of ill-health retirement	Very low
Mortality before retirement	Very low
Discount rate	Very high
Rates of pension increases	Very high
Future mortality improvements	High
Rates of CARE revaluation	High
State pension ages	Medium
Deficit spreading periods	Medium
Rates of salary increases	Medium

■ **Scheme-set assumptions**   ■ **Directed assumptions**

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 11.5% 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

Assumption	Importance
Mortality after retirement	Medium
Promotional pay increases	Very low
Proportion commuted	Medium
Retirement ages	Low
Rates of leaving service	Low
Family statistics	Low
Rates of ill-health retirement	Very low
Mortality before retirement	Very low
Discount rate	Very low
Rates of pension increases	Very low
Future mortality improvements	High
Rates of CARE revaluation	Very low
State pension ages	High
Deficit spreading periods	High
Rates of salary increases	Very low

■ Scheme-set assumptions   ■ Directed assumptions

Limitations

Data

In preparing this report, GAD has relied on data and other information supplied by SPPA as the administrators of NHSPS (Scotland), as described in our report titled 'Membership data', dated 20 October 2023. 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

Where possible, 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 Scottish Ministers. This report will be published as part of completing the 2020 valuation of the Scheme, and we are content for the Scottish Ministers 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 Scottish Ministers and SPPA, 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

Summarv 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	🟠 Medium	⬇ Lower costs
Proportion commuted	🟠 Average	🟠 Medium	🟠 Medium	⬇ Lower costs
Retirement ages	🟠 Average	🟢 Low	🟢 Small	🚫 No impact
Rates of leaving service	🟠 Average	🟢 Low	🟢 Small	⬇ Lower costs
Promotional pay increases	🟠 Average	🔴 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 employer contribution rates (ECR) and 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 employer contribution rates (ECR) and 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 ECR **or** CCC by more than 1%. 🟠 **Average** An assumption with an impact in between most and least. 🟢 **Least** An assumption that could plausibly impact both the ECR **and** 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** ECR and CCC likely to be higher. ⬇️ **Lower** ECR and CCC likely to be lower. ✛ **Uncertain** Likely impact on the ECR and 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 ECR or CCC.

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

Importance

Mortality after retirement (M)

Proportion commuted (M)

Retirement ages (N)

Rates of leaving service (S)

Promotional pay increases (N)

Rates of ill-health retirement (N)

Mortality before retirement (N)

Family statistics (N)

Volatility and unreliability

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 act typically 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	🟠 Medium	⬇ Lower costs

Our recommendations and rationale

We recommend updating the mortality assumption to be based on recent experience. We were not able to carry out an analysis of NHSPS (Scotland) experience. Therefore, we have considered the assumption recommended for the 2020 valuation of the NHS Pension Scheme in England and Wales (NHSPS (E&W)), together with national mortality data to analyse the differences between the Scotland and England & Wales populations. For NHSPS (Scotland), we recommend continuing to apply an adjustment of 12.5% to the NHSPS (E&W) assumptions.

It should be noted that our analysis of the NHSPS (E&W) experience identified an inconsistency compared to previous analyses and more information is set out on the following page.

We recommend adopting a single baseline mortality assumption for both current and future ill-health pensioners, based on recent experience. This differs from the 2016 valuation when the assumption for future ill-health pensioners was set equal to the standard ill-health table.

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 pension scheme data, and so, are more appropriate for the scheme than the 'S2' tables adopted at the 2016 valuation.

Mortality data issue for the NHSPS (E&W)

The results of the analysis of mortality of NHSPS (E&W) pensioners for the period 2016-20 has shown an unexpected inconsistency compared to the previous 8 years' analysis and taking into account the similar analysis of the Teachers' Pension Scheme (and other schemes) over the period. This inconsistency means higher rates of mortality have been observed based on the most recent data, than that expected based on the analysis of prior periods' data. We are now confident that the inconsistency results from an error in the data supplied for the 2012 and 2016 valuations, which were the first valuations for which comprehensive mortality data was provided. Cessation amounts in the 2012 and 2016 data were in many cases inconsistent with previously reported amounts of pension being paid.

There remain some issues with the provision of accurate data to support a robust mortality analysis for NHSPS (E&W), which are associated with challenges of updating records for large numbers of new awards and following member deaths. However, the identified error has now been corrected and in our view, the data available for the 2020 valuation, though not perfect, is adequate for setting a mortality assumption for the NHSPS (E&W). Given the previous error, this will result in some inconsistency both with the assumption previously adopted and when comparing the NHSPS (E&W) 2020 valuation results with other schemes' valuation results.

Ordinarily, when recommending the best estimate mortality assumption to be used for the 2020 valuation, we expect to recommend the analysis for the 2016-20 period be considered in conjunction with the previously set assumption, with some average of the two being concluded. This 'look back' to prior periods is intended to smooth the impact of variations over shorter periods. Given the acknowledged error in the previously set assumption, it is difficult to conclude any best estimate assumption should continue to refer to the prior assumption for the NHSPS (E&W).

For this reason, we have recommended aligning the NHSPS (E&W) mortality assumption for the 2020 valuation solely to the results of the 2016-20 analysis. Making this change will reduce the assumed life expectancies.

As the mortality assumptions set for the 2012 and 2016 valuations of the NHSPS (Scotland) were based on the NHSPS (E&W) mortality assumption, the identified issue also has implications for the NHSPS (Scotland).

For the 2020 valuation, we are continuing to recommend that the mortality assumption for the NHSPS (Scotland) is based on the NHSPS (E&W) mortality assumption.

The impact on the 2020 valuation results for NHSPS (Scotland) is a reduction in the Employer contribution rate of around 1.5% of pay and a reduction in the Cost cap cost of up to 0.7% of pay.

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 **second column** for males and females is the 2016 assumption, but updated to use a valuation date of 2020 and ONS-2020 improvements.
- The **third column** for males and females is the assumptions we recommend for the 2020 valuation for NHSPS (Scotland).
- The **fourth column** for males and females is the assumptions we recommend for the 2020 valuation for NHSPS (E&W).

The changes between the first and second columns show the impact of directed changes to future mortality improvements and the normal passage of time. The changes between the second and third 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	2020 valuation recommendation (NHS (E&W))	2016 valuation assumption	2016 assumption updated	2020 valuation recommendation	2020 valuation recommendation (NHS (E&W))
Current pensioners, age 65	88.1	87.2	87.0	87.8	89.6	88.9	88.2	89.0
Future pensioners, age 45	90.0	88.9	88.6	89.5	91.4	90.5	89.7	90.5

Recommendations in detail

Category		2016 Assumptions			2020 Recommendations		
		Standard table	Adjustment	Based on	Standard table	Adjustment	Based on
Normal health Pensioners	**Male**	S2NMA	95.5%	Scheme experience in NHSPS (E&W) and wider analysis of mortality differentials experienced by population in Scotland compared to England & Wales	S3NMA	102%	Scheme experience in NHSPS (E&W) and wider analysis of mortality differentials experienced by population in Scotland compared to England & Wales
	Female	S2NFA	97.5%		S3NFA	116%	
Current ill-health Pensioners	**Male**	S2IMA	95.5%		S3IMA	151%	
	Female	S2IFA	97.5%		S3IFA	151%	
Future ill-health Pensioners	**Male**	S2IMA	100%	UK-wide expectations	S3IMA	151%	
	Female	S2IFA	100%		S3IFA	151%	
Dependants	**Male**	S2NMA	112.5%	Scheme experience in NHSPS (E&W) and wider analysis of mortality differentials experienced by population in Scotland compared to England & Wales	S3DMA	92%	
	Female	S2NFA	112.5%		S3DFA	100%	

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

Recommendations in detail (NHSPS (E&W))

Category		2016 Assumptions			2020 Recommendations		
		Standard table	Adjustment	Based on	Standard table	Adjustment	Based on
Current pensioners	Male	S2NMA	83%	NHSPS (E&W) experience	S3NMA	91%	NHSPS (E&W) experience
	Female	S2NFA	85%		S3NFA	103%	
Future normal health pensioners	Male	S2IMA	83%		S3IMA	134%	
	Female	S2IFA	85%		S3IFA	134%	
Future ill-health pensioners	Male	S2IMA	100%	UK-wide expectations	S3IMA	134%	
	Female	S2IFA	100%		S3IFA	134%	
Dependants	Male	S2NMA	100%	NHSPS (E&W) experience	S3DMA	82%	
	Female	S2NFA	100%		S3DFA	89%	

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

Our approach

Analysis

The scheme experience provided was not sufficiently credible to carry out a robust analysis. We have analysed the NHSPS (E&W) mortality experience over the period 1 April 2016 to 31 March 2020 and have based our recommendation on that analysis. We show on page 27 how we have considered accounting data to test the reasonableness of the reliance on the NHSPS (E&W) assumption.

Our experience analysis for NHSPS (E&W) 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 underlined 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.

We have considered the corresponding analysis carried out for NHSPS (E&W), being the larger data set of the same workforce, and assessed the likely difference between mortality for Scotland relative to England & Wales.

Scheme experience: overall

Considerations for setting assumption

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

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.

For the 2016 valuation, the mortality assumptions were derived by applying a loading of 12.5% to the 2016 valuation mortality assumptions for NHSPS (E&W).

For the 2020 valuation, we recommend that the existing approach of applying an adjustment of 12.5% to the updated NHSPS (E&W) mortality assumption is retained.

For the 2016 valuation, the adjustment was applied as an additional +12.5%. For the 2020 valuation, we recommend applying this as a multiplication of x1.125. This gives consistency with the approach used for other public service pension schemes.

Annual accounting data: pensioner mortality

Rate of death as a proportion of start of year headcount

Key: ——— **NHSPS (E&W)**
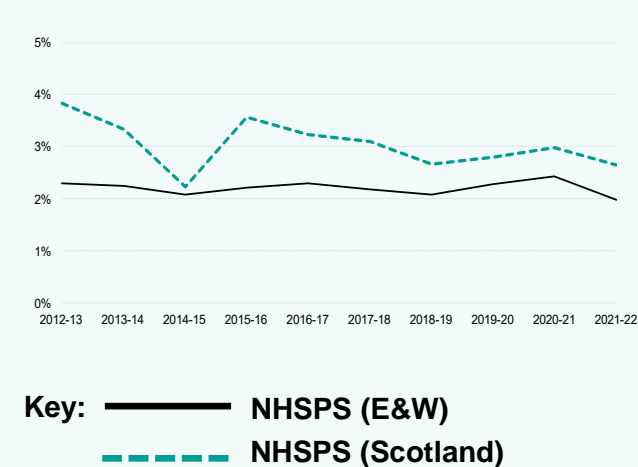
- - - - - **NHSPS (Scotland)**

Conclusion of Reasonableness check

The chart shows the number of cessations each year as a proportion of the start of year headcount in that year for NHSPS (Scotland) compared to the number of deaths for the NHSPS (E&W). This information has been extracted from the annual scheme accounts.

It should be recognised that this is a crude analysis which does not allow for differences in the underlying populations, such as age and gender profile.

If the underlying populations were similar, the relatively stable pattern shown on the graph could help support the conclusion that it is appropriate to continue to assume higher mortality rates apply to NHS staff in Scotland, compared to NHS staff in E&W. However, the evidence is not firm.

Summary of NHSPS (E&W) experience

Updating the baseline mortality assumption leads to reduced life expectancies in isolation.

Directed future mortality improvements also reduce life expectancies.

Scheme experience: in numbers (NHSPS (E&W))

The table shows NHSPS (E&W) figures. This shows the larger data set available. Experience data was not available for NHSPS (Scotland).

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	**Male**	£265 m	£254 m	105%	£266 m	100%
	Female	£210 m	£194 m	108%	£209 m	100%
Ill-health Pensioners	**Male**	£64 m	£42 m	151%	£64 m	100%
	Female	£61 m	£44 m	137%	£61 m	100%
Dependents	**Male**	£7 m	£6 m	114%	£7 m	100%
	Female	£79 m	£83 m	95%	£79 m	100%

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

Comparison with England and Wales mortality

Population mortality data

We have considered the most recent analysis of differences between aggregate population mortality rates.

The charts on this page show the ratios of Scottish population mortality rates to those for England & Wales over different time periods. These are taken from the ONS National Life Tables.

Scottish mortality rates are higher than England & Wales rates at almost all ages and the differences have been relatively stable over time. The ratios generally converge as age increases.

Similar differentials were observed for the 2012 and 2016 valuations. The 2016 valuation assumptions were set similar to those recommended for the 2016 valuation of the NHSPS (E&W), but with a 12.5% higher adjustment factor being applied.

Range of differences

From the updated comparison, a reasonable range for the excess of Scottish mortality over that for England & Wales for determining the mortality after retirement assumptions for pension scheme members is in the region of 5% to 20%. Our view is that, when considering the NHSPS (Scotland) membership, the uplift is likely to be below that for the population as a whole. This supports the retention of the existing 12.5% differential.

Ratio of Scotland to England & Wales population mortality rates, males
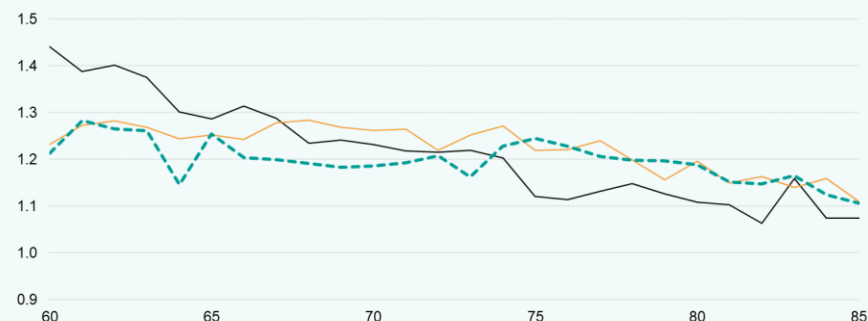
Ratio of Scotland to England & Wales population mortality rates, females

Key:
- ----- **2018 - 2020**
- ——— **2010 - 2012**
- ——— **2000 - 2002**

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
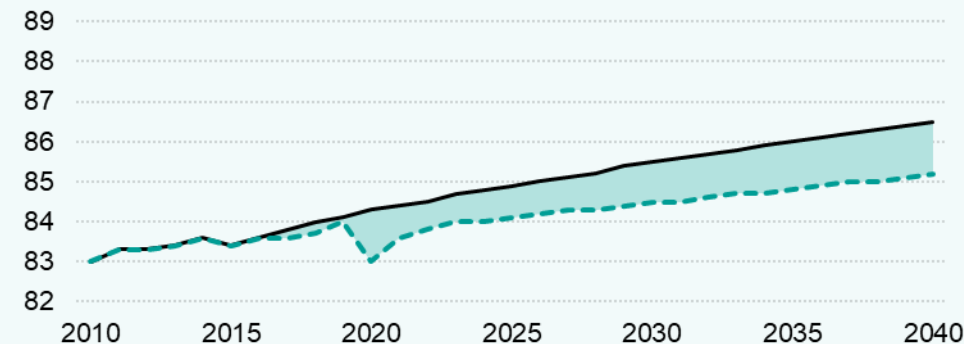
Life expectancies for UK females, aged 65
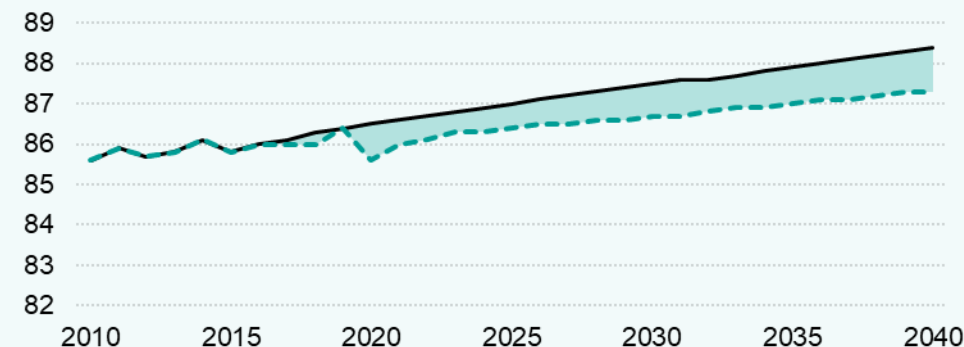
Key: ——— Based on **ONS-2016 projections**, which were adopted for the 2016 valuation

- - - - 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

We recommend an increase to each of the assumed commutation proportions. We were not able to carry out an experience analysis for this assumption for the NHSPS (Scotland). Therefore, we have considered the analysis carried out for NHSPS (E&W) being the larger data set of the same workforce. We recommend continuing to align the assumption with that of NHSPS (E&W).

For the **1995 section**, we recommend increasing the assumed commutation proportion to 10% for males (+2%) and to 12% for females (+1%). This is due to continued higher commutation proportions in the NHSPS (E&W) since 2016. Increasing the assumed commutation proportion, reduces the employer contribution rate.

For the **2008 section**, we recommend increasing the assumed commutation proportion to 20% for all members (+2.5%). As there are relatively few retirements over the period in the NHSPS (E&W) analysis, this is based on the NHSPS (E&W) experience combined with experience from other large schemes.

For the **2015 scheme**, we recommend increasing the assumed commutation proportion to 20% for all members (+2.5%). There are too few 2015 scheme retirements in the NHSPS (E&W) to set an assumption, so we looked to the 2008 section assumption to inform our recommendation.

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 **middle line** ( ) shows the impact of the assumptions adopted for the 2016 valuation.
- The **bottom line** ( ) shows the impact of the assumptions we recommend for the NHSPS (E&W) valuation.

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

1995 section - males	Additional lump sum	£24,000 / £19,200 / £24,000
	Pension remaining	£18,000 / £18,400 / £18,000
1995 section - females	Additional lump sum	£28,800 / £26,400 / £28,800
	Pension remaining	£17,600 / £17,800 / £17,600
2008 section	Additional lump sum	£48,000 / £42,000 / £48,000
	Pension remaining	£16,000 / £16,500 / £16,000
2015 scheme	Additional lump sum	£48,000 / £42,000 / £48,000
	Pension remaining	£16,000 / £16,500 / £16,000

In the 1995 section, members also receive an automatic lump sum equal to three times pension.

Our approach

Analysis

The scheme experience provided was not sufficiently credible to carry out a robust analysis. We have relied on the analysis of NHSPS (E&W) commutation experience over the period 1 April 2016 to 31 March 2020 and have based our recommendation on that analysis. We show on page 35 how we have considered accounting data to test the reasonableness of the reliance on the NHSPS (E&W) assumption.

The NHSPS (E&W) experience 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. We have relied on the NHSPS (E&W) data for the purposes of recommending suitable commutation assumptions.

- 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 to have a significant impact on members' commutation choices.

For NHSPS (E&W) analysis of the **1995 section**, we removed all deferred members from the analysis as a reasonable simplification to exclude many historic deferred members who have no commutation rights in the scheme.

For NHSPS (E&W) analysis of the **2008 section**, we removed all 2008 choice optant members from the analysis on the basis that they would not be representative of members who have a free commutation decision.

Scheme experience: overall

Considerations for setting assumption

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

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.

For the 2016 valuation, the commutation assumptions were the same as those adopted for the equivalent valuation of NHSPS (E&W).

We have no reason to believe that the commutation experience between NHS staff in Scotland and E&W would differ. Therefore, we have recommended increases to the assumed proportions commuted for the NHSPS (E&W) 2020 valuation and recommend the same changes to the NHSPS (Scotland) assumptions.

Annual accounting data: lump sum payments as a proportion of total pension

Lump sum payments as a proportion of total pensions

Key: ———— **NHSPS (E&W)**
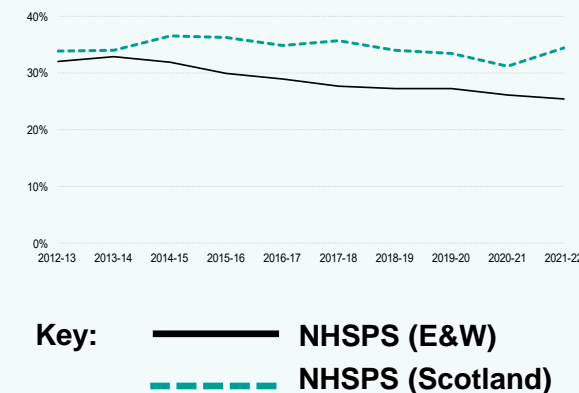
‐ ‐ ‐ ‐ ‐ ‐ **NHSPS (Scotland)**

Reasonableness check on NHSPS assumptions

The chart shows the total of lump sums taken each year as a proportion of total pensions in payment over that year for both the NHSPS (Scotland) and NHSPS (E&W). This information has been extracted from scheme accounts.

It should be recognised that this is a crude analysis which does not allow for differences in the underlying populations.

If the populations were similar, the analysis suggests higher lump sums are taken from NHSPS (Scotland) than NHSPS (E&W). However, the evidence is not firm. The comparison between the two schemes has not changed significantly since 2016, which gives some support for NHSPS (Scotland) continuing to align with NHSPS (E&W) assumption.

Summary of NHSPS (E&W) experience

The **1995 section**, for both males and females, has seen a higher proportion of commutation in recent years compared to the 2016 assumption.

The **2008 section** has 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 2008 section and other large schemes commutation experience, the proportion of commutation has been 20%, on average.

No analysis was carried out on the **2015 scheme** due to low rates of retirement.

Scheme experience: in numbers

Scheme	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
NHSPS (Scotland)	**1995 section - males**	N/A	N/A	N/A	8.0%	10.0%
	1995 section - females	N/A	N/A	N/A	11.0%	12.0%
	2008 section	N/A	N/A	N/A	17.5% (**)	20.0%
	2015 scheme	N/A	N/A	N/A	17.5% (**)	20.0%
NHSPS (E&W)	**1995 section - males**	£450 m	£46 m	10.2%	8.0%	10.0%
	1995 section - females	£996 m	£118 m	11.8%	11.0%	12.0%
	2008 section	£29 m	£6 m	21.4%	17.5% (**)	20.0%
	2015 scheme	N/A	N/A	N/A	17.5% (**)	20.0%
Other large public service schemes (*)		£226 m	£44 m	19.4%	17.5% (**)	20.0%

N/A - There was insufficient data to analyse. Therefore, we have not included any output in the table above

(*) Other large public service schemes data includes data from NHS Pension Scheme (E&W) – 2008 section, Civil Service Pension Scheme – Non-Classic schemes, Teachers' Pension Scheme (England and Wales) – NPA 65 section and Local Government Pension Scheme England and Wales – Post 2008 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.

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

We recommend no change to the retirement rates, but a change to the treatment of members in scope of the McCloud remedy. We were not able to carry out an experience analysis for the NHSPS (Scotland) for this assumption and recommend continuing to align the assumption with that of NHSPS (E&W).

Actual retirement experience for NHSPS (E&W) 1995 section between 2016-2020 was reasonably close to the expected position at most ages. We therefore recommended no changes to the current assumptions. There is insufficient NHSPS (E&W) data for the 2008 section and 2015 scheme to undertake a robust analysis of experience. Again, we therefore recommended no changes to the current assumptions.

The approach for the 2016 valuation set the same rates for members who transferred to the post-2015 scheme on 1 April 2015 and new joiners thereafter. Different rates were set for those who continued in the 1995/2008 Section after that date. We propose to change the criteria so that the second set of rates are applied more widely to include those up to 7 years' younger than the original cohort of "protected" members. This is intended to reflect retirement behaviour changes resulting from the McCloud remedy. We recognise this will mean 2012-2015 joiners out of scope of remedy will also have their retirement age set with reference to the legacy scheme, but we do not consider this to have sufficient impact to warrant a more sophisticated approach.

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 **middle line** (▬) shows the impact of the assumptions adopted for the 2016 valuation.

- The **bottom line** (▨) shows the impact of the assumptions we recommend for the NHSPS (E&W) 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
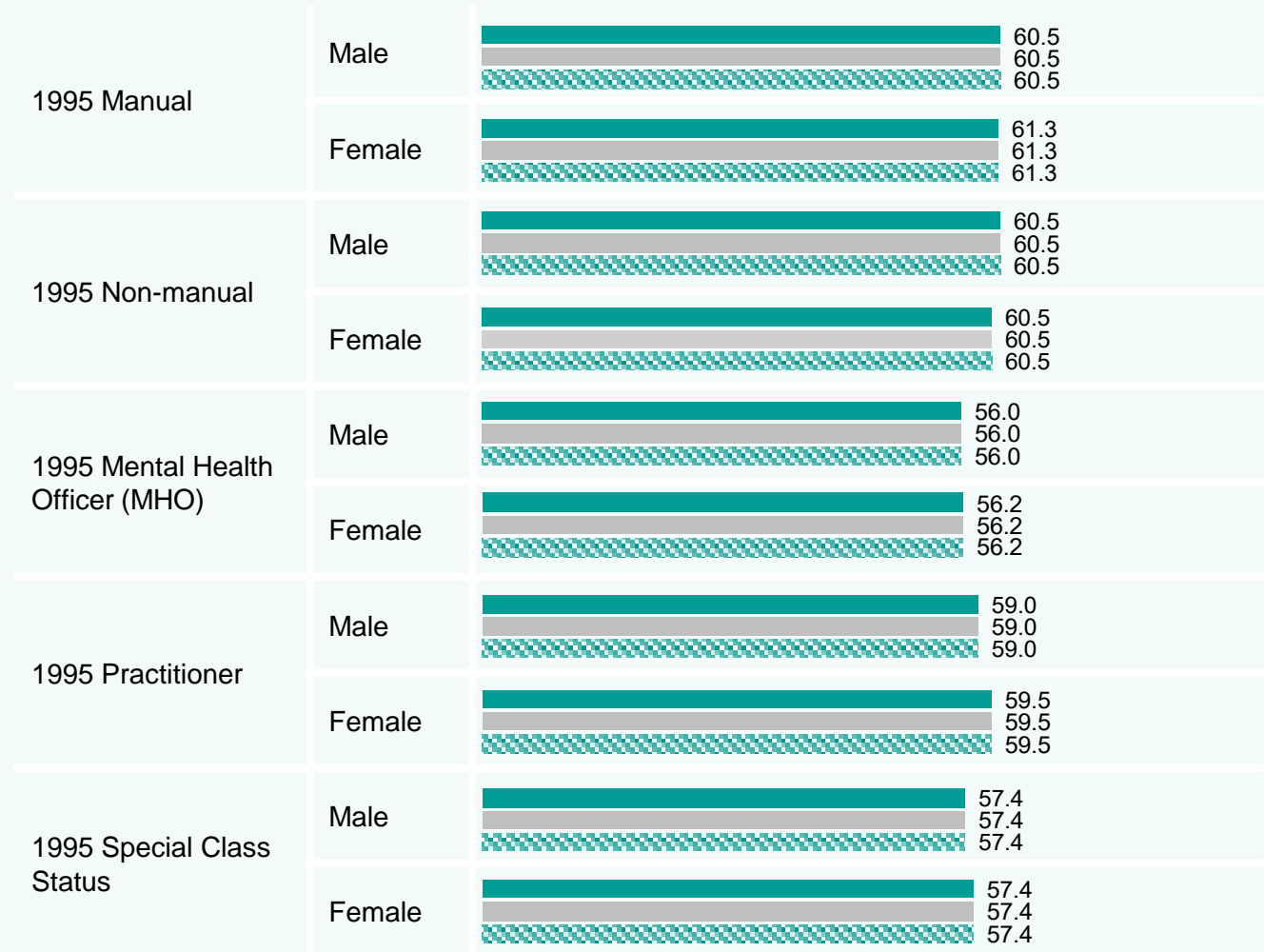
1995 Manual	Male	60.5 / 60.5 / 60.5
	Female	61.3 / 61.3 / 61.3
1995 Non-manual	Male	60.5 / 60.5 / 60.5
	Female	60.5 / 60.5 / 60.5
1995 Mental Health Officer (MHO)	Male	56.0 / 56.0 / 56.0
	Female	56.2 / 56.2 / 56.2
1995 Practitioner	Male	59.0 / 59.0 / 59.0
	Female	59.5 / 59.5 / 59.5
1995 Special Class Status	Male	57.4 / 57.4 / 57.4
	Female	57.4 / 57.4 / 57.4

Our approach

Analysis

The scheme experience provided was not sufficiently credible to carry out a robust analysis. We have analysed the NHSPS (E&W) retirement experience over the period 1 April 2016 to 31 March 2020 and have based our recommendation on that analysis. It has not been possible to perform any verification checks on the reasonableness of aligning the age retirement assumption to the NHSPS (E&W) assumption.

The NHSPS (E&W) analysis is based on active members of the scheme. Deferred members are not analysed and 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. We have relied on the NHSPS (E&W) data for the purposes of recommending suitable age retirement assumptions.

- 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.

We have considered the corresponding analysis carried out for NHSPS (E&W), being the larger data set of the same workforce, and assessed the likely difference between experience for Scotland relative to England & Wales.

Scheme experience: overall

Considerations for setting assumption

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

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.

For the 2016 valuation, the age retirement assumptions were set to be the same as those adopted for the equivalent valuation of NHSPS (E&W). We have no reason to believe that the retirement experience between NHS staff in Scotland and E&W would differ.

We have recommended no change to the assumed retirement rates for NHSPS (E&W) and therefore, we recommend no change to the NHSPS (Scotland) rates.

We have proposed that a change is made to application of the NHSPS (E&W) age retirement rates for unprotected members following the McCloud judgment and recommend the same change is made for NHSPS (Scotland) rates.

Summary of NHSPS (E&W) experience

1995 section members have been retiring broadly in line with rates assumed for the 2016 valuation. The average age of recent retirements are close to the 2016 assumptions. The number of retirements are also close to the 2016 assumptions.

There is insufficient information to test the impact on the 2008 section and the 2015 scheme.

We propose that a change is made to age retirement rates for unprotected members following the McCloud judgment, to allow for members potentially having an additional 7 years' service in legacy schemes.

Scheme experience: in numbers (NHSPS (E&W))

The table shows NHSPS (E&W) figures. This shows the larger data set available. Experience data was not available for NHSPS (Scotland).

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
1995 section - Manual	**Male**	3,716	61.2	61.8	61.8
	Female	3,423	61.5	62.6	62.6
1995 section - Non-Manual	**Male**	10,321	60.4	60.7	60.7
	Female	57,000	60.4	60.9	60.9
1995 section - Mental Health Officer (MHO)	**Male**	2,362	55.9	56.2	56.2
	Female	4,748	56.0	56.2	56.2
1995 section - Practitioner	**Male**	2,223	59.2	59.3	59.3
	Female	1,293	59.0	59.2	59.2
1995 section - Special Class Status	**Male**	1,216	56.8	57.0	57.0
	Female	25,667	56.9	57.3	57.3

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

Wider environment: McCloud and NMPA

McCloud judgment

For the 2016 valuation, different rates of age retirement were assumed for members who:

a. transferred to the 2015 scheme on 1 April 2015 (including all unprotected members), and new joiners thereafter.
b. continued in the 2008 section after 1 April 2015.
c. continued in the 1995 section after 1 April 2015.

This approach recognises that a member's retirement age is likely to be heavily influenced by the NPA in the scheme they have most benefits in.

The McCloud judgment could result in many unprotected members exchanging up to 7 years' service from the State Pension age-linked 2015 scheme to earlier NPA legacy arrangements.

It has been proposed that a change is made to age retirement rates for some unprotected members following the McCloud judgment. The change will recognise that retirement behaviours for those up to 7 years' younger than those originally subject to transitional protection, are likely to be influenced by the longer period of eligibility for legacy scheme benefits.

There are many other factors that might influence member behaviour, such as changes in the State Pension age and the recent increase in inflation.

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. 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.

Wider environment: Member behaviours

Partial / flexible retirement

SPPA announced on 29 March 2023, following a consultation process, that it would implement permanent retirement flexibilities and extend existing temporary measures to allow the most experienced staff to return to service or stay in service longer. New provisions, including partial retirement in the 1995 Section, have been introduced from 1 October 2023.

As the policy has not started, there is no experience on which to base assumptions about member behaviour. Any change to assumptions for the 2020 valuation would be based on predictions of member behaviour.

Given the uncertainty over the effect on member behaviour, it would be reasonable to make no change at the 2020 valuation and revisit the assumption at the 2024 valuation when some experience data will be available.

Similar changes have been introduced to the NHSPS (E&W). No changes to the retirement ages assumptions were made in the 2020 valuation for NHSPS (E&W) for the retirement flexibilities.

Annual Allowance (AA) and Lifetime Allowance (LTA)

The Spring 2023 Budget increased the AA and removed the LTA. The Chancellor made this pension tax reform to incentivise "workers to stay in work for longer".

This may change member behaviour in future, though at this stage, no direct evidence is available on the potential effects. Since the impact on member behaviours is not yet known, no adjustment to the retirement patterns is proposed for the 2020 valuation.

Evidence may emerge in due course, at which time it will be considered in relation to the assumptions to be adopted for future valuations.

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
Average	Low	Small	Lower costs

Our recommendations and rationale

We recommend increasing the rates of leaving service. We were not able to carry out an experience analysis for this assumption for the NHSPS (Scotland). We have, however, considered the analysis carried out for NHSPS (E&W).

For NHSPS (E&W), withdrawal experience has been consistently higher than previously assumed across all age groups, and this is in line with experience in other public sector schemes. The increase in rates has been highest for those with short service. However, we focused our review for NHSPS (E&W) on those members who stay longer than 3 years, as these are the most material from a financial perspective.

For NHSPS (E&W), we recommended updating assumptions to make equal allowance for recent experience and the 2016 valuation assumptions individually for each category of service period for the assumption. We also recommended using the unrounded individual rates of leaving at each age. This leads to an increase in the rate of leaving service at all ages for each category of the assumption.

We recommend making the same change for NHSPS (Scotland). Increasing rates of service reduces the employer contribution rate, although the effect is relatively small.

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 impact of the assumptions we recommend for the 2020 valuation.

- The **middle line** (▬) shows the impact of the assumptions adopted for the 2016 valuation.

- The **bottom line** (▨) shows the impact of the assumptions we recommend for the NHSPS (E&W) 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
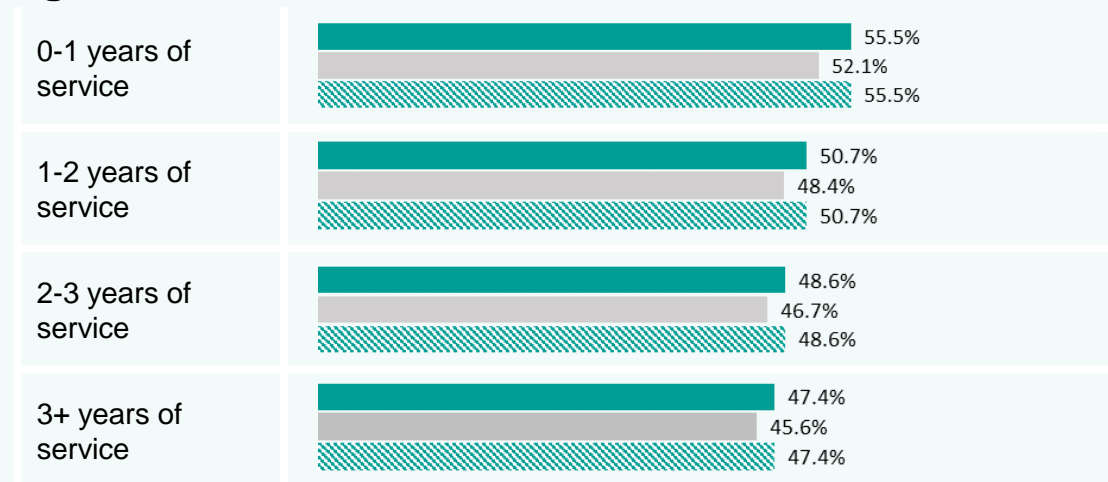
0-1 years of service		55.5%
		52.1%
		55.5%
1-2 years of service		50.7%
		48.4%
		50.7%
2-3 years of service		48.6%
		46.7%
		48.6%
3+ years of service		47.4%
		45.6%
		47.4%

Our approach

Analysis

The scheme experience provided was not sufficiently credible to carry out a robust analysis. We have analysed the NHSPS (E&W) experience over the period 1 April 2016 to 31 March 2020 and have based our recommendation on that analysis. We show on page 49 how we have considered accounting data to test the reasonableness of the reliance on the NHSPS (E&W) assumption.

In the NHSPS (E&W) analysis, we excluded all leavers who rejoined within 5 years as these members are treated as if they had never left the scheme.

Re-entry of members to pensionable service was modelled by a 'net' withdrawal assumption for active members. This explicitly allows for a proportion of those leaving active service to return. No further explicit allowance has therefore been made in the valuation for a proportion of those deferred at the effective date to subsequently rejoin.

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. We have relied on the NHSPS (E&W) data for the purposes of recommending suitable withdrawal assumptions.

- 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.

We have considered the corresponding analysis carried out for NHSPS (E&W), being the larger data set of the same workforce, and assessed the likely difference between experience for Scotland relative to England & Wales.

Scheme experience: overall

Considerations for setting assumption

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

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.

For the 2016 valuation, the rates of leaving service were the same as those adopted for the equivalent valuation of NHSPS (E&W).

We have recommended a small increase to the rates of leaving service for NHSPS (E&W). Although there has been a divergence in the number of leavers identified in scheme accounts, we do not have any detailed experience data to analyse the membership breakdown. We have no reason to believe that the experience between NHS staff in Scotland and England & Wales would differ.

We therefore recommend making the same change for NHSPS (Scotland).

Annual accounting data: leavers

Withdrawals as a proportion of start of year headcount (NHS EW net withdrawals)
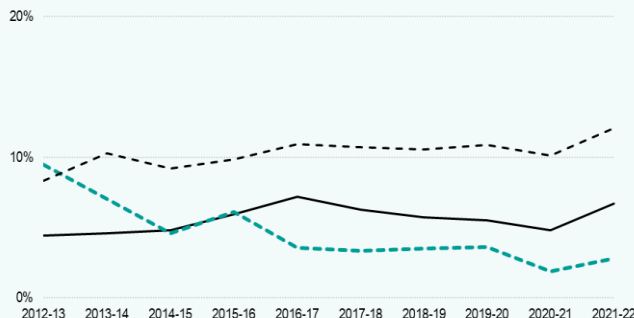
Key:
— **NHSPS (E&W) (net withdrawals)**
-■- **NHSPS (E&W) (leavers)**
-■- **NHSPS (Scotland) (leavers)**

Reasonableness check conclusion

The chart shows the number of leavers each year as a proportion of the start of year headcount in that year for both the NHSPS (Scotland) and NHSPS (E&W). This information has been extracted from the annual scheme accounts.

It should be recognised that this is a crude analysis, which does not identify differences in the underlying populations, such as age, service and gender profile.

If the populations were similar, the analysis suggests the proportion of leavers is lower in NHSPS (Scotland), compared to NHSPS (E&W). The number of withdrawals from NHSPS (Scotland) also appears to have reduced in recent years. However, the evidence here is not firm.

Summary of NHSPS (E&W) experience

The analysis shows that the 2016 valuation assumed a lower level of withdrawals than emerged in experience. This was particularly observed for males and those with shorter service. 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 2020 proposed withdrawal assumption allows for a c.6% increase in rates which makes equal allowance for recent experience and the 2016 valuation assumptions for those with more than 3 years service which are the most financially material.

Scheme experience: in numbers (NHSPS (E&W))

The table shows NHSPS (E&W) figures. This shows the larger data set available. Experience data was not available for NHSPS (Scotland).

	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
0-1 years of service	133,655	87,947	110,813
1-2 years of service	68,943	49,360	59,152
2-3 years of service	32,451	28,095	30,278
3+ years of service	175,397	158,855	167,259

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

Promotional pay increase assumptions are important as they help determine the value of 'final salary' benefits which make up a high proportion of scheme costs. The final salary proportion will reduce over time as more CARE benefits are built up in the reformed scheme, which are less dependent on promotional pay increases.

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
🟠 Average	🔴 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.

We have carried out two types of analysis, which are explained on the following pages. We have carried out our analysis using a blend of assumptions for manual and non-manual employees, as the data does not categorise any members as manual.

The 'profile analysis' repeats the approach that was possible at the 2016 valuation. This indicates that the rate of promotional pay increases experienced is broadly aligned with the previous assumption.

The 'annual increase analysis' suggests that promotional pay increases have been higher than expected over 2016 to 2020, based on the 2016 assumptions, with larger differences at younger ages. It is worth noting that younger members would not be expected to accrue final salary benefits, and therefore, promotional increases are less relevant to their benefit accrual.

The two analyses appear to lead to different conclusions. Given this uncertainty, we do not feel that there is sufficient evidence to allow us to make a recommendation of an alternative promotional scale.

At the 2016 valuation, the assumptions adopted for NHSPS (Scotland) were the same as those for NHSPS (E&W). No change is proposed for the promotional pay assumptions for NHSPS (E&W).

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 **middle line** (▬) shows the impact of the assumptions adopted for the 2016 valuation.

- The **bottom line** (▨) shows the impact of the assumptions we recommend for the NHSPS (E&W) valuation.

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

Manual	Males	£31,935 / £31,935 / £31,935
	Females	£30,834 / £30,834 / £30,834
Non-Manual	Males	£33,767 / £33,767 / £33,767
	Females	£32,293 / £32,293 / £32,293
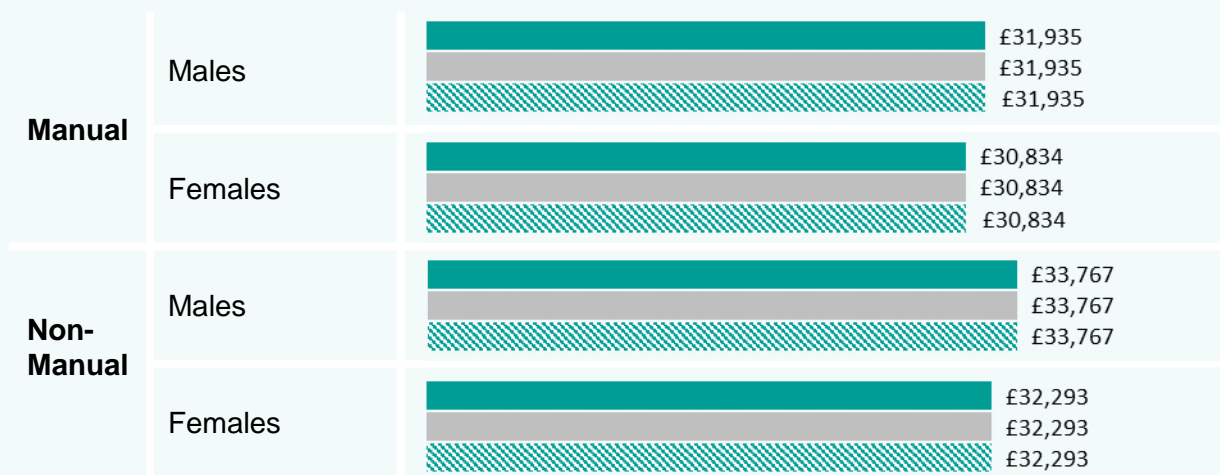
General (non-promotional) salary increases are set to be zero in the chart so that the impacts of different promotional pay assumptions can be seen more clearly. In practice a member's salary will also be expected to increase due to general salary increases. The assumed rate of general salary increases is set by HM Treasury.

General pay awards differ between NHSPS (Scotland) and NHSPS (E&W). There are also differences in the underlying pay scales.

Our approach

Analysis

We have carried out two types of analysis.

Profile analysis: We have analysed the scheme's salary growth experience by comparing the average (whole-time equivalent) pensionable pay of the overall active membership as at 31 March 2020 for each year of age, with that for the next year of age.

Annual increase 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. 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.

This analysis could not be undertaken for the 2016 valuation due to data limitations.

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.

We have also considered the corresponding analysis carried out for NHSPS (E&W), being the larger data set of the same workforce.

Scheme experience: profile analysis

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

Profile analysis illustrates how pay varies by age and may help support setting an age-related pay scale. A similar analysis was completed as part of the 2016 valuation, as it was not possible to carry out the 'annual increase' analysis. The results of profile analysis should be treated with some caution when considering how to set forward looking promotional pay growth assumptions.

The charts show the underlying trend broadly aligns to the 2016 assumption for most ages, although there are some ages for both males and females where the increases are higher or lower than assumed.

The implied age-related pay increases at older ages are lower than the 2016 valuation assumptions, which is inconsistent with the conclusions of the experience analysis set out on the following pages where experience has been higher than the assumption across all ages.

Care should be taken when interpreting this analysis as the membership at each age is not homogeneous. The relative rates of pay at each age is likely to be distorted by the changing mix of members and different behaviours at different ages.

Annual promotional pay increases by age, split by category

Key:

Experience (line) and difference from 2016 assumptions (shaded area)

2016 assumptions   2020 recommendations
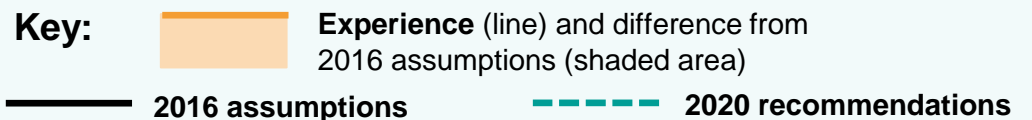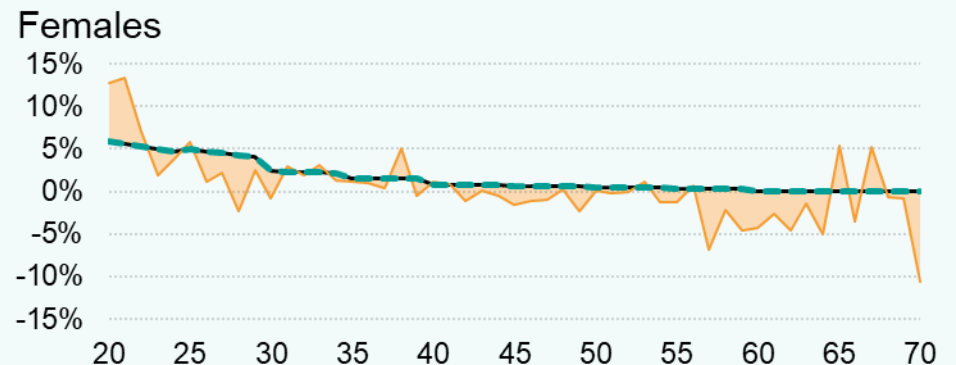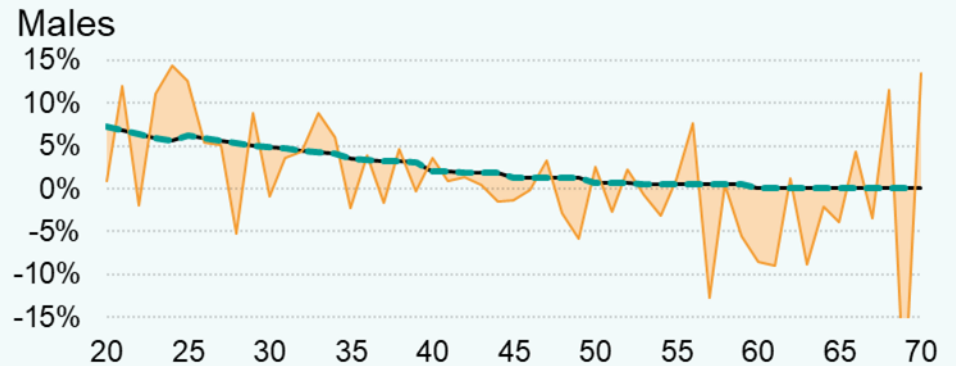
Scheme experience: annual increase analysis

The charts here and overleaf compare:

- **actual experience** (⬛) - what has happened over the last 4 years.

- **2016 assumptions** (⬛) – what we thought would happen, based on the assumptions adopted for the 2016 valuation.

- **2020 recommendations** (⬛) – 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
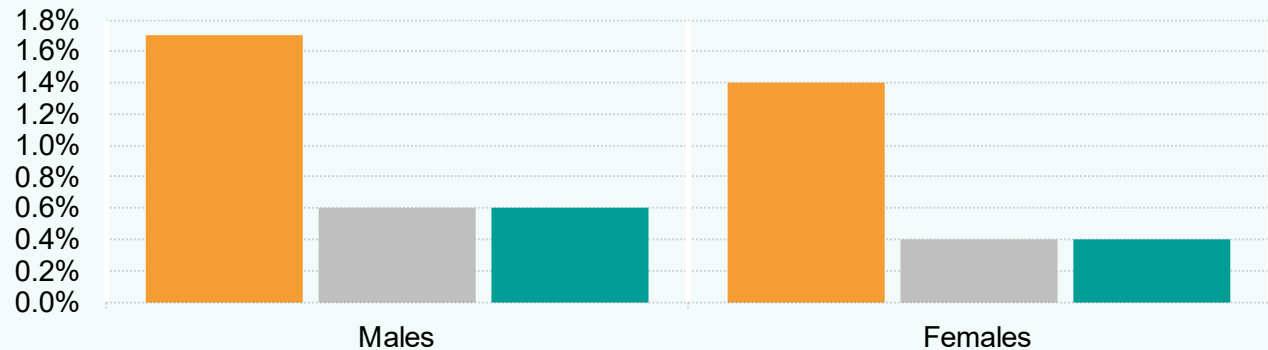
Summary

The charts above show the average annual promotional pay increase from age 45 to 65. This analysis indicates that average annual promotional pay increases between these ages has been higher than that assumed in the 2016 valuation for both males and females.

The charts overleaf show the annual promotional pay increases at each age. They suggest that both males and females have experienced higher promotional pay increases than expected, based on the 2016 assumptions, at all ages. The differences are larger at younger ages. Members at younger ages would not be expected to accrue final salary benefits and therefore promotional increases are less relevant to their benefit accrual.

While there is some evidence that experience has been higher than assumed, we are cautious to rely solely on this analysis to support a change to this assumption. Data limitations meant this analysis could not be undertaken for the 2016 valuation. Therefore, we have some concerns around using the 2016 valuation membership data as our starting point for this analysis.

Scheme experience: annual increase analysis

Annual promotional pay increases by age

Males

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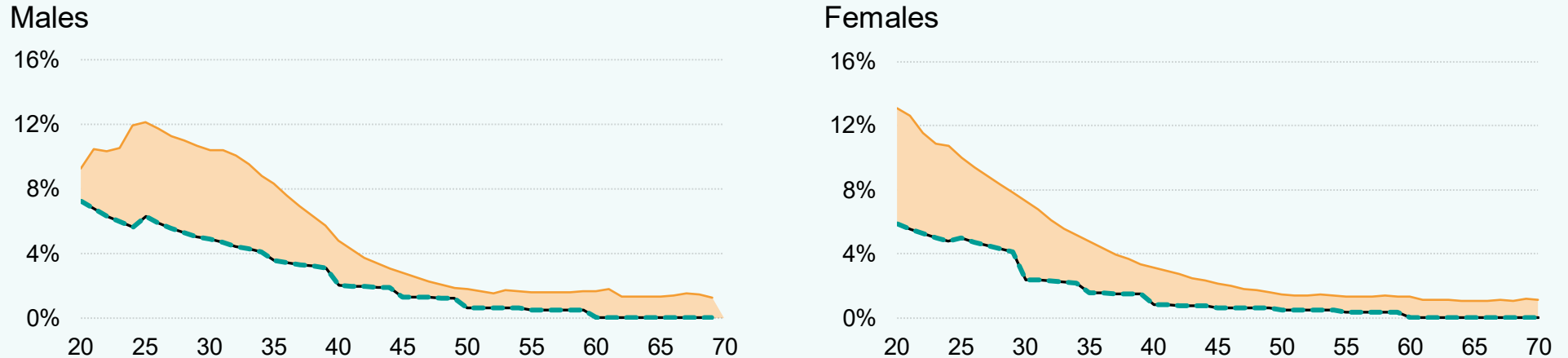
Key: ——— **2016 assumptions**   - - - - **2020 recommendations**   **Experience** (line) and difference from 2016 assumptions (shaded area)

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
NHSPS (Scotland)	**All (blended)**	Males	£773 m	£881 m	1.7%	0.6%	0.6%
		Females	£2,633 m	£2,933 m	1.4%	0.4%	0.4%
NHSPS (E&W)	**Manual**	Males	£836 m	£909 m	1.2%	0.3%	0.3%
		Females	£751 m	£805 m	1.0%	0.1%	0.1%
	Non-Manual	Males	£8,825 m	£9,725 m	0.7%	0.6%	0.6%
		Females	£24,558 m	£26,444 m	0.7%	0.4%	0.4%

The table provides the data underlying the annual increase analysis. For the 2020 valuation of the NHSPS (E&W), the annual increase analysis was the analysis used in forming the recommendations.

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.

The NHSPS (Scotland) 2016 and 2020 Expectations are calculated using a blend of 5% of the 'manual' and 95% of the 'non-manual' assumptions. The proportions are based on previous NHSPS (Scotland) data and the NHSPS (E&W) data for the 2020 valuation. We intend to use this blended assumption for the purposes of our calculations.

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 upper-tier or lower-tier 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

We recommend no change to the assumptions adopted for the 2016 valuation. We were not able to carry out an experience analysis for these assumptions for NHSPS (Scotland). The 2016 valuation assumed the same ill-health assumptions as NHSPS (E&W).

Ill-health incidence: Ill-health retirement rates for NHSPS (E&W) have been lower than previously assumed. However, adjusting the assumption for recent experience would not make a material change to the valuation results, so we recommended that the 2016 valuation assumptions were retained for NHSPS (E&W). As the available data ends at 31 March 2020, it misses most of the impact of COVID-19. There is anecdotal evidence that COVID-19 has increased the number of ill-health retirements, which supports retaining the current assumption despite pre-pandemic evidence.

We have no reason to believe that the ill-health retirement experience between NHS staff in Scotland and E&W would differ. Therefore, we recommend no change for NHSPS (Scotland).

Split Between ill-health tiers: The NHSPS (E&W) data showed a slightly lower proportion of upper-tier retirements than expected. As the difference did not have a material financial impact, we proposed no change.

In the absence of evidence to support a change, we recommend no change for NHSPS (Scotland).

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 impact of the assumptions we recommend for the 2020 valuation.

- The **middle line** (▬▬▬) shows the impact of the assumptions adopted for the 2016 valuation.

- The **bottom line** (▨▨▨) shows the impact of the assumptions we recommend for the NHSPS (E&W) 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
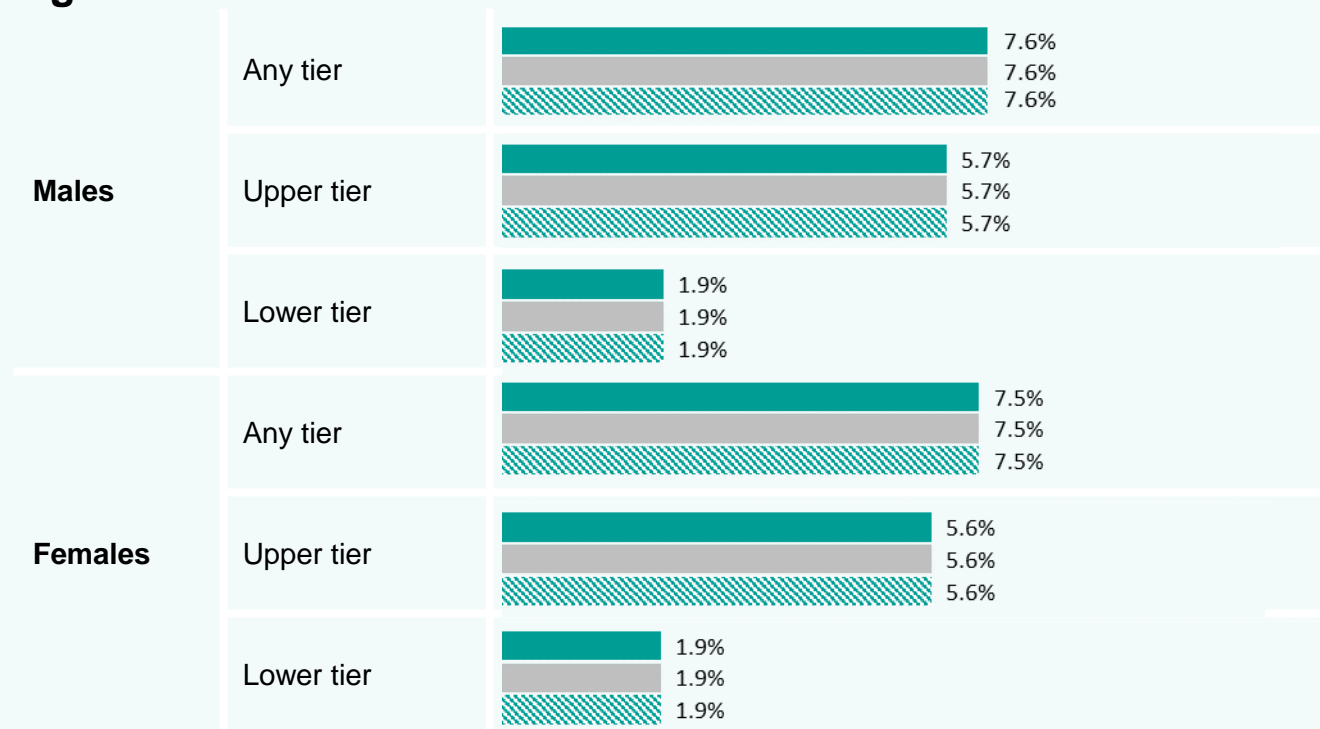
Males	Any tier	7.6% / 7.6% / 7.6%
	Upper tier	5.7% / 5.7% / 5.7%
	Lower tier	1.9% / 1.9% / 1.9%
Females	Any tier	7.5% / 7.5% / 7.5%
	Upper tier	5.6% / 5.6% / 5.6%
	Lower tier	1.9% / 1.9% / 1.9%

Our approach

Analysis

The scheme experience provided was not sufficiently credible to carry out a robust analysis. We have analysed the NHSPS (E&W) experience over the period 1 April 2016 to 31 March 2020 and have based our recommendations on that analysis. It has not been possible to independently verify the reasonableness of this approach.

As ill-health criteria sometimes differ between schemes, there is a chance that experience might have been slightly different if members in scope for the McCloud remedy were in a different scheme at the time of assessment of eligibility. We expect the overall impact of this to be immaterial and have made no allowance for this possibility.

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. We have relied on the analysis of the NHSPS (E&W) data to formulate our recommendation.

- 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.

We have considered the corresponding analysis carried out for NHSPS (E&W), being the larger data set of the same workforce, and assessed the likely difference between experience for Scotland relative to England & Wales.

Scheme experience: overall

Considerations for setting assumption

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

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.

For the 2016 valuation, the ill-health assumptions for NHSPS (Scotland) were set to be the same as that for NHSPS (E&W). We have no reason to believe that the ill-health retirement experience between NHS staff in Scotland and E&W would differ.

No change was recommended to the NHSPS (E&W) assumptions for ill-health incidence and the split between ill-health tiers. It was noted that the differences between the existing assumptions and the 2016-2020 experience were not expected to have a material impact on employer contribution rates.

No change in assumption is correspondingly proposed for NHSPS (Scotland).

Summary of NHSPS (E&W) experience

There have been fewer ill-health retirements compared to the 2016 assumptions. However, this difference is small and unlikely to be material to the contribution rate and so we would propose retaining the 2016 ill-health retirement decrement assumption for the 2020 valuation.

We separately considered the ill-health tiers. For the 2016 valuation, 75% of members were assumed to retire with upper-tier benefits when leaving due to ill-health. Our analysis identified that around 70% of actual retirements over 2016-2020 were with upper-tier benefits. As this is not significantly different, we propose to maintain the current assumption.

Scheme experience: in numbers (NHSPS (E&W))

The table shows NHSPS (E&W) figures. This shows the larger data set available. Experience data was not available for NHSPS (Scotland).

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
Males	**Any tier**	1,634	2,175	2,175
	Upper tier	1,143 (70%)	1,631 (75%)	1,631 (75%)
	Lower tier	491 (30%)	544 (25%)	544 (25%)
Females	**Any tier**	5,938	6,725	6,725
	Upper tier	4,154 (70%)	5,044 (75%)	5,044 (75%)
	Lower tier	1,784 (30%)	1,681 (25%)	1,681 (25%)

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 tests for the eligibility of members to receive ill-health benefits can differ between the legacy and reformed schemes.

Therefore, there may be an increased rate of ill-health retirement for in scope members, who may be reassessed under different rules. We would not expect this to have a material impact on contribution rates.

This difference ceased to apply from 1 April 2022 when all members moved into the reformed scheme.

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

We recommend no change to the assumption. We were not able to carry out an experience analysis for this assumption for NHSPS (Scotland) and recommend continuing to align the assumption with that of NHSPS (E&W).

Actual death before retirement experience for NHSPS (E&W) was not materially different to that expected (albeit lower) at most ages. We recommend no changes to the current assumptions as this difference is not material to the contribution rate.

The analysed experience runs to 31 March 2020, and as such misses most of the impact of COVID-19. It is accepted that COVID-19 increased the number of deaths before retirement.

We recommend continuing to align the assumption for NHSPS (Scotland) with that of NHSPS (E&W). There is no evidence to suggest the existing assumption is inappropriate.

Practical implications

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

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

- The **middle line** (▬▬) shows the impact of the assumptions adopted for the 2016 valuation.

- The **bottom line** (▨▨) shows the impact of the assumptions we recommend for the NHSPS (E&W) 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
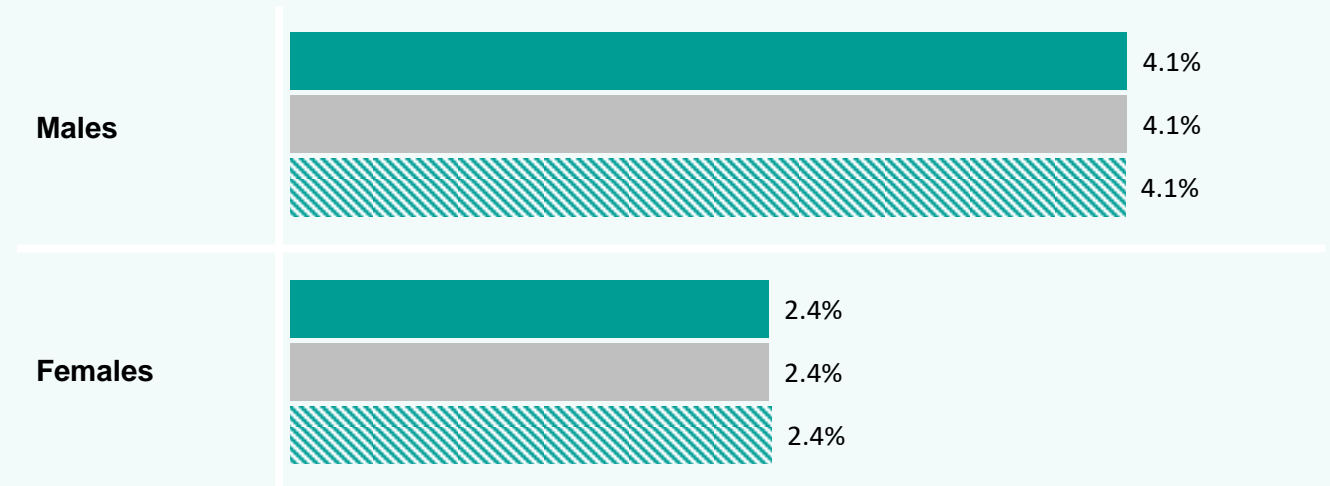
Males
- 4.1%
- 4.1%
- 4.1%

Females
- 2.4%
- 2.4%
- 2.4%

Our approach

Analysis

The scheme experience provided was not sufficiently credible to carry out a robust analysis. We have analysed the NHSPS (E&W) pre-retirement mortality experience over the period 1 April 2016 to 31 March 2020 and have based our recommendations on that analysis. It has not been possible to independently verify the reasonableness of this approach.

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. In the case of the pre-retirement mortality assumption, we have relied on the NHSPS (E&W) data.

- 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.

We have considered the corresponding analysis carried out for NHSPS (E&W), being the larger data set of the same workforce, and assessed the likely difference between experience for Scotland relative to England & Wales.

Scheme experience: overall

Considerations for setting assumption

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

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.

For the 2016 valuation, the pre-retirement mortality assumptions were the same as those adopted for the equivalent valuation of the NHSPS (E&W).

Although we recommend a shorter life expectancy for post-retirement mortality, the rates of mortality before retirement are lower and therefore less material to the employer contribution rate. We have no reason to believe that the mortality before retirement experience between NHS staff in Scotland and E&W would differ to a material extent.

The mortality before retirement experience in the NHSPS (E&W) was slightly lower than assumed for the 2016 valuation. No change was made to the pre-retirement mortality assumption for the 2020 valuation of the NHSPS (E&W) and therefore we recommend no change to the NHSPS (Scotland) assumption.

Summary of NHSPS (E&W) experience

There have been slightly fewer deaths before retirement than expected since 2016.

The age profile of the recent deaths broadly match the 2016 assumptions, with average ages of death of around 52 for men and 51 for women.

Adjusting the assumption for recent experience would not have a material effect on the valuation result.

Scheme experience: in numbers (NHSPS (E&W))

The table shows NHSPS (E&W) figures. This shows the larger data set available. Experience data was not available for NHSPS (Scotland).

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
Males	1,187	1,384	1,384
Females	2,543	2,940	2,940

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

We recommend no change to any of the NHSPS (Scotland) family statistic assumptions which are the same as the NHSPS (E&W) assumptions.

For the **current pensioner proportion married** assumptions (applicable to 1995 section members), we do not have the experience data to test the suitability of this assumption and so have considered NHSPS (E&W) experience which is broadly in line with the current 2016 assumptions. On the basis of there being no reason to expect circumstances to differ between members in NHSPS (Scotland) and NHSPS (E&W), we recommend no change to the 2016 assumptions for NHSPS (Scotland).

For the **current pensioner proportion married/partnered** assumptions (applicable to 2008 section and 2015 scheme members), there are too few deaths arising from the 2008 section and 2015 scheme to test the suitability of this assumption, which was similarly the case for NHSPS (E&W), so we considered the ONS married and married/partnered assumptions. We recommend no change to the 2016 assumptions. For the **future pensioner proportion married and married/partnered** assumptions, we do not have the experience data to test the auditability of this assumption (and neither did NHSPS (E&W)). We recommend no change to the 2016 assumptions.

We recommend no change to the 2016 assumptions for **age difference** and other **minor** assumptions on grounds of materiality. More information is on page 78.

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 impact of the assumptions we recommend for the 2020 valuation.

- The **middle line** ( ) shows the impact of the assumptions adopted for the 2016 valuation.

- The **bottom line** ( ) shows the impact of the assumptions we recommend for the NHSPS (E&W) valuation.

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

Leaving service before 31 March 2008	Males	49% / 49% / 49%
	Females	13% / 13% / 13%
In service on or after 31 March 2008	Males	49% / 49% / 49%
	Females	13% / 13% / 13%
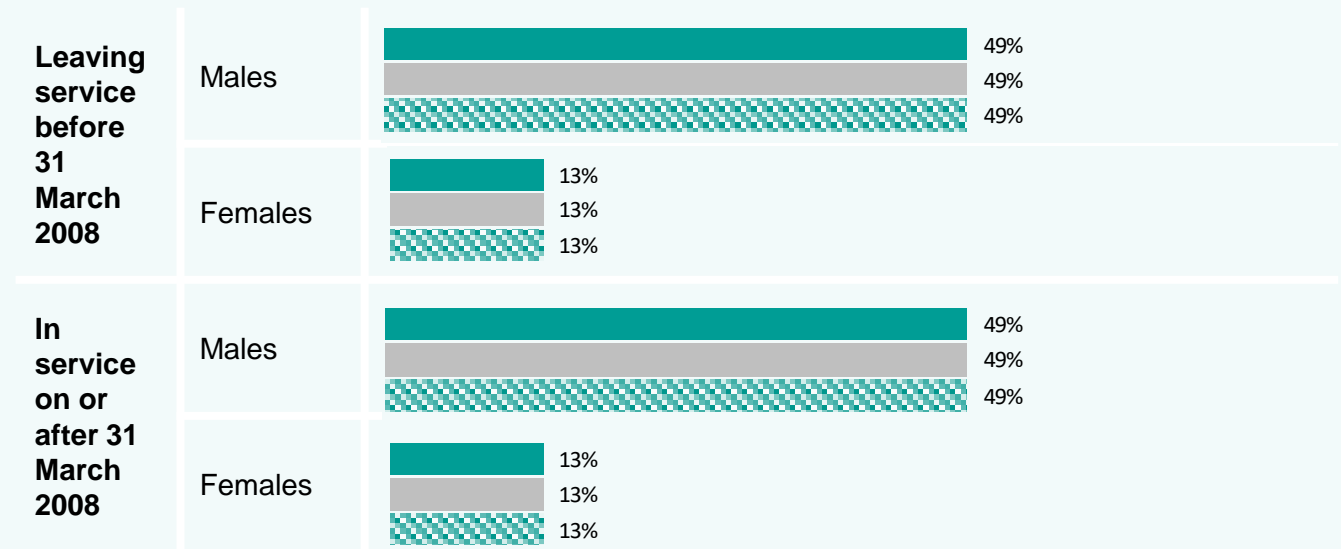
*Assumed age at death for normal health male pensioners is 87 and for female is 88.

Our approach

Analysis

The scheme experience provided was not sufficiently credible to carry out a robust analysis. We have relied on the analysis of the NHSPS (E&W) proportion married experience over the period 1 April 2016 to 31 March 2020 and have based our recommendation on that analysis.

The NHSPS (E&W) 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 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. We have relied on the NHSPS (E&W) data for the purposes of recommending suitable proportion married assumptions.

- 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 on an equal allowance for recent experience and the 2016 valuations assumptions, which were in turn set using pre-2016 experience.

Scheme experience: overall

Considerations for setting assumption

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

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.

In the absence of NHSPS (Scotland) experience data, we have considered the experience analysis carried out on the equivalent valuation of the NHSPS (E&W) scheme.

Summary

For the 2016 valuation, the family statistics were the same as those adopted for the equivalent valuation of the NHSPS (E&W). We have no reason to believe that the experience between NHS staff in Scotland would differ to that in England & Wales.

We were not able to carry out an experience analysis for this assumption for NHSPS (Scotland). An experience analysis was carried out for the current pensioner proportion married for NHSPS (E&W) and experience was broadly in line with that expected.

No other NHSPS (E&W) analysis was possible, but ONS 2020 family statistics were also considered. We recommended no change to other family statistic assumptions for NHSPS (E&W). These other assumptions have a small effect on the results and no change was recommended on the grounds of materiality.

In line with our recommendations for no changes to the NHSPS (E&W) family statistics, we also recommend no change to these assumptions for NHSPS (Scotland).

Summary of NHSPS (E&W) experience

The **1995 section (i.e. members leaving service before 31 March 2008)**, for both males and females, has seen a similar proportion married in recent years compared to the 2016 assumption. The charts show that the age profile of the proportion married for recent deaths broadly match the 2016 assumptions.

There is insufficient information to test the impact on the **2008 section and 2015 scheme (i.e. members in service on or after 31 March 2008)**, due to low rates of deaths. However, ONS married and married/partnered statistics were considered when informing whether the married/partnered assumption remained appropriate. The ONS data supported no change to the gap between the married and married/partnered assumption.

Scheme experience: in numbers (NHSPS (E&W))

Proportion married or married/partnered at death, by age and category

The table shows NHSPS (E&W) figures. This shows the larger data set available. Experience data was not available for NHSPS (Scotland).

Category		**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 married/partnered at death under the 2016 recommendations	**2020 Expectations** Expected proportion married or married/partnered at death under the 2020 recommendations
Leaving service before 31 March 2008	**Males**	21,672	55%	57%	57%
	Females(*)	26,039	38%	38%	38%
In service on or after 31 March 2008 (**)	**Males**	377	71%	75%	75%
	Females	543	51%	51%	51%

*Female members aged 84 and younger.
**There was insufficient data to produce a robust analysis and therefore, the output included in the table above is for information only.

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

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
NHSPS (Scotland)	**Leaving service before 31 March 2008**	**Males**	N/A (*)	N/A (*)	3	3
		Females	N/A (*)	N/A (*)	-3	-3
	In service on or after 31 March 2008	**Males**	N/A (*)	N/A (*)	3	3
		Females	N/A (*)	N/A (*)	-3	-3
NHSPS (E&W)	**Leaving service before 31 March 2008**	**Males**	11,925	N/A (*)	+3	+3
		Females	9,896	N/A (*)	-3	-3
	In service on or after 31 March 2008	**Males**	266	N/A (*)	+3	+3
		Females	276	N/A (*)	-3	-3

* There was no experience data to produce an analysis of the age difference between member and spouse or partner.

Full details of our 2020 recommendations and the 2016 assumptions will be set out in an Excel spreadsheet 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 (TPS). 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.

However, the 2016-20 experience reflects survivors pension rules before Goodwin. Therefore, it is reasonable to continue to look at female deaths for members aged 84 and below in the NHSPS (E&W) analysis.

Age difference at death

We recommend retaining the assumption that male members are three years older than their partners and female members are three years younger than their partners, on the grounds of materiality.

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.
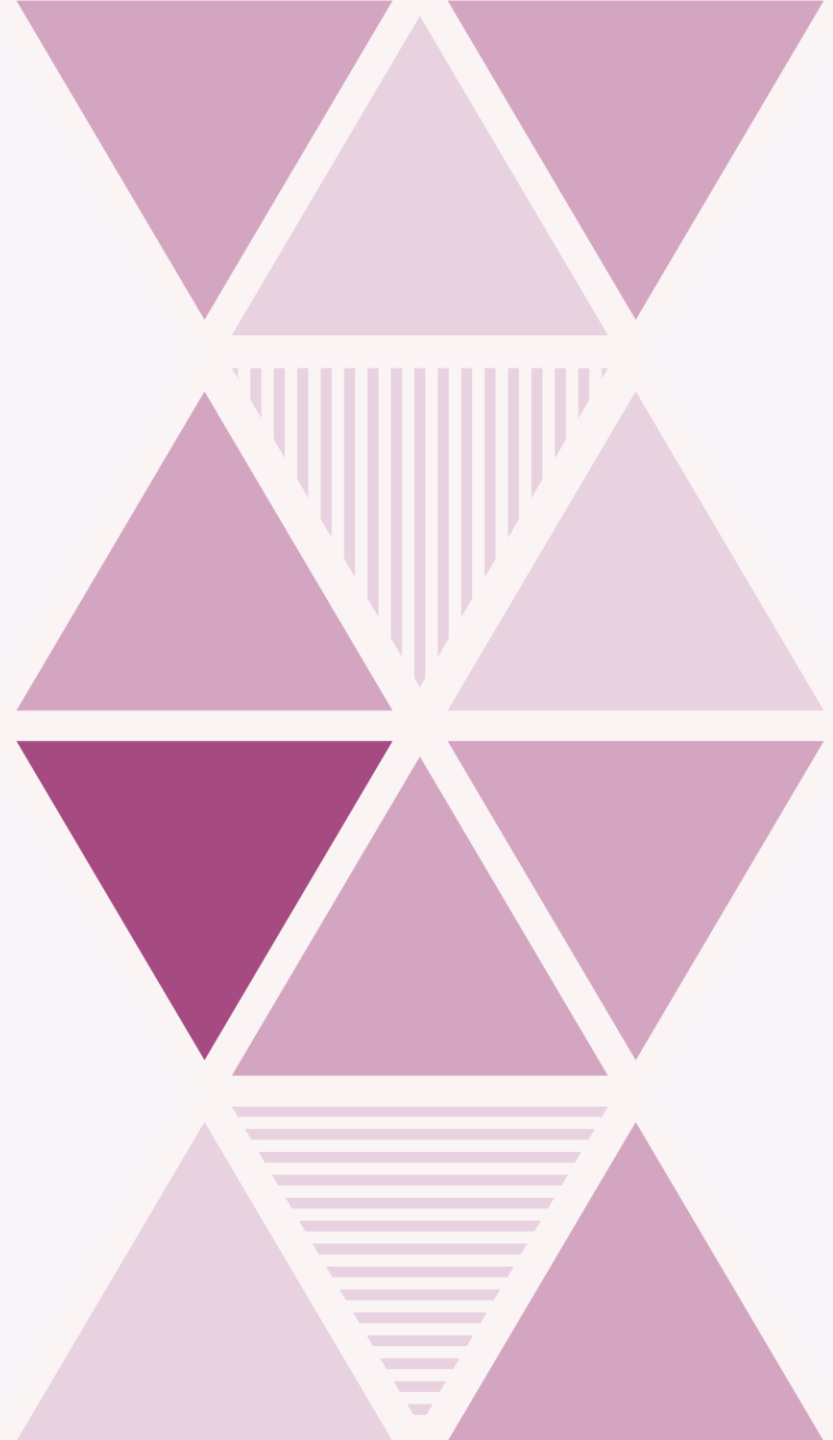
Dependants' gender

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.
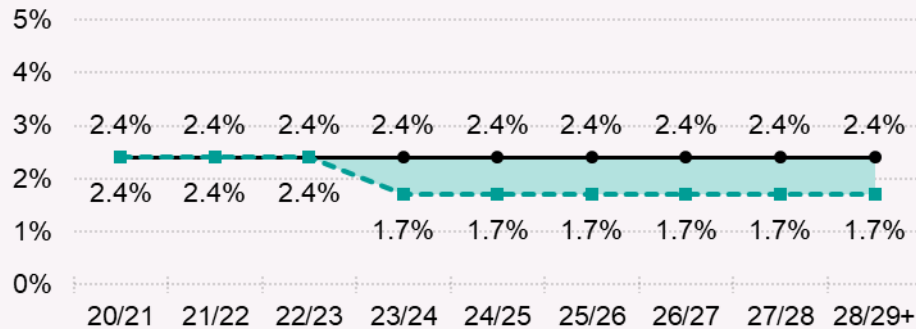
Part C: Appendices

C1. Directed assumptions 1

Annual financial assumptions
Taken from Directions dated 30 August 2023.

Discount rate, net of assumed pension increases

| 20/21 | 21/22 | 22/23 | 23/24 | 24/25 | 25/26 | 26/27 | 27/28 | 28/29+ |

- 2016 assumptions: 2.4% (all years)
- 2020 assumptions: 2.4%, 2.4%, 2.4%, 1.7%, 1.7%, 1.7%, 1.7%, 1.7%, 1.7%

Rates of pension increases

- 2016 assumptions: 2.0% (all years)
- 2020 assumptions: 0.5%, 3.1%, 10.1%, 4.1%, 0.6%, 0.0%, 0.8%, 1.7%, 2.0%

*Note: applicable from April at end of period

Rates of CARE revaluation

- 2016 assumptions: 3.5% (all years)
- 2020 assumptions: 2.0%, 4.6%, 11.6%, 5.6%, 2.1%, 1.5%, 2.3%, 3.2%, 3.5%

*Note: applicable from April at end of period

Rates of salary increases

- 2016 assumptions: 2.6%, 2.8%, 2.8%, 4.2%, 4.2%, 4.2%, 4.2%, 4.2%, 4.2%
- 2020 assumptions: 7.6%, 4.7%, 3.0%, 2.5%, 1.6%, 1.6%, 1.9%, 2.7%, 3.8%
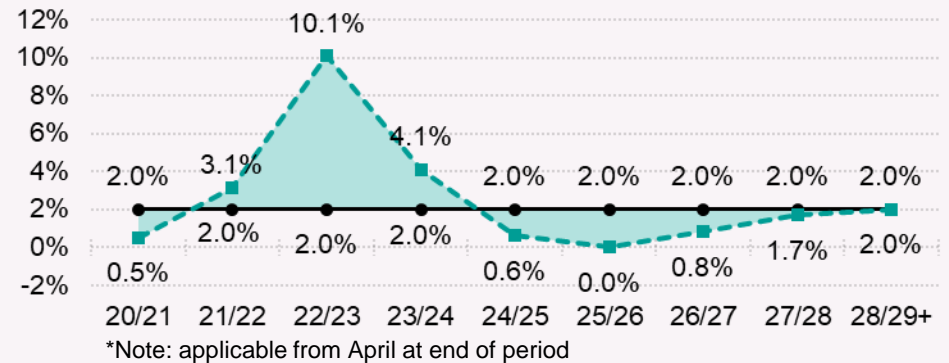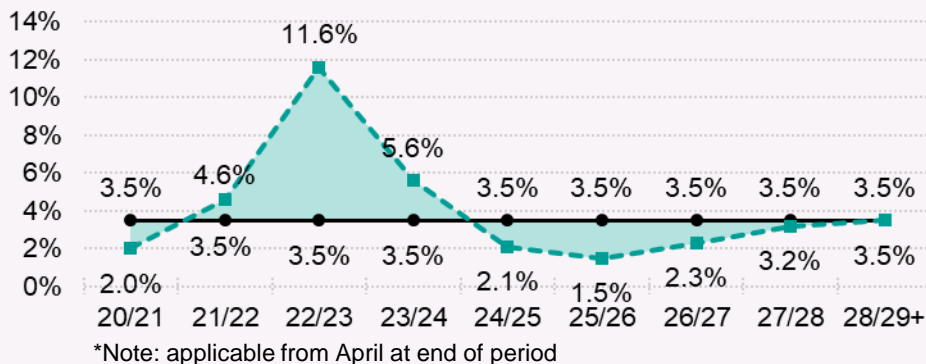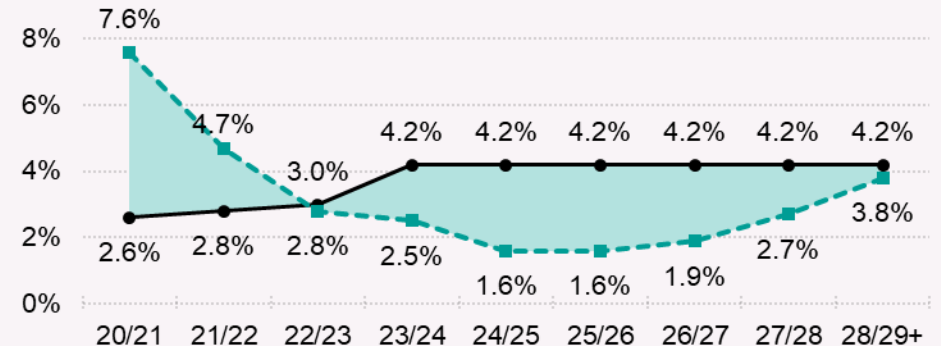
Key: ━━●━━ 2016 assumptions   ▢▢▢ 2020 assumptions (dotted line) and difference from 2016 assumptions (shaded area)

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. The groupings are made for each section/scheme, former protection status, age and service.

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 scheme information known, in and around the Spring Budget 2023. This includes payrolls up to 2022/23, derived from information from the scheme accounts, and 2023/24 pay awards. Subsequent payroll figures assume a stable workforce size and use valuation assumptions.

Member contribution yield over implementation period

The average member contribution yield assumed to apply over the implementation period is 9.8% of pensionable pay.

This is in line with the target yield.

C2. Other minor assumptions 3

McCloud calculation approach

The outcome of the remedy required to address the McCloud judgement is twofold:

- When benefits become payable, eligible members can select to receive them from either the reformed or legacy sections for the period 1 April 2015 to 31 March 2022.

- All active members still in the legacy scheme were transferred to the reformed scheme from 1 April 2022.

Members are likely to choose the option that provides them with the highest benefits. This impact was also allowed for in the 2016 cost cap valuation and we have followed the same approach for the 2020 valuation.

To allow for the McCloud remedy in our calculation methodology we have valued the 'better' benefits for groups of members when comparing benefits in their reformed and legacy sections.

Benefits are valued in each contingency (eg retirement or death), at each future date and for each eligible individual, using the same demographic assumptions (eg retirement ages) for both the reformed and legacy section calculations.

In determining which benefits members will choose, we have taken account of the member's pension after commutation (valuing £1 pa pension as £20) and lump sum (both commuted lump sum and any automatic lump sum).

The chosen benefit structure is then valued using the valuation assumptions (ie pensions are not valued using the 20:1 factor in the final results and explicit allowance is made for contingent survivor pensions).

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 NHSPS (Scotland) target cost is set at 11.5% 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.
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.

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 in different scheme sections: • Age 60 for (most) legacy scheme benefits (1995 Section) • Age 65 for legacy scheme benefits (2008 Section) • State Pension age (SPA) (i.e. currently ages 65 to 68 depending on date of birth) for the reformed scheme benefits (2015 Scheme).
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	The reformed section of the scheme is the section that was set up in line with the Public Service Pensions Act 2013, and which came into force on 1 April 2015. All non-reformed sections are known as legacy sections. This terminology is used in the McCloud judgment.
Scheme Advisory Board	The Board set up in line with section 7 of the 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.