



# Government Actuary's Department



## **Judicial Pension Schemes**

**Actuarial valuation as at 31 March 2016**

**Advice on assumptions**

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Author: Michael Scanlon

Ian Sharpe



## Contents

<b>1</b>	<b>Executive summary</b>	<b>3</b>
<b>2</b>	<b>Introduction</b>	<b>7</b>
<b>3</b>	<b>General considerations</b>	<b>10</b>
<b>4</b>	<b>Pensioner Mortality</b>	<b>12</b>
<b>5</b>	<b>Age retirement from service</b>	<b>18</b>
<b>6</b>	<b>Ill-health retirement from service</b>	<b>21</b>
<b>7</b>	<b>Voluntary withdrawal from service</b>	<b>22</b>
<b>8</b>	<b>Death before retirement</b>	<b>23</b>
<b>9</b>	<b>Promotional pay increases</b>	<b>24</b>
<b>10</b>	<b>Commutation of pension for cash at retirement</b>	<b>26</b>
<b>11</b>	<b>Family statistics</b>	<b>27</b>
	<b>Appendix A: Details of assumptions</b>	<b>29</b>
	<b>Appendix B: Modelling approach</b>	<b>32</b>
	<b>Appendix C: Assumptions made for data uncertainties</b>	<b>37</b>
	<b>Appendix D: Sensitivity of valuation results to Lord Chancellor set assumptions</b>	<b>42</b>



## 1 Executive summary

*This report contains our recommendations for the best estimate assumptions to be set by the Lord Chancellor for the 2016 valuation of the Judicial Pension Scheme ('JPS' or 'the Scheme').*

- 1.1 An actuarial valuation of the Judicial Pension Scheme<sup>1</sup>, is being carried out as at 31 March 2016. The Public Service Pension (Valuation and Employer Cost Cap) Directions 2014 as amended ("the Directions") require that, unless specified otherwise<sup>2</sup>, the assumptions to be adopted for this valuation will be set by the Lord Chancellor, having obtained advice from the scheme actuary. Direction 19(c) requires the assumptions to be the Lord Chancellor's best estimates.
- 1.2 GAD is the appointed scheme actuary to the Scheme. This report sets out GAD's formal advice to the Lord Chancellor on the actuarial assumptions to be adopted where these are not otherwise specified in the Directions. The advice covers the assumptions to be set by the Lord Chancellor. The main advised assumptions are summarised in Table 1 with further detail in Appendix A. A draft of this report dated 27 April 2018 was shared with the Ministry of Justice, the Scheme Advisory Board and Judicial Pension Committee. The main additions in this version of the report are completed appendices on the modelling approach and minor assumptions (Appendix B) and assumptions made for data uncertainties (Appendix C). This report has been signed alongside the formal valuation report.
- 1.3 This report relates to demographic assumptions, i.e. assumptions about member behaviours. When considering appropriate assumptions past experience, both recent and longer term, generally provides the most reliable evidence when considering best estimates of future experience. Anticipated future events may also influence how assumptions are set. This advice sets out relevant analysis of recent experience and indicates which other factors have been considered in deriving recommendations of best estimate assumptions.
- 1.4 There is little recent experience available to determine some assumptions. In these cases we have recommended assumptions having regard to the assumptions adopted previously and other relevant data, as set out in Table 1.
- 1.5 This report relates to the salaried and fee-paid judiciary.
- 1.6 The previous actuarial valuation of the JPS was carried out as at 31 March 2012. Most of the assumptions put forward in this report are the same as those adopted for that valuation. The only significant change to scheme-specific assumptions (i.e. those not Directed by HMT) is:

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<sup>1</sup> As provided by the Judicial Pension Act 1981 (1981 c 20), the Judicial Pensions and Retirement Act 1993 (1993 c 8) and The Judicial Pensions Regulations 2015 (SI 2015/182).

<sup>2</sup> Certain assumptions are specified in the Directions.



- > Increased life expectancy for males and females as a consequence of proposed changes to the scheme-specific baseline mortality assumption. For example, male members currently aged 45 are assumed to have a life expectancy at age 67 of 0.1 years more than assumed for the 2012 valuation (holding HMT-Directed mortality assumptions constant). The corresponding figure for female members is an increase of 0.4 years. For context, note that assumed life expectancies for the 2016 valuation will be lower than at the 2012 valuation, despite this recommended change to the baseline mortality assumption. This is due to the change in the Directed assumption for the rate of improvement in longevity.
- 1.7 The following chapters provide more detail on the advice, supporting analysis and an indication of the magnitude of financial impact of each assumption on the valuation results. They also contain important background information about the context of this advice and its limitations.
- 1.8 Where the scheme membership data is not sufficient for the scheme actuary to carry out a robust analysis of that aspect, the Directions require the report to include a statement to that effect. Due to the small size of the scheme (rather than issues with the quality of the data), there was insufficient data to undertake a robust analysis of:
- > pensioner baseline mortality;
  - > age retirement in the 1981, 2015 and Fee-Paid schemes;
  - > deaths before retirement;
  - > the age difference between members and their spouse; or
  - > remarriage rates.

### **Compliance and quality standards**

- 1.9 This work has been carried out 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.

**Table 1: Summary of recommended assumptions consistent with the 'best estimate' requirement**

Assumption	Summary of recommended assumptions	Rationale for recommendation	Estimated impact of change from 2012 valuation assumptions on employer contributions	
			Past service <sup>3</sup>	SCR <sup>3</sup> (2019-23)
<b>Pensioner baseline mortality<sup>4</sup></b>	Aligned to standard SAPS table <sup>5,6</sup>			
Males	92% of S2NMA_L	Based on 2012-2016 experience of members with high pensions in the Teachers' and NHS pension schemes.	+½% of pay	+¼% of pay
Females	80% of S2NFA	In line with average difference in life expectancy between females and males across public service schemes.		
<b>Age retirement</b>				
1981 Scheme	All members retire at age 70	Unchanged from 2012. Only 75 members (2% of actives) are in the 1981 scheme so there is a lack of experience of which to amend this assumption	No change in assumption	
1993 Scheme	All members retire at age 67	Unchanged from 2012. This is supported by 2012-2016 experience (464 retirements, average age 67.08)	No change in assumption	

<sup>3</sup> SCR is the Standard Contribution Rate, which is the contribution rate required to be received by the scheme to cover the cost of benefits accruing to active members over a particular period. The SCR does not include any allowance for the recovery / release of any past service deficit / surplus. The impact on uncorrected employer contributions is the combination of the impact on the SCR and the past service impact. The employer contribution correction cost impact will normally differ.

<sup>4</sup> As directed by HM Treasury, future improvements in mortality will be assumed to be in line with those underlying the most recent ONS population projections. The financial impact shown relates only to the change in the baseline mortality.

<sup>5</sup> SAPS tables are published by the Actuarial Profession and are based on the experience of self-administered pension schemes from 2004 to 2011. The S2 series has separate standard tables based on experience of members retiring in normal health (S2NXA), in ill health (S2IXA) and for widows (S2DFA). The assumption for males relates to the low mortality variant of the main table (S2NMA\_L). No corresponding low mortality variant for females was produced in the S2 series.

<sup>6</sup> Adjusted to take account of improvements in population mortality between the base year for the tables and the date the future improvements are applied from.

Assumption	Summary of recommended assumptions	Rationale for recommendation	Estimated impact of change from 2012 valuation assumptions on employer contributions	
			Past service <sup>3</sup>	SCR <sup>3</sup> (2019-23)
2015 Scheme salaried (including unprotected members)	(SPA + compulsory retirement age of 70)÷2, but 67 for those with SPA 65.	Unchanged from 2012 due to lack of scheme experience on which to amend this assumption	No change in assumption	
Fee-paid members (in both the 2017 scheme and the 2015 scheme)	All members retire at age 69	New assumption set to be in line with experience of pre-commencement FPJPS retirements	New assumption	
<b>Ill-health retirement</b>	Nil	Unchanged from 2012. Experience over 2012-2016 still low – 19 ill health retirements, or approximately 0.2% of the membership per year	No change in assumption	
<b>Withdrawal</b>	Nil	Unchanged from 2012. Experience over 2012-2016 still low, but higher than in 2010-2012. There were 20 withdrawals over 2012-2016, or approximately 0.2% of the membership per year	No change in assumption	
<b>Death before retirement</b>	Increasing by age, around 0.15% (F) and 0.25% (M) a year at age 60	Unchanged from 2012. 25 deaths in service over 2012-16, or approximately 0.3% per year	No change in assumption	
<b>Promotional salary scale</b>	0.25% per annum at all ages	Unchanged from 2012. Analysis indicates recent promotional increases have been around 1/3% to 1/2% a year on average.	No change in assumption	
<b>Commutation</b>	N/A	No option for commutation in the 1981 and 1993 scheme rules. Assumption for commutation in the 2015 scheme is directed by HM Treasury	Not applicable	

Assumption	Summary of recommended assumptions	Rationale for recommendation	Estimated impact of change from 2012 valuation assumptions on employer contributions	
			Past service <sup>3</sup>	SCR <sup>3</sup> (2019-23)
<b>Family statistics</b>				
Proportion married/partnered	90% (M) and 80% (F) at retirement In retirement, the assumption reduces in line with ONS analysis of proportions married in the UK population	Unchanged from 2012. For active members, current proportions married/partnered are: Males: 90% (1,226 out of 1,361) Females: 76% (453 out of 598)	No change in assumption	
Age difference	Male member 3 years older than partner Female 2 years younger than partner	Unchanged from 2012. There is a lack of evidence on which to amend this assumption	No change in assumption	
Remarriage	No allowance	Unchanged from 2012. There is a lack of evidence on which to amend this assumption	No change in assumption	



## 2 Introduction

*This report contains our advice to the Lord Chancellor but will be of interest to other parties who should note the limitations.*

- 2.1 An actuarial valuation of the Judicial Pension Scheme<sup>7</sup> ('JPS' or 'the Scheme'), is being carried out as at 31 March 2016. The Public Service Pension (Valuation and Employer Cost Cap) Directions 2014 as amended require that, unless specified otherwise<sup>8</sup>, the assumptions to be adopted for this valuation will be set by the Lord Chancellor, having obtained advice from the scheme actuary. Direction 19(c) requires the assumptions to be the Department's best estimates.
- 2.2 GAD is the appointed scheme actuary to the Scheme. This report is addressed to the Lord Chancellor and contains our formal advice on the appropriate assumptions to be adopted for the 2016 valuation, as required by the Directions. The purpose of this advice is to enable the Lord Chancellor to determine the required best estimate assumptions.
- 2.3 The advice covers the main assumptions to be set by the Lord Chancellor. In particular, we consider the following sets of demographic assumptions in this report:
- > Pensioner mortality
  - > Age retirement from service
  - > Ill-health retirement from service
  - > Voluntary withdrawal from service
  - > Death before retirement
  - > Promotional pay progression
  - > Commutation of pension for cash at retirement
  - > Family statistics
- Appendix B includes other calculation assumptions as required to complete the valuation and Appendix C sets out assumptions made for data uncertainties.
- 2.4 This report was provided to the Ministry of Justice in draft form, and was also circulated to the Scheme Advisory Board and Judicial Pension Committee in draft dated 27 April 2018. It has been signed alongside the formal valuation report. The main additions in this version of the report are completed appendices on the modelling approach and minor assumptions (Appendix B) and assumptions made for data uncertainties (Appendix C).

<sup>7</sup> As provided by the Judicial Pension Act 1981 (1981 c 20), the Judicial Pensions and Retirement Act 1993 (1993 c 8), The Judicial Pensions Regulations 2015 (SI 2015/182) and The Judicial Pensions (Fee-Paid Judges) Regulations 2017 (SI 2017/522).

<sup>8</sup> Certain assumptions are specified in the Directions.





- 2.5 The Ministry of Justice on behalf of the Lord Chancellor has confirmed to GAD, having consulted with relevant stakeholders, that the actuarial assumptions to be adopted for the valuation should be those set out in this report.
- 2.6 Punter Southall Administration Limited (PSAL), the Scheme's administrator, supplied data on the experience of the scheme membership over the four-year period to 31 March 2016, and data is also available in the published accounts of the Judicial Pension Schemes over the period. We have used this data to analyse the Scheme's experience in order to develop our advice on the assumptions. Our report, *Judicial Pension Scheme: Actuarial Valuation at 31 March 2016: Report on valuation data*, also finalised today, provides information about this data and should be read in conjunction with this advice. The report includes details of the checks carried out on the data, the amendments made to the data and our residual concerns about the quality of the data. In preparing our advice, we have relied upon the general completeness and accuracy of the data provided.
- 2.7 When considering appropriate assumptions past experience, both recent and longer term, generally provides the most reliable evidence when considering best estimates of future experience. Anticipated future events may also influence how assumptions are set. However robust analysis of scheme experience will only be possible where there is both sufficient quality, and quantity, of data available. The level of reliance that can be placed on any assumptions derived from this analysis will also vary depending on these two factors.
- 2.8 It is generally accepted that larger datasets will be subject to less volatility and statistical variation, and may be less prone to the impact of errors in individual records. For the smallest public service pension schemes it may therefore not be possible to undertake, in isolation, a statistically reliable analysis of that scheme's own experience. For other schemes it may only be possible to complete a reliable analysis of certain aspects of the scheme's own experience. Where appropriate, it may be preferable to consider whether the experience of similar larger schemes might be used when setting assumptions.
- 2.9 The JPS is a small scheme of fewer than 10,000 members. As a result, there is little recent experience available to determine some assumptions. In these cases we have recommended assumptions having regard to the assumptions adopted previously and other relevant data.
- 2.10 This report sets out relevant analysis of recent experience and indicates which other factors have been considered in deriving recommendations of best estimate assumptions. The Lord Chancellor should consider whether there is any reason why the conclusions reached would be inappropriate.
- 2.11 We are content for the Lord Chancellor to release this report to third parties, provided that:
- > 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.
- 2.12 Third parties whose interests may differ from those of the Lord Chancellor should be encouraged to seek their own actuarial advice where appropriate. Other than the Lord Chancellor, GAD has no liability to any person or third party for any act either taken or not taken, whether in whole or in part, on the basis of this report.
- 2.13 No allowance is made in this report for any consequences of the judgment in *McCloud vs Ministry of Justice*.



### 3 General considerations

*This chapter sets out a number of general considerations common to the setting of the different assumptions considered in this report.*

- 3.1 The key considerations taken into account in formulating the advice in this report are explained in this section.

#### **Directions**

- 3.2 The advice in this report reflects the requirements of the Directions issued by HMT that assumptions should be set as the Lord Chancellor's 'best estimates' of future experience and should contain no margin for prudence or optimism. They should be set having regard to:

- > assumptions set for previous valuations
- > analysis of demographic experience in the period up to the valuation date
- > historic long term trends and emerging evidence which may illustrate long-term trends in the future
- > relevant data from any other sources

#### **Different populations**

- 3.3 The Directions require this actuarial valuation to cover the scheme established under the Public Service Pensions Act 2013<sup>9</sup> ("2015 scheme"), the previous pension schemes ("1981 scheme" and "1993 scheme" and other pre-2015 schemes listed under the Directions) and the Fee-Paid Judicial Pension Scheme ("FPJPS" or "2017 scheme"). Assumptions appropriate to the 2015 scheme and the 1981, 1993 and FPJPS schemes are required for the valuation. The Directions also require assessment of benefit accrual costs over the implementation period.<sup>10</sup> This requires assumptions about anticipated member behaviour and characteristics during 2019 - 2023 as well as assumptions about member behaviour and characteristics in the longer term.
- 3.4 There are currently three distinct groups of active members.
- > Those with full protection and remaining in the 1981, 1993 or FPJPS scheme to retirement. The introduction of the 2015 scheme is not expected to have any impact on this group's behaviours
  - > New members to the 2015 scheme. These members' retirement behaviours are expected to be heavily influenced by the provisions of the 2015 scheme

<sup>9</sup> Public Service Pensions Act 2013 (2013 c 25)

<sup>10</sup> 1 April 2019 to 31 March 2023.



- > Members with service in both the 2015 scheme and at least one of the 1981, 1993 or FPJPS schemes (including members with tapered protection). Over time, as the proportion of 2015 scheme service increases, the retirement behaviours of these members are expected to become increasingly influenced by the provisions of that scheme.

3.5 Where relevant we indicate in each of the following chapters the relative importance of each set of assumptions to each of the three groups of members identified above.

#### **Relative importance of assumptions**

3.6 The key considerations taken into account in formulating the advice in this report are explained in this section. The Directions require the valuation results to be estimated to the nearest 0.1% of pensionable payroll. This is a required level of accuracy for a particular calculation and based on a particular set of assumptions. Appendix D provides an indication of the sensitivity of the valuation results to the particular assumptions under consideration.



## 4 Pensioner Mortality

*This chapter sets out our recommendation for the baseline pensioner mortality assumptions and summarises the analysis undertaken in order to inform that recommendation.*

### Proposed assumptions for 2016 valuation

- 4.1 The assumptions we recommend for baseline pensioner mortality for the 2016 valuation are summarised in the following table. The corresponding assumptions for the 2012 valuation are also shown.

**Table 4.1: Proposed baseline pensioner mortality assumptions**

	2016 valuation	2012 valuation
<b>Baseline mortality</b>	<b>Standard table<sup>11</sup> and adjustments</b>	<b>Standard table and adjustments</b>
Males	92% of S2NMA_L	80% of S1NMA
Females	80% of S2NFA	85% of S1NFA

### Use of the assumption

- 4.2 The assumption for baseline pensioner mortality represents the “current” mortality rates of retired members of the Scheme. Taken together with an assumption in respect of future improvements in longevity, this determines how long both current and future pensioners’ pensions will be assumed to be paid. Therefore, it is one of the main drivers of the assessed cost of benefits in respect of both pensioner and non-pensioner members. A separate assumption is made in respect of pre-retirement mortality, which is discussed in section 8 of this report.
- 4.3 As specified by HM Treasury, future improvements in mortality will be assumed to be in line with those underlying the most recent ONS population projections, ONS 2016.

<sup>11</sup> SAPS (S2) tables are published by the Actuarial Profession and based on the experience of self-administered pension schemes over the period 2004 to 2011. The ‘S2’ series includes separate standard tables based on experience of members retiring in normal health (S2NXA) and in ill health (S2IXA) and for female dependants (S2DFA). The proposed 2016 assumption for males relates to the ‘light’ variant of the main table (S2NMA\_L). No corresponding low mortality variant for females was produced in the S2 series. The S3 series of tables were released by CMI on 5 December 2018, these updated mortality tables cover experience between 2009 and 2016. The final tables are unchanged from the working paper issued during 2018, from which GAD concluded that moving to the S3 tables would likely have no material impact on the valuation results as a whole. It therefore remains appropriate to use the S2 tables for the current valuation.



### Comparison of expected pensioner longevity

- 4.4 The table below gives a comparison of the resulting life expectancies<sup>12</sup> (allowing for future improvements) assumed and recommended for the 2012 and 2016 valuations. The Directions specify that the future improvement basis for the 2016 valuation should be the ONS 2016 projections.

**Table 4.2: Comparison of life expectancies (years) at the valuation date**

<b>Baseline mortality:</b>	<b>2012 valuation</b>	<b>2012 valuation</b>	<b>2016 proposal</b>
<b>Mortality improvements:</b>	<b>ONS 2012</b>	<b>ONS 2016</b>	<b>ONS 2016</b>
<b>Effective date for life expectancy:</b>	<b>2012</b>	<b>2016</b>	<b>2016</b>
<b>Current pensioners</b>			
Male aged 65	25.1	24.1	24.4
Female aged 65	27.1	25.6	26.1
Male aged 76 <sup>13</sup>	14.9	14.1	14.1
Female aged 76 <sup>13</sup>	16.6	15.3	15.7
<b>Future pensioners – current age 45</b>			
Male life expectancy from age 65	27.4	26.2	26.3
Female life expectancy from age 65	29.3	27.6	28.0
Male life expectancy from age 67 <sup>14</sup>	25.4	24.4	24.5
Female life expectancy from age 67 <sup>14</sup>	27.3	25.8	26.2

### Impact of proposed change

- 4.5 The change in baseline mortality assumptions is estimated to increase the uncorrected employer contribution rate by around ¾% of pay, split between an increase in the assessed cost of benefits currently accruing and an increase in payments in respect of past service deficit.

<sup>12</sup> Cohort life expectancies based on the ages shown as at the valuation date, i.e. allowing for future mortality improvement. Mortality improvements as assumed for the relevant valuation, with the assumption for mortality improvements underlying the latest 2016-based ONS principal population projections used for the 2016 valuation figures.

<sup>13</sup> At 31 March 2016 the average age of salaried pensioners was 76 years old

<sup>14</sup> At 31 March 2016 the average age at retirement of salaried members was 67 years old



### **Analysis and setting the assumption**

- 4.6 Our standard approach to setting a baseline mortality assumption is to propose the adoption of an appropriate standard table of mortality rates by age published by the Actuarial Profession and a scheme-specific adjustment to that standard table. Where scheme-specific mortality experience (ie, actual numbers of deaths in the scheme) is sufficient, the proposed adjustment to the standard table is informed by that experience. However, for small schemes, such as the JPS, the scheme-specific experience may be too volatile to inform the adjustment.
- 4.7 We considered the pensioner mortality experience in the JPS over the four-year period to 31 March 2016. The number of deaths each year varied between 34 and 56 with an average of 47. This volatility supports the view that experience in the JPS is insufficient to base an assumption on. Therefore, we have based the proposed assumption for JPS baseline mortality on wider evidence. The analysis is carried out using ONS 2014 projections, being the set of projections available at the time that the analysis was carried out. Previous analysis carried out by GAD suggested that the impact of using ONS 2014 or 2016 projections for mortality analysis would be minimal.

### **Mortality experience of high-pension members in the TPS and NHSPS**

- 4.8 When deriving the assumption adopted for the 2012 valuation, we considered the mortality experience of all members in the Teachers Pension Scheme (TPS) and NHS Pension Scheme (NHSPS). The Judicial Scheme Advisory Board has queried the suitability of an assumption based on the entire TPS and NHSPS mortality experience for the JPS on the grounds that the TPS and NHSPS memberships are a mix of highly-paid professional staff and a wide range of other functions, whereas the JPS membership consists exclusively of highly-paid professionals.
- 4.9 To help in setting our proposed assumption for the 2016 valuation of the JPS we have therefore considered the TPS and NHSPS mortality experience of members with high pensions (more than £30k a year) only. Members with high pensions in the TPS and NHSPS are likely to have been highly-paid professional staff. There were too few females in the TPS and NHSPS with pensions of more than £30k a year to conduct a credible analysis, so the analysis was undertaken for male members only.
- 4.10 To set an assumption based on this analysis, it is necessary to select an appropriate standard table published by the Actuarial Profession. In our view, the most suitable standard table is 'S2NMA\_L' from the 'S2' series of standard tables.<sup>15</sup> This '\_L' or 'light' variant best matches the analysis of pensions above a £30k threshold because it is also based on an analysis that is restricted to pensions above a threshold, which in the case of S2NMA\_L is around £15k. S2NMA\_L also applies to male members who retired with a normal-health pension, and uses an analysis of deaths weighted by pension amounts, which is the same technique used in our analysis to further capture correlation between pension size and longevity.

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<sup>15</sup> The SAPS (S2) series of standard tables are published by the Actuarial Profession and based on the experience of self-administered pension schemes over the period 2004 to 2011.



### Results of Analysis (Males)

4.11 Table 4.3 sets out the amount of pension ceasing due to deaths over the intervaluation period for these male high-pension members. We have considered only pensioners over age 67 since this assumption will largely be applied to Judges over age 67, when they are assumed to retire. The amount of pension ceasing is compared with the expected amount of pension ceasing under the 2012 JPS valuation assumption (with ONS-2014 improvements) and under the unadjusted S2NMA\_L base table. The table shows that over 2012-16 mortality rates for those with high pensions has been considerably lighter than the assumption adopted for the 2012 valuation of the JPS.

**Table 4.3: Pensioner mortality experience 2012-16 (over age 67)**

Category	Actual pension amount ceasing due to deaths £m (annual)	Actual vs expected deaths relative to the 2012 valuation assumption <sup>16</sup>	Actual vs expected deaths relative to the S2NMA_L Base Table <sup>16</sup>
Males	113.5	90%	88%

4.12 An assumption based solely on the analysis of high-pension mortality would be 88% of S2NMA\_L. However, we propose to allow for only 50% of the impact of the change in analysis methodology compared to the 2012 valuation on the following grounds:

- > While in our view the high-pension analysis is an improvement on the analysis that was available for the 2012 valuation (resulting from access to the detailed NHSPS and TPS data), that is not unambiguously the case. It is not obvious, though it seems likely, that income correlation would apply to judges in the same way as to senior to medical professionals. (In practice, the high-pension group is predominantly from the NHSPS, with a minority from the TPS.) More generally, it has not been established that judges experience similar mortality to medical professionals.
- > Public service pension schemes and GAD have provided data for the next review of the standard SAPS tables, so it is likely that the next iteration of those tables, or other developments, will mean that further improvements to the methodology will become available at the next valuation (as at 2020). As assumptions are intended to represent long-term expectations it is reasonable to seek to smooth out the impact of uncertain, emerging methodological changes.
- > Taking only 50% of the change is analogous to the approach taken for other schemes, which have sought to smooth out short-term experience effects (as opposed to methodological changes) in the same way.

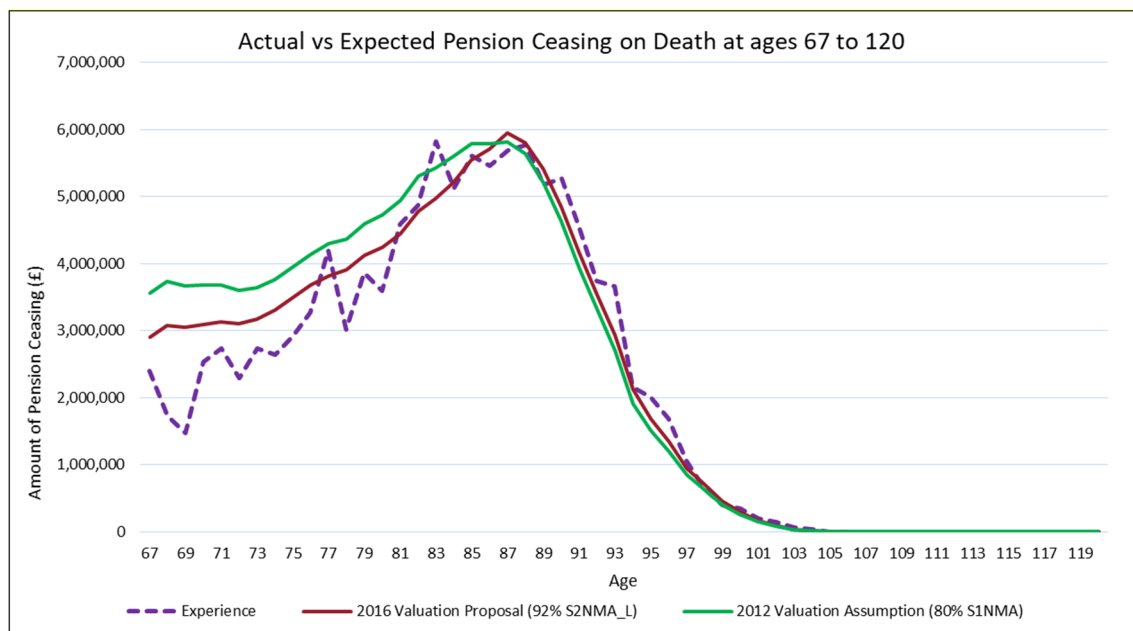
<sup>16</sup> Adjusted from the base year of the underlying table to allow for improvements in population mortality up to 2014 and in line with ONS 2014-based improvements thereafter.





- 4.13 Taking 50% of the change results in the proposed assumption of 92% of S2NMA\_L. This has been derived by first expressing the 2012 assumption (80% of S1NMA) in terms of a broadly equivalent adjustment to the S2NMA\_L table, which gives 98% of S2NMA\_L. The average of this rating (98%) and the full experience shown in Table 4.3 (88% of S2NMA\_L) gives 92% of S2NMA\_L (the rounding between 92% and 93% is marginal when using unrounded figures to derive the rating).
- 4.14 The following graph shows a comparison of the mortality experience for members with high pensions over the four-year intervaluation period with that expected based on the 2012 valuation assumption and the proposed 2016 valuation assumption. There is a reasonable fit between the data and our recommended assumption.

**Graph 4.1: Mortality experience of males with high pensions 2012-16**



#### Analysis (females)

- 4.15 Females make up about a fifth of JPS pensioners and around a third of JPS active payroll.
- 4.16 There were too few female members with high pensions in the TPS and NHSPS to perform a robust analysis similar to that for male members. There is also no “light” S2 table for females.
- 4.17 We have considered the relative mortality assumptions of males and females across other public service schemes.

#### Results of analysis (females)

- 4.18 The unweighted average of the difference in life expectancy between males and females at age 67 across the largest public service pension schemes was around 1.7 years.



- 4.19 We propose adopting a baseline mortality assumption of 80% of S2NFA for females on the grounds that this gives a gap in life expectancy at age 67 of approximately 1.7 years between male and female judges.
- 4.20 It is possible that the gap between male and female life expectancy could be lower or higher at higher incomes or for healthier populations than for the wider membership of public service pension schemes. However, there does not appear to be clear evidence to support this. National statistics<sup>17</sup> indicate that in the past differences were larger for professionals than for other groups, but that this difference has since fallen away. Therefore, we do not propose assuming that the difference is any larger or smaller for judges than is typical for public service schemes.

#### Other mortality assumptions

- 4.21 For comparison, Table 4.4 shows life expectancies resulting from mortality assumptions reflecting different underlying populations.

**Table 4.4: Life expectancies at 67 under other mortality assumptions**

Group	Source <sup>18</sup>	Men	Women
UK population	ONS 2016-based principal population projections <sup>19</sup>	18.8	20.8
Occupational pension schemes	100% of S2NMA/S2NFA	20.8	22.4
Occupational pension schemes, high pension (>£15k)	100% of S2NMA_L	21.8	N/A
JPS 2012 baseline assumption	80% of S1NMA 85% of S1NFA	22.2	23.7
JPS 2016 proposed baseline assumption	92% of S2NMA_L 80% of S2NFA	22.4	24.1

#### Fee-paid judges

- 4.22 We recommend that the same mortality assumptions are adopted for salary-paid and fee-paid members of the JPS.

<sup>17</sup><https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/lifeexpectancies/datasets/onslongitudinalstudybasedestimatesoflifeexpectancylebythenationalstatistics socioeconomicclassificationsssecenglandandwales>

<sup>18</sup> All life expectancies have been calculated as at 2016 using ONS 2016-based mortality improvements.

<sup>19</sup><https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/lifeexpectancies/datasets/expectationoflifeprincipalprojectionunitedkingdom>



## 5 Age retirement from service

*This chapter sets out our recommendation for the assumed patterns of retirement on grounds other than ill-health, and summarises the analysis undertaken in order to inform that recommendation.*

### Proposed assumptions for 2016 valuation

- 5.1 We recommend no change to the assumptions adopted for the 2012 valuation of the JPS in respect of salaried members. We propose an assumption that fee-paid members retire at age 67.
- 5.2 Our recommended rates of age retirement are set separately for members in the 1981 scheme, 1993 scheme, FPJPS and 2015 scheme. Our recommendations are summarised in Table 5.1 and sample age retirement rates are provided in Annex A.

**Table 5.1: Proposed age retirement assumptions**

<b>Current Scheme</b>	<b>Assumption</b>
<b>1981 Scheme</b> (including members with tapered protection)	Members assumed to retire at age 70
<b>1993 Scheme</b> (including members with tapered protection)	Members assumed to retire at age 67
<b>2015 Scheme salary paid</b> (including all unprotected members)	In general, members assumed to retire half way between State Pension Age and age 70. Members with a State Pension Age of 65 who are assumed to retire at age 67.
<b>Fee-paid in FPJPS and 2015 scheme</b>	Members assumed to retire at age 69

### Use of the assumption

- 5.3 Age retirement rates specify the rate at which members are assumed to retire on grounds other than ill health and therefore potentially include allowance for retirements before and after NPA.



- 5.4 In the 1981, 1993, FPJPS and 2015 schemes an actuarial reduction is applied to the pension payable on retirement earlier than NPA. The actuarial reduction is set to give the early retirement pension the same value as the deferred benefits payable following withdrawal at the same age (with special terms applying for the period between 65 and SPA in the 2015 scheme). As the deferred benefits in the existing scheme are expected to be less valuable than the benefits payable had the member stayed in service and retired at NPA, early retirement in the existing scheme represents a saving to the Scheme. However, deferred benefits in the new scheme are expected to have a very similar value to the benefits payable if a member stays in service and retires at NPA.
- 5.5 An actuarial uplift will be applied to the 2015 scheme for retirement after NPA. However in the 1981, 1993 and FPJPS sections the pension payable on retirement after NPA is not subject to actuarial adjustment. This means pensions paid from the existing schemes on retirement after NPA will be less costly to the scheme (i.e. the value of the benefit payable to a member is lower) than a pension paid at or before NPA. The rates of retirement of members in the 1981, 1993 and FPJPS schemes on at or after NPA are therefore the most financially significant components of the assumption. Late retirement is common in the JPS and so the late retirement assumptions have a significant impact on overall costs.

#### **Analysis and setting the assumption**

- 5.6 There were around 586 age retirements in the 1981, 1993 and 2015 schemes over the four-year period to 31 March 2016, most of which were from the 1993 scheme. There were 730 retirements from the FPJPS in the period from 31 March 2012 to 31 March 2017.
- 5.7 For 1981 scheme members we recommend no change to the current assumption that members retire at age 70. There are only around 75 members remaining in this scheme, which is about 2% of the active membership of the JPS. As a result, there is a lack of experience on which to amend this assumption.
- 5.8 For 1993 scheme members, the unweighted average age at retirement over the four-year period to 31 March 2016 was 67.1, and the corresponding pension-weighted average age was 67.2. This supports the current assumption that 1993 scheme members retire at age 67, so we recommend that this assumption remains unchanged.
- 5.9 For 2015 scheme members, there is a lack of experience over the period 2015 to 2016 to suggest any change to this assumption.
- 5.10 For FPJPS, the average retirement age weighted by pension has been relatively stable each year in the period considered, with an average of 69.4 over the full period. However, it is uncertain how the introduction of the FPJPS might change behaviours, for example
- > Members might choose to retire earlier now they will receive a pension and lump sum on retirement



- > Members with more than one office may take partial retirement from one office while continuing to work in another office
- 5.11 In the presence of these possible behavioural changes, it is not clear which of the following two sources of evidence is the best guide to future behaviour of FPJPS members:
- > Average FPJPS pre-2017 retirement age of 69 (rounded): This reflects the behaviour of fee-paid members, but does not reflect the behavioural influence of a pension being available on retirement.
  - > Average 1993 scheme retirement age of 67 (rounded): This reflects the behaviour of salaried members rather than fee paid members, but does reflect any behavioural influence (for salaried members) of a pension being available on retirement.
- 5.12 The Judicial Scheme Advisory Board provided valuable insight into this, noting in particular that fee-paid judiciary's choice of retirement date may not be much influenced by the availability of a pension as they will generally have much larger pensions available from other careers. Therefore, we propose to assume that FPJPS members retire at age 69.
- 5.13 For the same reason, we propose to assume that membership of the 2015 scheme will not influence the retirement patterns for fee-paid members. Therefore, we propose to use the age retirement assumption for fee-paid members of the 2015 scheme as for FPJPS members, i.e. retirement at age 69.



## 6 Ill-health retirement from service

*This chapter sets out our recommendation for the assumed rates of retirement on grounds of ill-health, and summarises the analysis undertaken in order to inform that recommendation.*

### Proposed assumptions for 2016 valuation

- 6.1 We recommend that the assumption for the incidence of ill-health retirement is nil at all ages. This recommendation applies to members of the 1981, 1993, FPJPS and 2015 schemes.
- 6.2 As a result, it is not necessary to set an assumption for the proportion of members retiring on ill health who would qualify for an upper tier ill health pension.
- 6.3 Our recommendation is unchanged from the assumption adopted for the 2012 valuation of the JPS. It is a new assumption for FPJPS.

### Use of the assumptions

- 6.4 Ill-health retirement rates specify the rate at which members are assumed to retire on grounds of ill health. The assumed eligibility for upper or lower-tier awards specifies the benefits which will be provided. The rates of mortality experienced after ill-health retirement are also relevant to the valuation calculations. Post-retirement mortality is addressed in Chapter 4.

### Analysis and setting the assumption

- 6.5 There were 19 ill-health retirements in the 1981, 1993 and 2015 schemes over the four-year period to 31 March 2016. This is equivalent to an annual rate of ill-health retirement of around 0.2% of the active members of the scheme. There have only been around 6 ill-health retirements in the FPJPS to date.
- 6.6 No in-depth analysis was carried out on these retirements due to the small number. There is not sufficient evidence to both demonstrate that the previous valuation assumption is materially inappropriate and on which to base an alternative credible assumption which would give a materially different valuation result. If an alternative assumption were to be adopted instead of retaining the existing assumption, it would not materially affect the valuation results. We therefore recommend that the existing assumption of nil ill-health retirements is retained.



## 7 Voluntary withdrawal from service

*This chapter sets out our recommendation for the assumed rates of withdrawal from active service, and summarises the analysis undertaken in order to inform that recommendation.*

### **Proposed assumptions for 2016 valuation**

- 7.1 We recommend that the assumption for rates of withdrawal is nil at all ages. This recommendation applies to members of the 1981, 1993, FPJPS and 2015 schemes.
- 7.2 Our recommendation is unchanged from the assumption adopted for the 2012 valuation of the JPS. It is a new assumption for FPJPS.

### **Use of the assumption**

- 7.3 Withdrawal rates specify the rate at which members are assumed to leave voluntarily before retirement, becoming entitled to either deferred benefits or, for those with less than two years' service, a refund of contributions.

### **Analysis and setting the assumption**

- 7.1 There were 20 withdrawals in the 1981, 1993 and 2015 schemes over the four-year period to 31 March 2016. This is equivalent to an annual rate of withdrawal of around 0.2% of the active members of the scheme. The total population of deferred members of FPJPS is around 1% of the size of the FPJPS active population, which indicates that rates of withdrawal from FPJPS have been trivial for valuation purposes.
- 7.2 No in-depth analysis was carried out on these withdrawals due to the small number. There is not sufficient evidence to both demonstrate that the previous valuation assumption is materially inappropriate and on which to base an alternative credible assumption which would give a materially different valuation result. If an alternative assumption were to be adopted instead of retaining the existing assumption, it would not materially affect the valuation results. We therefore recommend that the existing assumption of nil voluntary withdrawals is retained.



## 8 Death before retirement

*This chapter sets out our recommendation for the assumed rates of death before retirement, and summarises the analysis undertaken in order to inform that recommendation.*

### Proposed assumptions for 2016 valuation

- 8.1 We recommend no change to the assumptions adopted for the 2012 valuation of the JPS. We propose to assume that the same rates apply to fee-paid members as to salaried members.
- 8.2 Our recommended rates are different for males and females and increase with age. Fewer than 1% of members are assumed to die each year, even at the highest ages. Sample age retirement rates are provided in Appendix A.

### Use of the assumption

- 8.3 Death before retirement rates are used to allow for the possibility of deaths whilst in active service or whilst entitled to a deferred pension. The numbers of deaths observed annually, and the recommended rates to be assumed are low, and thus this assumption has relatively little financial significance.

### Analysis and setting the assumption

- 8.4 There have been around 25 deaths of active members of the 1981, 1993 and 2015 schemes over the four-year period to 31 March 2016. This is equivalent to an annual rate of death of around 0.3% of the active members of the scheme. We have not considered FPJPS separately.
- 8.5 There is not enough data to allow a full analysis by age and gender of deaths of active members or to set a robust assumption by analysing the Scheme's own data.
- 8.6 The assumption used in the 2012 valuation was based on the experience of the NHS Pension Scheme, with a reduction applied to allow for the average difference in socio economic class between members of the JPS and the NHSPS.
- 8.7 Given the low number of deaths in service in the Judicial Pension Scheme, there is a lack of experience to suggest any change to this assumption. We therefore recommend that the existing assumption for deaths before retirement is retained.





## 9 Promotional pay increases

*This chapter sets out our recommendation for the assumed promotional pay increases of active members, and summarises the analysis undertaken in order to inform that recommendation.*

### Proposed assumptions for 2016 valuation

- 9.1 We recommend no change to the assumptions adopted for the 2012 valuation of the JPS. We propose to adopt the same assumption for fee-paid members.
- 9.2 Our recommendation is that promotional pay increases are assumed to increase pay by 0.25% a year at all ages.

### Use of the assumption

- 9.3 For the 1981, 1993 and FPJPS schemes benefits earned are linked to salary at, or near, retirement. Members' salaries can increase through a combination of general annual pay awards and promotional, or other, increases to pensionable pay. To calculate an estimate of the level of benefit payable in the future requires assumptions for both these components. The assumption for general pay awards is directed by HM Treasury. The assumption for promotional pay increases is set by the Lord Chancellor.
- 9.4 It should be noted that the data available only allows analysis of general and "non-general" pay growth. The non-general pay growth relates to promotional pay growth and changes in non-basic pay, i.e. pensionable allowances, and regrading. It is possible that in a period of general pay restraint, such as the inter-valuation period, increases in other elements of pay may not be representative of the level of increases in periods of more normal pay growth. For this reason care should be applied when considering if the evidence from recent periods would be equally applicable to periods with more 'normal' general pay policy.
- 9.5 Future pay progression will be more significant (in terms of expected pension) for those members with either full or tapered protection because they continue to have benefits linked to final pensionable pay for service beyond 31 March 2015.

### Analysis and setting the assumption

- 9.6 We have analysed the change in pay in the 1981, 1993 and 2015 schemes over one year and four years to 31 March 2016. There was some difficulty in matching individual members between different data sets and in removing any distorting effect of changes in part-time working on the rate of increase of full-time equivalent pay. However, on average, non-general increases over the one-year period were equivalent to 0.2% per member. Our estimates of average annual non-general increases over the four-year period ranged from  $\frac{1}{3}\%$  to  $\frac{1}{2}\%$  (the difference relates to different approaches to removing the effect of moves between full-time and part-time working, which should be excluded to leave only promotional pay changes. The higher figure excludes low actual salaries and the lower figure is based on



approximate full-time equivalent pay for part-timers). We would expect to see modest variations from the long-term assumption over shorter periods. Therefore, our view is that this experience is broadly consistent with the current assumption that promotional pay increases are 0.25% a year.

- 9.7 We separately considered pay increases in the period 2012 to 2017 for FPJPS members who retired in that period. Our estimates of average annual non-general increases over the five-year period ranged from 0.1% to 0.5% (this difference relates to the complexity of interactions between office moves and final pay, which depends on whether or not offices are held simultaneously and whether the member opts for partial retirement). This broadly supports the suitability for FPJPS of the salaried assumption that promotional pay increases are 0.25% a year, so we recommend that this assumption is also adopted for FPJPS.



## 10 Commutation of pension for cash at retirement

*This chapter sets out our recommendation for the assumed level of pension commutation at retirement (where this is not specified in the HM Treasury valuation directions), and summarises the analysis undertaken in order to inform that recommendation.*

### Proposed assumptions for 2016 valuation

- 10.1 Members in the 1981, 1993 and FPJPS schemes cannot commute pension for a lump sum.
- 10.2 HM Treasury have specified a commutation assumption in the Valuation Directions to be used by all schemes. This is set to be 17.5%<sup>20</sup> of pension. There is therefore no requirement for the Lord Chancellor to decide an assumption or the Scheme Actuary to provide advice.
- 10.3 This is consistent with the approach undertaken for the 2012 valuation of the JPS.

### Use of the assumption

- 10.4 Members may commute part of their 2015 scheme pension for a lump sum at a rate of £12 for each £1 of annual pension given up. The assumption is important because the value of the pension given up, as assessed using the actuarial assumptions underlying the valuation is, on average, more than £12 and so commutation has a significant impact on total liabilities and contribution rates. Differences between assumed and actual experience in the 2015 scheme will feed through into the cost cap fund.

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<sup>20</sup> Note that HM Treasury's letter of 28 July 2017 to TUC noted that HMT were reviewing this assumption.



## 11 Family statistics

*This chapter sets out our recommendation for the assumptions around dependants' pensions, and summarises the analysis undertaken in order to inform that recommendation.*

### Proposed assumptions for 2016 valuation

- 11.1 We recommend no change to the assumptions adopted for the 2012 valuation of the JPS. We propose that the same assumptions be adopted in respect of fee-paid members.
- 11.2 Our recommended assumptions are the same for all schemes and are that:
- > 90% of men and 80% of women are assumed to be married or have a qualifying partner at retirement.
  - > For current pensioners, these proportions are steadily reduced after retirement age in line with the proportion married analysis undertaken by the Office for National Statistics.
  - > Men are assumed to be three years older than their partners and women are assumed to be two years younger than their partners.
  - > No allowance is made for remarriage in line with scheme experience.

### Use of the assumption

- 11.3 Dependants' pensions<sup>21</sup> are provided to qualifying dependants on the death of a member. Assumptions are required for the proportion of members who are married or partnered to determine how many dependants' pensions will be paid. The 2015 scheme has extended provision to unmarried dependants. Assumptions are required about age differences between members and partners as this affects how long dependants' pensions will be paid for.

### Analysis and approach to setting the assumptions

#### *Proportions married/partnered*

- 11.4 To formulate a recommended assumption we have analysed the marital status of active members as at 31 March 2016. Data was provided on marital status for approximately 60% of active members. Table 11.1 shows the results of our analysis.

<sup>21</sup> Pensions are also payable to dependent children on a member's death but the costs are not material overall.



**Table 11.1: Proportions married/partnered as at 31 March 2016**

<b>Gender</b>	<b>Number of members married or with a qualifying partner</b>	<b>Number of members with a valid marital status</b>	<b>Proportion married / partnered</b>
Male	1,226	1,361	90%
Female	453	598	76%

- 11.5 The results of this analysis are close to the assumption adopted for the 2012 valuation of the JPS, which was that 90% of men and 80% of women are married or have a qualifying partner at retirement. As a result, we recommend that this assumption remains unchanged.

***Age difference between member and spouse***

- 11.6 There is not enough data to allow a credible analysis of the age differences between member and spouse or to set a robust assumption. As there is insufficient evidence to demonstrate that the previous valuation assumption is materially inappropriate we recommend that the existing assumption for age differences is retained.

***Fee-paid members***

- 11.7 We are aware of no evidence that marital statistics for fee-paid members are different to those for salaried members.



## Appendix A: Details of assumptions

This appendix contains details of the recommended assumptions including sample rates and values.

### Pensioner mortality

**Table A1: Baseline mortality assumptions**

Baseline Mortality	Standard table <sup>22</sup>	Adjustment
Males	S2NMA_L	92%
Females	S2NFA	80%

Future improvements in mortality will be assumed to be in line with those specified in HM Treasury Directions.

### Age retirement from service

**Table A2: Age retirement rates for salaried members with full and tapered protection and all fee-paid members**

Age	1981 Section		1993 Section		Fee-paid (FPJPS and 2015 scheme)	
	Males	Females	Males	Females	Males	Females
67	0%	0%	100%	100%	0%	0%
68	0%	0%	100%	100%	0%	0%
69	0%	0%	100%	100%	100%	100%
70 and over	100%	100%	100%	100%	100%	100%

<sup>22</sup> From the 'S2' series of standard tables published by the CMI and based on the experience of self-administered pension schemes. Separate tables are available based on experience of members retiring in normal and ill-health and for dependants.



**Table A3: Age retirement rates for members with service in the 2015 scheme only, or members with service in more than one scheme but no protection**

Age	SPA 65		SPA 66		SPA 67		SPA 68	
	Males	Females	Males	Females	Males	Females	Males	Females
67	100%	100%	0%	0%	0%	0%	0%	0%
68	100%	100%	100%	100%	50%	50%	0%	0%
69	100%	100%	100%	100%	100%	100%	100%	100%
70 and over	100%	100%	100%	100%	100%	100%	100%	100%

### III-health retirement from service

Nil

### Voluntary withdrawal from service

Nil

### Death before retirement

**Table A4: Death before retirement rates for all members**

Age	Males	Females
20	0.0002	0.0002
30	0.0002	0.0002
40	0.0005	0.0003
50	0.0010	0.0007
60	0.0025	0.0015
65	0.0040	0.0022

### Promotional pay increases

Increases are assumed to be 0.25% a year at all ages.

### Commutation of pension for cash at retirement

The 1981, 1993 and FPJPS Judicial Pension Schemes do not allow commutation of pension for cash at retirement. Instead all members receive a lump sum at retirement. Therefore there is no need to set an assumption.

Members are assumed to commute 17.5% of their 2015 scheme pension, as directed by HM Treasury.



## Family statistics

**Table A5: Recommended proportion married or with a qualifying partner at retirement**

	<b>Proportion married / partnered</b>
<b>Males</b>	90%
<b>Females</b>	80%

For current pensioners, these rates are reduced after normal retirement ages; in line with Office for National Statistics proportion married data.

Male members are assumed to be three years older than their partners and female members are assumed to be two years younger than their partners.

No allowance is made for pensions to cease on remarriage.





## Appendix B: Modelling approach

### Active membership projections

- B.1 Direction 11<sup>23</sup> 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 2016). The expected cost of benefits provided to members remaining in the 1981, 1993 and 2017 Schemes under the provisions of transitional protection differs from the expected cost of providing members with benefits in the 2015 Scheme. Further, the expected cost of providing benefits varies for members in the 1981, 1993 and 2017 Schemes. This implicitly requires the actuary to estimate the membership at future dates in order to determine the valuation results.
- B.2 Given that the members continuing to accrue benefits in the pre-2015 schemes (including the 2017 Scheme) are expected to rapidly decline to close to nil over the future periods being considered in this valuation, a pragmatic approach to estimating the future membership of each scheme over the relevant future periods is suitable.
- B.3 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 end of implementation period. In particular:
- > Allow for the protected population to reduce over the projection period (ie to 2023) with a corresponding increase in those accruing benefits in the 2015 Scheme to maintain the stable population. SPA in the projected populations is determined by implied dates of birth and so the SPA mix changes over time despite the assumed stable population.
  - > Mortality is projected forward to the relevant year of use in all cases.
  - > The run off of the protected population is broadly linear from the relevant calculation date to the average age at which members of each identified group are expected to retire.
- B.4 The expected cost of accruing benefits over periods after the effective date for calculating the employer contribution correction cost has been determined by assuming:
- > The aggregate membership has the same age/pay profile over all projection periods (i.e. to 2023) (and assuming all in the 2015 Scheme).
  - > Allow for the actual membership (assumed) accruing benefits in the 2015 Scheme to change over the projection period (i.e. to 2023). SPA in the projected populations is determined by implied dates of birth and so the SPA mix changes over time despite the assumed stable population.

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<sup>23</sup> The Public Service Pensions (Valuations and Employer Cost Cap) Directions 2014 (as amended) ("the Directions").



- > Mortality is projected forward to the relevant year of use in all cases.

#### **Accrual cost methodology**

- B.5 See B.3 and B.4. The cost over each relevant period has been taken as the average of the cost at the start and end of each period.
- B.6 Direction 11 requires use of the projected unit methodology to determine the valuation results. Directions 14, 16 and 17 specify some modifications to the financial assumptions in the short term. An implication of the short term modifications is that the projected unit methodology is expected to result in an increasing standard contribution rate over successive periods. For example the cost of accrual over the period 2015 - 2019 is lower than that over the period 2019 - 2023 (before allowing for any redistribution of members into the 2015 Scheme). This effect is not immaterial for final salary benefits, but has no effect on the cost cap future service cost calculation since short term assumptions are explicitly disregarded for this purpose in Direction 40.
- B.7 Non-accruing benefits such as lump sums payable on death in service have been recognised only when a benefit payment is expected.

#### **Guaranteed Minimum Pensions (GMPs)**

- B.8 A global adjustment was applied to reduce the past service liability in respect of estimated GMP entitlements for which provision of post SPA pension increases is not the responsibility of the scheme. The reduction is equivalent to a reduction in the contribution rate of around 0.5% of pensionable pay over the 15 year period from the implementation date. This estimation has no impact on the calculation of the employer contribution correction cost.

#### **General pay increases**

- B.9 Direction 17 sets out the general pay increases that are to be assumed for valuation purposes.

#### **Final pensionable pay**

- B.10 All liabilities have been based on pensionable pay at the effective date as provided by administrators. No explicit allowance has been made for the impact of prior years' earnings resulting in higher final pensionable pay for particular members since this effect is not expected to impact a material number of members.

#### **Dependants' pensions**

- B.11 No allowance has been taken for short term dependant pensions or children's pensions (other than those already in payment), on ground of immateriality.



## Expenses

- B.12 No allowance has been made for expenses. Expenses are outside the valuation framework.

## Additional voluntary contributions

- B.13 Additional voluntary contributions paid on a money purchase basis are paid in accordance with Regulations which are separate to the pension scheme regulations and have not been considered for the valuation.
- B.14 Before 2006, the 1993 scheme had an option to take out added years contracts. A corresponding option has been made available to 2017 scheme members who were in office before 2006 to purchase add years on terms that were in force before 2006. It is not yet clear how many members will take up this option in the 2017 scheme and we have made no allowance for this in the valuation. In the 1993 scheme, additional voluntary contributions paid in accordance with the pension scheme regulations to secure added years are taken into account as liabilities of the scheme. This is modelled as an uplift of 0.3% to the relevant active liabilities.

## Treatment of fee-paid members

- B.15 The Fee-Paid Judicial Pension Scheme (FPJPS or 2017 scheme) commenced in April 2017 and granted backdated service to 7 April 2000 for eligible members. Both fee-paid and salaried judges were eligible for the 2015 scheme from its commencement in April 2015. Prior to that fee-paid judges were not members of the judicial pension schemes, and as such were not included in the 2012 valuation.
- B.16 The allowance for fee-paid judges is as follows:
- > Fee-paid judges in the 2015 and 2017 schemes are included in the future service calculations in the implementation period (2019 to 2023) in the same way as salaried members.
  - > The backdated 2017 scheme liabilities are reflected in the past service liability. There are no additional notional assets credited to offset this liability. Therefore, this notional deficit increases the uncorrected employer contribution rate.
  - > Interim compensation payments made in respect of fee-paid judges' pensions before the commencement of the 2017 scheme have been deducted from the notional assets.
  - > Fee-paid judges are also included within the employer contribution correction cost calculation. There is no past service cost in the employer contribution correction cost resulting from the introduction of fee-paid members, i.e. the initial cost cap fund is credited with notional assets to meet both fee-paid and salaried liabilities at 2015, including allowance for backdated service credited to 2017 scheme members.



- > The proposed employer cost cap has been recalculated using the methodology and assumptions of the 2012 valuation, but with fee-paid members included. This creates consistency in the comparison of the employer contribution correction cost calculated at the 2016 valuation (which includes fee-paid members) against the recalculated proposed employer cost cap.
- > The employer contribution rate from the 2012 valuation has not been recalculated to reflect the inclusion of fee-paid members.

### Member contribution yield over implementation period

- B.17 Directions require that the member contribution yield expected over the implementation period be calculated for employer contribution correction cost purposes as if all members were in JPS 2015. At the 2012 valuation, GAD estimated for the purposes of setting the cost cap that this notional yield would be 7.5% of pay. We estimate that if fee-paid members had been included in this calculation then the notional yield would have been 7.1% of pay.
- B.18 It is assumed at the 2016 valuation that the notional yield over the implementation period will remain at 7.1%, i.e. that the Lord Chancellor will if necessary adjust contributions so that it is expected that this yield will be achieved. The actual yield in the implementation period corresponding to a notional yield of 7.1% is estimated to be 6.2%.
- B.19 Estimated yields make use of the following data on pensionable pay and contributions in 2017-18 provided by the Ministry of Justice:

**Table B1: Pay and member contributions 2017-18 (£m)**

	2015 Scheme		2017 Scheme	Other	Total
	Salary paid	Fee paid			
Pensionable pay	104.9	42.1	46.7	148.4	342.0
Member contributions*	7.8	2.6	1.8	6.0	18.2

\*Personal and dependant contributions excluding additional contributions for added pension, added years or AVCs.

### Senior Salaries Review Body recommendations

- B.20 No allowance has been made for any government response to the Senior Salaries Review Body's recommendations on judicial pay published in October 2018.

### Judicial Service Awards

- B.21 Judges in the pre-2015 schemes (including the 2017 scheme) receive a Judicial Service Award on retirement. This is an additional payment outside the judicial pension schemes and is not in scope of the valuation. No allowance has been made for Judicial Service Awards.



### **Other Direction interpretations**

#### *Directions 27 and 28 (contribution rates)*

- B.22 27(1)(a) and 27(1)(c) : Payroll at effective date projected forward (only) in line with valuation earnings assumptions for purposes of spreading the deficit.
- B.23 27(1)(c)(ii) and 28 : Member contributions since the effective date based on actual (or expected) yield for past periods and periods up to 31 March 2019. Set corresponding to recalculated proposed employer cost cap notional contribution yield of 7.1% from April 2019. See B.17 to B.19.
- B.24 27(1)(b) and 27(1)(d) : See B.3 and B.4.

#### *Directions 28, 31, 32(1), 33(2)(a) (and related) – member contribution yields*

- B.25 See paragraph B.17 to B.19.

#### *Direction 25 – notional assets*

- B.26 Interim payments have been deducted as described at paragraph B.16.

#### *Direction 30 – Prior value of the cost cap fund*

- B.27 Liabilities in respect of past service for members of the 2017 Scheme is included in the liabilities as at 31 March 2015, as described in paragraph B.16.

#### *Direction 32(1) – expected cost of benefits for past periods (for cost cap fund purposes)*

- B.28 The contribution rate required to cover cost of benefits over 2015-16 is calculated by considering the membership over the period 2015-16.

#### *Directions 32(1) and 40(1) – expected cost of benefits for future periods (for employer contribution correction cost purposes)*

- B.29 See B.4.

#### *Directions 50(d)(vi)*

- B.30 For fee-paid members, where no scheme-specific demographic assumptions existed at the 2012 valuation, assumptions for the recalculated 2012 cost cap have been taken to be the same assumptions as for salaried members at the 2012 valuation, except for age retirement which has taken to be age 69 on average. This corresponds to the 2016 valuation where assumptions for fee-paid and salaried members are the same, except for age retirement.



*Other – “effective date”, “closing date” throughout*

- B.31 For the 2017 Scheme, data as at 31 March 2017 has been used, not data at 31 March 2015 or 31 March 2016, since the 2017 scheme did not exist at the effective date but is in scope of the valuation. 2016-17 accrual in the 2017 scheme has been removed from the liability as at 2016. The comparison of the employer contribution correction cost against the proposed cost cap includes the impact of assumption changes on 2016-17 accrual in the 2017 scheme. It also includes the impact of salary experience (around 0.2% of pay), but no other 2015-17 experience.

**Other member options**

- B.32 Member options other than added years, such as scheme pays and cash equivalent transfers, are assumed to be materially cost neutral relative to the valuation basis.

**Contribution arrears**

- B.33 Member contribution arrears are owed to the 2017 Scheme in respect of members' backdated service. It is assumed that these are recovered from members' retirement lump sums.



## Appendix C: Assumptions made for data uncertainties

### Summary

- C.1 Whilst comprehensive data was received from Punter Southall Administration Limited (PSAL) for the 2016 valuation, some aspects of the data were incomplete and/or unreliable for certain elements of our valuation calculations.
- C.2 It has not been possible to fully resolve these data issues in the timescale required for the valuation. Therefore to calculate results for the 2016 valuation of the Scheme requires assumptions in respect of incomplete and/or unreliable individual member records and movements data, the latter is used for setting assumptions and in the calculation of the Net Leavers Liability.
- C.3 Scheme specific assumptions are determined by the “responsible authority”, which is the Lord Chancellor in the case of the Scheme, and must be set as best estimate assumptions and not include margins for prudence or optimism.

### Individual member records

- C.4 Membership data is provided by Punter Southall Administration Limited (PSAL) for the purpose of the 2016 valuation and we apply checks to these membership records to ensure all key data items are provided and reliable for valuation purposes. Following these checks, it was identified that individual member records at the relevant dates as required for valuation purposes were not fully complete and reliable. We worked with Punter Southall Administration Limited (PSAL) to address a number of these issues, however where critical data items were missing from member records the general approach taken was to exclude that record for calculation purposes with calculations based on the remaining dataset being rated up incorporate an allowance for the excluded records.
- C.5 Uprating factors were determined for each membership category equal to the ratio of known valid records and the number of records with adequate data. Implicitly this uprating approach assumes that the records with omissions or errors have the same average profile (age, sex, pay, service) as fully complete records. Some 0.5% of records were excluded from the 2016 valuation data and 0% of the 2015 data provided for the purposes of setting the initial cost cap fund. Around 1.4% of records were excluded from the 2017 data (provided in respect of the 2017 scheme only).
- C.6 As noted, the approach taken to data omissions is to assume each record with missing data has the same average profile as the complete records and therefore there is a risk that this assumption is not appropriate. The table below indicates the extent to which the valuation results might be incorrect if the approach in fact under/overstates the liability for the omitted members by 10%, which we believe to be a reasonable level to consider.



	Impact of error in assumption for excluded members	
	Uncorrected employer contribution rate	Employer contribution correction cost
Actives 2016 data (uprating applied: 0.8%)	Less than 0.1%	Less than 0.1%
Deferreds 2016 data (uprating applied: nil)	Nil	Nil
Pensioners 2016 data (uprating applied: nil)	Nil	Nil
Actives 2017 data (uprating applied: 1.5%)	Less than 0.1%	Less than 0.1%
Pensioners 2017 data (uprating applied: 1.3%)	Less than 0.1%	Nil

- C.7 The table above illustrates the potential impact if known data omissions are subsequently found to have been handled incorrectly. Since it is not possible to undertake independent checks for all categories of members and a full reconciliation has not been achieved against all prior datasets there is the potential for currently unidentified problems with the data to emerge in future. For example a group of deferred members could be identified where no liability has previously been determined. The impact of such unknowns emerging at subsequent valuations could be considerably more than the sensitivity indicated above.

### **Movements data**

#### ***Setting assumptions***

- C.8 Punter Southall Administration Limited (PSAL) supplied data on the experience of the scheme membership over the four-year period to 31 March 2016. Fully complete and comprehensive data about members moving status between certain dates (e.g. leaving active status due to death or retirement) was not able to be provided. Analysis of member movements is needed to inform scheme specific demographic assumptions as scheme-specific experience, both recent and longer term, generally provides the most reliable evidence when considering best estimates of future experience.
- C.9 Assumption setting relies on analysis of movements data in consideration with such other relevant information which is available. The setting of demographic assumptions is to some extent subjective and a matter of interpretation. Changes in assumptions may be expected at successive valuations as circumstances change even with full data. Thus the absence of fully complete movements data does not necessarily introduce uncertainty into the valuation results provided there is other relevant information available to inform those assumptions. It is to be expected that there is some volatility in the experience arising from an analysis of movements data. As the judicial schemes have a relatively small population, only limited use has been made of the movements data in setting assumptions, so for purpose of assumption setting limitations of the movements data may be less significant than for other pension schemes.





- C.10 It should however be recognised that should significantly different movements data become available for future valuations it could result in recommendations regarding appropriate assumptions which lead to greater changes in valuation results than otherwise. It is difficult to quantify the potential scale of this discontinuity but it is likely to be relatively small for the Judicial Schemes since reliance is placed on wider evidence and less use is made of scheme-specific movements evidence. However, if there were errors in the wider data used in respect of the Teachers and Health schemes than that may have a more significant impact. For example, if the number of pensioner deaths was overstated or understated in the data available for setting assumptions for the 2016 valuation but correctly stated at a subsequent valuation, this would have an impact on the mortality assumptions adopted and potentially lead to a large change in the assumption at future valuations and hence a corresponding change in liability and employer cost.

***Cost Cap Net Leavers Liability (NLL)***

- C.11 The initial cost cap fund is set equal to the liability for actives members at 31 March 2015. The cost cap mechanism is intended to manage the costs of the reformed scheme and recognise any unexpected experience relating to pre-reformed entitlements of members in service at 1 April 2015, but only to the point at which they leave active service. The CCNLL is a quantification of the amount of pre-reformed liabilities which fall out of the cost cap fund at a valuation owing to members who have left service since the previous valuation (or since the initial cost cap fund was set in the case of the 2016 valuation), net of the additional liabilities in respect of any members with pre-reformed service who rejoined active membership during 2015-16.
- C.12 To accurately calculate the CCNLL in accordance with the directions requires full movement data for all members who were active in 2015 and are no longer active at the 2016 valuation. Some approximation has been required to determine the CCNLL for all valuations being undertaken in accordance with the valuation directions.
- C.13 For the purposes of determining the 2016 valuation results, we recommend an approach which implicitly makes an assumption that there is no unidentified experience gain or loss arising over the period 2015 to 2016. A risk of this approach is that any upward or downward cost pressure that has occurred over the period but which has not been explicitly identified will not be reflected in the 2016 valuation results.
- C.14 We expect that the uncertainty introduced by the approach above is not more than 0.2% of pay.
- C.15 We would not expect significant unidentified experience gains or losses to arise over the one year period 2015 to 2016, although some uncertainty remains. In addition we have reconciled the surplus or deficit arising over the period 2012-16 with an unexplained item of around £13m, which is equivalent to around 0.3% of pay. There could only be an unidentified experience gain or loss over the period one year 2015 to 2016 greater than 0.3% of pay if it was offset by another unidentified experience gain or loss arising in the period 2012-15 (or in 2015-16 in respect of non-active members of the pre-reform schemes).



- C.16 For the 2016 valuation, the CCNLL calculation period is only one year, rather than a full four-year valuation. Given the short period over which any gain or loss may have arisen it might reasonably be concluded that the lack of data for the CCNLL calculation is not critical for this valuation although it would become so in future valuations when a longer period is considered.



## Appendix D: Sensitivity of valuation results to Lord Chancellor set assumptions

D.1 The table below provides an indication of the sensitivity of the valuation results to the particular assumptions under consideration. The figures shown here are also provided in section 4 of the formal valuation report.

### Sensitivity of valuation results to Lord Chancellor set assumptions

	Addition to uncorrected employer contribution rate <sup>12</sup>	Addition to employer contribution correction cost
Membership profile: 2 years older on average over implementation period	1.7%	1.7%
Mortality rates: 5%* heavier rates of pensioner mortality	(1.4)%	(0.9)%
Age retirement rates: 1993 scheme active members retire 1 year later than currently assumed	(1.0)%	(0.6)%
Proportions partnered: 5%* more members assumed to have qualifying partners at death	0.7%	0.3%
Promotional pay increases: 0.5% higher promotional pay increases than assumed	1.2%	1.0%

\* Opposite changes in the assumptions will produce approximately equal and opposite changes in the valuation results.

D.2 In each variant of the above table the sensitivity shown is in relation only to the change in assumption described. The impact of a combination of assumption changes will not necessarily equate to the sum of the relevant rows above.