



# Government Actuary's Department

## **National Health Service Superannuation Scheme (Scotland):**

Actuarial valuation as at 31 March 2012  
Report by the Scheme Actuary

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## 1 Executive summary

*This report is addressed to the Scottish Ministers and provides the results of the actuarial valuation of the NHS Superannuation Scheme (Scotland) carried out as at 31 March 2012.*

- 1.1 An actuarial valuation of the National Health Service Superannuation Scheme (Scotland) (NHSSS or 'the Scheme') has been carried out as at 31 March 2012 (the **effective date**). The valuation has been undertaken in accordance with *The Public Service Pensions (Valuations and Employer Cost Cap) Directions 2014* as amended ('the Directions'), which specify certain assumptions and require other assumptions to be the Scottish Ministers' best estimates. HM Treasury has confirmed its consent to the assumptions proposed by the Scottish Ministers.
- 1.2 This report is addressed to the Scottish Ministers and sets out the results of the valuation. The **valuation results** specify the rate of employer contribution payable for the four year period from 1 April 2015 (the **implementation period**) and the **employer cost cap**<sup>1</sup>, both of which are to be set in regulations.
- 1.3 The key results of the valuation are as follows:
  - > **Employer contribution rate** payable for the **implementation period**: 14.9% of pensionable pay
  - > **Employer cost cap**: 11.5% of pensionable pay
  - > Total Scheme liabilities for service to the **effective date** of £28.2 bn and **notional assets** of £26.8 bn giving a notional past service deficit of £1.4 bn.

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<sup>1</sup> In accordance with Section 12 of the Public Service Pensions Act 2013 ('the Act')



## 2 Background

*The valuation has been carried out in accordance with the HMT Directions.*

- 2.1 The National Health Service Superannuation Scheme (Scotland) (NHSS or 'the Scheme') provides pensions to employees who have worked in the National Health Service in Scotland. The Scheme is an unfunded statutory public service pension scheme with the benefits underwritten by the Government. The Scheme is financed by payments from employers and from those current employees who are members of the Scheme, who pay contributions at different rates based on pay and as specified in the regulations<sup>2</sup>. The rate of employer contributions is typically set following an actuarial valuation. The previous valuation of the Scheme was carried out as at 31 March 2004<sup>3</sup> and this recommended an employer contribution rate of 13.5% of pay from 1 April 2009.
- 2.2 GAD has been appointed as **Scheme Actuary**<sup>4</sup> by the Scottish Ministers to carry out an actuarial valuation of the Scheme as at 31 March 2012 (the **effective date**). This report on the valuation is addressed to the Scottish Ministers and is also being made available to HM Treasury (HMT).
- 2.3 The valuation has been undertaken in accordance with *The Public Service Pensions (Valuations and Employer Cost Cap) Directions 2014 as amended*<sup>5</sup> ('the Directions'). Terms defined in the Directions are shown in **bold italics** when used in this report.
- 2.4 The Directions require the NHSS and the new scheme being introduced for the NHS workforce on 1 April 2015 under Section 1 of the 2013 Act<sup>6</sup> ('the 2015 Scheme') to be taken into account in aggregate for the purposes of the current valuation. The results shown in this report relate to 'the aggregate scheme' that is the combination of the NHSS and 2015 Scheme<sup>7</sup>.
- 2.5 The main requirements of the valuation are set out in the Directions. These are to determine the rate of employer contribution payable from 1 April 2015 (the **implementation date**) for the four year period from 1 April 2015 (the **implementation period**) and the initial **employer cost cap**<sup>8</sup>, both of which are to be set in regulations. Paragraph 22 of the Directions require a number of results relating to the liabilities, **notional assets**, and contribution rates to be prepared and reported. These results are set out in Section 4 of this report. Appendix H sets out where other information as

<sup>2</sup> SSI 2011/117 Regulation D1 and SSI 2013/174 Regulations 2.C.2 and 3.C.2

<sup>3</sup> A valuation as at 31 March 2008 was started but not completed and so did not lead to a change in the contribution rate

<sup>4</sup> In accordance with Direction 50(a) of the Public Service Pensions (Valuations and Employer Cost Cap) Directions 2014

<sup>5</sup> Amendments are the Public Service Pensions (Valuations and Employer Cost Cap) (Amendment) Directions 2014 and the Public Service Pensions (Valuations and Employer Cost Cap) (Amendment) (No 2) and (No 3) Directions 2014.

<sup>6</sup> The Public Service Pensions Act 2013

<sup>7</sup> Members can pay money purchase AVCs under The National Health Service Superannuation Scheme (Scotland) (Additional Voluntary Contributions) Regulations 1998. This is not a connected scheme for the purpose of Section 11 of the Public Service Pensions Act 2013 and so is not part of the aggregate scheme.

<sup>8</sup> In accordance with Section 12 of the Public Service Pensions Act 2013



required by the Directions is provided in this, or related, valuation reports.

2.6 The **employer contribution rate** is expected to be reassessed at the actuarial valuation to be carried out as at 31 March 2016 (and each subsequent four yearly valuation). The next revision to the **employer contribution rate** is expected to take effect from 1 April 2019. The financial position relative to the **employer cost cap** will also be reconsidered at each four yearly valuation.

2.7 We have previously provided advice and information on certain aspects of the valuation. The following documents have been signed alongside this report and should be read in conjunction with it.

- > NHS Superannuation Scheme (Scotland): Report on membership data as at 31 March 2012 dated 20 January 2015
- > NHS Superannuation Scheme (Scotland) actuarial valuation as at 31 March 2012: Report on data used for experience analysis dated 20 January 2015
- > NHS Superannuation Scheme (Scotland) actuarial valuation as at 31 March 2012: Advice on assumptions dated 20 January 2015
- > NHS Superannuation Scheme (Scotland) actuarial valuation as at 31 March 2012: Report on methodology dated 20 January 2015

The advice on assumptions report was made available in draft to, and discussed with, the Scheme's member and employer representatives in September 2013 in accordance with Direction 19(b). The only substantive changes made between the draft and final report were to reflect the results of the Scottish Ministers considerations on the post retirement mortality assumption in light of advice provided by GAD in relation to the valuation of the Scottish Teachers Superannuation Scheme, and to incorporate changes resulting from the finalisation of the Directions, notably to include specific assumptions for new entrants and to accommodate the direction of assumed proportions commuted for certain purposes.

2.8 Throughout this report the totals given for summed data may not be exactly the same as the sum of the components shown due to rounding effects.

2.9 Appendix I sets out the limitations of this report.



### 3 Key inputs

*This section summarises what calculations were carried out, including the data, methodology and assumptions used, and the analysis performed on the results.*

#### Data

- 3.1 At the **effective date**, there were some 149,400 contributors to the Scheme with a total payroll of £4.42 billion and 80,400 pensions in payment with total annual pensions amounting to £612 million. There were a further 52,700 ex-contributors who had not yet started to receive their pension. Appendix A provides a summary of the membership data. Further details on the data, including the checks carried out on that data, the limitations of those checks and adjustments made, are provided in the report 'NHS Superannuation Scheme (Scotland): Report on membership data as at 31 March 2012' dated 20 January 2015.

#### Benefits

- 3.2 The benefits provided to members of the NHSS are set out in regulations<sup>9</sup>. A new scheme ('the 2015 Scheme') is being introduced from 1 April 2015. Most existing Scheme members will transfer to the 2015 Scheme on 1 April 2015. Under transitional arrangements aimed at providing protection for those nearest retirement age, some older members will continue in the existing scheme until they leave due to retirement or otherwise, while others will transfer to the new Scheme at a later date.
- 3.3 The NHSS is a final salary scheme with two main sections (the 1995 section with normal pension age (NPA) 60 and the 2008 section with NPA 65). The 1995 section has an accrual rate of 1/80 (with an automatic lump sum of three times the accrued pension). The 2008 section has an accrual rate of 1/60 (with lump sum by commutation only). Both sections provide benefits to practitioners on a career average, rather than final salary, basis. The 2015 Scheme is a career average revalued earnings (CARE) scheme with NPA equal to State Pension Age, an accrual rate of 1/54, and revaluation of CPI+1.5% a year while in service and CPI out of service. In both schemes member contribution rates are tiered based on members' pay.
- 3.4 Appendix B gives a summary of the benefits provided under the NHSS and of those to be provided under the 2015 Scheme. It also sets out the criteria by which Scheme membership will be determined from 1 April 2015 when the 2015 Scheme is introduced. Further details on benefits and the membership of the two Schemes from 1 April 2015 is provided in the report 'NHS Superannuation Scheme (Scotland): Report on membership data as at 31 March 2012' dated 20 January 2015.

<sup>9</sup> SSI 2011/117 (1995 section) and SSI 2013/174 (2008 section)



### Notional assets

- 3.5 The Scheme is financed by contributions from employers and current members of the Scheme. The contributions paid to the Scheme fall into general government revenues. There is no actual fund of assets but an account is maintained of a notional fund made up of contributions paid by employers and members, supplemented by a return on the notional fund at a pre-determined rate and reduced by benefits as and when they are paid to retired and former members of the Scheme. The notional fund stood at £26.8 billion as at the **effective date**. Appendix C provides further information on the development of the notional fund since the previous valuation as at 31 March 2004. Appendix D sets out the rates of contribution paid since the previous valuation and summarises other events affecting the Scheme since that valuation.

### Assumptions

- 3.6 The Directions specify certain assumptions to be used for the valuation whilst requiring certain other assumptions to be set as the Scottish Ministers' best estimates, after taking the advice of the **Scheme Actuary**. The Scheme regulations require HM Treasury consent to the assumptions used. Actuarial advice on the scheme specific assumptions (including variations appropriate for the purposes of determining the **employer cost cap**), and other relevant information (including an analysis of the Scheme's demographic experience), is set out in the reports:
- > NHS Superannuation Scheme (Scotland) actuarial valuation as at 31 March 2012 : Advice on assumptions dated 20 January 2015
  - > NHS Superannuation Scheme (Scotland) actuarial valuation as at 31 March 2012: Report on data used for experience analysis dated 20 January 2015.
- 3.7 We have been instructed by the Scottish Ministers, following consultation with relevant stakeholders, to adopt the best estimate assumptions recommended in our advice, having obtained HMT consent to those assumptions. Appendix E summarises the key assumptions made.

### Methodology and calculations

- 3.8 The Directions specify that the Projected Unit Methodology should be used. Application of this methodology to determine the **valuation results** as specified requires some assumptions to be made about the size and make-up of the workforce up to the end of the **implementation period**<sup>10</sup>.
- 3.9 To calculate the **employer contribution rate**, we have placed a net present value on the extra annual benefit accrual over the four-year **implementation period** and then adjusted for the repayment of the deficit over 15 years and member contributions. The **employer cost cap** is a measure of the cost of the 2015 Scheme only. The calculation of the **employer cost cap** is similar to that of the **employer contribution rate** but is based on all members being in the 2015 Scheme in April 2015, with

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<sup>10</sup> 1 April 2015 to 31 March 2019



assumptions reflecting members' likely behaviour had they never been members of the existing schemes, and no deficit contributions apply.

- 3.10 Appendix F summarises the actuarial methodology adopted for the valuation in more detail. Further details on methodology, including the approach taken to projecting the workforce and the rationale for that approach, are provided in the report NHS Superannuation Scheme (Scotland) actuarial valuation as at 31 March 2012: Report on methodology dated 20 January 2015. Appendix F also summarises the calculations undertaken to determine the **valuation results** in more detail.

#### **Analysis of result**

- 3.11 Section 5 of this report provides a reconciliation of the financial position at the previous valuation date, 31 March 2004, and at the **effective date** of the current valuation.
- 3.12 Section 6 provides further information which is intended to assist in the interpretation of the results shown. In particular, this section shows the main sensitivities of the **valuation results** to the assumptions set by the Scottish Ministers. The most significant of these are post-retirement mortality, withdrawal rates and promotional pay increases.
- 3.13 Section 7 comments on the main risks which could result in some variations in the **valuation results** at subsequent valuations.





## 4 Valuation results

*This section provides the valuation results required by the Directions.*

- 4.1 Direction 22 requires certain numerical **valuation results** to be reported. This section provides the information required by the Directions.

### Valuation balance sheet at 31 March 2012

- 4.2 The assets and past service liabilities of the aggregate scheme<sup>11</sup> as at the **effective date** calculated in accordance with the Directions, and otherwise as specified in this report, are set out in Table 4.1. The liabilities valued include all benefits currently or prospectively payable under the aggregate scheme to pensioners and deferred pensioners as at 31 March 2012 and to active members as at 31 March 2012 in respect of service completed to the **effective date**. In the case of active members liabilities arising from future pay inflation, or in service benefit revaluation, to the assumed future date of cessation of pensionable service is included in the liability shown. Corresponding figures at the previous valuation date are shown for comparison purposes. However, that valuation used a different valuation method, the Entry Age method, so not all results are directly comparable.

**Table 4.1 - Valuation balance sheet**

	£ billion 31 March 2012	<i>Direction</i>	£ billion 31 March 2004
<b>Aggregate scheme assets</b>	26.8	25	12.4 <sup>12</sup>
<b>Aggregate scheme liabilities in respect of:</b>			
Active members	16.6		7.6
Deferred pensioners	2.3		0.8
Pensioners	9.3		4.4
<b>Total aggregate scheme liabilities</b>	28.2	24	12.8 <sup>13</sup>
<b>Surplus (Shortfall) as at 31 March 2012</b>	(1.4)		(0.4)

### Contribution rates

- 4.3 Whilst the **effective date** of the actuarial valuation is 31 March 2012, the **employer contribution rate** determined is that payable in respect of the period 1 April 2015 to 31 March 2019 (the **implementation period**). The **employer contribution rate**

<sup>11</sup> The results shown in this report relate to 'the aggregate scheme' that is the combination of the NHSS and 2015 Scheme. All liabilities in respect of service to the valuation date relate to the NHSS.

<sup>12</sup> As reported in the 31 March 2004 valuation report. An adjusted amount of £14.5 bn is set out in the Directions to correct for omissions in the data used to set the notional fund originally.

<sup>13</sup> The liabilities as at 31 March 2004 were based on an incomplete dataset and should not be relied upon.



required over the **implementation period** is determined from the following components

- > The contribution rate, payable from 1 April 2015 for a period of 15 years, required to meet the shortfall between assets and liabilities as shown in Table 4.1
- > Plus the contribution rate, payable from 1 April 2015 for a period of 15 years, required to meet any shortfall in the expected cost of benefits accruing between the **effective date** and 31 March 2015 and the actual contributions paid by employers and members over the same period
- > Plus the contribution rate, payable from 1 April 2015, required to cover the expected cost of benefits accruing by members over the **implementation period**
- > Less normal<sup>14</sup> member contributions expected to be payable during the **implementation period**.

The relevant **valuation results**, expressed as a percentage of pensionable payroll, are summarised in Table 4.2.

**Table 4.2 - Contribution rates**

	%	%	<i>Direction</i>
Contribution rate required to be paid for 15 years from 1 April 2015 to correct shortfall at 31 March 2012		2.6	A
Contribution rate required to cover cost of benefits accruing between 1 April 2012 and 31 March 2015	23.7		27(1)(b)
Less normal member contribution rate expected between 1 April 2012 and 31 March 2015 <sup>15</sup>	9.0		28(a)
Less employer contribution rate expected between 1 April 2012 and 31 March 2015	13.5		28(b)
Net contribution shortfall between 1 April 2012 and 31 March 2015	1.2		
Contribution rate required to be paid for 15 years from 1 April 2015 to correct underpayment of contributions between 1 April 2012 and 31 March 2015		0.3	B
Contribution rate required to cover cost of benefits accruing over implementation period	21.8		C
Less normal member contribution rate expected over implementation period <sup>16</sup>	9.8		D
Employer contribution rate required for cost of accrual of benefits over implementation period		12.0	C-D
Employer contribution rate required over implementation period (A + B + C) - D		14.9	29

<sup>14</sup> Excluding additional voluntary contributions (past added years, additional pension, money purchase AVCs) and contributions for any other options exercised

<sup>15</sup> Target overall rate expected when member contribution tiers were set

<sup>16</sup> Target overall rate as set out in Framework Agreement dated 23 May 2013

[http://www.sppa.gov.uk/Documents/NHS/NHS%202015%20Scheme/NHSScotland\\_2015\\_Pension\\_Scheme\\_Framework\\_Document\\_Updated\\_23\\_May\\_2013\\_\(3\).pdf](http://www.sppa.gov.uk/Documents/NHS/NHS%202015%20Scheme/NHSScotland_2015_Pension_Scheme_Framework_Document_Updated_23_May_2013_(3).pdf)



### Cost cap

4.4 The **proposed employer cost cap** is determined from the following components.

- > The contribution rate, payable from 1 April 2015, required to cover the expected cost of benefits accruing by members over the **implementation period**. This being determined using data, methodology and assumptions adjusted in accordance with Direction 53 (3) to (6))
- > Less normal member contributions expected to be payable over the **implementation period**.

The relevant valuation results, expressed as a percentage of pensionable payroll, are summarised in Table 4.3.

**Table 4.3 - Cost cap**

	%	<i>Direction</i>
Contribution rate required to cover expected cost of benefits accruing over implementation period, assuming all members are accruing benefits in the 2015 scheme	21.3	A
Less normal member contribution rate expected over implementation period <sup>17</sup>	9.8	B
Proposed employer cost cap (A - B)	11.5	53

4.5 The **valuation results** have been determined in accordance with the requirements as to data, assumptions and methodology as specified in the Directions.

<sup>17</sup> Target overall rate as set out in Framework Agreement dated 23 May 2013

[http://www.sppa.gov.uk/Documents/NHS/NHS%202015%20Scheme/NHSScotland\\_2015\\_Pension\\_Scheme\\_Framework\\_Document\\_Updated\\_23\\_May\\_2013\\_\(3\).pdf](http://www.sppa.gov.uk/Documents/NHS/NHS%202015%20Scheme/NHSScotland_2015_Pension_Scheme_Framework_Document_Updated_23_May_2013_(3).pdf)



## 5 Reconciliation of result with previous valuation results

*This section looks at how the valuation results have changed since the previous valuation as at 31 March 2004.*

- 5.1 The previous valuation of the NHSS was carried out as at 31 March 2004<sup>18</sup>. The framework for that valuation was different to that under which the current valuation has been carried out. This has resulted in some considerable movements in the calculation of the liabilities. Table 5.1 shows how the valuation balance sheet has changed since the previous valuation. Some figures have been calculated in an approximate manner but are sufficient to show the general size of the impact on the balance sheet. Table 5.2 provides further information on the items identified. Impacts are considered in the order listed. Using a different order could change the intermediate figures significantly, though there is no impact on the unattributed item or the final shortfall.

**Table 5.1- Valuation balance sheet - Comparison with previous valuation**

	£ billion	Note
<b>Surplus (shortfall) at 31 March 2004</b>	<b>(0.4)</b>	
Change in actuarial method	0.4	1.
<b>Adjusted surplus (shortfall) at 31 March 2004</b>	<b>0.0</b>	
Interest on surplus (shortfall)	0.0	
Shortfall in return on notional assets	(0.1)	2.
Excess of contributions paid against cost of benefits accruing 2004 to 2012	0.3	3.
<b>Experience effects</b>		
Pay increases lower than expected	1.7	4.
Ill health retirements fewer than expected	0.3	
Age retirements earlier than expected	(0.1)	
Withdrawal experience	0.0	
More commutation than expected	0.1	
Pensioner mortality lighter than expected	(0.1)	
Fewer dependant pensions payable than expected	0.0	
Negative inflation in 2009 (pensions held level in 2010 and practitioner dynamisation of 1.5%)	(0.1)	
Change in long-term financial assumptions	(4.2)	5.
Impact of short-term variation of assumptions	2.4	6.
Impact of change in demographic assumptions	(1.6)	7.
Unattributed	0.0	8.
<b>Surplus (shortfall) at 31 March 2012</b>	<b>(1.4)</b>	

<sup>18</sup> [http://www.sppa.gov.uk/Documents/Corporate/NHS%20Valuations/NHSSS\\_funding\\_valuation\\_2004.pdf](http://www.sppa.gov.uk/Documents/Corporate/NHS%20Valuations/NHSSS_funding_valuation_2004.pdf)



**Table 5.2 Explanation of analysis**

Note	Explanation
1.	The Directions require the use of the Projected Unit methodology for the current valuation. The Entry Age method was used for the previous valuation. The net effect of the change in method for the NHSS is that the liability attributed to past service is lower.
2.	At the previous valuation the return on the <b>notional assets</b> was anticipated to be 3.5% a year above pension increases. This rate applied until 31 March 2011 but was reduced to 3% above pension increases after that date, see Direction 25 (4). The impact of this change means the <b>notional assets</b> are lower than anticipated at the previous valuation.
3.	This impact has been assessed on the financial assumptions applying to the 2004 valuation. If the cost of accrual had instead been assessed on the financial assumptions applying to the 2012 valuation then the contributions paid would have been less than the cost of accrual.
4.	Pay increases over the period between the previous and current valuations are believed to have been substantially lower than anticipated due to the pay restraint policy applied to public service workers during the period. Data was not available to quantify this item of experience accurately. The effect attributed to pay experience relies on analysis undertaken for the National Health Service Pension Scheme for England and Wales.
5.	The financial assumptions are set by HM Treasury. Appendix E summarises the financial assumptions set for the current and previous valuations. The most financially significant change in the long term financial assumptions is the reduction in the rate of discount net of pension increases from 3.5% pa to 3.0% a year. This includes the impact of changing from RPI to CPI revaluation of pensions in payment and deferment, which in isolation would reduce liabilities by about 12% <sup>19</sup> .
6.	The Directions for the current valuation specify some variation in financial assumptions for the period between the <b>effective date</b> and the end of the <b>implementation period</b> . The short-term assumptions specified result in lower assessed liabilities. No short-term variations were assumed for the previous valuation other than an allowance for transition to Agenda for Change pay scales (see Appendix E).
7.	The impact of the change in demographic assumptions is the net result of a number of changes. These include an increase in life expectancy, a reduction in proportions assumed to qualify for a dependant's benefit, allowance for commutation of pension for cash and changes to the rates of assumed exit from membership. The changes in demographic assumptions result in higher assessed liabilities.
8.	Without adjustment to the notional fund as at 31 March 2004 (from £12.4bn as shown in the 31 March 2004 valuation report to £14.5bn as set out in the Directions) the unattributed element would amount to £(3.5)bn, arising from inconsistency in the data sets used for the 2004 and 2012 valuations.

<sup>19</sup> In line with 2010/11 Annual Accounts which assumed a difference between CPI and RPI of 0.75% per annum



- 5.2 Table 5.3 illustrates how the employer contribution rate has changed since the previous valuation. Again, some figures have been calculated in an approximate manner but are sufficient to show the general size of the impact on the contribution rate. Impacts are considered in the order listed. Using a different order could change the intermediate figures significantly, though there is no impact on the final contribution rate.

**Table 5.3 Employer contribution rate - Comparison with previous valuation**

	% pay
<b>Employer contribution rate determined at 31 March 2004<sup>20</sup></b>	<b>14.7</b>
Change in actuarial method	(0.6)
Changes in cost of accrual arising from changes to benefits, assumptions and membership mix	2.7
Change in adjustment for past service effects	2.0
Increase in member contributions	(3.9)
<b>Employer contribution rate determined at 31 March 2012</b>	<b>14.9</b>

<sup>20</sup> This is the rate recommended in the report on the valuation as at 31 March 2004 before allowing for the changes implemented with effect from 1 April 2008; in anticipation of those changes the Employer contribution rate was reduced to 13.5% of pensionable pay. This rate was paid from 1 April 2009.



## 6 Sensitivity of valuation results to assumptions

*This section illustrates how the valuation results would change if different assumptions were used.*

- 6.1 This section illustrates the sensitivities of the **valuation results** to the assumptions determined by the Scottish Ministers<sup>21</sup>. Sensitivities are not shown for assumptions specified in the Directions since these are fixed for the purpose of this valuation.
- 6.2 Table 6.1 shows the sensitivities relative to the past service liabilities, the cost of future accrual, the **employer contribution rate** and the **proposed employer cost cap**. The sensitivities shown are intended to illustrate a range of reasonable outcomes which might have been determined at this valuation had different assumptions been used. They are not intended to show the possible range of variation in assumptions which might be considered at future valuations and in light of future experience. Section 7 and Appendix G comment on the main risks which could result in some variations in the **valuation results** at subsequent valuations.

**Table 6.1 Sensitivity of valuation results to Scottish Ministers set assumptions<sup>22</sup>**

	<b>Addition to past service liabilities</b>	<b>Addition to contribution rate for future accrual</b>	<b>Combined addition to employer contribution rate<sup>23</sup></b>	<b>Addition to proposed employer cost cap</b>
(i) <b>New entrant profile*</b> : new joiners assumed 2 years older on average	No impact	0.2%	0.2%	0.2%
<b>(ii) Mortality rates* :</b>				
(a) each pensioner subject to mortality rates 5% heavier than assumed <sup>24</sup>	£(0.2)bn	(0.2)%	(0.6)%	(0.2)%
(b) 5% more deaths before retirement than currently assumed	Nil	Nil	Nil	Nil
<b>(iii) Age retirement rates*</b> (where no actuarial adjustment is applied): 5% more members of the 1995 section assumed to retire at normal pension age than currently assumed, with correspondingly fewer members assumed to retire later	<£0.1bn	<0.1%	0.1%	No impact

<sup>21</sup> As specified in Direction 19(e)

<sup>22</sup> 'Nil' indicates that there is an impact but this appears to be zero to the level of rounding used, ie nearest £50m for past service liabilities and nearest 0.1% for contribution rates.

<sup>23</sup> Combined effect of additions for past service, underpayment of contributions over 2012-15 (not shown separately) and future accrual.

<sup>24</sup> Broadly speaking this is equivalent to assuming members spend 0.5 years less in retirement



	<b>Addition to past service liabilities</b>	<b>Addition to contribution rate for future accrual</b>	<b>Combined addition to employer contribution rate</b>	<b>Addition to proposed employer cost cap</b>
(iv) <b>Commutation*</b> (other than as directed) : all eligible members of the 1995 section commute 2% of pension more than assumed	£(0.1)bn	Nil	(0.2)%	No impact
(v) <b>Early and late retirements*</b> (where actuarially adjusted benefits are paid): 5% higher number of members assumed to retire at each age before/after normal pension age than currently assumed	Nil	Nil	Nil	Nil
(vi) <b>Ill health retirements*</b>				
(a) Rate of ill health retirements : 5% higher numbers of members assumed to retire on ill health grounds than currently assumed	Nil	Nil	Nil	Nil
(b) Severity of ill health retirements : 5% more members assumed to receive Tier 2 benefits than currently assumed	Nil	Nil	Nil	Nil
(vii) <b>Members' dependants*</b>				
(a) proportions partnered : 5% more members assumed to have qualifying partners at death	£0.1bn	0.1%	0.2%	0.1%
(b) age difference between member and partner: dependants assumed to be 1 year older than that based on current assumption	Nil	Nil	Nil	Nil
(viii) and (ix) <b>Resignations and opt outs*</b> : 5% higher numbers assumed to leave voluntarily before retirement (net of rejoiners)	<£0.1bn	(0.2)%	(0.3)%	(0.1)%
(x) <b>Promotional pay increases*</b> : promotional pay increases 0.5% per annum higher on average than assumed	£0.8bn	0.7%	2.3%	No impact

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

6.3 In each variant of Table 6.1 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.





## 7 Uncertainties around possible outcomes of the next valuation

*This section considers some of the risks relating to the outcomes of the next valuation.*

- 7.1 The results of this valuation are set out in Section 4. Section 6 outlines the sensitivity of the results to those assumptions set by the Scottish Ministers. The sensitivities shown in that section are intended to illustrate a range of reasonable outcomes which might have been determined at this valuation had different assumptions been used. The range of reasonable outcomes at this valuation is different to, and not necessarily related to, the possible range of outcomes at future valuations.
- 7.2 The results of the next valuation (both the **employer contribution rate** and the **cost cap cost of the scheme**<sup>25</sup>) will differ from the results shown in this report for many reasons. Table 7.1 shows some of these reasons. These differences can be split into three categories:
- > those that are expected
  - > those that are likely to occur due to short-term variations between experience and assumptions
  - > those that are possible but less likely and result from more significant experience variations leading to changes in assumptions or from material data errors
- 7.3 The results of future valuations might affect the level of contributions payable by both employers and members and/or the amount of benefits payable to members for future service. Further information on the cost cap mechanism and how this may affect member benefits and/or contributions after future valuations is provided in Appendix G.
- 7.4 More explanation relating to the items in the table is given in the remainder of this section.

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<sup>25</sup> This will be compared to the cost cap at the next valuation. See Appendix G for further details.



**Table 7.1: Items that may affect the next valuation<sup>26,27</sup>**

Item	Employer contribution rate <sup>28</sup>	Cost cap cost of the scheme <sup>29</sup>
Expected:		
Reduction in proportion of membership accruing benefits in existing schemes	✓	o
Partial deficit repayment	o	N/A <sup>29</sup>
Short-term mortality improvements & increases in members' average SPA	o	o
Run-off of short-term financials up to the next valuation date (final salary benefits only)	✓	N/A
Likely:		
Short-term experience effects:		
- demographic	✓	✓
- financial	✓✓	✓
Assumption changes:		
- short-term financials after the next valuation date	✓✓	✓✓
- mortality improvements	✓✓	✓✓
Possible:		
Errors found in data sets from previous valuations	✓✓	✓
Unanticipated membership changes	✓✓	✓
Assumption changes:		
- demographics set by the Scottish Ministers subject to HMT approval	✓✓	✓

Key<sup>30,31</sup>: N/A = not applicable, o = impact is likely to be less than 0.5% of pay,

✓ = impact may well be more than 0.5% of pay but, although possible, is quite unlikely to be more than 2% of pay,

✓✓ = impact may well be more than 2% of pay

<sup>26</sup> All cost pressures are assumed to feed through to the **employer contribution rate** and the **cost cap cost of the scheme** in line with the Directions; more detail on how the Directions treat cost pressures is set out in paragraphs 2.31 to 2.35 of *Public service pensions: actuarial valuations and the employer cost cap mechanism* published by HMT in March 2014.

<sup>27</sup> We have ignored items such as changes to the Directions (apart from those described as "likely" in paragraph 2.39 of *Public service pensions: actuarial valuations and the employer cost cap mechanism*), benefit changes or changes to relevant law (including European law), because it is impossible for us to form any judgement on the likelihood or quantum of such changes.

<sup>28</sup> Each item is considered separately; a combination of these items could have a larger impact than is considered likely for any of those items individually.

<sup>29</sup> N/A at this valuation but will become relevant at future valuations

<sup>30</sup> Showing relative importance of items in the table in our judgement at the time of signing

<sup>31</sup> Shown in increasing order



- 7.5 As explained above, some of the factors affecting the results of the next valuation are relatively predictable. For example:
- > **Scheme membership:** There will be fewer members of the existing sections of the Scheme as protected members retire and tapered members move across. This will impact on the cost of future accrual.
  - > **Deficit:** Part of the existing deficit will be paid off through the deficit contributions payable before the next **implementation date**.
  - > **Mortality improvements:** Life expectancies are expected to continue to increase, though the impact of this should be offset to an extent by increases in the average SPA of active members.
  - > **Short term financials:** The short term financial assumptions up to the effective date of the next valuation will determine some of the experience effects at the next valuation but otherwise will not be relevant to the determination of the valuation results of the next valuation.
- 7.6 It would be possible to calculate the expected contribution rate at the next valuation allowing for these more predictable effects. However, any estimate would still be subject to considerable uncertainty, not least because of the long period over which the membership would need to be projected.
- 7.7 Other impacts on the results of the next valuation are less predictable. These include:
- > **Data:** If the data used for this valuation is later shown to be materially incorrect, a gain or loss will emerge when it is corrected. For example, if the next valuation reveals that the accrued pensions at this valuation are found to be 5% underreported, all other things being equal, the **employer contribution rate** could increase by around 2.5% of pay.
  - > **Scheme membership:** The distribution of future scheme membership may differ from that projected at this valuation. For example, if the scheme membership unexpectedly grows<sup>32</sup> by 10% by 2016 then this might reduce the **employer contribution rate** by about 0.2%.
  - > **Short term experience effects:** If experience is not in line with the assumptions made, a gain or loss will emerge over an inter-valuation period. Although the scale of the experience effects seen over the current inter-valuation period is not necessarily indicative of the scale of the effects for future periods it is reasonable to infer that the impact of demographic experience effects is likely to be considerably lower than the potential impact of financial experience effects. For example, at this valuation none of the items of demographic experience resulted in an impact on the **employer contribution rate** of more than 0.5% whereas the pay experience was equivalent to a contribution impact of around 3.0% of pay.

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<sup>32</sup> Growth due to a surge of new entrants which result in the overall profile of the membership remaining unchanged



- > **Longer term experience effects:** Assumption changes at future valuations, in light of scheme experience, may have more substantial effects on the results than actual experience effects. The greater sensitivity to assumption changes is because typically the assumptions apply to longer periods than the experience effects are measured over. The results of future valuations might affect the level of contributions payable by both employers and members and/or the amount of benefits payable to members for future service.
  
- > **Other assumption changes:** Assumptions may change for reasons other than scheme experience, and paragraph 2.39 of *Public service pensions: actuarial valuations and the employer cost cap mechanism* flags that some of the assumptions set in the Directions (including short-term financial assumptions) are likely to change. The **employer contribution rate** is particularly sensitive to the short-term financial assumptions (the use of short term rather than long term assumptions up to March 2019 for this valuation reduced the **employer contribution rate** by about 4.5% of pay). **Valuation results** are also sensitive to other assumptions set in the Directions, such as the discount rate, mortality improvements and commutation take up. It is expected that any changes to assumptions in the Directions will impact on the **employer contribution rate**. The impact of changes in assumptions on the cost cap mechanism is described in paragraphs 2.31 to 2.35 of *Public service pensions: actuarial valuations and the employer cost cap mechanism*.



## 8 Conclusion

*This section summarises the valuation results.*

- 8.1 Based on the detailed analysis as set out in this report, the key results of the valuation are as follows:
- > **Employer contribution rate** payable for the **implementation period**: 14.9% of pensionable pay
  - > **Employer cost cap**: 11.5% of pensionable pay
  - > Total Scheme liabilities for service to the valuation date of £28.2 bn and **notional assets** of £26.8 bn; a notional past service deficit of £1.4 bn.
- 8.2 The next valuation of the Scheme is due to be undertaken as at 31 March 2016. This will set the **employer contribution rate** payable from 1 April 2019, determine the opening value of the **cost cap fund** and provide the cost cap analysis as required by the Directions for future valuations.

Sue Vivian  
Fellow of the Institute and Faculty of Actuaries  
20 January 2015

George Russell  
Deputy Government Actuary  
20 January 2015



## Appendix A: Summary of membership data and comparison with data at previous valuation

Table A1 : Actives

Valuation group <sup>(i)</sup>	2004						2012					
	Number of members 000	Total WTE pay <sup>(ii)</sup> £m	Average WTE pay £	Average age (weighted by WTE pay)	Average reckonable service <sup>(iv)</sup> yrs	Average accrued pension <sup>(v)</sup> £	Number of members 000	Total pensionable pay <sup>(iii)</sup> £m	Average pensionable pay £	Average age (weighted by WTE pay)	Average reckonable service <sup>(iv)</sup> yrs	Average accrued pension <sup>(v)</sup> £
1	16.7	540	32,418	44.5	9.9	4,785	17.4	730	42,046	46.7	13.3	9,321
11	45.5	963	21,162	41.5	6.8	1,903	74.1	1,811	24,455	43.1	9.7	4,134
2	2.1	62	30,218	45.1	20.0	8,375	1.5	62	42,439	50.4	30.2	19,377
12	3.6	89	24,794	44.0	18.0	5,762	3.1	108	34,764	49.9	27.7	15,691
3	5.9	90	15,296	44.6	9.9	1,949	5.7	130	22,795	48.9	13.3	4,358
13	5.9	74	12,551	42.6	4.2	657	5.6	83	14,735	46.5	7.5	1,993
5	2.6	39	15,096	35.8	2.5	488	2.8	108	38,933	35.9	4.1	2,983
15	25.3	411	16,230	36.8	2.6	557	5.5	157	28,759	35.0	4.6	2,374
7	2.3	150	64,924	47.0		20,081	2.3	223	96,338	47.3		31,043
17	1.9	83	43,688	43.0		9,217	2.8	177	63,206	44.8		17,119
8	1.2	57	47,440	42.7		14,496	1.6	99	63,280	43.0		16,423
18	0.7	24	33,599	36.5		5,886	1.3	65	48,363	38.9		9,299
9	1.8	40	22,785	42.4	13.3	3,818	0.9	31	33,706	49.1	22.4	10,086
19	31.6	758	23,927	43.2	11.4	3,409	18.4	534	28,961	49.5	20.3	8,966
10							0.1	3	27,145	49.0	10.2	4,458
20							6.3	102	16,101	48.3	8.8	2,579
<b>All male</b>	<b>32.5</b>	<b>979</b>	<b>30,134</b>	<b>44.4</b>	<b>10.2</b>	<b>5,549</b>	<b>32.2</b>	<b>1,387</b>	<b>43,043</b>	<b>46.1</b>	<b>13.5</b>	<b>10,271</b>
<b>All female</b>	<b>114.6</b>	<b>2,401</b>	<b>20,960</b>	<b>41.4</b>	<b>7.4</b>	<b>2,224</b>	<b>117.2</b>	<b>3,037</b>	<b>25,921</b>	<b>44.3</b>	<b>11.5</b>	<b>5,301</b>
<b>All</b>	<b>147.1</b>	<b>3,380</b>	<b>22,987</b>	<b>42.2</b>	<b>7.9</b>	<b>2,959</b>	<b>149.4</b>	<b>4,424</b>	<b>29,614</b>	<b>44.8</b>	<b>11.9</b>	<b>6,373</b>

- (i) Defined in Table A4 (2004 data is shown by reference to the 2012 categorisation)
- (ii) The pay shown at 31 March 2004 is whole-time equivalent pay. Actual pay was not available and was estimated based on information provided
- (iii) The pay shown at 31 March 2012 is actual pay for the time worked
- (iv) Reckonable service is not applicable to practitioner groups whose benefits are calculated on a CARE basis
- (v) Accrued CARE pension rights held by officers relating to past service as practitioner are valued in addition



**Table A2 : Deferreds**

		2004 <sup>(i)</sup>				2012			
	Section	Number of members 000	Total deferred pension <sup>(ii)</sup> £m	Average pension £	Average age (weighted by pension)	Number of members 000	Total deferred pension <sup>(iii)</sup> £m	Average pension £	Average age (weighted by pension)
Preserved	Male					10.2	24.2	2,375	51.2
	Female					35.1	56.0	1,597	48.5
Pension credit	Male					0.6	21.8	39,188	50.5
	Female					0.8	16.8	21,663	47.7
Undecided leavers	Male					1.5	7.3	5,015	48.7
	Female					4.7	12.7	2,723	43.8
<b>Male</b>	<b>All</b>	<b>11.8</b>	<b>8.5</b>	<b>717</b>	<b>49.1</b>	<b>12.2</b>	<b>53.3</b>	<b>4,369</b>	<b>50.6</b>
<b>Female</b>	<b>All</b>	<b>49.8</b>	<b>35.5</b>	<b>712</b>	<b>46.1</b>	<b>40.5</b>	<b>85.5</b>	<b>2,111</b>	<b>47.6</b>
<b>Total</b>	<b>All</b>	<b>61.7</b>	<b>44.0</b>	<b>713</b>	<b>46.7</b>	<b>52.7</b>	<b>138.8</b>	<b>2,634</b>	<b>48.8</b>

*A further 28,662 members were eligible only to a refund of contributions as at 31 March 2012*

- (i) Breakdown of membership by category (preserved, pension credit, undecided leavers) is not available as at 31 March 2004
- (ii) Pension amounts exclude increase granted on 12 April 2004
- (iii) Pension amounts exclude increase granted on 9 April 2012

For the purposes of determining the valuation results the assessed liabilities for deferred members aged over 70 at the valuation date and 50% of the assessed liabilities for those between Normal Pension Age and age 70 were disregarded to reflect experience of likelihood of such benefits being claimed. 209 members aged over 70 with total pensions of £ 0.5m pa and 890 members aged between NPA and age 70 with total pensions of £ 3.7m pa are included within the figures as at 31 March 2012 above.



**Table A3 : Pensioners**

		2004				2012			
Type of benefit		Number 000	Total pension <sup>(i)</sup> £m	Average pension £	Average age (weighted by pension)	Number 000	Total pension <sup>(ii)</sup> £m	Average pension £	Average age (weighted by pension)
Age retirement <sup>(iii)</sup>	Male	12.4	142	11,469	67.4	10.5	180	17,104	70.5
	Female	38.7	152	3,921	66.0	37.5	198	5,294	69.7
	Total	51.1	294	5,753	66.7	48.0	378	7,882	70.0
Ill-health retirement <sup>(iii)</sup>	Male	1.2	8	6,771	60.0	2.4	26	10,808	65.9
	Female	4.2	14	3,232	61.1	9.5	50	5,284	65.8
	Total	5.4	22	4,010	60.7	11.9	76	6,417	65.9
Redundancy	Male					1.9	31	15,968	71.7
	Female					3.8	28	7,347	71.1
	Total					5.7	59	10,251	71.4
Spouses and other dependants	Male	1.8	2	1,226	47.9	3.3	8	2,284	56.8
	Female	7.2	29	4,008	70.1	7.2	43	5,897	73.5
	Total	9.0	31	3,465	68.6	10.5	50	4,769	71.0
Uncategorised	Male					1.4	33	23,054	69.4
	Female					2.8	16	5,671	69.3
	Total					4.2	48	11,497	69.4
<b>All</b>	<b>Male</b>	<b>15.4</b>	<b>153</b>	<b>9,932</b>	<b>66.7</b>	<b>19.6</b>	<b>277</b>	<b>14,148</b>	<b>69.7</b>
	<b>Female</b>	<b>50.2</b>	<b>195</b>	<b>3,875</b>	<b>66.2</b>	<b>60.8</b>	<b>335</b>	<b>5,510</b>	<b>69.7</b>
	<b>Total</b>	<b>65.6</b>	<b>347</b>	<b>5,295</b>	<b>66.8</b>	<b>80.4</b>	<b>612</b>	<b>7,615</b>	<b>69.7</b>

(i) Pension amounts exclude increase granted on 12 April 2004

(ii) Pension amounts exclude increase granted on 9 April 2012

(iii) In 2004, there were 7,880 injury award members that were included as age retirements rather than ill health.





**Table A4 : Description of valuation groups**

Description		2012 Valuation Group (used for all data in Table A1)	Correspond -ing 2004 valuation group
Administrative and managerial staff not in GP practices	Men	1	1 (Male)
	Women	11	1 (Female)
MHOs (including those not yet doubling service)	Men	2	3 & 4 (Male)
	Women	12	3 & 4 (Female)
Manual staff (not MHOs)	Men	3	7 (Male)
	Women	13	7 (Female)
Clinical staff not in any other group	Men	5	2 (not SC) (Male)
	Women	15	2 (not SC) (Female)
Medical Practitioners	Men	7	5 (Male)
	Women	17	5 (Female)
Dental Practitioners	Men	8	6 (Male)
	Women	18	6 (Female)
Nurses, physiotherapists, midwives and health visitors with special class status.	Men	9	2 (SC) (Male)
	Women	19	2 (SC) (Female)
GP practice staff (except Practitioners and those with special class status who are included in the appropriate groups above).	Men	10	Incl in 1 (Male)
	Women	20	Incl in 1 (Female)



## Appendix B: Summary of benefits

B1 The Directions require the NHSSS and the new scheme being introduced for the NHS workforce on 1 April 2015 ('the 2015 Scheme') to be taken into account in aggregate for the purposes of the current valuation. The summary of benefits provided is shown separately for the NHSSS and the 2015 Scheme. The criteria by which Scheme membership will be determined from 1 April 2015 is also shown. A full summary of the Schemes' provisions is set out in the report 'NHS Superannuation Scheme (Scotland): Report on membership data as at 31 March 2012' dated 20 January 2015.

### NHSSS

B2 The main benefit provisions of the Scheme for each category of member is shown in Table B1.

**Table B1 - Main benefit provisions of NHSSS**

	1995 section			2008 section	
	Standard officer	Special class officer*	Practitioner	Officer	Practitioner
<b>Basis of provision</b>	Final salary		Career average with revaluation of CPI + 1.5% pa	Final salary	Career average with revaluation of CPI + 1.5% pa
<b>Contracted out/in</b>	Contracted out to 2016†		Dependent on employment status	Contracted out to 2016†	Dependent on employment status
<b>Normal Pension Age (NPA)</b>	60	55 (subject to certain criteria)	60	65	65
<b>Pension accrual rate</b>	1/80	1/80 with doubling of service in some cases	1.4%	1/60	1.87%
<b>Retirement lump sum accrual rate</b>	3.75%	3.75% (doubling as above)	4.2%	None Cash by commutation only (£12: £1pa)	
<b>Final Pensionable pay</b>	Best 12 months Pensionable Pay in final 3 years		Generally practitioner income and other fee based earnings less expenses	Average of the best 3 consecutive years pay in the 10 years before retirement that are revalued by price inflation.	Generally practitioner income and other fee based earnings less expenses
<b>Dependant benefits</b>	50% of member pension subject to some service restrictions. Eligibility for benefit depends on whether in service on or after 1 April 2008			37.5% of member pension	
<b>Ill health pension</b>	Tier 1 (permanently unable to do current job) - accrued pension, no reduction Tier 2 (permanently unable to do any job) - 2/3 prospective service to NPA, no reduction				
<b>Pension increases</b>	In line with increases in price inflation				

\*members with reserved rights to special provisions

†contracting out is due to cease from 5 April 2016



## 2015 scheme

B3 The main benefit provisions of the 2015 scheme are shown in Table B2.

**Table B2 - Main benefit provisions of 2015 scheme**

	<b>2015 scheme</b>
<b>Basis of provision</b>	Career average with earnings revaluation of CPI + 1.5% pa whilst in service
<b>Contracted out/in</b>	Contracted out (to 2016†)
<b>Normal Pension Age (NPA)</b>	Equal to each member's state pension age
<b>Pension accrual rate</b>	1/54 (1.85%)
<b>Retirement lump sum accrual rate</b>	None - cash by commutation only (£12: £1pa)
<b>Final Pensionable pay</b>	Not applicable
<b>Dependant benefits</b>	33.75% of member pension
<b>Ill health pension</b>	Tier 1 (permanently unable to do current job) - accrued pension, no reduction Tier 2 (permanently unable to do any job) - 50% prospective service to NPA, no reduction
<b>Pension increases</b>	In line with increases in price inflation

†contracting out is due to cease from 5 April 2016

## Criteria for scheme membership from 1 April 2015

### Protected Members

#### *1995 section - excluding Special Classes*

B4 All members in pensionable service on 1 April 2012 or members with entitlement to vested benefits in the Scheme from service before that date who re-join pensionable service within five years of date of leaving and whose date of birth is on or before 1 April 1962. Such members will remain in the existing Scheme to retirement. Any member exercising the option to switch to the 2008 section are treated as 2008 section members for the purposes of protection.

#### *1995 section - Special Classes*

B5 All members in special class posts as at 1 April 2012, or otherwise with entitlement to vested benefits from service before 1 April 2012 and in reserved posts as at 1 April 2015 or date of ceasing to accrue benefits in the scheme and who were within 10 years of their earliest pension age as at 1 April 2012 ie whose date of birth is between 1 April 1962 and 1 April 1967 will remain in the existing Scheme to retirement. Entitlement to unreduced benefits before age 60 will continue to be based on the existing criteria. Any member exercising the option to switch to the 2008 section are treated as 2008 section members for the purposes of protection.



*2008 section*

- B6 All members in pensionable service on 1 April 2012 or members with entitlement to vested benefits in the Scheme from service before that date who re-join pensionable service within five years of date of leaving and whose date of birth is on or before 1 April 1957. Such members will remain in the existing Scheme to retirement. Members in scope of protection will be provided with a one off opportunity to switch to the 2015 scheme on 1 April 2015.

**Tapered Members**

- B7 Members meeting the above criteria but within a further 3 years and 5 months of retirement age at 1 April 2012 will transfer to the 2015 scheme at a date between 1 June 2015 and 1 February 2022. The final date of service in the 1995 and 2008 sections will be determined as follows:

31 March 2022 –  $2 \times T$  months

Where  $T$  = the number of months by which the member's age on 1 April 2012 (rounded down to the nearest whole month) is less than  $NPA - 10$  years.



## Appendix C: Notional assets and cashflows

C1 The Directions specify the calculation of the notional assets as at 31 March 2012. The calculation is set out in Table C1. Income and benefit payments have been derived from the NHSS Resource Accounts for each year and the relevant information is summarised in Table C2. The notional return credited each year in line with the return specified in the Directions is also shown. Income and expenditure is assumed to occur mid-year for the purposes of crediting the notional return.

**Table C1 : Notional assets**

	£ billion	Direction	
<b>Scheme Notional Assets at 31 March 2004 (adjusted since 31 March 2004 valuation)</b>	14.5	A	Schedule 2
<b>Change in Scheme Notional Assets since in respect of:</b>			
Income received	6.8	B	25
Benefits paid	5.0	C	25
Notional investment returns	10.5	D	25
<b>Scheme Notional Assets at 31 March 2012 (A + (B – C)) + D</b>	<b>26.8</b>		<b>25</b>

**Table C2 : Cashflows**

	2004/05 £ m	2005/06 £ m	2006/07 £ m	2007/08 £ m	2008/09 £ m	2009/10 £ m	2010/11 £ m	2011/12 £ m
<b>Income</b>	698.4	760.6	804.1	847.2	884.2	947.2	964.7	937.1
<b>Benefit payments</b>	454.3	479.6	512.2	572.2	643.1	718.8	782.0	855.4
<b>Notional investment returns<sup>33</sup></b>	980	998	1,238	1,406	1,763	458	1,542	2,061
<b>(%)</b>	6.7%	6.3%	7.2%	7.5%	8.7%	2.1%	6.7%	8.4%

C2 Future cashflows to the Scheme will comprise income and benefit payments. The liabilities set out in this report are based on the overall cashflows expected to arise in all future years based on the assumptions used. Over shorter time periods it is likely that actual cashflows will differ from those taken into account when considering the longer term. Given the sensitivity of cashflow projections to particular time periods they are required for, none are provided in this report. It is recognised cashflow projections based on the valuation data may be required for other purposes.

<sup>33</sup> Calculated in accordance with direction 25(4). In basic terms, the rate of return is the measure of price inflation (which can be negative) compounded with the net discount rate applying at the time.



## Appendix D: Events since the 2004 actuarial valuation

### Changes to Scheme benefits from 1 April 2008

- D1 A new section of the Scheme ('the 2008 Section') was introduced for new members and some returning members, depending on the period of absence. The section for existing members ('the 1995 Section') remained in place, with some amendments. These amendments included provision for commutation of pension at retirement, provision of benefits to a wider range of dependants and the introduction of a two tier ill health benefit. The benefits provided from both sections are summarised in Appendix B.

### Member contributions

- D2 Changes to member contribution rates were also introduced from 1 April 2008. These applied equally to both the 1995 and 2008 sections. Prior to the changes member contributions were payable at the rate of 6%, or 5% of pay for manual staff. The revised rates were earnings related and are shown in Table D1.

**Table D1 - Member contribution rates 1 April 2008 to 31 March 2012**

Earnings	Member contribution rate
£0-£20,224	5%
£20,225-£66,789	6.5%
£66,790-£105,318	7.5%
Over £105,319	8.5%

- D3 Further changes to member contributions were introduced after the current valuation date as set out in Table D2.

**Table D2 - Member contribution rates 1 April 2012 to 31 March 2015**

Earnings	Member contribution rate		
	2012/13	2013/14	2014/15
≤£15,000	5.0%	5.0%	5.0%
£15,001 - £21,175	5.0%	5.3%	5.6%
£21,176 - £26,557	6.5%	6.8%	7.1%
£26,558 - £48,892	8.0%	9.0%	9.3%
£48,983 - £69,931	8.9%	11.3%	12.5%
£69,932 - £110,273	9.9%	12.3%	13.5%
> £110,273	10.9%	13.3%	14.5%

### Employer contributions

- D4 Employer contributions during the inter-valuation period were paid at the rate of 14% of pensionable pay to 31 March 2009 and 13.5% from 1 April 2009.



## Pension increases

- D5 The government announced that Consumer Price Index (CPI) rather than the Retail Price Index (RPI) would be used to set pension increases with effect from the April 2011 increase. The financial assumptions were amended accordingly as set out in Appendix E. The actual rate of increase awarded since the 2004 valuation are set out in Table D3. The known rates of increase awarded since the **effective date** are also shown. These have been taken into account in the valuation.

**Table D3 - pension increases since the previous valuation**

Year	Pension Increase
April 2004	2.8%
April 2005	3.1%
April 2006	2.7%
April 2007	3.6%
April 2008	3.9%
April 2009	5.0%
April 2010	0%
April 2011	3.1%
April 2012	5.2%
April 2013	2.2%
April 2014	2.7%



## Appendix E: Summary of assumptions

**Table E1 : Financial assumptions at current and previous valuation**

	Current valuation 31 March 2012				Previous valuation 31 March 2004
<b>Discount rate</b>	3% pa real; 5.06% pa nominal				3.5% pa real; 6.5% pa nominal
<b>Pension increases</b>	2% pa				2.9% pa
<b>Long term salary growth</b>	4.75% pa, 2.75% pa in excess of assumed CPI				4.4% pa*, 1.5% pa in excess of assumed RPI
<b>Short term variations in assumptions</b>	Year	Gross discount rate	Pension increases	Salary growth	None
	2012/13	5.27%	2.2%	1.8%	
	2013/14	5.78%	2.7%	0.5%	
	2014/15	5.27%	2.2%	1.5%	
	2015/16	5.16%	2.1%	2.0%	
	2016/17	n/a	n/a	2.5%	
	2017/18	n/a	n/a	3.0%	
	2018/19	n/a	n/a	3.0%	

\*at the previous valuation an additional one-off allowance of 3.5% was made for officer pay growth to allow for transition to Agenda for Change pay scales

### Demographic assumptions

- E1 Full details of the demographic assumptions are provided in the report 'NHS Superannuation Scheme (Scotland) actuarial valuation as at 31 March 2012: Advice on assumptions' dated 20 January 2015. Sample rates and values are provided below.
- E2 Retirements are assumed to occur on a member's birthday. Other decrements are applied based on age nearest at the valuation date.





## Pensioner mortality

**Table E2: Baseline mortality assumptions**

Baseline mortality	Standard table <sup>34,35</sup>	Adjustment
<b>Males</b>		
Retirements in normal health	S1NMA	92.5%
Current ill-health pensioners	S1IMA	92.5%
Future ill-health pensioners	S1IMA	100%
Dependants	S1NMA	92.5%
<b>Females</b>		
Retirements in normal health	S1NFA	97.5%
Current ill-health pensioners	S1IFA	97.5%
Future ill-health pensioners	S1IFA	100%
Dependants	S1NFA	97.5%

- E3 As specified by HM Treasury, future improvements in mortality will be assumed to be in line with those underlying the ONS 2012-based population projections.
- E4 Resultant expectations of life are shown in Table E3 together with comparative figures for the previous valuation.

**Table E3 - Future life expectancy<sup>36</sup> (normal health retirement)**

	2004 assumptions	2012 assumptions
<b>Current pensioners</b>		
Male aged 60	24.3 years	28.8 years
Male aged 65	19.4 years	23.8 years
Female aged 60	27.4 years	30.8 years
Female aged 65	22.5 years	25.9 years
<b>Future pensioners – current age 45</b>		
Male life expectancy from age 60	25.4 years	30.5 years
Male life expectancy from age 65	20.8 years	26.1 years
Female life expectancy from age 60	28.4 years	32.5 years
Female life expectancy from age 65	23.8 years	28.0 years

<sup>34</sup> From the 'S1' series of standard tables published by the CMI and based on the experience of self-administered pension schemes over the period 2000 to 2006. Separate tables are available based on experience of members retiring in normal and ill-health and for dependants.

<sup>35</sup> Adjusted to take account of improvements in population mortality between 2002 (the base year for the tables) and the date the future improvements are applied from.

<sup>36</sup> Cohort life expectancy, with future improvements in line with assumptions used at the relevant valuation



**Age retirement from service**

**Table E4: Age retirement rates for members remaining in the existing scheme after 31 March 2015**

MEN	1995 section					2008 section			
	Age	Non-manual	Manual	MHO	Special Class Nurses	Practitioner	Non-Manual	Manual	Practitioner
50	0.01	0.01	0.01	0.02	0.01	0	0	0	0
51	0.01	0.01	0.01	0.02	0.01	0	0	0	0
52	0.01	0.01	0.01	0.03	0.01	0	0	0	0
53	0.01	0.01	0.01	0.02	0.02	0	0	0	0
54	0.02	0.02	0.02	0.19	0.09	0.01	0	0	0
55	0.03	0.03	0.03	0.44	0.16	0.03	0.02	0.02	0.02
56	0.03	0.03	0.03	0.22	0.09	0.03	0.02	0.02	0.02
57	0.04	0.03	0.03	0.20	0.09	0.06	0.02	0.02	0.02
58	0.05	0.04	0.04	0.22	0.11	0.10	0.02	0.02	0.02
59	0.12	0.09	0.09	0.24	0.21	0.29	0.03	0.03	0.03
60	0.24	0.17	0.17	0.33	0.35	0.64	0.04	0.04	0.04
61	0.17	0.12	0.12	0.26	0.23	0.36	0.05	0.05	0.05
62	0.20	0.14	0.14	0.27	0.23	0.35	0.06	0.06	0.06
63	0.21	0.16	0.16	0.24	0.30	0.28	0.07	0.07	0.07
64	0.42	0.47	0.47	0.56	0.53	0.37	0.08	0.08	0.08
65	0.83	0.98	0.98	1	1	0.61	0.94	0.90	0.87
66	0.47	0.44	0.44			0.45	0.55	0.70	0.32
67	0.46	0.36	0.36			0.40	0.50	0.55	0.32
68	0.30	0.37	0.37			0.42	0.50	0.50	0.32
69	0.43	0.38	0.38			0.34	0.55	0.40	0.32
70	1	1	1			1	1	1	1



WOMEN	1995 section					2008 section		
	Age	Non-manual	Manual	MHO	Special Class Nurses	Practitioner	Non-manual	Manual
50	0	0	0.03	0.01	0	0	0	0
51	0.01	0.01	0.02	0.01	0	0	0	0
52	0.01	0.01	0.02	0.01	0	0	0	0
53	0.01	0.01	0.02	0.01	0.01	0	0	0
54	0.01	0.01	0.14	0.10	0.01	0	0	0
55	0.02	0.01	0.30	0.21	0.02	0.02	0.02	0.02
56	0.02	0.02	0.16	0.12	0.03	0.02	0.02	0.02
57	0.03	0.02	0.16	0.12	0.05	0.02	0.02	0.02
58	0.04	0.03	0.15	0.14	0.08	0.02	0.02	0.02
59	0.15	0.15	0.23	0.26	0.28	0.03	0.03	0.03
60	0.36	0.38	0.46	0.50	0.59	0.04	0.04	0.04
61	0.21	0.19	0.26	0.30	0.27	0.05	0.05	0.05
62	0.24	0.20	0.27	0.32	0.27	0.06	0.06	0.06
63	0.25	0.22	0.28	0.33	0.39	0.07	0.07	0.07
64	0.37	0.35	0.59	0.63	0.34	0.08	0.08	0.08
65	0.64	0.67	1	1	0.46	0.92	0.94	0.87
66	0.40	0.35	1	1	0.39	0.45	0.50	0.40
67	0.41	0.31	1	1	0.23	0.40	0.50	0.40
68	0.37	0.40	1	1	0.5	0.35	0.50	0.40
69	0.42	0.42	1	1	0.35	0.35	0.50	0.40
70	1	1	1	1	1	1	1	1



**Table E5: Age retirement rates for members joining the 2015 scheme on or after 1 April 2015**

All members (and applicable to all service)	
NPA*	1
NPA-1	0.08
NPA-2	0.07
NPA-3	0.06
NPA-4	0.05
NPA-5	0.04
NPA-6	0.03
NPA-7	0.02
NPA-8	0.02
NPA-9	0.02
NPA-10	0.02
NPA-11}	0.01
NPA-12} to min age 55	0.01
NPA-13}	0.01

\* NPA in 2015 scheme in all cases

### III-health retirement from service

**Table E6: III-health retirement rates for all members**

Age*	Males	Females
20	0.0001	0.0001
25	0.0002	0.0002
30	0.0002	0.0002
35	0.0004	0.0004
40	0.0006	0.0005
45	0.0013	0.0008
50	0.002	0.001
55	0.004	0.003
60	0.005	0.006
62	0.006	0.007
64	0.006	0.008
66	0.007	0.009
68	0	0

\*rates are zero if above the NPA of the relevant section

E5 75% of ill-health retirements are assumed to qualify for higher tier awards.



### Voluntary withdrawal from service

E6 No net withdrawals are assumed for practitioner or 1995 section special class members.

**Table E7: Withdrawal rates (net of re-entry within 5 years) for all other members**

Age	Duration of service			
	0-1 year	1-2 years	2-3 years	>3 years
≤ 20	0.30	0.20	0.20	0.20
25	0.20	0.15	0.08	0.06
30	0.10	0.09	0.05	0.04
35	0.10	0.06	0.05	0.04
40	0.10	0.06	0.05	0.03
45	0.10	0.06	0.05	0.03
50+	0.10	0.06	0.05	0.03

### Commutation of pension for cash at retirement

**Table E8: Proportion of pension assumed commuted for cash**

	1995 section	2008 section*	2015 scheme*
<b>Males and females</b>	8.5%	15%	15%

\* As specified in the Direction 18(e)

### Death before retirement

**Table E9: Death before retirement rates for all members**

Age	Males	Females
20	0.0002	0.0002
25	0.0002	0.0002
30	0.0003	0.0002
35	0.0005	0.0003
40	0.0006	0.0004
45	0.0009	0.0006
50	0.0013	0.0008
55	0.0020	0.0013
60	0.0031	0.0019
65	0.0050	0.0028



## Promotional pay increases

**Table E10: Promotional salary scales for members**

Age	Non-manual Officers and Practitioners		Manual Officers	
	Males	Females	Males	Females
	Index value*	Index value*	Index value*	Index value*
20	73	77	83	83
25	100	100	100	100
30	132	125	120	120
35	165	140	136	132
40	195	151	146	140
45	215	157	155	144
50	229	162	161	147
55	236	166	165	148
60	242	169	165	148
65	242	169	165	148

\* Relative to an index value of 100 at age 25.

## Family statistics

**Table E11: Proportion married or partnered at death**

Age	Members leaving service before 31 March 2008		Members in service on or after 31 March 2008	
	Males	Females	Males	Females
50	72%	52%	76%	54%
60	72%	52%	76%	54%
70	72%	45%	74%	46%
80	60%	22%	61%	23%
90	34%	7%	34%	7%

Only a legal spouse of a member leaving before 31 March 2008 is eligible for a dependant's pension. Other dependants may be eligible to dependant's pension for members in service on or after 1 April 2008.

- E7 Male members are assumed to be three years older than their partners and female members are assumed to be three years younger than their partners.

## New entrants

- E8 A distribution of new entrants to the scheme is assumed over relevant periods such as to maintain a stable profile of the overall active membership in terms of age, gender and pay. The average age and average pay of new entrants is 34 years and around £24,000 in real terms (ie in earnings terms as at 31 March 2012) respectively.



## Appendix F: Summary of methodology and calculations

### Methodology

- F1 The Directions specify the use of the projected unit methodology and that benefits should be attributed to periods of service in accordance with the requirements of International Accounting Standard 19: Employee Benefits.
- F2 Since the expected cost of benefits provided to members remaining in the existing scheme differs from the expected cost of providing those members with benefits in the 2015 scheme, and the expected cost of providing benefits varies for members with differing benefit provisions within the existing scheme (notably for members with differing normal pension ages), projecting the membership gives a materially different estimate of the valuation result.
- F3 Since for short term workforce planning purposes the Scottish Ministers assume overall a largely stable population will be maintained we have assumed that over the period from the **effective date** to the end of the **implementation period** the overall profile of the membership in terms of distribution of headcount and pay by age and gender will remain stable. Allowing the existing membership to 'run off' in accordance with the assumptions set out in Appendix E over the projection period means an implicit assumption is made about the profile of new joiners to the scheme over that period. Full details of the membership projection is provided in the report 'NHS Superannuation Scheme (Scotland) actuarial valuation as at 31 March 2012: Report on methodology' dated 20 January 2015.

### Calculations

- F4 The following provides a brief explanation of the actuarial calculations used to derive the **valuation results**.

### Scheme benefits

- F5 First, an estimate is made of the amount of benefit to be received by each scheme member (and their dependants, where applicable) over each future year of the Scheme, from the **effective date** onwards. In order to do that, it is necessary to make some assumptions about the future service and salaries of the scheme members, and the length of time over which they will receive benefits. (More information about the assumptions is set out in Appendix E.)
- F6 Having estimated the benefits as a stream of projected cashflows from the **effective date** onwards, the second step is to calculate the capital sum which would need to be held at the **effective date** in order to pay all of the benefits. This requires an assumption to be made as to rate of return which would be earned by the capital sum if it were invested. In the case of the Scheme, there is no actual sum of money, but the valuation approach is predicated on the premise that there is a notional fund with a notional investment return.



- F7 This capital sum is often referred to as the 'present value' of the benefits and is calculated by 'discounting' the future cashflows back to the **effective date** using the valuation discount rate (see Appendix E). The present value can alternatively be considered as the amount of money which would need to be invested at an assumed interest rate (equal to the discount rate) in order to pay all the benefits. The result of the calculation is, by its nature, a planning or budgeting estimate, not a 'valuation' as such.

### Calculations

- F8 For the valuation, it is necessary to separate the capital sum into two parts: (i) the sum needed to pay out benefits which relate to service *prior to the effective date* ('past service'), and (ii) the sum needed to pay out those benefits which relate to service *after the effective date* ('future service').

### Past service position

- F9 In relation to the past service element, we compare the capital sum (or present value) relating to past service with the balance in the notional fund at the **effective date**. If all the assumptions made during previous reviews had been borne out exactly, and assuming no errors in previous data sets are revealed, the notional fund would exactly equal the capital sum now needed to pay for those past service benefits. But, if actual events have differed from the assumptions made, then the notional fund will exceed, or fall short of, the capital sum now estimated to be needed.
- F10 To the extent that the notional fund is *less* than the capital sum needed to pay out all the benefits relating to past service, the fund is said to be in *deficit*. This deficit needs to be met by additional contributions. If the notional fund *exceeds* the capital sum required for past service benefits, it is said to be in *surplus* and there would be a reduction in the contributions that would otherwise be paid for future service.

### Future contributions

- F11 To arrive at the level of contributions required to meet benefits estimated to arise out of future service, we calculate the percentage of total pensionable pay which, if paid from the **effective date** onwards, would be sufficient to make up the capital sum needed to pay out the benefits. (Or, using the terminology from above, we calculate the contribution rate which has the same 'present value' as the benefit stream which the contributions will pay for.) In making this calculation, we adopt the same assumptions that we mentioned above regarding the future service and salaries of the scheme members and the rate of return which would be earned by the capital sum if it were invested.





## Appendix G: The cost cap mechanism

G1 This report recommends an **employer contribution rate** and proposes an **employer cost cap** (the **valuation results**) based on a number of assumptions about the future. Section 7 outlines the main reasons why future **valuation results** may differ from the results shown in this report. This section gives further information on the cost cap mechanism and the factors which may influence the level of contributions payable by, or amount of benefits payable to, members at future valuations.

### Allocation of cost savings/increases at future valuations

G2 The cost cap mechanism specifies that:

- a. if the **cost cap cost of the scheme** determined at a future valuation differs from the **employer cost cap** by more than 2% of pay, then member contributions or benefits will be adjusted.
- b. if the **cost cap cost of the scheme** is within 2% of the **employer cost cap**, then member contributions and benefits will not be adjusted.

### Liabilities considered for future valuation results

G3 The **employer contribution rate** takes into account the whole of the aggregate scheme's liabilities ie those attributable to all service in both the existing and 2015 schemes.

G4 By contrast, only part of the aggregate scheme's liabilities are considered for the calculation of the **cost cap cost of the scheme**. In particular the **cost cap fund** is intended to exclude costs relating to deferred and pensioner members of the existing schemes. More detail is set out in paragraphs 2.24 to 2.27 of *Public service pensions: actuarial valuations and the employer cost cap mechanism*.

G5 The prior value of the **cost cap fund** will be first determined at the actuarial valuation due to be carried out as at 31 March 2016. This will be based on the scheme's liabilities only for members who are active (that is, still in employment) as at 31 March 2015. As members with existing scheme benefits progressively leave active service, their liability will move outside the **cost cap fund**. Of the liabilities expected to establish the cost cap fund as at 31 March 2015 a significant proportion will relate to members who are in protection (including tapered protection) and who are expected to retire in the relatively short term. Over this period, the cost cap mechanism may therefore be exposed to significant variations in pay experience and retirement patterns.



- G6 Over the longer term, the cost cap mechanism will become relatively more sensitive to other demographic assumptions, particularly rates of voluntary withdrawal and the impact of this on the age profile of the active membership. The **cost cap cost of the scheme** is also sensitive to changes in longevity expectations. Initially, this only relates to active members but once members with 2015 scheme service have retired, then any changes in expectations of their longevity will also have an impact on the **cost cap cost of the scheme**. Further, although the retirement age of active members is intended to vary in line with longevity expectations, the timing of any legislative changes to retirement age is unlikely to be synchronised with the timing of future valuation cycles.
- G7 More information about the employer cost cap mechanism can be found in of *Public service pensions: actuarial valuations and the employer cost cap mechanism* published by HMT in March 2014.



## Appendix H: Location of material required by Directions

Direction	Description	Location
21(a)(i) (ii)	Summary of membership data and checks carried out	Appendix A NHS Superannuation Scheme (Scotland): Report on membership data as at 31 March 2012 dated 20 January 2015
21(a)(iii)	Adjustments made to data  Projections made	NHS Superannuation Scheme (Scotland) - Report on membership data as at 31 March 2012 dated 20 January 2015 NHS Superannuation Scheme - Actuarial valuation as at 31 March 2012 : Methodology report dated 20 January 2015
21(b)	Average age of active members	Appendix A, Table A1
21(c)	Statement of compliance with directions	Paragraph 4.5
21(d)	Summary of regulations, directions and professional standards	Paragraphs 2.2, 2.3, GAD <a href="#">website</a>
21(e)	Summary of main provisions of the schemes	Appendix B NHS Superannuation Scheme (Scotland): Report on membership data as at 31 March 2012 dated 20 January 2015, Appendix E
21(f)	Analysis of demographic experience	NHS Superannuation Scheme (Scotland) actuarial valuation as at 31 March 2012: Advice on assumptions dated 20 January 2015
21(g)(i) (ii)	Statement of assumptions, including rationale	NHS Superannuation Scheme (Scotland) actuarial valuation as at 31 March 2012: Advice on assumptions dated 20 January 2015 See also Appendix E of this report
21(g) (iii)	Illustration of sensitivity to assumptions set by the Scottish Ministers	Section 6
21(h)	Other liabilities valued	None
22(a), (b)	Valuation balance sheet	Section 4, Table 4.1
22(c)	Notional asset cashflows	Appendix C, Table C2
22(d), (e), (f)	Contribution rates	Section 4, Table 4.2
53	<b>Proposed employer cost cap</b>	Section 4, Table 4.3



## Appendix I: Limitations

- I1 This report is intended solely for the use of the Scottish Ministers for the purposes of determining the **employer contribution rate** payable for the period 1 April 2015 to 31 March 2019 and the initial **employer cost cap**, both of which are to be set in regulations. The information and advice in this report should not be relied upon, or assumed to be appropriate, for any other purpose or by any other person. GAD does not accept any liability to third parties, whether or not GAD has agreed to the disclosure of its advice to the third party.
- I2 We are content for the Scottish Ministers 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.
- I3 Third parties whose interests may differ from those of the Scottish Ministers should be encouraged to seek their own actuarial advice where appropriate. GAD has no liability to any person or third party for any act or omission taken, either in whole or in part, on the basis of this report.
- I4 GAD is not responsible for any decision taken by the Scottish Ministers, except to the extent that the decision has been made in accordance with specific advice provided by GAD. Advice provided by GAD must be taken in context and is intended to be read and used as a whole, not in parts. GAD does not accept responsibility for advice that is altered or used selectively. No significant action should be taken based on oral advice alone. Clarification should be sought if there is any doubt about the intention or scope of advice provided by GAD.
- I5 GAD relies on the accuracy of data and information provided by SPPA. GAD does not accept responsibility for advice based on wrong or incomplete data or information provided by SPPA or the Scottish Ministers.