



Government Actuary's Department



HSC Pension Scheme (Northern Ireland)

Actuarial valuation as at 31 March 2016

Report on valuation data

Date: 13 March 2019

Author: Sue Vivian



Contents

1	Introduction	3
2	Summary of data used for the valuation	5
3	Data provided and checks and adjustments made	12
	Appendix A: Summary of membership data	15
	Appendix B: Summary of movements data	26
	Appendix C: Description of valuation groups	28
	Appendix D: Data items – membership data	29
	Appendix E: Data items - movements data	31
	Appendix F: Checks and adjustments applied to the membership	33
	Appendix G: Uncertainty in valuation results arising from data deficiencies	38
	Appendix H: Checks and exclusions applied to the movements data	40
	Appendix I: Summary of benefits	41



1 Introduction

- 1.1 This report is addressed to the Department of Health (Northern Ireland). It is also being made available to the HSC Pension Scheme Advisory Board (SAB) as part of the consultation process relating to the actuarial valuation of the HSCPS which is being carried out as at 31 March 2016.
- 1.2 Pension scheme membership data for the HSC Pension Scheme ('HSCPS' or 'the Scheme') is required for the actuarial valuation of the Scheme as at 31 March 2016, carried out in accordance with Department of Finance's (Valuations and Employer Cost Cap) Directions (Northern Ireland) 2014 ('DoF Directions'), as amended.
- 1.3 The membership data is used for the following:
- > to calculate valuation results including the uncorrected employer contribution rate, corrected employer contribution rate and past service liability (all valuation data);
 - > To assess the initial cost cap fund (membership data as at 31 March 2015)
 - > To assess elements of the Scheme's demographic experience in order to recommend assumptions for the valuation (movements data 31 March 2012 to 31 March 2016)
- 1.4 The results of the valuation are critically dependent on the quality and correctness of the data used. The data provided was not fully correct and complete for all members and approximations have been made to enable valuation calculations to be undertaken.
- 1.5 The purposes of this report are:
- > to discuss and summarise the membership data provided, and any checks and adjustments made to the data;
 - > to enable users of the valuation report to understand the underlying membership data used in the valuation and any issues relating to it; particularly those issues that may impact on the valuation results; and
 - > to discuss and summarise the movements data provided and to be used to inform decisions around scheme specific assumptions to be used for the valuation.
- 1.6 All member data and supplementary accounting information provided and discussed in this report were supplied by HSC. Resource accounts for the relevant period are publicly available.
- 1.7 In preparing this report, GAD has relied on data and other information supplied by HSC as described in the report. Any checks that GAD has made on this data and information are limited to those described in the report, including any checks on the overall reasonableness and consistency of the data. These checks do not represent a full independent audit of the data supplied and do not by themselves confirm or guarantee the overall quality or correctness of the data. In particular, GAD has relied on the general completeness and accuracy of the information supplied without independent verification.



- 1.8 Summaries of the membership and movements data used for the valuation are provided in section 2 of this report with further information in Appendices A and B of this report respectively.
- 1.9 We are required to comment on data quality. A considerable number of adjustments and assumptions were necessary to the data to enable the valuation to be completed. In addition other sources of data had to be considered, notably data from the NHS Pension Scheme for England and Wales. In GAD's opinion these adjustments and assumptions are reasonable and appropriate for the purpose of this actuarial valuation. However, it should be noted that the uncorrected employer contribution rate and employer contribution correction cost in this report might have been different if more reliable data had been available.
- 1.10 Given the potential impact of data deficiencies, GAD recommends that the Department takes forward initiatives to improve valuation data quality before the next actuarial valuation as at 31 March 2020.
- 1.11 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.
- 1.12 We are content for the Secretary of State for Health and Social Care 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.
- 1.13 Third parties whose interests may differ from those of the Secretary of State for Health and Social Care 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.
- 1.14 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.



2 Summary of data used for the valuation

Membership data at 31 March 2016

2.1 The membership data to be used for the purposes of the 2016 valuation is summarised below together with comparative data at 2015 (where relevant) and as used for the 2012 valuation. Detailed tables are set out in Appendix A.

Chart 2.1: Number of active members

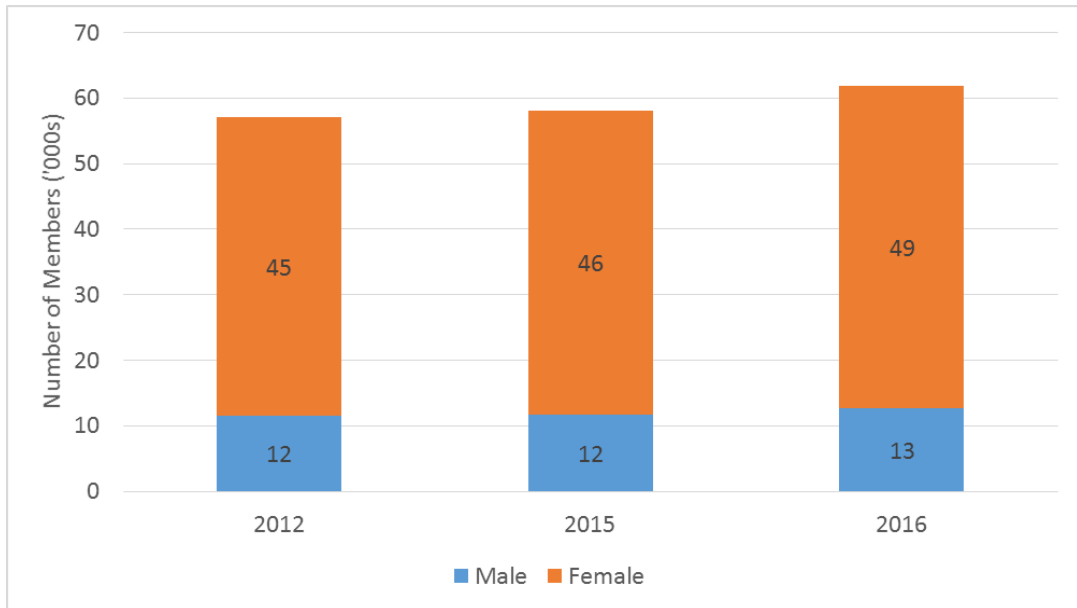


Chart 2.2: Active total pensionable pay (actual annualised pay)

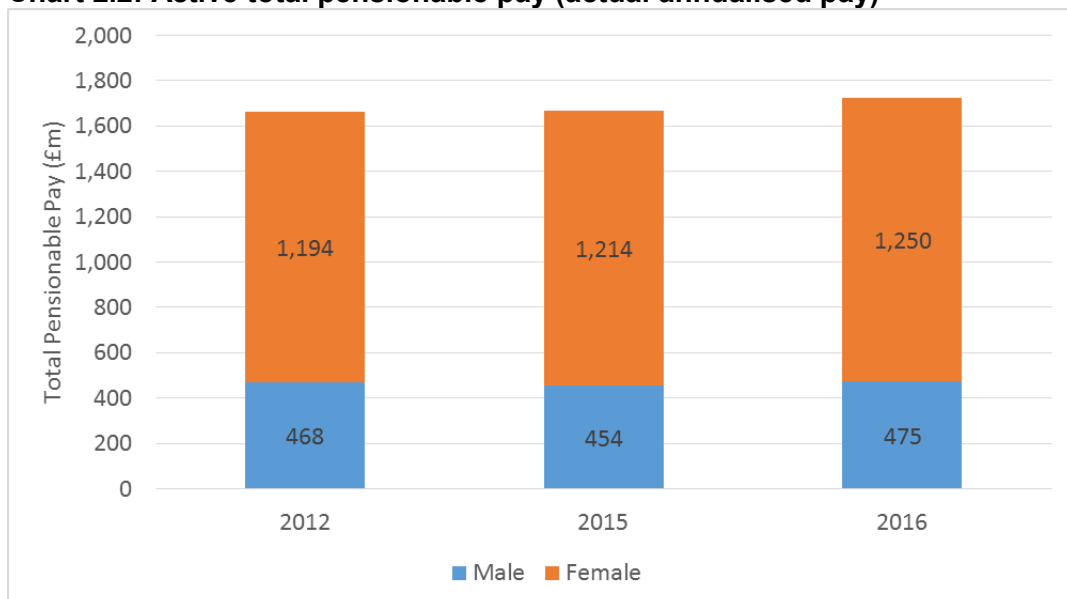




Chart 2.3: Number of deferred members

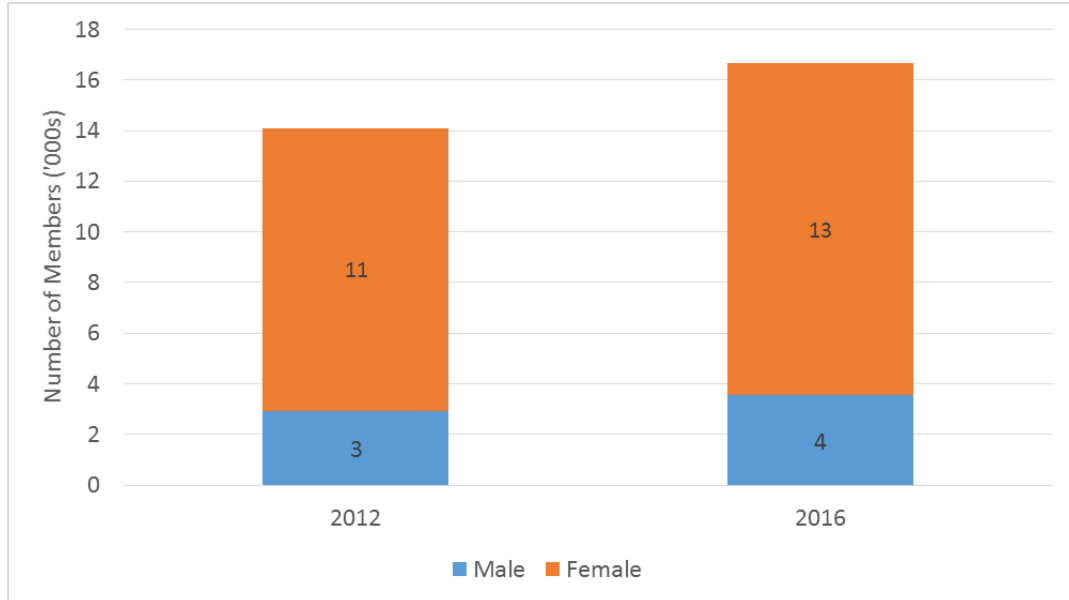


Chart 2.4: Total deferred pension

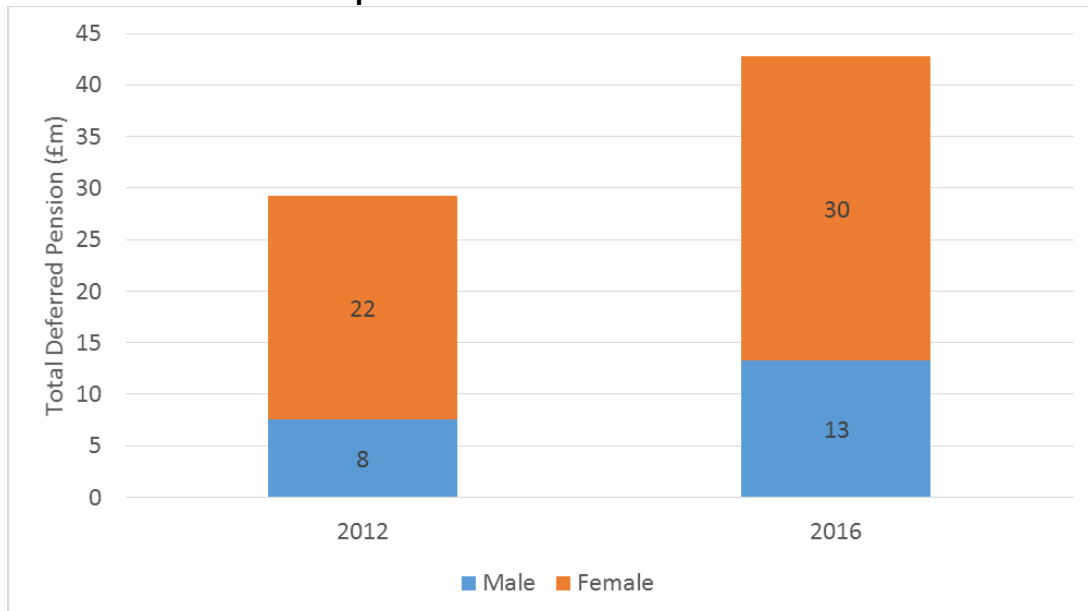




Chart 2.5: Number of pensioners and dependants

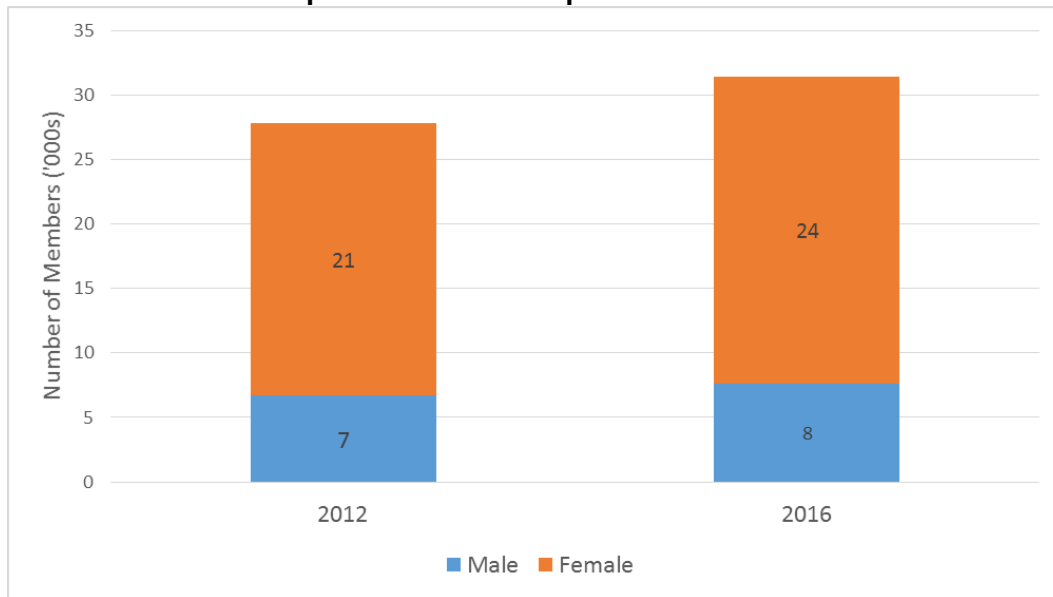
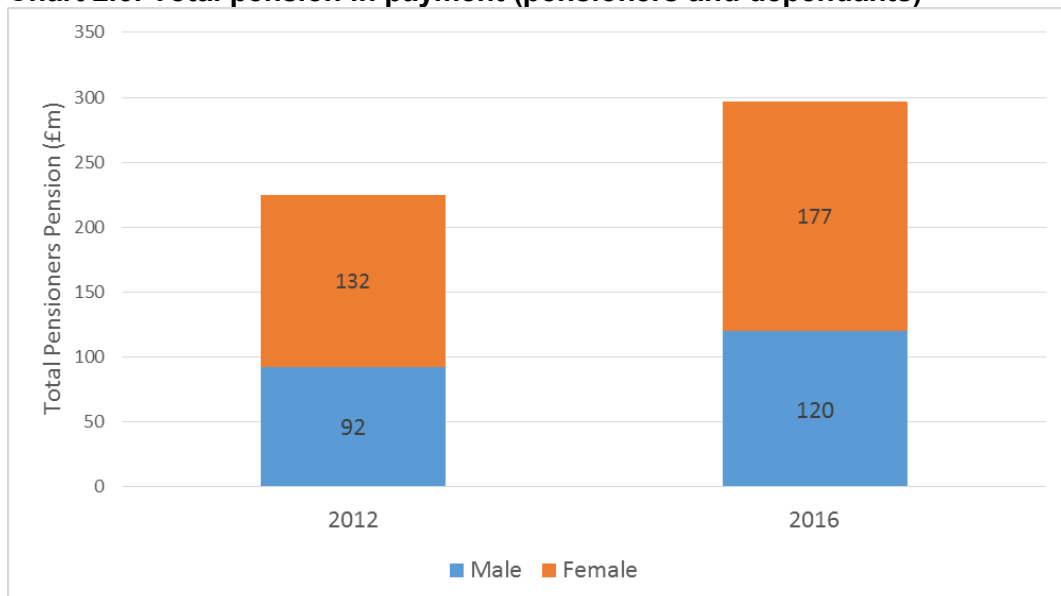


Chart 2.6: Total pension in payment (pensioners and dependants)



2.2 The graphs above show an increase between 2012 and 2016 in the active, deferred and pensioner membership by both headcount and total salary/pension roll.



2.3 Around 105,000 records¹ were provided to GAD across all three membership categories (active, deferred and pensioner) as at 31 March 2016. Checks were applied to these records to ensure all key data items are provided and reliable for valuation purposes. Some adjustments were made where reasonable estimates of missing or unreliable data could be made. Adjustments were made for around 10,000 members. Further details of these estimates are provided in section 3 and Appendix F. Where reasonable estimates could not be made records with key data items either missing or unreliable were excluded and remaining data uprated. This approach implicitly assumes that the records with missing/unreliable data have the same average profile as the complete/reliable records. The derivation of the uprating factors and the checks and adjustments applied to the data are explained further in the next section of this report. The overall uprating factors applied to each category of member are shown below with the comparative factors at 2015 and at the 2012 valuation.

Table 2.1: Uprating factors

	Uprating factor 2016	Uprating factor 2015	Uprating factor 2012
Active members	1.08	1.16	1.13
Deferred members	1.26	n/a	1.07
Pensioner members	1.01	n/a	1.01
Total membership	1.08	1.16	1.09

2.4 Making assumptions about missing or unreliable data and allowing for known members with unusable data by uprating introduces uncertainty into the valuation results. Appendix G gives an indication of the potential level of uncertainty introduced by the approach taken to missing or unreliable data.

2.5 The uprating approach for unreliable/missing data has been taken for many years for HSC scheme valuations. We have no evidence to indicate that this approach and the implicit assumption is not appropriate in itself. However it should be acknowledged that this approach does not deal with potentially excluded liabilities owing to unidentified members. This has been a difficulty encountered in both this and the previous valuation where more up to date data sets suggest members have previously been missed. The number of data adjustments applied and the missing new entrants (see paragraph 2.6) introduce further uncertainty into the valuation calculations. Whilst in our opinion the data as adjusted does not appear to be unreasonable for use for valuation purposes, comments about the level of uncertainty introduced (set out in Appendix G) should be noted, and we recommend identified issues are rectified before subsequent data extracts are commissioned.

2.6 In addition to the exclusion and uprating approach explained above a separate adjustment was made to allow for expected missing entrants (predominantly new entrants but also including re-entrants) to the scheme. This included the explicit addition of 5,671 members who were assumed to have an average entrant profile. Further details are given in Appendix F.

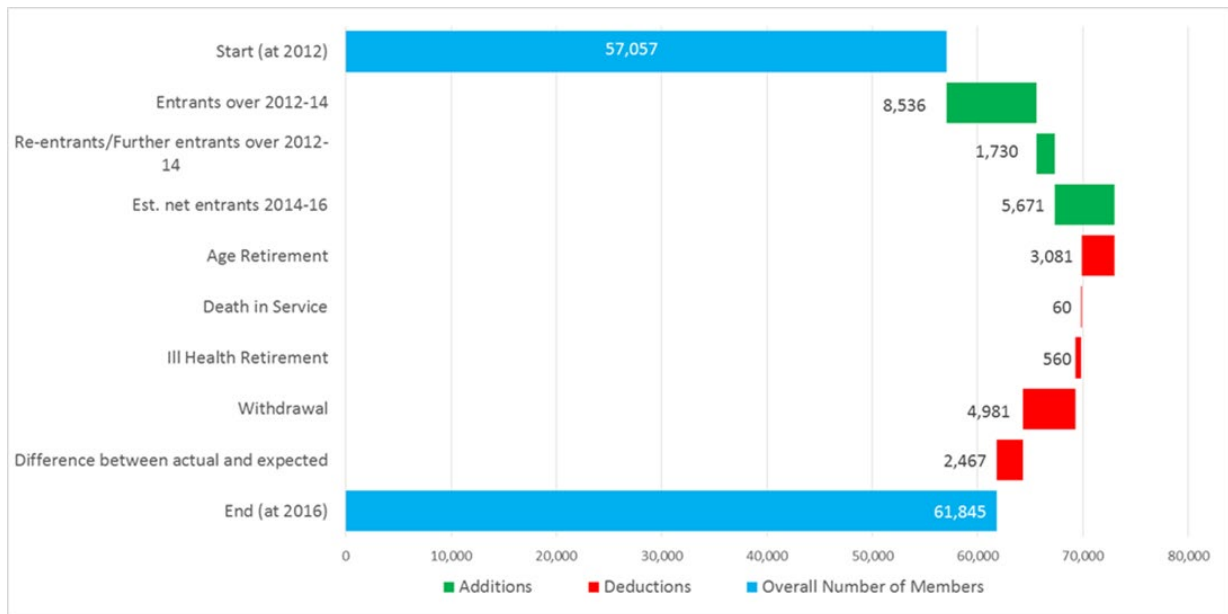
¹ Before allowance for missing new entrants. See paragraph 2.6.



Movements data 31 March 2012 to 31 March 2016

2.7 The movements data is used predominantly for the purposes of informing the demographic assumptions to be used for the 2016 valuation. It is used in conjunction with the membership data at both 2016 and 2015 to determine an element of the cost cap calculation termed the Net Leavers Liability ('NLL'). The charts below show a reconciliation of the movements data as provided between 2012 and 2016. The underlying data and some further information is set out in Appendix B. Appendix G gives an indication of the potential level of uncertainty introduced into the valuation results owing to missing or unreliable movements data.

Chart 2.7: Active membership reconciliation



2.8 Following receipt of the movements data reflected above (which illustrates some discrepancy (2,467) between the number of expected members at 2016 and those within the valuation dataset) further information was provided for the latter two years i.e. for 2014/15 and 2015/16. Although this data included an additional 310 retirements it showed fewer movements from active to deferred status. System changes mean it has not been possible to retrospectively access more reliable movements data. The above indicates fewer members at the valuation date than suggested by the movements data which suggests that the numbers of movements are likely to be understated.

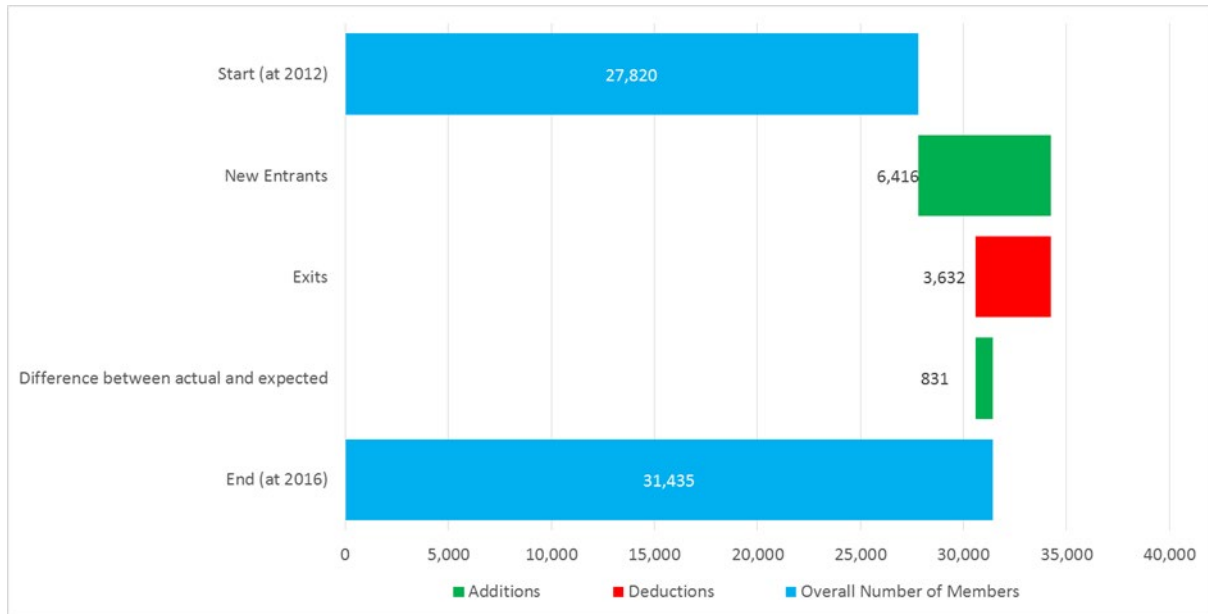
2.9 The valuation results show a material difference between the liabilities expected at this valuation and those calculated. Although the absence of complete movements data means a full explanation is not possible it has been accepted that some previously unrecognised liabilities are included within the membership data and this has resulted in an agreed uplift to the notional fund of £500m. This is reflected in the valuation Directions.



Chart 2.8: Deferred membership reconciliation

2.10 The deferred membership reconciliation chart has not been provided as only one year of movement data for the year 31 March 2015 to 31 March 2016 has been provided.

Chart 2.9: Pensioner membership reconciliation



2.11 As for the actives movements the reconciliation above illustrates there is some discrepancy (831) between the number of expected pensioners at 2016 and those within the valuation dataset. In this case we have more members within the valuation dataset at the valuation date than suggested by the movements data. Although this could suggest the number of deaths is overstated, it is also possible that both the number of new pensioners and number of deaths are unreliable to some extent.

Data quality

2.12 The introduction of the reformed HSC scheme in April 2015 and the requirements of the valuation Directions means data requirements for this valuation are considerably expanded compared to the requirements for the 2012 valuation. HSC have been required to build a new extraction process to accommodate these requirements whilst also developing the administrative capability to deal with the new scheme. In the circumstances it is understandable that some data issues remain. The level of completeness achieved has also required considerable manipulation of data, including cross referencing with prior year data sets and other information. Whilst we have taken the view this manipulation is appropriate for the current valuation, it should be recognised that the valuation results could be different if full data were available. We recommend that the Department takes timely action to rectify the underlying issues before the 2020 valuation data is due.



- 2.13 The issues we have encountered with the data prepared for valuation purposes do not directly imply that the scheme data are of insufficient quality to support the delivery of benefits to members. However, the quality of scheme data and the management of risks associated with data are of paramount importance and are subjects with which the Pensions Regulator is concerned. In this regard you should note that GAD does have regular discussions with the Regulator, on a non-scheme specific basis, to promote a wider understanding of the role of the actuarial valuation as it relates to data quality of the public service pension schemes.



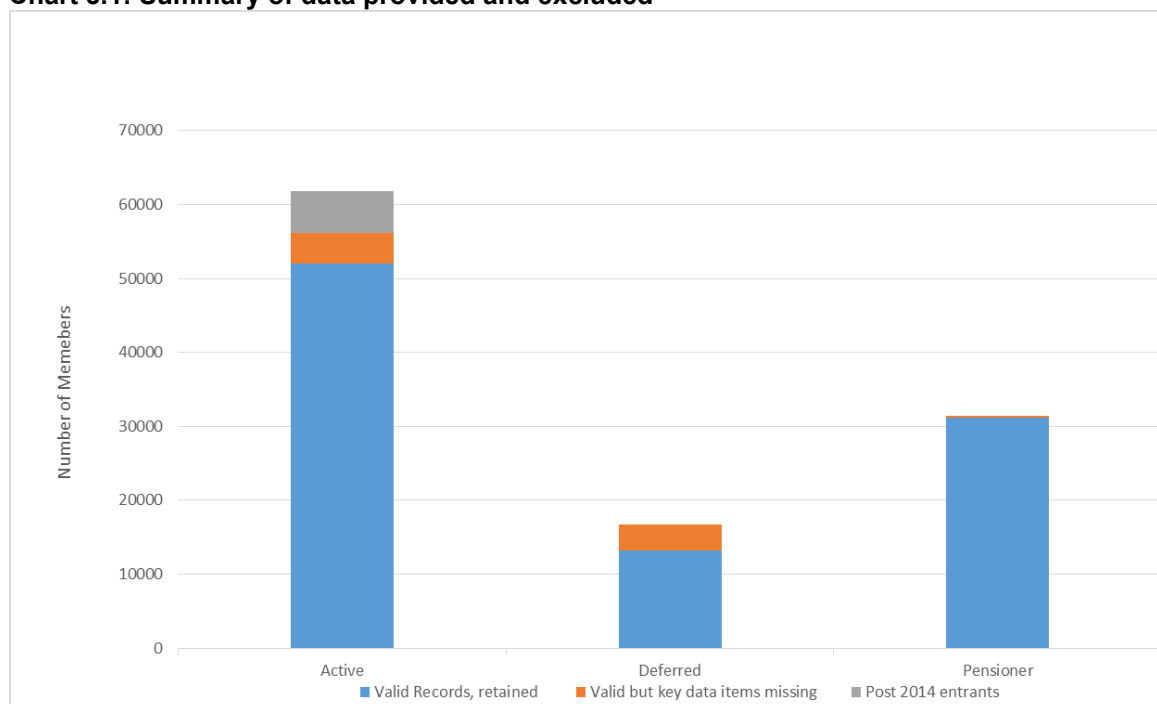
3 Data provided and checks and adjustments made

Membership data at 31 March 2016 and 31 March 2015

3.1 Individual member data was supplied for all active (officer, practitioner and concurrent officer and practitioner) members, deferred members and current beneficiaries of the Scheme at the valuation date. The individual data items supplied which are critical to the valuation calculations are summarised in Appendix D. The chart below shows the total number of valid records* (i.e. key data items are complete and appear to be reliable), the total number of records excluded that are rated up for and the total number of additional typical active members we believe should be present in order to make overall payroll match with the contributions in accounting data. Further details are set out in Appendix F.

*For active members valid records for this purpose includes around 10,000 records where GAD have made estimates of individual data items as set out in Appendix F. 5,671 missing and expected new entrants are in effect also valid records but are shown as a separate grey bar in the chart (see Appendix F).

Chart 3.1: Summary of data provided and excluded



Checks made and adjustments applied

3.2 All key data items were checked against the specification requested for both completeness and consistency.



- 3.3 Checks were carried out to determine which records would need to be excluded based on applying reasonableness tests to key data items. The checks also identified a number of areas where adjustments to the data could be made to avoid the need to exclude the records. Data 'corrections' were made for 10,000 active members. In addition, there appeared to be too few recent entrants in the data supplied as at 31 March 2016. 5,671 expected missing recent entrants to the Scheme were modelled by estimating expected numbers and based on an expected entrant profile (including a mix of new entrants and re-entrants) and added to the 2016 data. The checks and adjustments applied are summarised in Appendix F.
- 3.4 Based on the checks applied some records were excluded from the dataset for valuation purposes. 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 excluded records have the same average profile (ie age, sex, pay, service) as included records. Tables 3.1 and 3.2 shows the derivation of the uprating factors².

Table 3.1: Derivation of uprating factors (31 March 2016)

31-Mar-16	No of records received	Number of valid records (A)	Number of exclusions	Number of members after exclusions (B)	Uprating factor (A/B)
Active members†	56,247	56,174	4,133	52,041	1.08
Deferred members*	17,171	16,687	3,445	13,242	1.26
Pensioners	31,450	31,435	223	31,212	1.01
Total membership	104,868	104,296	7,801	96,495	1.08

† Before addition of expected missing entrants

* A revised set of data was provided for deferred members following receipt of that summarised above. This included information for an additional 1,397 members compared to that summarised above. Full data was not included within these additional records but those members with reliable data will be included in the valuation with uprating for those with missing data.

Table 3.2: Derivation of uprating factors (31 March 2015)

31-Mar-15	No of records received	Number of valid records (A)	Number of exclusions	Number of members after exclusions (B)	Uprating factor (A/B)
Active members	59,004	58,132	8,005	50,127	1.16

² In practice uprating factors are determined for each identifiable group by valuation group (see Appendix F), protection status, scheme section and SPA. 69 records were removed with no rate up applied because there were no valid records in the same group. These 69 records have been counted as invalid.



Movements data – 31 March 2012 to 31 March 2016

- 3.5 Individual member movement records were supplied for members who changed category of membership (ie active, deferred or pensioner) between the previous and current valuation dates. Where adequate movements data is available it is analysed and used to inform how assumptions of future members' behaviours should be set for the valuation. The key data items provided for member movements are set out in Appendix E.
- 3.6 Limited checks were applied to movements data and records were only excluded if key missing data materially impacted the analysis being undertaken. The checks and exclusions are summarised in Appendix H. As noted in paragraphs 2.8, 2.9 and 2.10 the movements data did not provide for a reliable reconciliation between the membership at the 2012 valuation and that at the 2016 valuation. The inability to fully reconcile both introduces uncertainty into the valuation calculations and limits the extent to which analysis can be undertaken to inform the assumptions appropriate for the purposes of the valuation.

Accounting information

- 3.7 Published resource accounts were available for the full intervaluation period. Certain pieces of financial accounting information have been used to perform independent checks on the dataset supplied. These checks and the data used are set out in Appendix F.

Benefit information

- 3.8 A summary of the benefits provided to members of the Scheme is given in Appendix I. HSC has confirmed that the only uncertainty that they are aware of about the form of benefits that the scheme is liable to provide is the potential requirement for sex equalisation of GMPs. No allowance has been made for this in the valuation calculations.



Appendix A: Summary of membership data

Table A1: Comparison of active membership as at 31 March 2012 and 31 March 2016 (final datasets after rating up)

Valuation group	2012						2016					
	Number of members (000's)	Total pensionable pay ¹ (£m)	Average pensionable pay (£)	Average age (weighted by WTE pay) (yrs)	Average reckonable service ² (yrs)	Average accrued pension ³ (£)	Number of members	Total pensionable pay ¹ (£m)	Average pensionable pay (£)	Average age (weighted by WTE pay) (yrs)	Average reckonable service ² (yrs)	Average accrued pension ^{3,4} (£)
1	10	345	35,269	44.6	12.9	7,268	11	378	33,557	45.1	12.5	7,412
11	38	949	24,687	42.0	10.2	4,246	44	1,064	24,142	43.5	11.6	5,150
2	0	17	41,869	51.2	32.4	17,295	0	12	43,862	52.5	34.3	18,990
12	1	34	35,905	50.2	30.1	14,526	1	36	33,627	49.7	29.8	14,659
7	1	73	100,135	49.8		32,561	1	59	98,033	47.6		35,582
17	1	43	62,185	47.4		17,631	1	47	59,744	44.5		16,041
8	1	28	54,928	44.8		16,888	0	23	49,639	44.8		17,527
18	1	22	40,454	39.8		8,358	1	20	36,545	38.6		9,096
9	0	5	33,875	48.3	23.9	10,614	0	3	35,010	52.8	29.4	13,369
19	5	146	30,161	50.1	23.0	10,565	3	83	31,037	53.5	28.6	13,460
All male	12	468	40,446	45.7	13.8	9,486	13	475	37,425	45.6	13.1	9,401
All female	45	1,195	26,263	43.3	12.1	5,289	49	1,250	25,431	44.2	12.9	6,029
All	57	1,663	29,138	43.9	12.4	6,140	62	1,725	27,891	44.6	13.0	6,721

1. The pay shown is the actual salary for the time worked.
2. Reckonable service excludes CARE service.
3. Any accrued CARE pension rights held by officers that relate to past service as practitioner are also valued.
4. The practitioner pension shown here doesn't include practitioner flexibilities/FVEC; these are valued in addition to the pension shown above.



Table A2: Final membership data after rating up for setting cost cap fund (active membership as at 31 March 2015)

Valuation group	2015					
	Number of members (000's)	Total pensionable pay ¹ (£m)	Average pensionable pay (£)	Average age (weighted by WTE pay) (yrs)	Average reckonable service ² (yrs)	Average accrued pension ³ (£)
1 ⁴	10	348	34,033	45.6	13.2	7,238
11 ⁵	41	1,008	24,554	43.5	11.5	4,777
2	0	13	43,374	52.5	33.3	17,975
12	1	28	37,384	51.8	31.8	15,624
7	1	61	103,848	48.0	n/a	36,478
17	1	50	66,717	44.5	n/a	19,078
8	0	28	59,176	44.3	n/a	19,966
18	1	23	42,476	39.2	n/a	10,048
9	0	4	35,515	51.2	27.6	12,570
19	3	106	31,661	52.6	26.4	12,394
All male	12	454	38,806	46.1	13.9	9,544
All female	46	1,214	26,156	44.4	13.0	5,790
All	58	1,669	28,703	44.8	13.2	6,546

1. The pay shown is the actual salary for the time worked.
2. Reckonable service excludes CARE service.
3. Any accrued CARE pension rights held by officers that relate to past service as practitioner are also valued.
4. Also includes valuation group 3.
5. Also includes valuation group 13.



Table A3: Active Membership split by protection status as at 31 March 2016

Scheme/Section	Number of members (000's)	Total pensionable Pay ¹ (£m)	Total WTE pensionable salary (£m)	Average age ² (yrs)	Average reckonable service ³ (yrs)
Protected 1995 ⁴	12	390	436	56.7	23.7
Protected 2008 ⁴	0	8	10	62.4	8.0
Unprotected 1995 ⁴	28	875	999	43.4	16.1
Unprotected 2008 ⁴	18	394	465	36.8	3.4
New to 2015 scheme	3	58	72	34.9	0.0
All male	13	475	496	45.6	13.1
All female	49	1,250	1,486	44.2	12.9
Total 2016	62	1,725	1,981	44.6	13.0
Total 2012	58	1,663	1,869	43.9	12.4

1. The pay shown is actual pay for the time worked
2. Weighted by whole time equivalent pensionable salary.
3. Reckonable service is not applicable to practitioner groups whose benefits are calculated on a CARE basis.
4. Tapered members have been included in the unprotected membership category.



Table A4: Active Membership split by protection status at 31 March 2015 (required for setting the cost cap fund)

Scheme/Section	Number of members	Total pensionable Pay ¹	Total WTE pensionable salary	Average age ²	Average service ³
	(000's)	(£m)	(£m)	(yrs)	(yrs)
Protected 1995	13	433	482	56.2	23.7
Protected 2008	0	6	7	61.6	9.4
Unprotected 1995⁴	30	910	1,047	42.8	13.8
Unprotected 2008⁴	15	319	371	35.2	3.8
Total M	12	454	473	46.1	14.7
Total F	46	1,214	1,434	44.4	13.2
Total 2015	58	1,669	1,908	44.8	13.5

1. The pay shown is actual pay for the time worked
2. Weighted by whole time equivalent pensionable salary.
3. In WTE years, including transferred in service, excluding practitioners.
4. Tapered members have been included in the unprotected category.



Table A5: Comparison of deferred membership as at 31 March 2012 and 31 March 2016 (final datasets after rating up)

Section	2012				2016			
	Number of members	Total deferred pension ¹ (000's)	Average pension ¹ (£)	Average age (weighted by pension) (yrs)	Number of members	Total deferred pension ² (000's)	Average pension ² (£)	Average age (weighted by pension) (yrs)
Male 1995	2,913	7,594	2,607	49.7	2,840	10,854	3,822	53.1
Female 1995	11,121	21,622	1,944	48.3	11,018	26,031	2,363	50.8
Male 2008	22	13	575	28.3	695	1,494	2,150	47.4
Female 2008	35	24	672	29.5	2,134	3,214	1,506	46.8
Male 2015								
Female 2015								
Male	2,935	7,606	2,592	49.7	3,535	12,349	3,493	52.1
Female	11,156	21,645	1,940	48.3	13,152	29,249	2,224	50.3
Total	14,091	29,252	2,076	48.7	16,687	41,598	2,493	50.9

A revised set of data was provided for deferred members following receipt of that summarised. This included information for an additional 1,397 members compared to that summarised above. Full data was not included within these additional records but those members with reliable data are included in the valuation with uprating for those with missing data.

1. 2012 pension amounts do not include the April 2012 PI
2. 2016 pension amounts include the April 2016 PI
3. Members with service in both the 1995 and 2008 schemes have been included with 2008 scheme members in the 2016 data.



Table A6: Comparison of pensioner membership as at 31 March 2012 and 31 March 2016 (final datasets after rating up)

Type of benefit		2012				2016			
		Number of members	Total pension ¹ (£m)	Average pension ¹ (£)	Average age (weighted by pension) (yrs)	Number of members	Total pension ² (£m)	Average pension ² (£)	Average age (weighted by pension) (yrs)
Age retirement	Male	3,400	60	17,430	71.3	3,813	78	20,356	71.1
	Female	10,900	65	6,002	69.9	12,961	95	7,326	68.9
	Total	14,300	125	8,732	70.5	16,774	173	10,288	69.9
Ill-health retirement	Male	1,400	14	10,386	63.8	1,533	18	11,585	66.9
	Female	5,700	33	5,833	63.2	6,170	41	6,624	66.0
	Total	7,100	48	6,714	63.4	7,703	59	7,611	66.3
Redundancy	Male	9,000	16	18,316	66.8	1,018	22	21,465	68.4
	Female	2,300	21	9,084	67.6	2,651	27	10,346	68.6
	Total	3,200	37	11,695	67.2	3,669	49	13,430	68.5
Spouses and other dependants	Male	1,000	2	2,171	56.3	1,227	3	2,365	59.2
	Female	2,200	13	5,655	74.4	2,042	13	6,575	74.9
	Total	3,200	15	4,583	71.8	3,269	16	4,996	72.1
Pension Credit Members ³	Male					3	0	4,401	62.8
	Female					17	0	16,854	64.6
	Total					20	0	14,986	64.6
All	Male	6,700	93	13,830	69.0	7,594	120	15,821	69.7
	Female	21,100	132	6,251	68.3	23,841	177	7,422	68.6
	Total	27,800	225	8,073	68.6	31,435	297	9,451	69.1

1. 2012 pension amounts do not include the April 2012 PI
2. 2016 pension amounts include the April 2016 PI
3. In 2012, Pension credit members are grouped with spouses and other dependants



Chart A7: Active Members whole-time equivalent pensionable pay by age

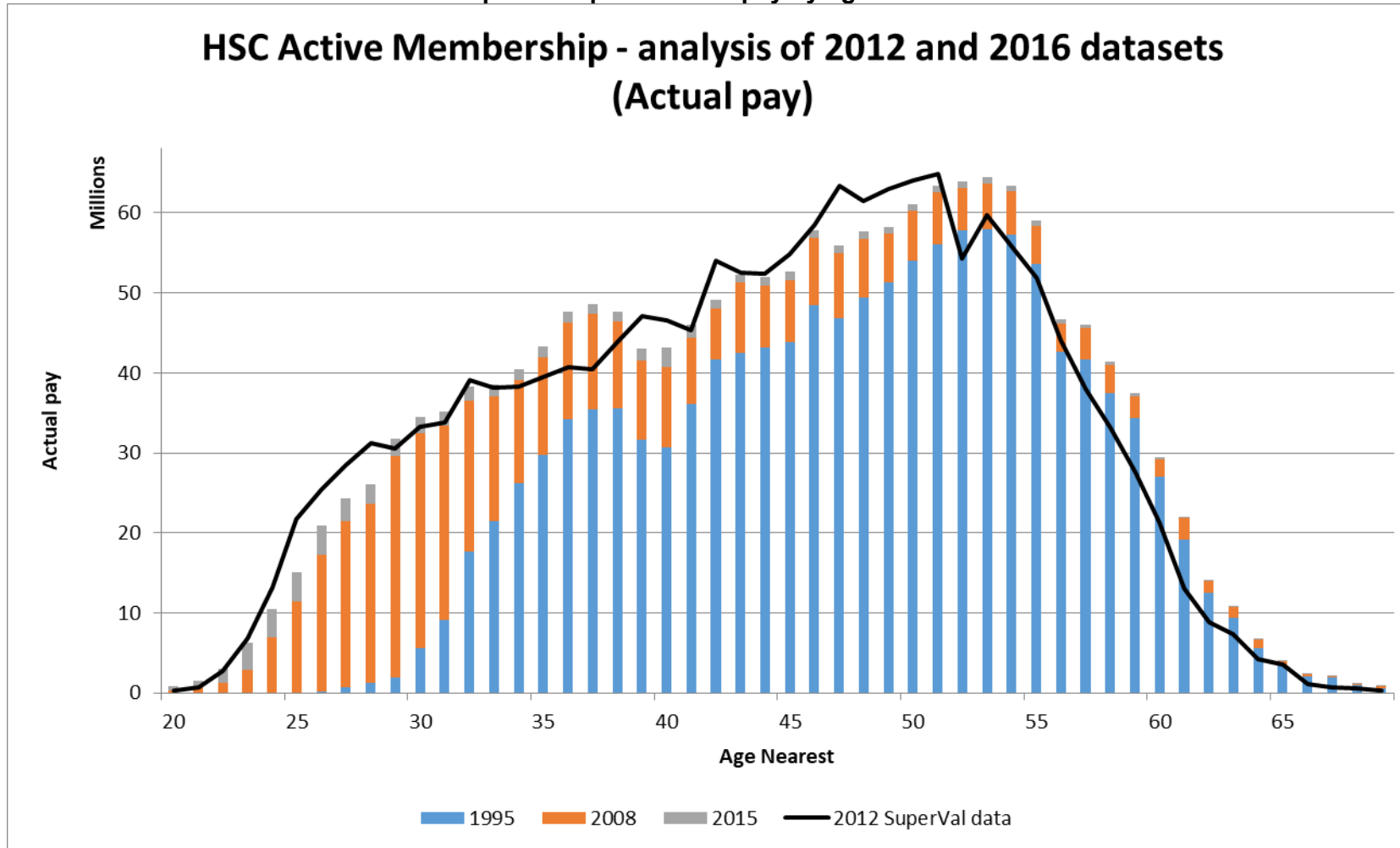
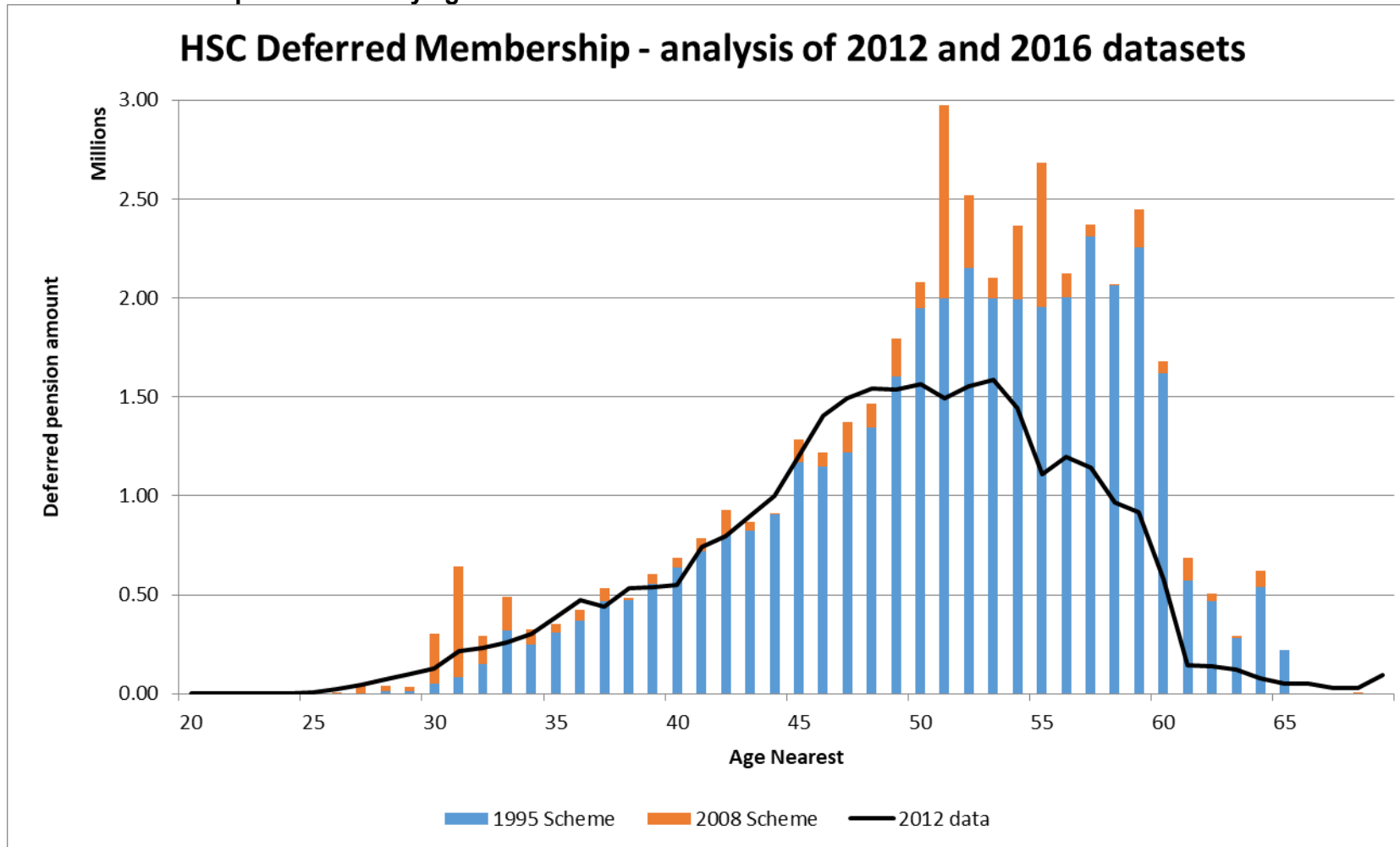




Chart A8: Deferred pension data by age*



*This shows the data before the adjustment made to pension amounts for 2008 scheme members described in appendix F



Chart A9: Summary of pension amount by age

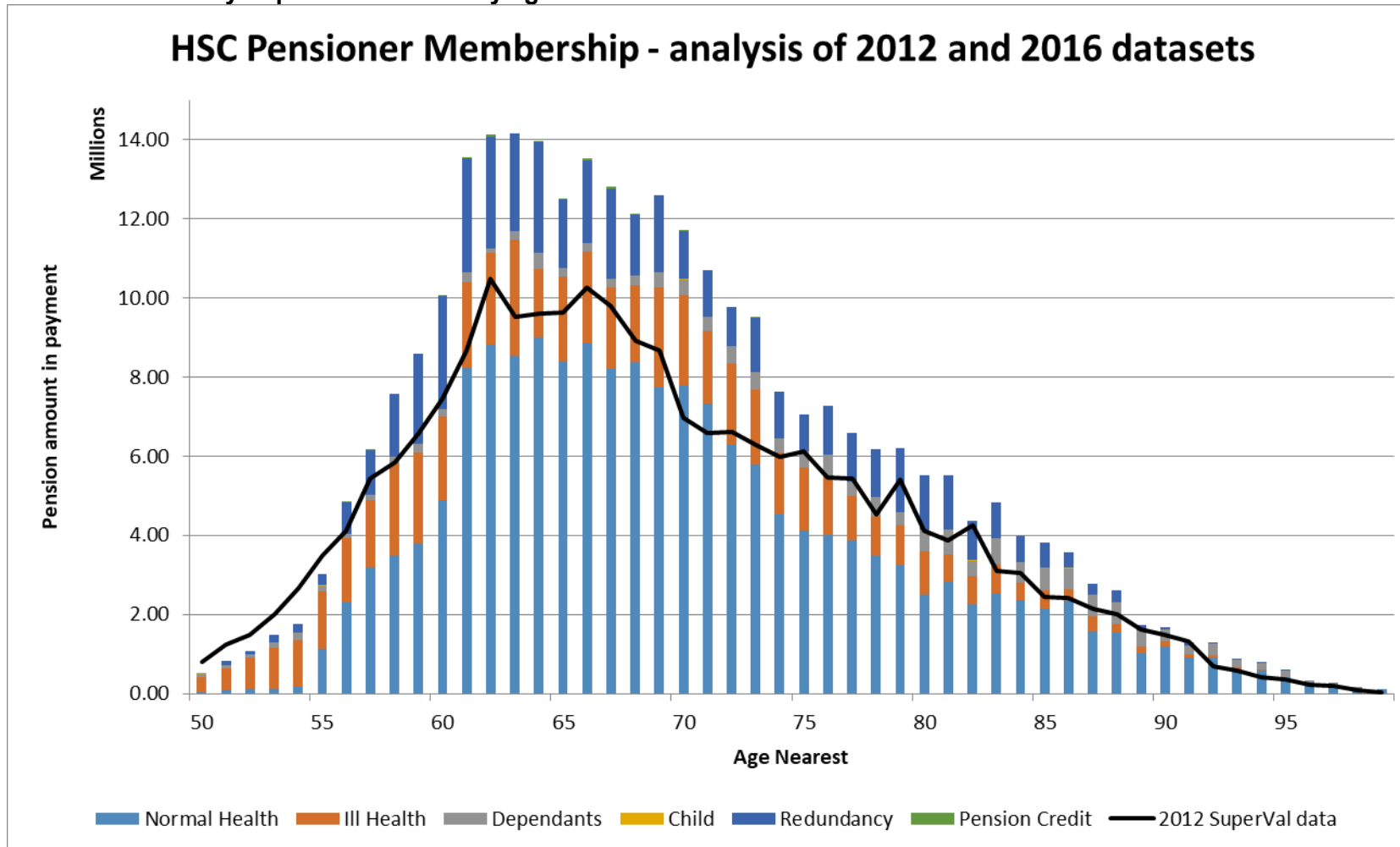
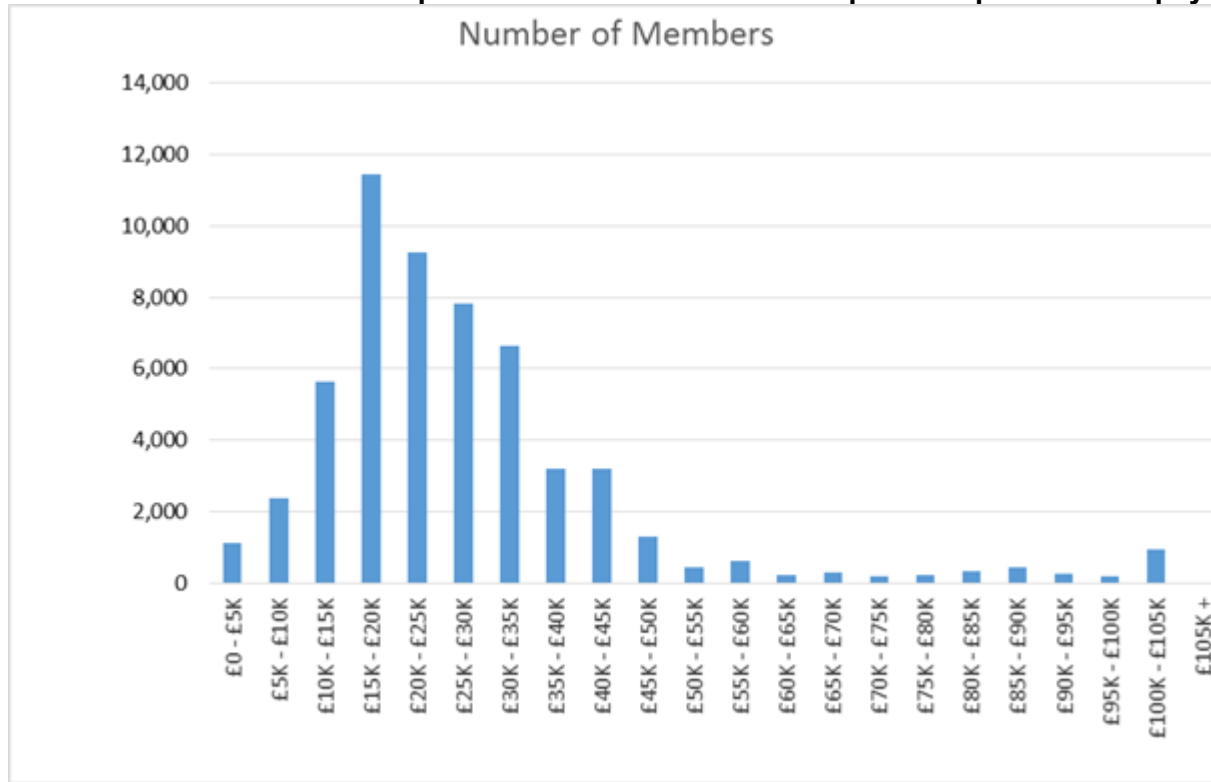




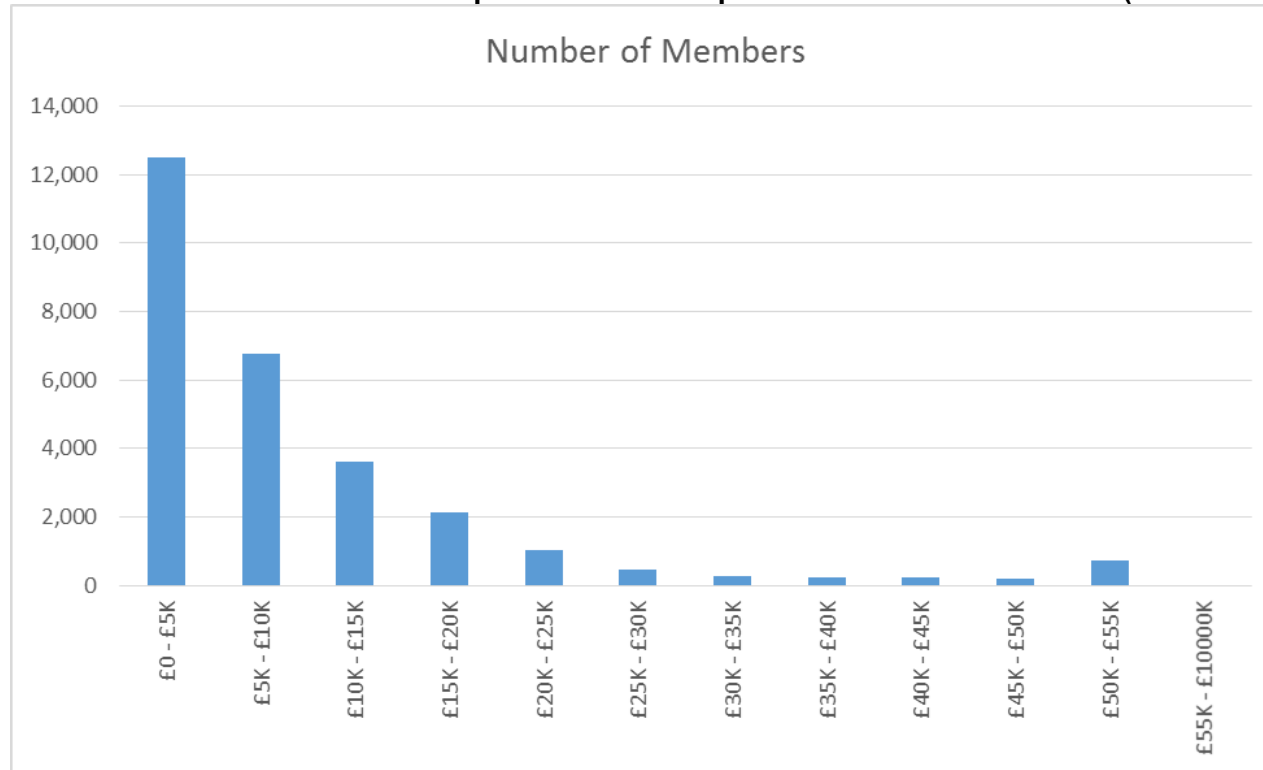
Chart A10: Active membership: Distribution of whole time equivalent pensionable pay as at 31 March 2016



This chart is based on the data before addition of missing entrants.



Chart A11: Pensioner membership: Distribution of pension as at 31 March 2016 (does not include dependants)





Appendix B: Summary of movements data

Table B1: Reconciliation of membership over the intervaluation period (2012-16) and the prior intervaluation period (2008-12)

	Reconciliation of membership over intervaluation period	Prior intervaluation period
	2012-2016 000s	2008-2012 000s
Actives		
Number at 31/3/12	57,057	56,191
Adjustment for data cleanse		
Additions		
• New entrants	8,536	14,436
• Re-entrants/Further entrants	1,730	
Deductions:		
• Age retirements	3,081	2950
• Ill health retirements	560	800
• Withdrawals	4,981	8,060
• Deaths	60	89
Additions		
• Additional new entrants	5,671	n/a
Number expected at 31/3/16	64,312	58,728
Valuation data at 2016	61,845	57,057
Deferreds¹		
Pensioners		
Number at 31/3/12	27,820	24,200
Adjustment for data cleanse		
Additions		
• Entrants	6,416	5926
Deductions:		
• Exits	3,632	2,972
Number expected at 31/3/16	30,604	27,154
Valuation data at 2016	31,435	27,820

1. Deferred movements data was not available for the first three years of the intervaluation period and therefore it was not possible to carry out a reconciliation.

Following receipt of the actives movements data reflected above (which illustrates some discrepancy (2,467) between the number of expected members at 2016 and those within the valuation dataset) further information was provided for the latter two years ie for 2014/15 and 2015/16. Although this data included an additional 310 retirements it showed fewer movements from active to deferred status.

There is some discrepancy in the reconciliation of active and pensioner members. For this reason care should be taken when interpreting any analysis of movements for the purposes of setting assumptions.



Table B2: Summary of active experience

Movement Type	Number of movements	Average age
Death	60	51.5
Ill Health Retirement	560	52.3
Normal Health Retirement	3,081	60.4
Withdrawal	4,981	36.7

Table B3: Summary of deferred pensioner experience (only 2015-16 experience summarised)

Movement Type	Number of movements
New Deferred ⁺	165
Exits	311

+ Note the number of new deferreds is inconsistent with the number of withdrawals from actives. Table B3 has not been used to carry out any experience analysis.

Table B4: Summary of pensioner experience

Movement Type	Number of movements	Average age
Entrant	6,416	60.4
Exits	3,632	78.8



Appendix C: Description of valuation groups

Description		Valuation Group*
Administrative and managerial staff not in GP practices; Manual staff (not MHOs); Clinical staff not in any other group; GP practice staff (except Practitioners and those with special class status who are included in the appropriate groups below).	Men	1
	Women	11
MHOs (including those not yet doubling service)	Men	2
	Women	12
Medical Practitioners	Men	7
	Women	17
Dental Practitioners	Men	8
	Women	18
Nurses, physiotherapists, midwives and health visitors with special class status.	Men	9
	Women	19



Appendix D: Data items – membership data

Key data items are shown below. These are the items where a valid and reasonable data value is required to determine a liability.

Actives

- > identifier;
- > date of birth;
- > valuation group;
- > valuation group – 1995 section;
- > valuation group – 2008 section;
- > protection status;
- > Date of Transfer to 2015 Scheme
- > old scheme section code ('1995' or '2008'); [only required for members in service before 1 April 2015]
- > whole-time equivalent pay at the extract date;
- > actual pay at the extract date;
- > total 1995 section pension; [only required for members in service before 1 April 2015]
- > GP flexibilities earnings in 1995 section revalued to extract date – only required for members in service before 1 April 2015 and with preserved practitioner service;
- > officer's 1995 section pension; [only required for members in service before 1 April 2015]
- > fixed practitioner pension in 1995 section revalued to extract date – only required for members in service before 1 April 2015 and with preserved practitioner service;
- > total 2008 section pension; [only required for members in service before 1 April 2015]
- > GP flexibilities earnings in 2008 section revalued to extract date – only required for members in service before 1 April 2015 and with preserved practitioner service;
- > officer's 2008 section pension; [only required for members in service before 1 April 2015]
- > fixed practitioner pension in 2008 section revalued to extract date – only required for members in service before 1 April 2015 and with preserved practitioner service;
- > accrued 2015 scheme pension amount
- > Information code(s)

Pensioners and Dependants

- > identifier;
- > date of birth;
- > pensioner group;
- > protection status (only expected for retirements after 31 March 2015);
- > gender;
- > total 1995 section pension in payment including pension increases awarded to the extract date;
- > total 2008 section pension in payment, including pension increases awarded to extract date;
- > total 2015 scheme pension in payment, including pension increases awarded to extract date;
- > total 1995 section prospective spouse's pension, including pension increases awarded to the extract date;



- > total 2008 section prospective spouse's pension, including pension increases awarded to extract date;
- > total 2015 scheme prospective spouse's pension, including pension increases awarded to extract date;
- > total 1995 section prospective partner's pension, including pension increases awarded to the extract date;
- > total 2008 section prospective partner's pension, including pension increases awarded to extract date;
- > total 2015 scheme prospective partner's pension, including pension increases awarded to extract date;
- > Information code(s)

Deferred pensioners

- > identifier;
- > date of birth;
- > protection status (only expected for leavers after 31 March 2015);
- > date of transfer to 2015 scheme;
- > gender;
- > date of most recent exit from active service
- > total 1995 section preserved pension including pension increases up to the extract date
- > total 2008 section preserved pension including pension increases up to the extract date;
- > total 2015 section preserved pension including pension increases up to the extract date;
- > Information code(s)



Appendix E: Data items - movements data

Actives

The following data was provided separately for each year of the inter-valuation period for active staff who joined / rejoined left the Scheme during that year:

- a. valuation group (see Appendix C);
- b. section/scheme (ie 1995, 2008 or 2015);
- c. movement code;
- d. unique identifier;
- e. gender;
- f. date of birth;
- g. date of first entry to the Scheme (fields g to m applicable for new and/or rejoiners only);
- h. most recent entry method
- i. whole time equivalent pay at joining
- j. date of rejoining;
- k. date of most recent exit before rejoining;
- l. service on rejoining;
- m. whether rejoined within 12 months of last exit - Yes/No indicator;
- n. date of exit (fields n to q applicable for leavers only);
- o. reason for exit from active membership;
- p. service at exit;
- q. final pensionable pay at exit

Deferreds

For deferred pensioners whose pension started or ceased during each year in the inter-valuation period, we were provided with the following details for each individual:

- a. unique identifier;
- b. section/scheme (ie 1995, 2008, 2015);
- c. exit code
- d. valuation group (see Appendix C);
- e. gender;
- f. date of birth;
- g. date leaving deferred status
- h. preserved pension with pension increases up to the extract date



Pensioners

For pensioners and dependants whose pension started or ceased during each year in the inter-valuation period, we were provided with the following details for each individual:

- a. unique identifier;
- b. section/scheme (ie 1995, 2008, 2015);
- c. gender;
- d. date of birth;
- e. reason pension commenced
- f. valuation group (see Appendix C);
- g. date pension payment commenced (DPPC)
- h. pre-commutation pension at DPPC
- i. post-commutation pension at DPPC
- j. date of cessation
- k. cessation reason
- l. post-commutation pension at cessation;



Appendix F: Checks and adjustments applied to the membership data

Checks and exclusion

Exclusions and upratings were identified as follows.

Table F1 – Active members

Reason for Exclusion	Number of exclusions ^β
Actual pay outside acceptable range or missing (< lower of FTE and £250k)	3,172
Category not assigned	63
FTE Pay outside reasonable range (£14k to £250k)	3,637
PT Proportion outside acceptable range (0-100%)	225
Reckonable service missing or outside range (0-45) for Concurrent and Officers	24
Total no of exclusions	4,133
Total exclusions for rating up	4,133

^β if a record fails for more than one reason it is included multiple times in the numbers shown

Table F2 – Deferred members

Reason for Exclusion	Number of exclusions ^β
Members age outside appropriate range (16 to NPA+5 years)	415
Category not assigned	11
Date of leaving missing	269
Member pension outside acceptable range or missing (£10 to £125k)	3,529
Post 2015 pension outside acceptable range or missing (< 5k)	269
Duplicates	51
Total no of exclusions	3,922
Total exclusions for rating up	3,445

^β if a record fails for more than one reason it is included multiple times in the numbers shown

Table F3 – Pensioners (including Dependants)

Reason for Exclusion	Number of Members ^β
Date Pension commenced after valuation date	7
Member Pension outside acceptable range (£0 to £125k)	155
Age outside acceptable range (16 to 120)	69
Total number of exclusions	230
Total exclusions for rating up	223

^β if a record fails for more than one reason it is included multiple times in the numbers shown



Table F4 – Summary of total exclusions

	Total number of excluded records (valid and no liability)	Total number of valid records excluded
Actives	4,133	4,133
Deferreds	3,922	3,445
Pensioners	230	223
Total exclusions	8,285	7,801

Table F5: Total data supplied (31 March 2016)

31 March 2016	Total number of records provided	Notified immediate exclusions	Valid records	Number of records after rate ups
Actives	56,247	4	56,174	56,174
Deferreds	17,171	484	16,687	16,687
Pensioners¹	31,450	15	31,435	31,435

1. Including Dependants

Table F6: Total data supplied (31 March 2015)

31 March 2015	Total number of records provided	Notified immediate exclusions	Valid records	Number of records after rate ups
Actives	59,004	872	58,132	58,132

Table F7: Derivation of uprating factors (31 March 2016)¹

31 March 2016	Number of valid records (A)	Number of exclusions	Number of members after exclusions (B)	Uprating factor (A/B)
Active members	56,174	4,133	52,041	1.08
Deferred members	16,687	3,445	13,242	1.26
Pensioners ²	31,435	223	31,212	1.01
Total membership	104,296	7,801	96,495	1.08

1. Before addition of missing new entrants

2. Including Dependants

Table F8: Derivation of uprating factors (active membership 31 March 2015)

31 March 2015	Number of valid records (A)	Number of exclusions	Number of members after exclusions (B)	Uprating factor (A/B)
Active members	58,132	8,005	50,127	1.16



Adjustments applied to data for included members

- > **Missing pay:** Some 9k active member records had missing or unreliable pay figures. For around 5.5k of these we were able to extract the corresponding figure from the 31 March 2015 data. For valuation purposes we added 1% to this figure to give an estimate of pensionable pay at the valuation date. The remaining 3.5k members were excluded for calculation purposes and the standard uprating approach was used.
- > **Missing CARE pension:** Some 4k members of the 2015 scheme members had missing CARE pension (as earned over the year 2015/16). For most of these members we were able to estimate the pension based on pay as provided and thus were able to include these records for valuation purposes. A system amendment will be incorporated by HSC to avoid repetition of this issue in future valuation extracts.
- > **Valuation groups:** Around 60 active members with officer or concurrent status (in the officer/practitioner status column) were assigned to a different valuation group as the given group was not consistent with other member information provided.
- > **Deferred pension amounts:** For deferred members of the 2008 section of the scheme 94% of the records were excluded because the deferred pension fell outside the expected range (with most values being 0). The remaining 6% of records were not considered sufficiently indicative of the expected average 2008 section member profile and so average deferred pension amounts for these members, and corresponding liabilities were based on those in the NHSPS E&W scheme.
- > **Deferred members over NPA:** There were a number of deferred members in the 31 March 2016 data who were over NPA at the valuation date. We have excluded members who are 5 years above NPA (without uprating) and assume such members to have no attaching liability.
- > **Deferred members:** A later set of deferred membership data was provided, with an additional 1,397 members (most of these records have zero pension). The figures throughout this report are before inclusion of such members. Those with reliable information will be included in the liability calculations with uprating applied for those with missing information
- > **Dependants' pensions:** Figures provided for the contingent benefit for deferred and pensioner members were capped at 50% (37.5% for 2008 section and 33.75% for the 2015 scheme) of the members' pensions to remove anomalies.



- > **Missing new entrants:** The number of new entrants since 31 March 2014 in the data extract was lower than expected based on prior year numbers and other checks. HSC were unable to provide information for these (expected) members. For valuation purposes, and as these members have little accrued liability, it is reasonable to allow for such members by adding into the existing data an estimate of the expected number of missing new entrants and assuming each of these entrants have an average new entrant profile (average in terms of age, gender, pay and service/care pension). For the purposes of estimating the number of new entrants we have used the numbers of actual new entrants in the previous two years and the average new entrant profile has been derived from that of new joiners to the NHSPS E&W. HSC provided a further set of movements data showing the number of new entrants over the 2 year period to 31 March 2016; these numbers broadly tie in with the numbers we have added into the active dataset. The total valuation data summaries shown elsewhere in this report are after addition of the following assumed missing new entrants.

As at 31 March 2016	Number	Total pensionable pay (£m)	Average pensionable pay (£)	Average reckonable service ¹ (years)	Average accrued pension ² (£)
Male	1,386	38.5	27,761	0.66	1,878
Female	4,285	89.7	20,946	1.66	1,317
Total	5,671	128.2	22,612	1.47	1,454

¹ Reckonable service excludes CARE service.

¹ Any CARE pension rights help by officers that relate to past service as practitioner are also valued.

- > **Guaranteed minimum pensions (GMPs):** GMP data was incomplete. An adjustment will be applied to the overall liabilities to allow for GMPs on an approximate basis.

Checks on updated dataset

Financial accounting information taken from published scheme accounts was used to perform independent checks on the dataset supplied.

For actives the total pensionable payroll in the adjusted³ actives data (£1,725m) was compared with pensionable pay derived from employer contribution payments recorded in accounting sources. The average figure for employer contributions in the published resource accounts for 2015-16 and 2016-17 was £302.6m ($= (£293.1m + £312.1m) / 2$). Additional information supplied indicated that 93.1% of the employer contributions were 'normal' contributions (ie not related to payments made in respect of premature retirements). This split between 'normal' and premature retirement contributions was assumed to apply in both years. An estimate of the pensionable payroll is therefore £1,728m = £281.7m/0.163). The two figures are very close and so we conclude that, after adjustments, the actual pay provided in the valuation data is as expected based on contributions paid.

³ Member level adjustments are as explained in this appendix. The aggregated adjusted figure is after the exclusion and uprating process.



For pensioners the total pensioner payroll for members and dependents in the adjusted pensioner data (£297.1m) was compared with the average of total pensions paid during 2015/16 and 2016/17 as recorded in the resource accounts⁴, £299.8m (= (£291.6m+£308.0m)/2). The pensioner payroll provided in the data is around 0.9% lower than that implied by the accounts which is reasonable given the nature of the check.

It was not possible to undertake any independent checks on the deferreds data.

⁴ No allowance was required for pension increases since no inflationary increase was awarded in April 2016.



Appendix G: Uncertainty in valuation results arising from data deficiencies

The table below 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 (again) 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 below.

The table below illustrates the potential impact on the results if the actual liability for each missing member is in fact under/overstated by 10%.

	Impact of error in assumption for missing data	
	Uncorrected Employer contribution rate	Employer contribution correction cost
Actives (uprating applied: 13%)	0.3%	0.3%
Deferreds (uprating applied: 7%)	<0.15%	nil
Pensioners (uprating applied: 1%)	nil	nil

As set out in Appendix F adjustments were also applied to 'correct' identified issues. It should be recognised that these adjustments themselves do introduce some element of uncertainty into the valuation results which could be of greater magnitude than the impacts illustrated in the table above.

Movements data

Setting assumptions

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. Further commentary on assumption setting is provided in the report HSC Pension Scheme : Actuarial Valuation at 31 March 2016; Advice on Assumptions report dated today.

Net Leavers Liability (NLL)

The NLL is a component part of the cost cap calculation and is a quantification of the amount of pre-reformed liabilities which fall out of the cost cap fund at a valuation owing to members which 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 members with pre-reformed service who rejoined active membership during 2015-16.

To accurately calculate NLL 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. Further details on the approach taken to determining NLL in the absence of fully complete data is provided in the Assumptions Report.



We expect that the uncertainty introduced by the approach above is not more than 0.2% of pay. Although it should be noted that the deficiencies in the membership data discussed above could compound this scale of uncertainty.



Appendix H: Checks and exclusions applied to the movements data

Checks were undertaken to ensure all records with sufficient information to assign the movement to the correct category for analysis were taken into account. Minimal exclusions were made based on these checks. The reconciliation shown in Appendix B illustrates there is some discrepancy between the movements data provided and the data provided as at the valuation date (compared to that at the 2012 valuation date).

The pensioner movements data was expected to be used to analyse commutation experience. For these purposes only relevant records and those with reasonable critical data could be used. There were significant issues with this data, with more than half of the dataset missing required information and no analysis was possible.



Appendix I: Summary of benefits

The Directions require the pre and post 2015 HSC schemes to be taken into account in aggregate for the purposes of the current valuation. A summary of benefits provided from the pre and post 2015 schemes is shown separately below. The criteria by which Scheme membership is determined after 31 March 2015 is also shown.

Pre-2015 scheme

The main benefit provisions of the pre-2015 scheme for each category of member is shown in Table I1.

Table I1 - Main benefit provisions of pre-2015 scheme

	1995 section			2008 section	
	Standard officer	Special class officer*	Practitioner	Officer	Practitioner
Basis of provision	Final salary		Career average with revaluation of CPI + 1.5% pa	Final salary	Career average with revaluation of CPI + 1.5% pa
Contracted out/in	Contracted out to 2016†		Dependent on employment status	Contracted out to 2016†	Dependent on employment status
Normal Pension Age (NPA)	60	55 (subject to certain criteria)	60	65	65
Pension accrual rate	1/80	1/80 with doubling of service in some cases	1.4%	1/60	1.87%
Retirement lump sum accrual rate	3.75%	3.75% (doubling as above)	4.2%	None Cash by commutation only (£12: £1pa)	
Final Pensionable pay	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
Dependant benefits	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	
Ill health pension	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				
Pension increases	In line with increases in price inflation				

*members with reserved rights to special provisions

†contracting out ceased on 5 April 2016



2015 scheme

The main benefit provisions of the post-2015 scheme are shown in Table I2.

Table I2 - Main benefit provisions of post-2015 scheme

	2015 scheme
Basis of provision Contracted out/in	Career average with earnings revaluation of CPI + 1.5% pa whilst in service Contracted out (to 2016†)
Normal Pension Age (NPA)	Equal to each member's state pension age
Pension accrual rate	1/54 (1.85%)
Retirement lump sum accrual rate	None - cash by commutation only (£12: £1pa)
Final Pensionable pay	Not applicable
Dependant benefits	33.75% of member pension
Ill health pension	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
Pension increases	In line with increases in price inflation

†contracting out is due to cease from 5 April 2016

Criteria for scheme membership after 31 March 2015

Protected Members

1995 section - excluding Special Classes

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

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 i.e. 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

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

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.