NHS Pension Scheme (England and Wales)

Actuarial valuation as at 31 March 2016
Report on membership data

Date: 15 February 2019
Author: Sue Vivian

Contents

1   Introduction

1.1   This report is addressed to the Department of Health. It is also being made available to the National Health Service Pension Scheme ('NHSPS' or 'the Scheme') Scheme Advisory Board (SAB) as part of the consultation process relating to the actuarial valuation of the NHSPS which is being carried out as at 31 March 2016.

1.2   Pension scheme membership data for the NHS Pension Scheme (the Scheme) is required for the actuarial valuation of the Scheme as at 31 March 2016, carried out in accordance with HM Treasury's Public Service Pensions (Valuations and Employer Cost Cap) Directions 2014 as amended ('HMT Directions').

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); and

  > 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 the Pensions Division of NHSBSA. 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 NHSBSA 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   In my opinion the data provided is adequate for the purposes of the valuation.

1.10   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.

1.11   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.

1.12   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.

1.13   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
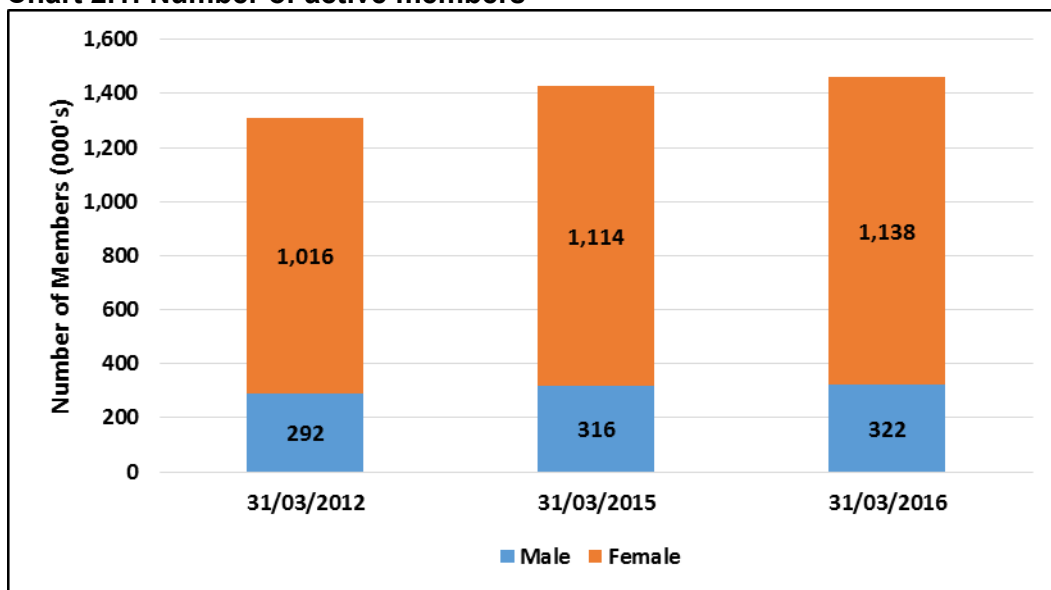
Chart 2.2: Active total pensionable pay (actual annualised pay)

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Actuarial valuation as at 31 March 2016
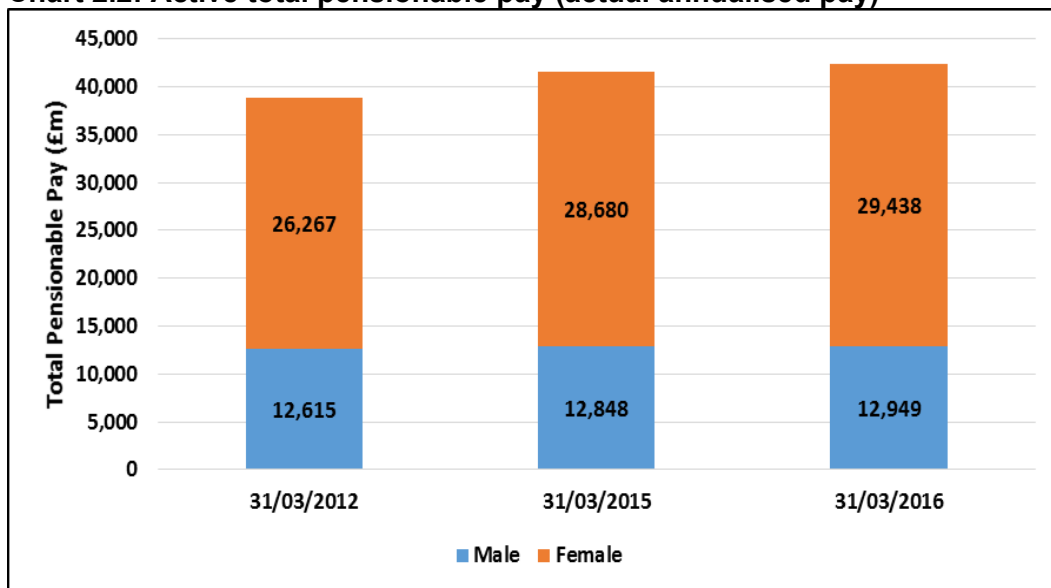*Report on membership data*
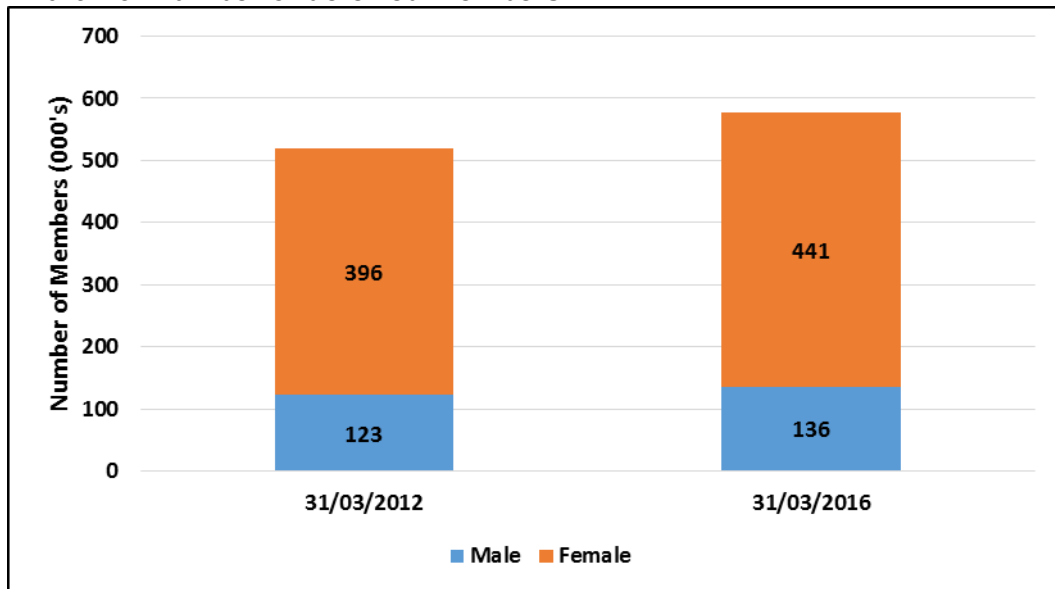
Chart 2.3: Number of deferred members

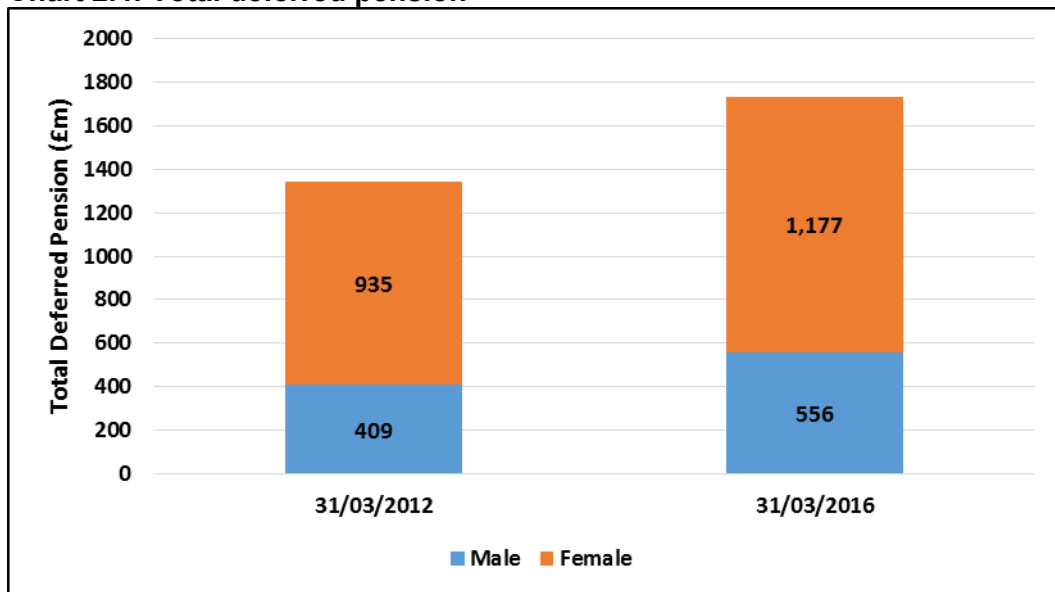**Chart 2.4: Total deferred pension**

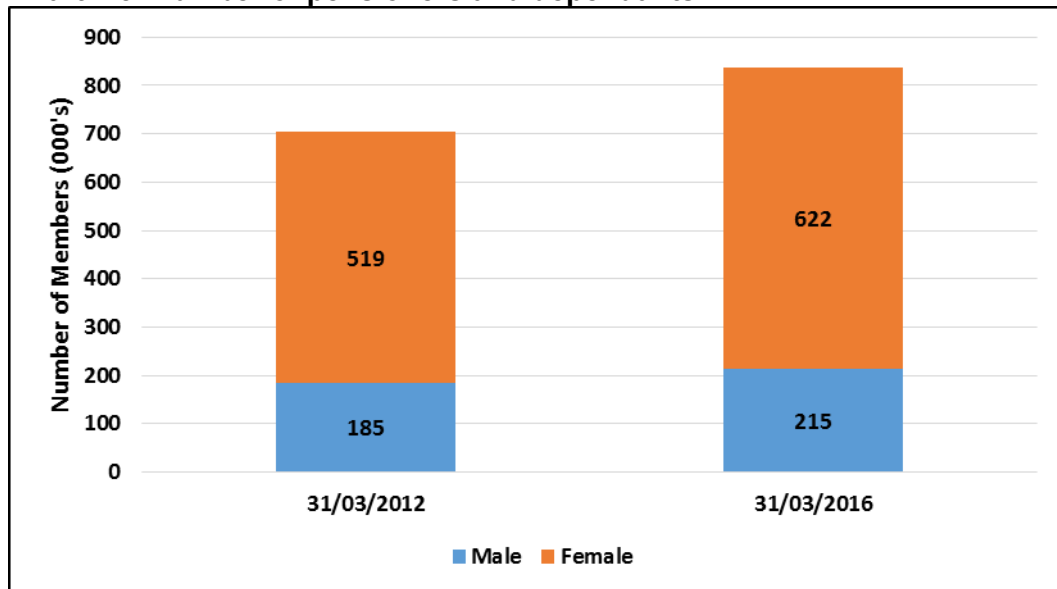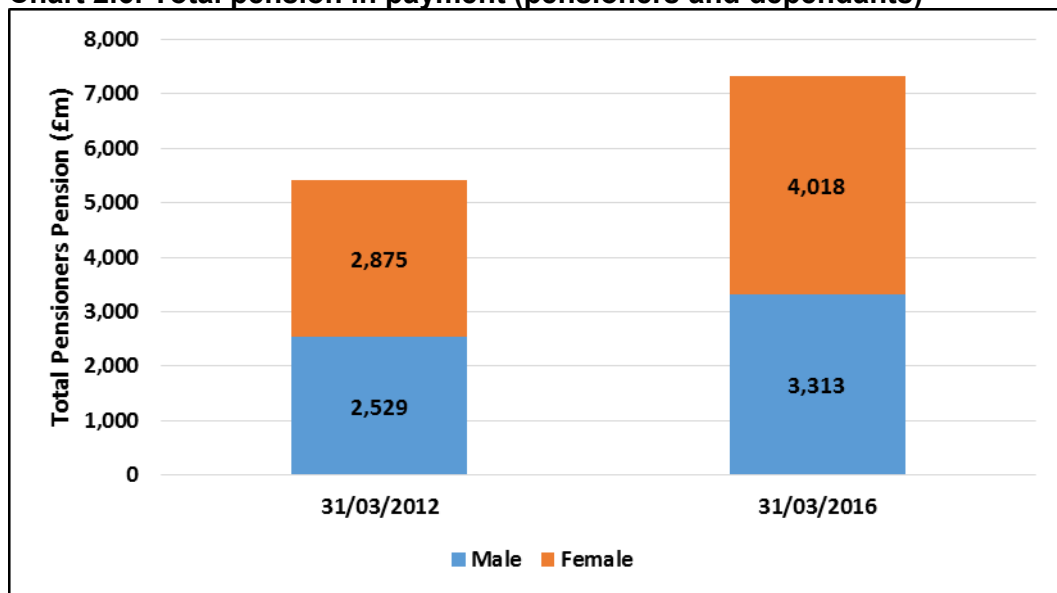**Chart 2.5: Number of pensioners and dependants**

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

2.2 The charts 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 2.9m records 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. 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 2.7: Uprating factors

	Uprating factor 2016	Uprating factor 2015	Uprating factor 2012
Active members	1.05	1.06	1.05
Deferred members	1.02	n/a	1.03
Pensioner members	1.00	n/a	1.01
Total membership	**1.03**	**n/a**	**1.03**

2.4   Making assumptions about missing 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 approach taken to missing or unreliable data has been taken for many years for NHS scheme valuations. We have no evidence to indicate that this approach and the implicit assumption is not appropriate. In our opinion the data used as summarised above is adequate for the purposes of the valuation.

Movements data 31 March 2012 to 31 March 2016

2.6   The movements data provided is used 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 between 2012 and 2016. The underlying numbers 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 2.8: Active membership reconciliation
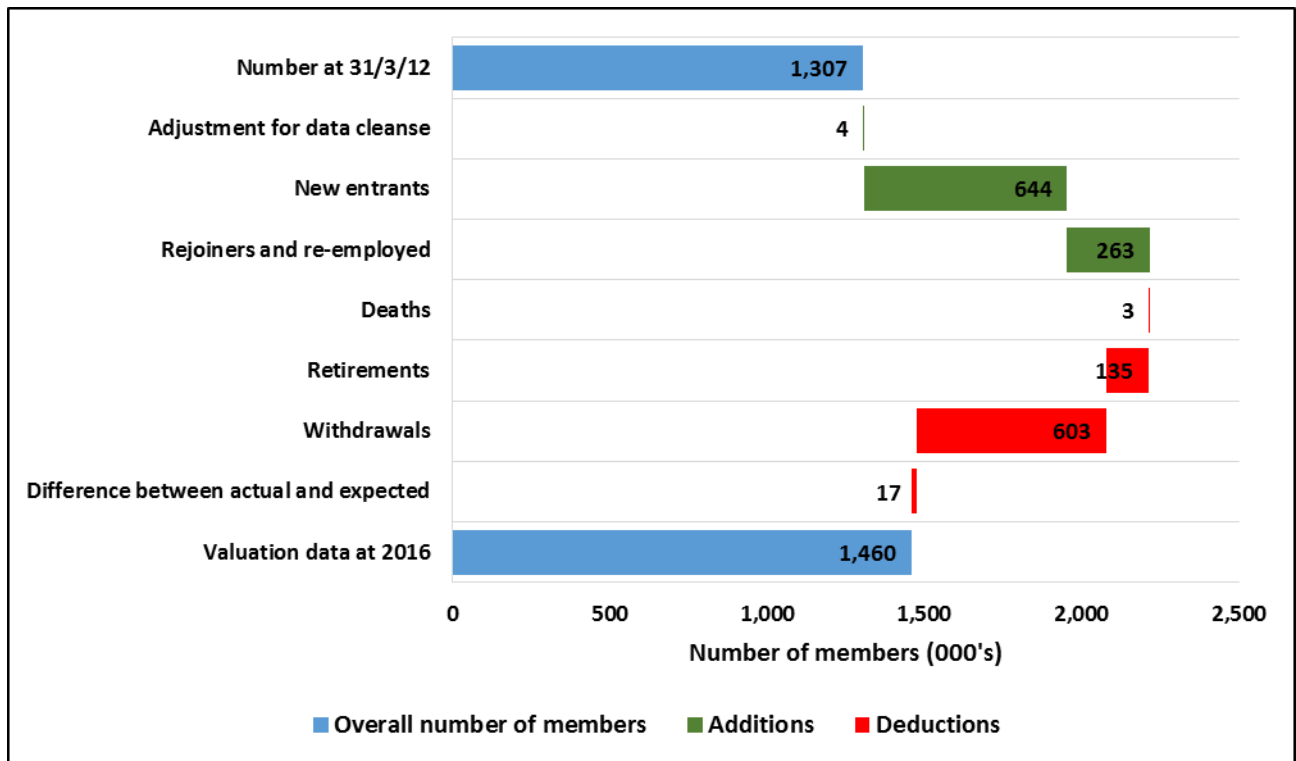
Chart 2.9: Deferred membership reconciliation
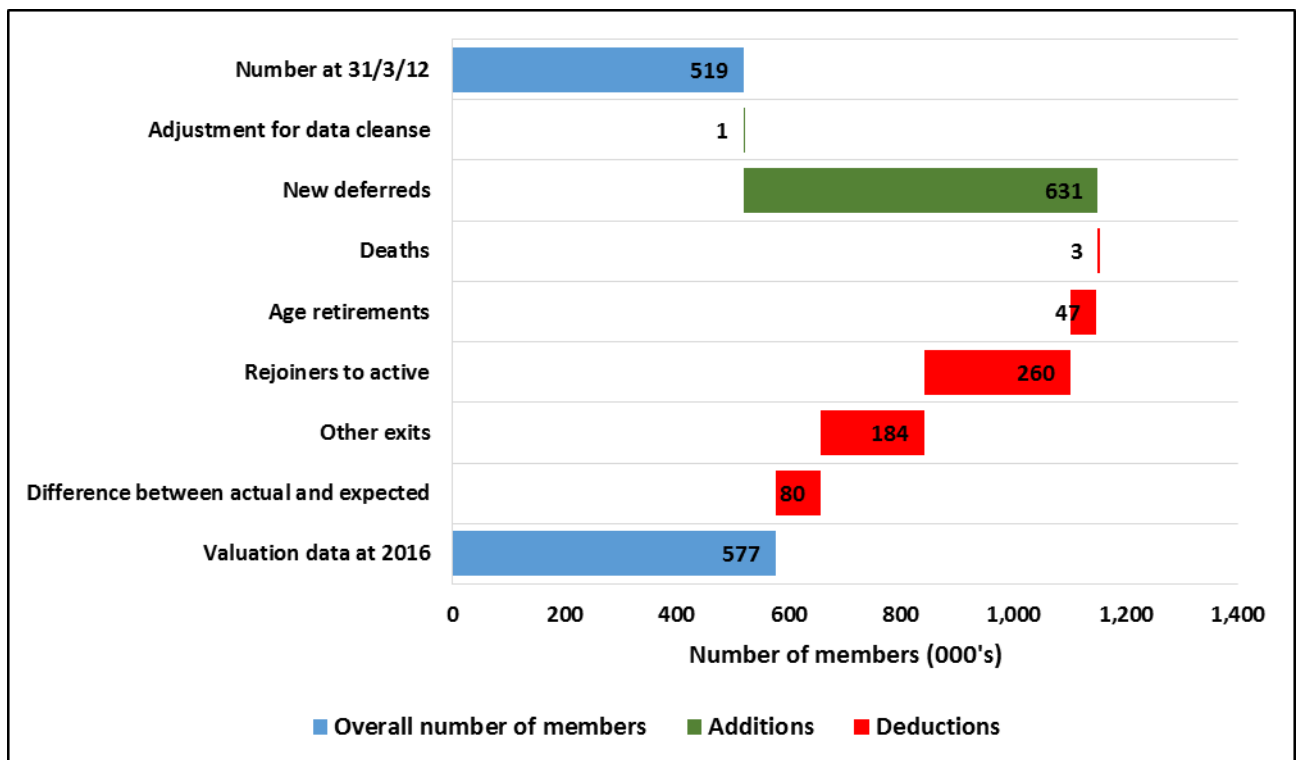
Chart 2.10: Pensioner membership reconciliation
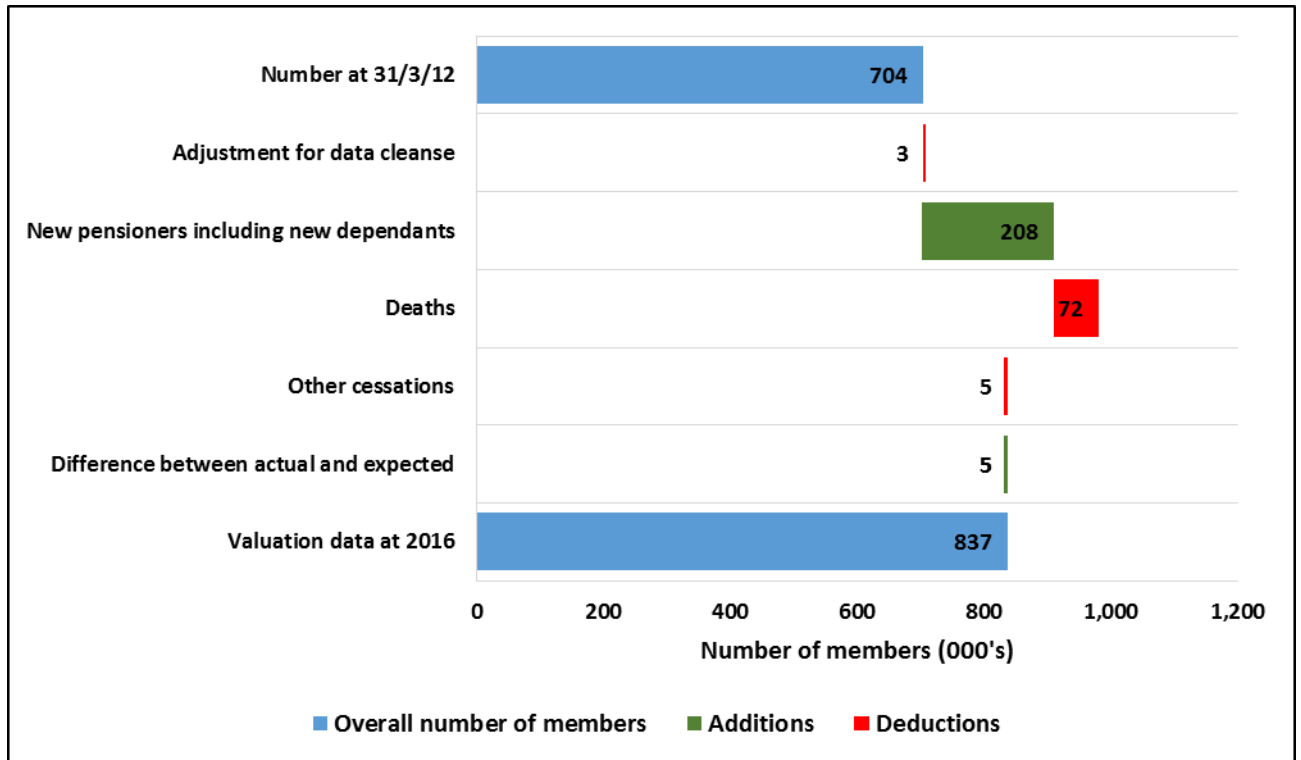
3   Data provided and checks and adjustments made

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 immediate exclusions without rate up. Further details are set out in Appendix F.

Chart 3.1: Summary of data provided and excluded
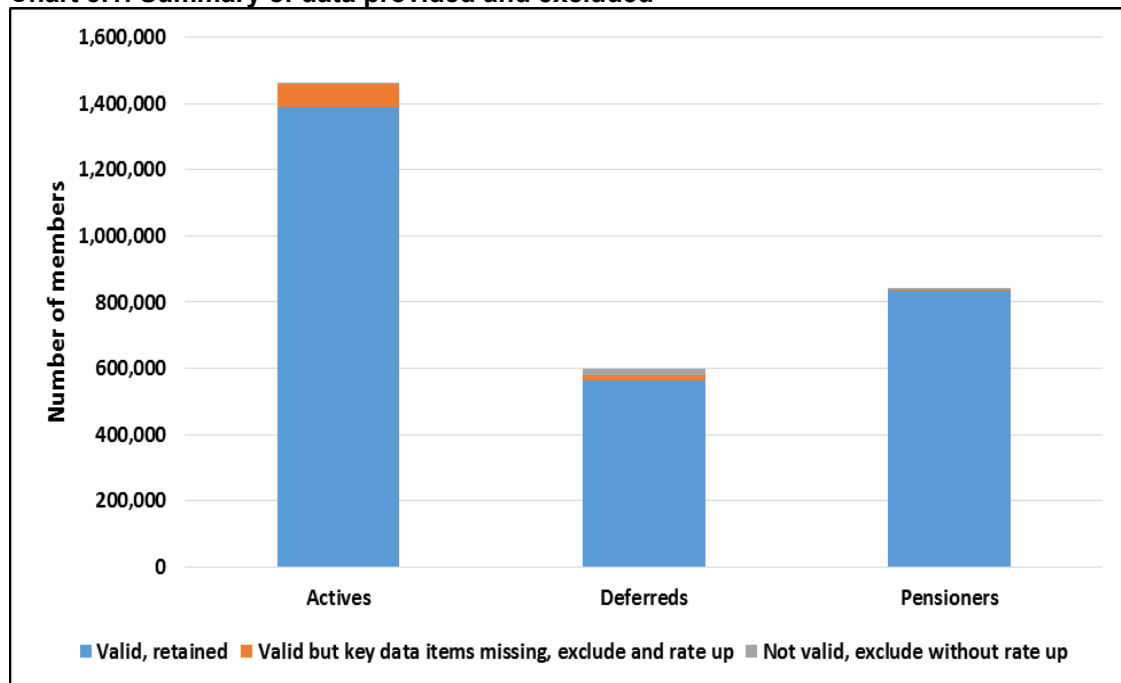
Checks made and adjustments applied

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 information codes assigned by NHSBSA to records with known data deficiencies and by applying other reasonableness tests. The checks also identified a number of areas where adjustments to the data were appropriate. 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 (i.e. age, sex, pay, service) as included records. Tables 3.2 and 3.3 shows the derivation of the uprating factors[1].

Table 3.2: Derivation of uprating factors (31 March 2016)

31-Mar-16	No of records received (m)	Number of valid records (m) (A)	Number of exclusions (m)	Number of members after exclusions (m) (B)	Uprating factor (A/B)
Active members	1.46	1.46	0.07	1.39	1.05
Deferred members	0.60	0.58	0.01	0.57	1.02
Pensioners	0.84	0.84	0.00	0.83	1.00
Total membership	2.90	2.87	0.08	2.79	1.03

Table 3.3: Derivation of uprating factors (31 March 2015)

31-Mar-15	No of records received (m)	Number of valid records (m) (A)	Number of exclusions (m)	Number of members after exclusions (m) (B)	Uprating factor (A/B)
Active members	1.43	1.43	0.08	1.35	1.06

Movements data – 31 March 2012 to 31 March 2016

3.5 Individual member movement records were supplied for all members who changed category of membership (ie active, deferred or pensioner) between the previous and current valuation dates. The movements data 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. In general this was only the case for commutation analysis. The checks and exclusions are summarised in Appendix H.

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[1] In practice uprating factors are determined for each identifiable valuation group (see Appendix F).

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. NHSBSA 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[4]	2012							2016						
	Number of members	Total pensionable pay[1]	Average pensionable pay	Total WTE pay	Average age (weighted by WTE pay)	Average reckonable service[2]	Average accrued pension[3]	Number of members	Total pensionable pay[1]	Average pensionable pay	Total WTE pay	Average age (weighted by WTE pay)	Average reckonable service[2]	Average accrued pension[3,4]
	(000's)	(£m)	(£)	(£m)	(yrs)	(yrs)	(£)	(000's)	(£m)	(£)	(£m)	(yrs)	(yrs)	(£)
1	85	2,903	34,015	2,984	44.9	11.4	6,304	104	3,292	31,806	3,461	44.1	9.2	5,607
11	328	7,665	23,356	8,881	44.4	9.6	3,837	383	8,911	23,275	10,474	44.2	8.6	3,932
2	8	375	48,616	382	51.2	30.0	18,549	5	241	50,315	246	52.7	32.9	20,997
12	15	565	37,032	616	50.5	28.1	14,235	10	403	38,571	439	52.2	31.5	16,533
3	44	1,002	22,743	1,041	46.5	11.4	3,867	47	1,060	22,445	1,137	46.0	9.9	3,794
13	44	712	15,991	896	45.0	7.2	2,014	51	830	16,398	1,083	45.0	6.7	2,254
5	116	5,588	48,043	5,728	44.3	9.8	9,140	133	6,183	46,427	6,490	44.3	8.9	8,889
15	406	11,055	27,254	12,643	40.7	7.2	3,470	489	13,532	27,695	15,795	40.9	6.9	3,961
7	18	1,813	100,328	1,813	47.6	n/a	29,004	14	1,358	95,628	1,392	47.1	n/a	27,515
17	18	1,195	65,407	1,195	44.6	n/a	15,642	19	1,236	65,010	1,285	45.0	n/a	16,178
8	10	615	59,603	615	43.2	n/a	16,508	10	529	55,348	554	43.5	n/a	17,917
18	8	374	46,657	374	38.4	n/a	8,281	9	420	45,918	443	39.3	n/a	9,574
9	6	233	37,032	241	48.9	23.9	11,568	4	171	38,975	177	51.5	26.7	13,652
19	108	3,366	31,265	3,952	49.7	21.8	10,208	78	2,596	33,152	3,008	51.7	24.2	11,891
10	3	87	25,110	99	47.9	6.0	2,663	5	114	22,087	134	44.9	4.5	2,521
20	88	1,336	15,135	1,785	48.7	7.1	2,121	99	1,510	15,232	2,027	47.9	6.4	2,210
All male	**292**	**12,615**	**43,270**	**12,902**	**45.3**	**11.5**	**9,220**	**322**	**12,949**	**40,212**	**13,590**	**44.9**	**9.8**	**8,319**
All female	**1,016**	**26,267**	**25,860**	**30,342**	**43.9**	**9.7**	**4,541**	**1,138**	**29,438**	**25,865**	**34,556**	**43.6**	**8.9**	**4,633**
All	**1,307**	**38,882**	**29,743**	**43,244**	**44.3**	**10.2**	**5,586**	**1,460**	**42,387**	**29,029**	**48,146**	**44.0**	**9.1**	**5,446**

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	Number of members	Total pensionable pay[1]	Average pensionable pay	Total WTE Pay	Average age (weighted by WTE pay)	Average reckonable service[2]	Average accrued pension[3]
	(000's)	(£m)	(£)	(£m)	(yrs)	(yrs)	(£)
1	102	3,265	32,010	3,427	44.2	10.1	5,628
11	375	8,699	23,170	10,248	44.2	9.3	3,898
2	5	271	49,769	277	52.2	32.1	20,224
12	12	450	38,291	494	51.7	30.8	16,021
3	46	1,026	22,092	1,098	46.1	10.7	3,773
13	49	775	15,959	1,012	45.0	7.1	2,167
5	128	5,908	46,314	6,179	44.2	9.6	8,510
15	467	12,771	27,358	14,940	40.9	7.4	3,756
7	16	1,528	96,991	1,528	46.9	n/a	29,266
17	20	1,271	63,660	1,271	45.1	n/a	16,496
8	10	558	58,448	558	42.6	n/a	18,808
18	9	426	48,586	426	38.9	n/a	9,981
9	5	186	38,483	192	50.9	26.1	13,148
19	86	2,819	32,621	3,288	51.2	23.7	11,475
10	5	105	22,549	125	45.4	5.2	2,595
20	96	1,469	15,332	1,982	48.1	7.1	2,278
All male	**316**	**12,848**	**40,624**	**13,385**	**44.9**	**10.6**	**8,415**
All female	**1,114**	**28,680**	**25,756**	**33,661**	**43.7**	**9.6**	**4,614**
All	**1,430**	**41,528**	**29,045**	**47,046**	**44.1**	**9.8**	**5,454**

1. The salary 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.

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

Scheme/Section	Number of members (000s)	Total pensionable Pay[1] (£m)	Total WTE pensionable salary (£m)	Average age (weighted by WTE pay) (yrs)	Average reckonable service[2] (yrs)
Protected 1995	237	8,011	8,945	56.6	20.0
Protected 2008	18	451	517	62.6	10.2
Tapered 1995	105	3,794	4,223	51.5	17.2
Tapered 2008	14	327	374	57.3	8.1
Unprotected 1995	413	14,654	16,531	41.8	11.9
Unprotected 2008	531	12,619	14,435	37.6	3.1
New to 2015 scheme	141	2,531	3,120	34.4	n/a
Total M	322	12,949	13,590	44.9	9.8
Total F	1,138	29,438	34,556	43.6	8.9
Total 2016	**1,460**	**42,387**	**48,146**	**44.0**	**9.1**
Total 2012	**1,307**	**38,881**	**43,245**	**44.3**	**11.1**

1. The pay shown is actual pay for the time worked.
2. Reckonable service is not applicable to practitioner groups whose benefits are calculated on a CARE basis.

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Table A4: 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]	Average pension[1]	Average age (weighted by pension)	Number of members	Total deferred pension[2]	Average pension[2]	Average age (weighted by pension)
		(000's)	(£m)	(£)	(yrs)	(000's)	(£m)	(£)	(yrs)
Male	1995	113	398	3,540	49.3	107	500	4,669	50.9
Female	1995	367	912	2,482	47.6	359	1,064	2,969	49.5
Male	2008	9	9	907	40.9	26	56	2,150	44.0
Female	2008	27	17	634	36.9	74	112	1,506	41.5
Male	1995/2008[3]	1	2	3,942	50.4				
Female	1995/2008[3]	2	6	2,521	48.6				
Male	2015					3	0	126	35.0
Female	2015					8	1	103	33.8
Male		**123**	**409**	**3,338**	**49.1**	**136**	**556**	**4,090**	**50.2**
Female		**396**	**935**	**2,358**	**47.4**	**441**	**1,177**	**2,668**	**48.8**
Total		**519**	**1,344**	**2,589**	**47.9**	**577**	**1,733**	**3,003**	**49.2**

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 A5: 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]	Average pension[1]	Average age (weighted by pension)	Number of members	Total pension[2]	Average pension[2]	Average age (weighted by pension)
		(000's)	(£m)	(£)	(yrs)	(000's)	(£m)	(£)	(yrs)
Age retirement	Male	109	1,831	16,760	69.9	138	2,543	18,476	69.9
	Female	350	1,820	5,200	68.5	456	2,839	6,220	68.1
	Total	**459**	**3,651**	**7,951**	**69.2**	**594**	**5,382**	**9,060**	**69.0**
Ill-health retirement	Male	32	350	10,796	66.8	30	369	12,492	68.9
	Female	84	473	5,658	66.1	81	519	6,397	68.1
	Total	**116**	**823**	**7,095**	**66.4**	**111**	**887**	**8,023**	**68.4**
Redundancy	Male	19	263	13,840	72.2	17	333	19,171	73.2
	Female	29	185	6,305	71.0	29	287	10,038	71.6
	Total	**48**	**448**	**9,272**	**71.7**	**46**	**619**	**13,488**	**72.5**
Spouses and other dependants	Male	24	83	3,491	59.6	31	69	2,245	58.3
	Female	56	390	6,961	74.4	56	374	6,642	75.4
	Total	**80**	**473**	**5,925**	**71.8**	**87**	**442**	**5,095**	**72.7**
Pension Credit Members[3]	Male	0	0	5,228	62.4				
	Female	1	7	14,358	63.9				
	Total	**1**	**8**	**13,073**	**63.8**				
All	**Male**	**185**	**2,529**	**13,692**	**69.3**	**215**	**3,313**	**15,405**	**69.9**
	Female	**519**	**2,875**	**5,535**	**69.1**	**622**	**4,018**	**6,457**	**69.0**
	Total	**704**	**5,403**	**7,675**	**69.2**	**837**	**7,331**	**8,755**	**69.4**

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

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Actuarial valuation as at 31 March 2016
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Chart A6: Active members whole-time equivalent pensionable pay by age

NHS Active Membership - analysis of 2012 and 2016 datasets

Legend: Protected 1995 | Protected 2008 | Unprotected 1995 | Unprotected 2008 | New 2015 | 2012 data
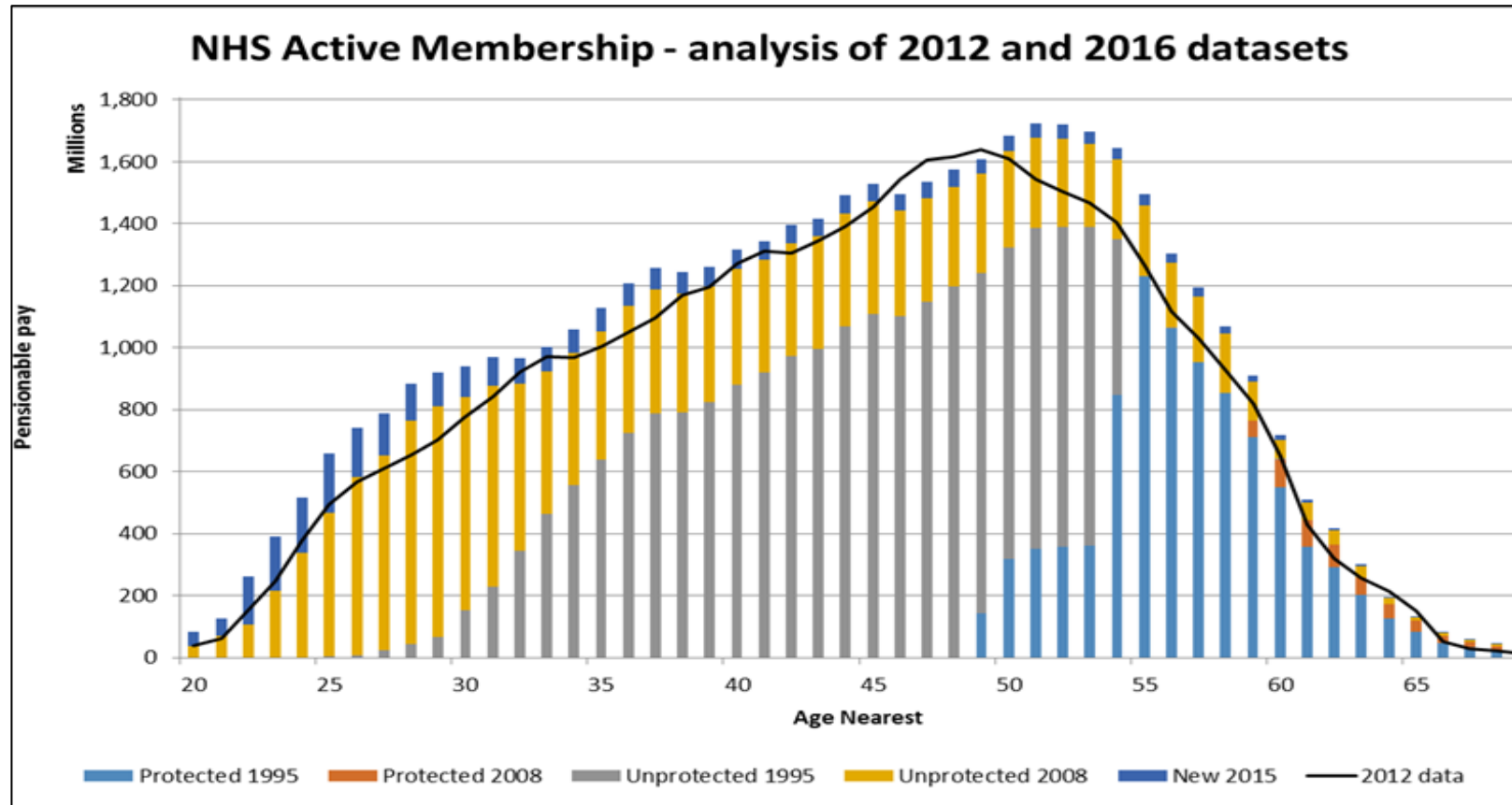
Chart A7: Summary of deferred pension amount by age
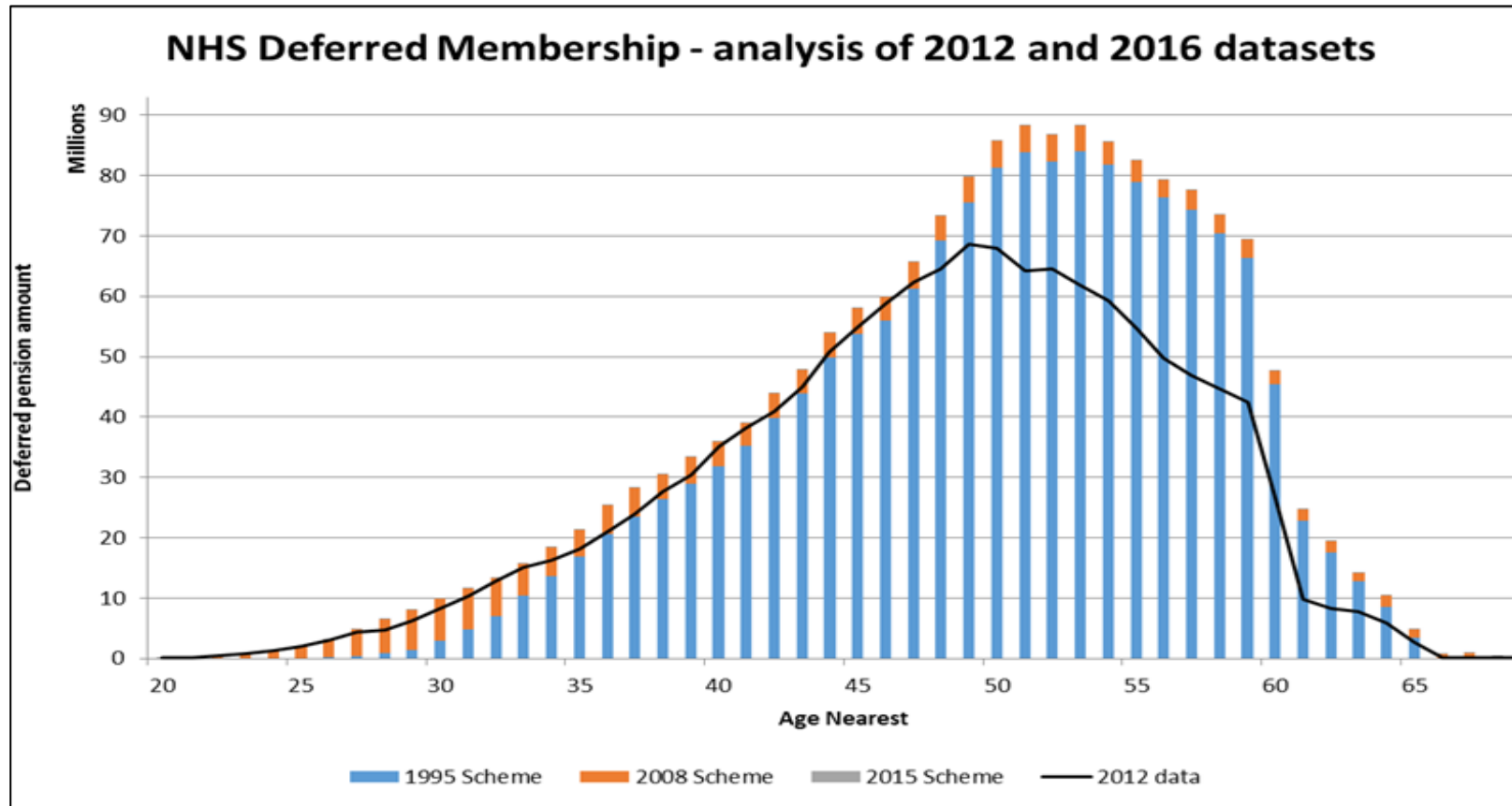
Chart A8: Summary of pension amount in payment by age

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Actuarial valuation as at 31 March 2016
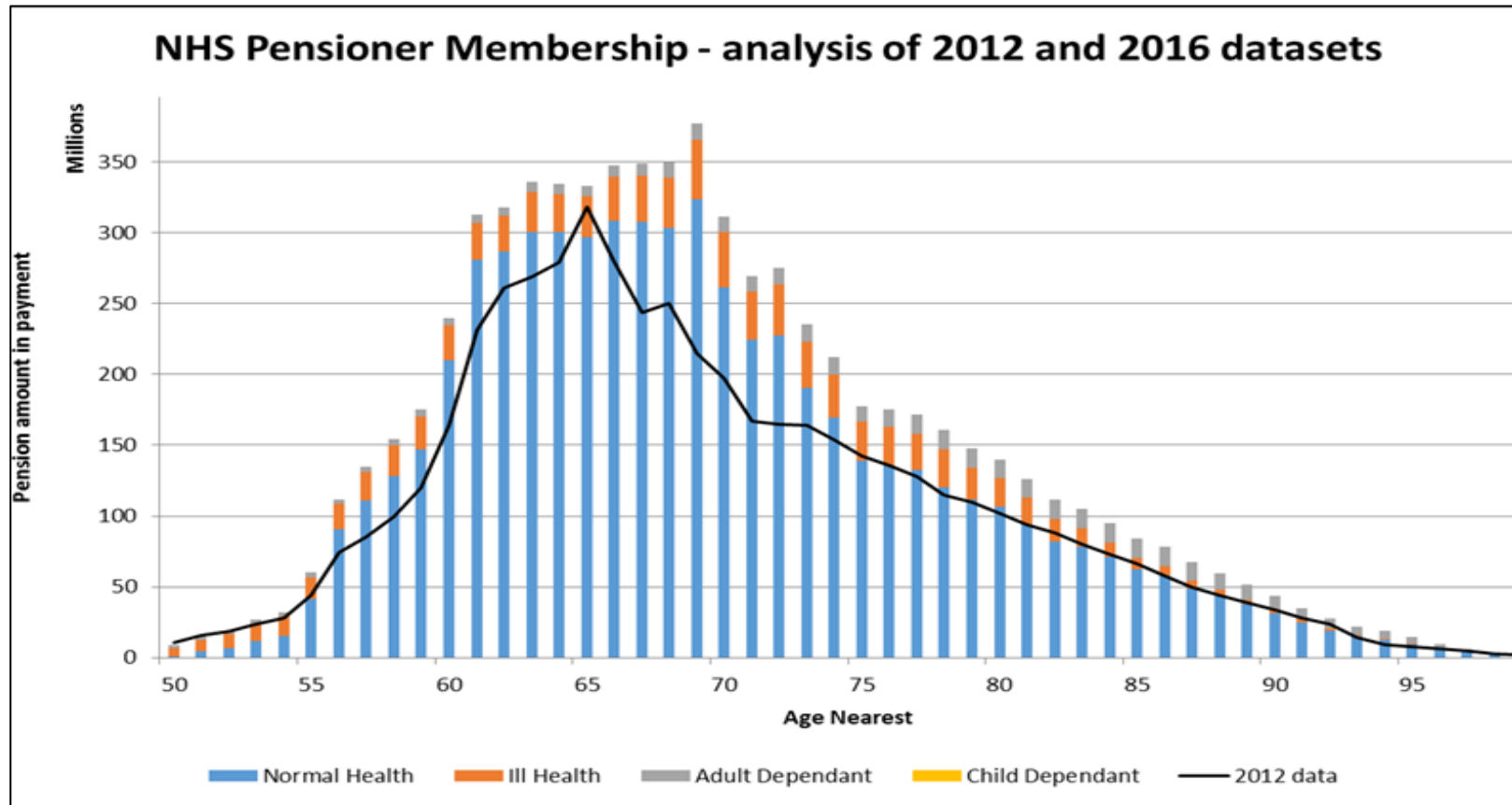Report on membership data

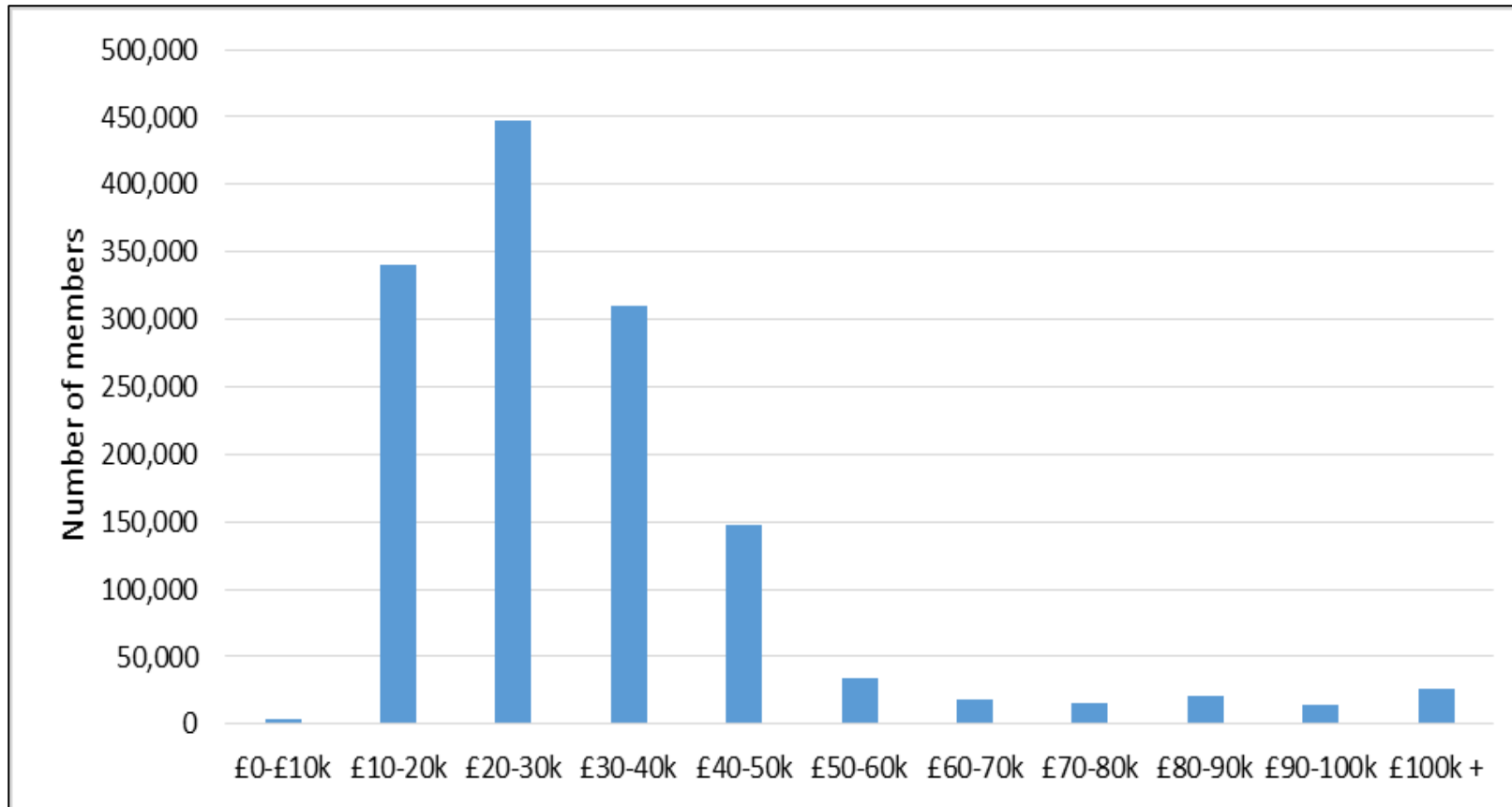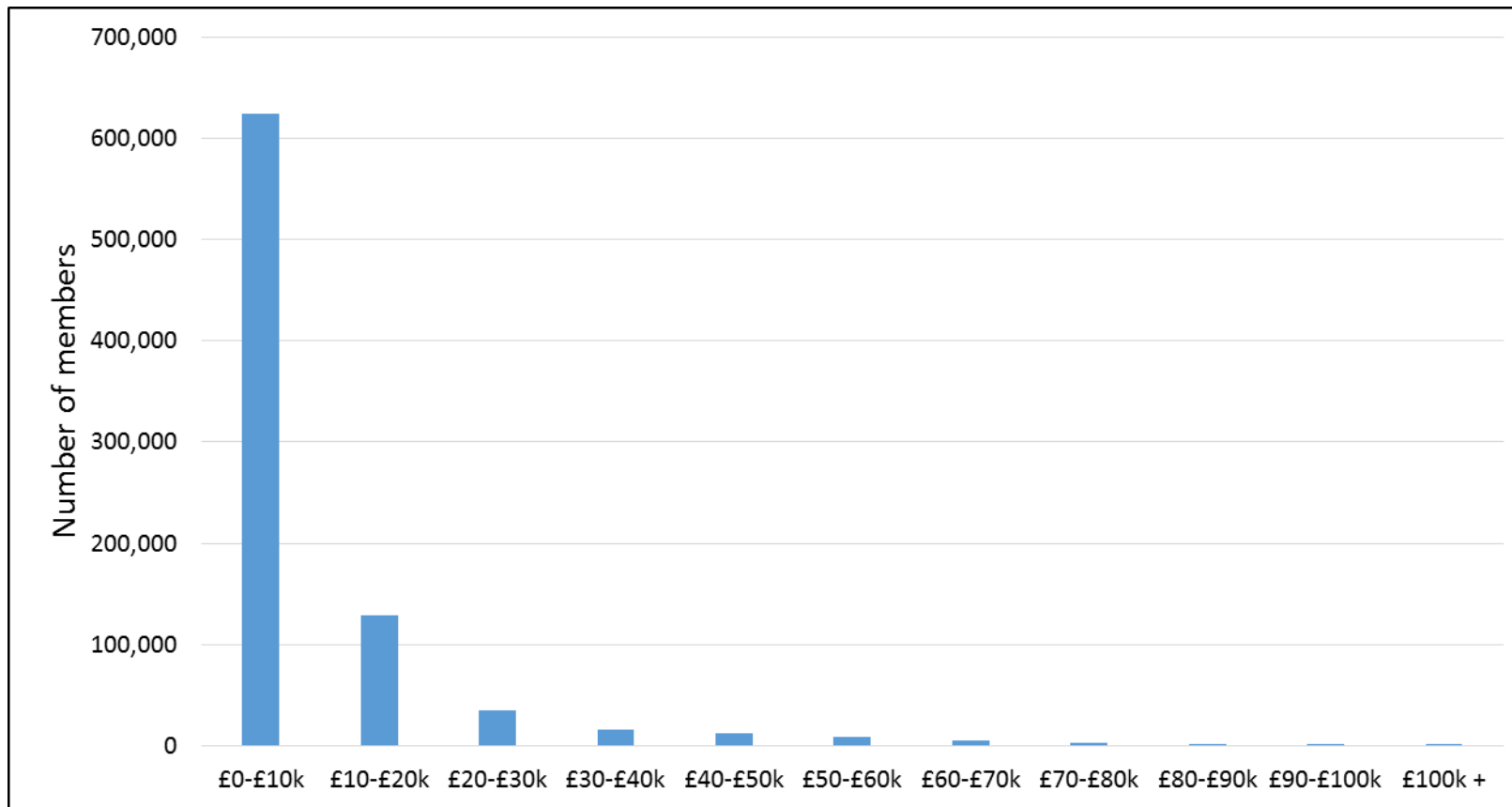**Chart A9: Distribution of whole-time equivalent pensionable pay as at 31 March 2016**

Chart A10: Distribution of pension amount in payment as at 31 March 2016

Appendix B: Summary of movements data

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

	Reconcilation of membership over intervaluation period 2012-2016 (000s)	Prior intervaluation period[3] 2008-2012 (000s)
Actives		
Number at 31/3/12	1,307	1,259
Adjustment for data cleanse	4	(10)
Additions		
• New entrants	644	473
• Rejoiners and re-employed	263	237
Deductions:		
• Deaths	(3)	(4)
• Retirements	(135)	(123)
• Withdrawals	(603)	(524)
Number expected at 31/3/16	1,477	1,308
Valuation data at 2016	1,460	1,307
Deferreds[1]		
Number at 31/3/12	519	478
Adjustment for data cleanse	1	(1)
Additions		
• New deferreds[2]	631	523
Deductions:		
• Deaths	(3)	(2)
• Age retirements	(47)	(37)
• Rejoiners to active	(260)	(236)
• Other exits	(184)	(185)
Number expected at 31/3/16	657	540
Valuation data at 2016	577	519
Pensioners		
Number at 31/3/12	704	584
Adjustment for data cleanse	(3)	4
Additions		
• New pensioners including new dependants	208	185
Deductions:		
• Deaths	(72)	(65)
• Other cessations	(5)	(4)
Number expected at 31/3/16	832	704
Valuation data at 2016	837	704

1. Excludes members entitled only to a refund of contributions.
2. Includes pension credit members.
3. Covers the period of 31 March 2008 to 31 March 2012.

Table B2: Summary of active experience

Movement type	Number of movements	Average age of movement
Entrant	906,944	34.7
Death	3,439	51.4
Ill Health Retirement	8,332	52.6
Normal Health Retirement	127,063	60.0
Withdrawal	603,050	37.0

Table B3: Summary of deferred pensioner experience

Movement type	Number of movements	Average age of movement
New Deferred[+]	631,345	37.2
Re-joiners to Active	259,924	37.1
Transferred out	4,110	42.6
Death	2,782	53.4
Paid Refund	95,736	33.2
Unclaimed Refund	83,533	34.3
Retirements	47,358	59.0
Pension Credit	223	59.5

+ Note the number of new deferreds is inconsistent with the number of withdrawals from actives. For analysis purposes we have used withdrawals from active membership movements; we have discussed this with BSA and the active movement data appears to be correct. The number of new deferred members shown in Table B3 is not used to carry out any experience analysis.

Table B4: Summary of pensioner experience

Movement type	Number of movements	Average age of movement
Entrant	208,327	60.0
Died no dependant	39,796	82.9
Died with a dependant	20,281	74.0
Dependant deaths	14,936	85.2
Trivial Commutation	1,640	63.7
Other	3,924	55.3

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Appendix C: Description of valuation groups

Description		Valuation Group
Administrative and managerial staff not in GP practices	Men	1
	Women	11
MHOs (including those not yet doubling service)	Men	2
	Women	12
Manual staff (not MHOs)	Men	3
	Women	13
Clinical staff not in any other group	Men	5
	Women	15
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
GP practice staff (except Practitioners and those with special class status who are included in the appropriate groups above).	Men	10
	Women	20

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 codel
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]
BSA Code 1008[*] (members have an open employment with no update and missing pensionable pay)	234
No liability exclusions (members aged over 75 or records have no awards present)[+]	325
Other BSA information codes	17,957
WTE pay outside reasonable range (£14k to £250k)	29,697
PT Proportion outside acceptable range (0-100%)	21,154
Zero reckonable service	3,328
Dummy data	2,959
Total no of exclusions	**69,532***
Total exclusions for rating up (69,532 – 50% x 234 – 325)	**69,090**

* Partly phantom data and partly invalid data, we rate up to cover 50% of this data.
+ Indicates initial exclusions which are assumed to have no attaching liability and therefore we have not uprated for these members.
[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]
BSA Code 0102[+] (member records may not have been set up correctly)	376
Age outside the appropriate range[+] (16 to NPA + 5 years)	21,648
Pension was outside acceptable range (<£10 or >£125k)	13,934
Members couldn't be assigned a category (missing pension/limited information on record)[+]	1,150
Other BSA information codes[++]	3,612
Total no of exclusions	**34,357**
Total exclusions for rating up (34,357 – 376 – 21,648 – 50% x 190)	**12,238**

[+] Indicates initial exclusions which are assumed to have no attaching liability and therefore we have not uprated for these members.
[++] Includes 190 members with BSA 1008 code, we have rated up for 50% of these members.
[β] If a record fails for more than one reason it is included multiple times in the numbers shown.

Table F3: Pensioners

Reason for exclusion	Number of exclusions[β]
Deceased members and others with no attaching liability[+]	512
Age less than 0 at the date of retirement	856
Members aged below 16 or above 120 at the valuation date	1,051
Pension was outside acceptable range (<£10 or >£125k)	978
BSA Information codes	311
Total number of exclusions	**3,583**
Total exclusions for rating up (3,583 – 512)	**3,071**

+ Indicates initial exclusions which are assumed to have no attaching liability and therefore we have not uprated for these members.
[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	69,532	69,090
Deferreds	34,357	12,238
Pensioners	3,583	3,071
Total exclusions	**107,472**	**84,399**

Table F5: Total data supplied (31 March 2016)

31 March 2016	Total number of records provided	Notified immediate exclusions	Valid records
Actives	1,460,589	442[1]	1,460,147
Deferreds	599,181	22,119[2]	577,062
Pensioners	837,904	512[3]	837,392

1. Phantom records or members over age 75.
2. Mainly incorrectly set up records or more than 5 years over NPA.
3. Notified as deceased or with no liability.

Table F6: Total data supplied (31 March 2015)

31 March 2015	Total number of records provided	Notified immediate exclusions	Valid records
Actives	1,432,195	2,418[1]	1,429,777

1. Phantom records or members over age 75.

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

31 March 2016	Number of valid records (A)	Number of exclusions	Number of members after exclusions (B)	Uprating factor (A/B)
Actives	1,460,147	69,090	1,391,057	1.05
Deferreds	577,062	12,238	564,824	1.02
Pensioners	837,392	3,071	834,321	1.00
Total membership	**2,874,601**	**84,399**	**2,790,202**	**1.03**

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)
Actives	1,429,777	78,530	1,351,247	1.06

Adjustments applied to data for included members

> **Missing pay:** Some 40k active member records originally had missing pay (information code 1010). NHSBSA were able to supply prior year pay for these members and their records were able to be included for valuation purposes with liabilities based on that prior year pay (no adjustments were applied owing to little evidence of pay growth over the year).

> **Missing CARE pension:** Some 80k members of the 2015 scheme had missing CARE pension (as earned over the year 2015/16). Where pay was available (60k members) we estimated the pension earned from this and were able to include these records for valuation purposes. A system amendment will be incorporated by NHSBSA to avoid repetition of this issue in future valuation extracts.

> **Valuation groups**: Around 3k active members with a practitioner status (in the officer/practitioner status column) were assigned a non-practitioner valuation group. We assumed the valuation group provided for these members is correct and have included them in that officer valuation group.

> **Dependants' pensions:** were capped at 50% (37.5% for 2008 section and 33.75% for the 2015 scheme) of deferred and pensioner members' pensions for to remove anomalies (if not excluded based on a relevant information code).

> **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 uprated dataset

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

For actives the total pensionable payroll in the adjusted actives data (£42.4bn) was compared with pensionable pay derived from employer contribution payments recorded in the resource accounts (£42.2bn = £6.03bn/0.143). The pensionable payroll from the data is fairly close (0.5% higher) to that implied from employer contributions. Over recent years' pensionable payroll (as implied from employer contributions paid) has been growing at around 1% per year. Allowing for this rate of growth would suggest that the actual pay supplied is very close to the contribution implied payroll.

For pensioners the total pensioner payroll in the adjusted pensioner data (£7.33bn) was compared with total pensions paid during 2015/16 recorded in the resource accounts (£7.30bn). Over recent years, in real terms, the pensioner payroll has been growing by 5% each year. Allowing for this rate of change would suggest that the pensioner payroll provided in the data is around 2% lower than that implied by accounts. Following discussions with NHSBSA we understand the difference is explained by the aggregation of a number of payments within the pension figure shown in the accounts, including scheme paid tax charges for members with benefits in excess of the annual and lifetime allowances.

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

Appendix G: Uncertainty in valuation results arising from data deficiencies

Membership data

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 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: 5%)	0.1%	0.1%
Deferreds (uprating applied: 2%)	<0.05%	nil
Pensioners (uprating applied: 0%)	nil	nil

Movements data

Setting assumptions
1. 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 NHS Pension Scheme : Actuarial Valuation at 31 March 2016; Advice on Assumptions report dated today.

Net Leavers Liability (NLL)
2. 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.

3. 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.

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4. We expect that the uncertainty introduced by the approach above is not more than 0.1% 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. No further checks were undertaken other than to ensure the overall number of movements compared reasonably with the comparable figures shown in the resource accounts.

The pensioner movements data was used to analyse commutation experience. For these purposes only relevant records and those with reasonable critical data were used for analysis purposes. The subset of data used, checks applied and resulting numbers of exclusions are shown below.

Total pensioner movements (new age retirement pensioners)	176k
Excluded as left service pre 1/4/08	42k
Excluded due to negative pension or lump sum values (pre or post commutation)	9k
Excluded as implied commutation greater than the maximum allowed	8k
Total exclusions*	51k
Total movements analysed	125k

*Number of exclusions are overlapping i.e. if they fail more than one check they are excluded more than once in numbers above, thus the figures don't add up to total number of exclusions.

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Appendix I: Summary of benefits

The Directions require the pre and post 2015 NHS 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 Match 2015 is also shown.

Pre-2015 schemes

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 schemes

	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	Career average with earnings revaluation of CPI + 1.5% pa whilst in service
Contracted out/in	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 x 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.