



Government Actuary's Department



Northern Ireland Civil Service Pension Schemes

Actuarial valuation as at 31 March 2016

Report on membership data

Date: 11 March 2019

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1 Introduction

- 1.1 This report is addressed to the Northern Ireland Department of Finance ('the Department' or 'DoF NI'). It is also being made available to the Northern Ireland Civil Service Scheme Advisory Board ('NICSSAB') as part of the consultation process relating to the actuarial valuation of the Northern Ireland Civil Service Pension Schemes ('the Schemes' or 'NICSPS') which is being carried out as at 31 March 2016.
- 1.2 Pension scheme membership data is required for the actuarial valuation of the Schemes as at 31 March 2016, carried out in accordance with Department of Finance Northern Ireland's Public Service Pensions (Valuations and Employer Cost Cap) Directions 2017 (Northern Ireland) ('DoF 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)
 - > To assess elements of the Schemes' 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 which is used to inform decisions around scheme specific assumptions to be used for the valuation.
- 1.6 All member data provided and discussed in this report, and all supplementary accounting information, was supplied by DoF NI. 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 DoF NI 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 membership data provided is adequate for the purposes of the valuation. It should be noted, however, that there were a number of issues with the active membership data as at 31 March 2016 as outlined in Section 2 and Appendix E, which introduce uncertainty into the valuation results. Appendix F gives an indication of the potential level of uncertainty introduced.
- 1.10 There are a number of issues with the movements data as outlined in Section 2. Inaccuracies in the movement data potentially feed through into the analysis of experience, and could therefore result in the Schemes' experience appearing higher or lower than it actually has been over the inter-valuation period.
- 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 This report should not be reproduced or disseminated to other parties without prior consent. The Government Actuary's Department (GAD) does not accept any liability to third parties, whether or not it has agreed to the disclosure.
- 1.13 This report has been prepared in accordance with the applicable Technical Actuarial Standards: TAS 100 and TAS 300 issued by the Financial Reporting Council (FRC). The FRC sets technical standards for actuarial work in the UK.

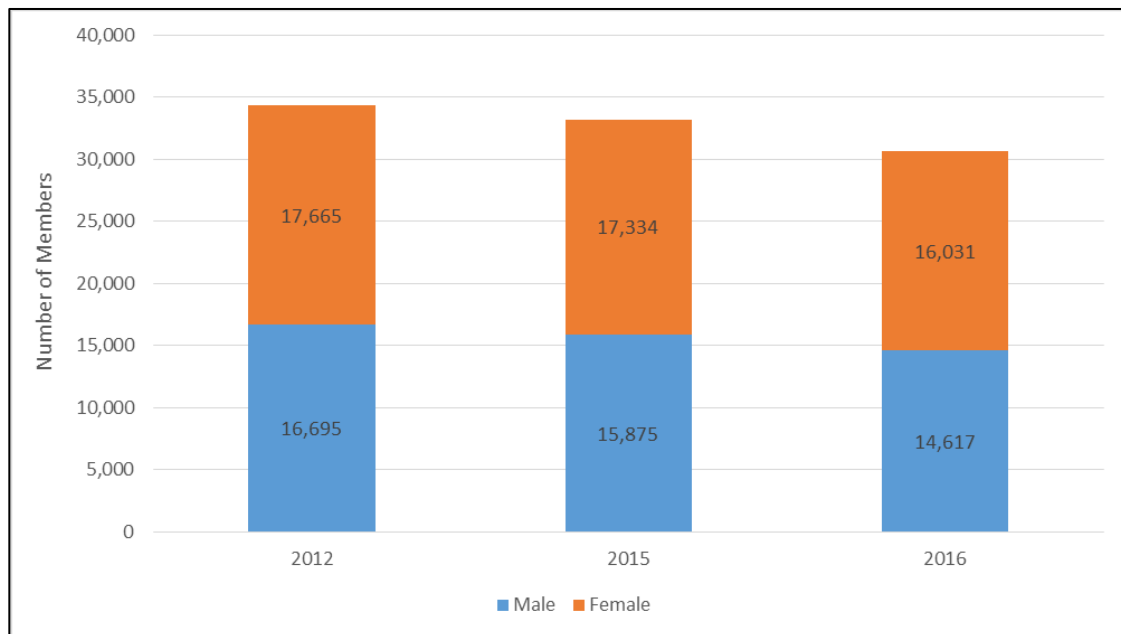


2 Summary of data used for the valuation

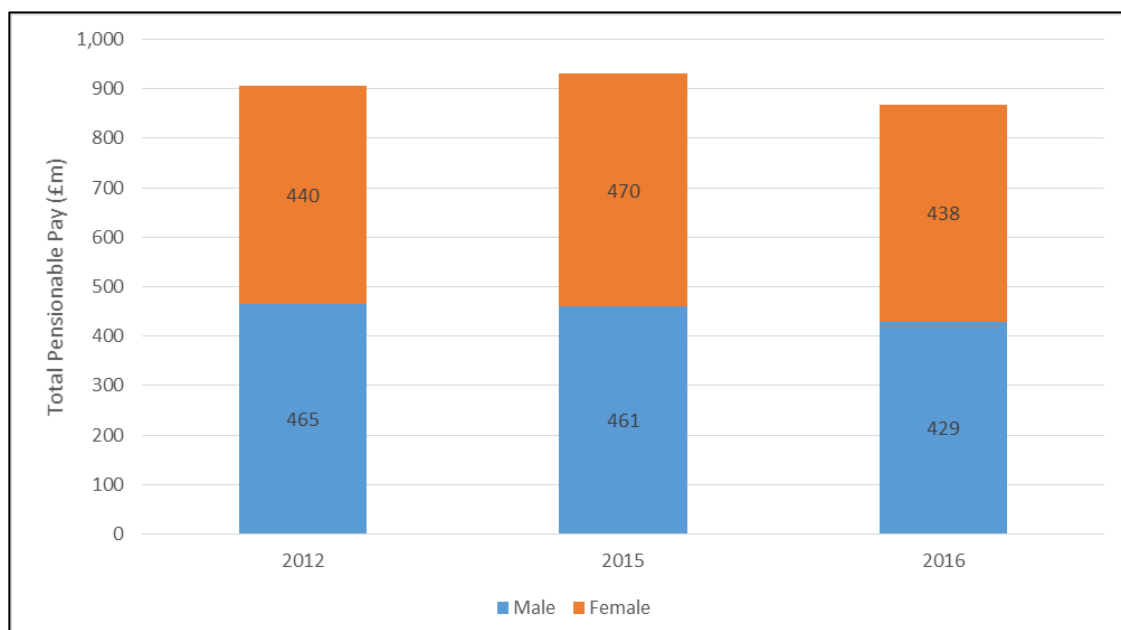
Membership data at 31 March 2016

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

Graph 2.1: Number of active members

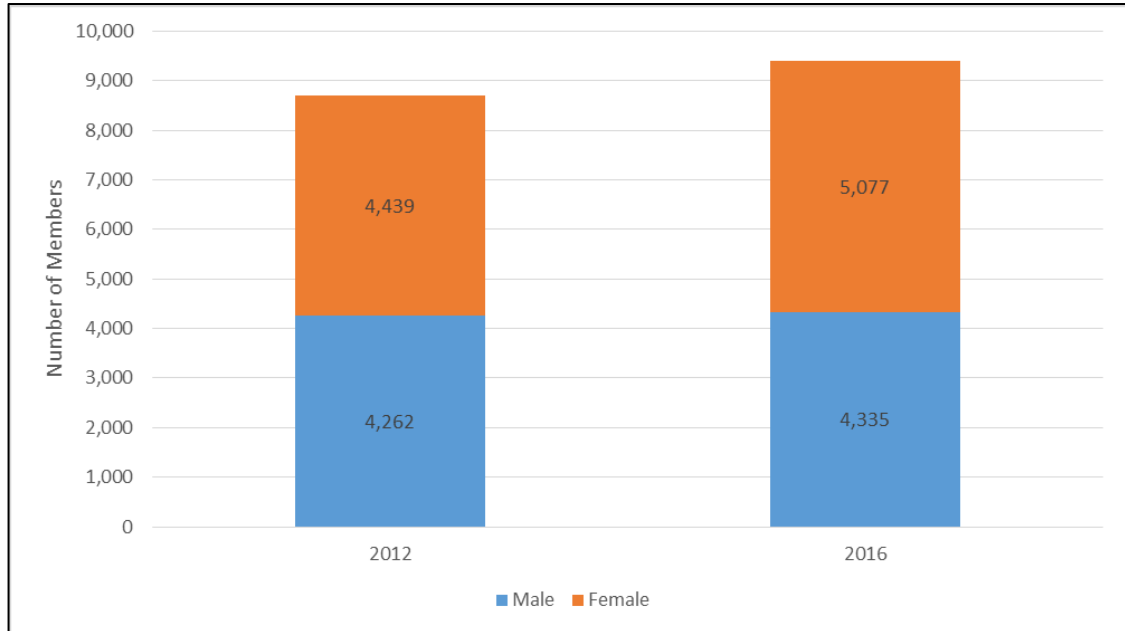


Graph 2.2: Active total pensionable pay (full time pay)

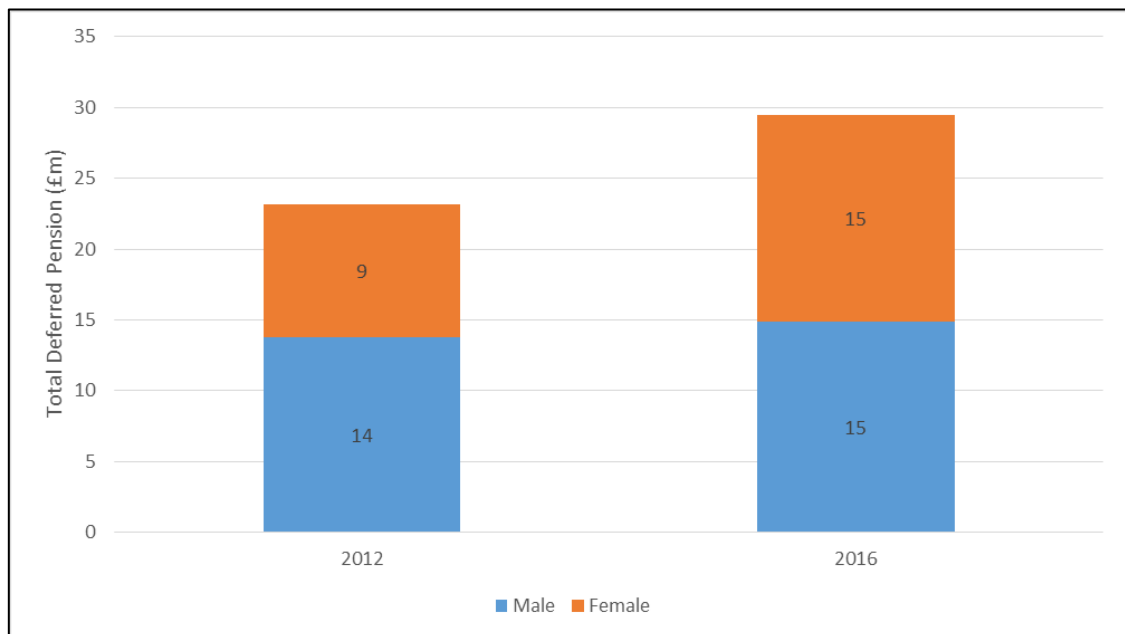




Graph 2.3: Number of deferred members



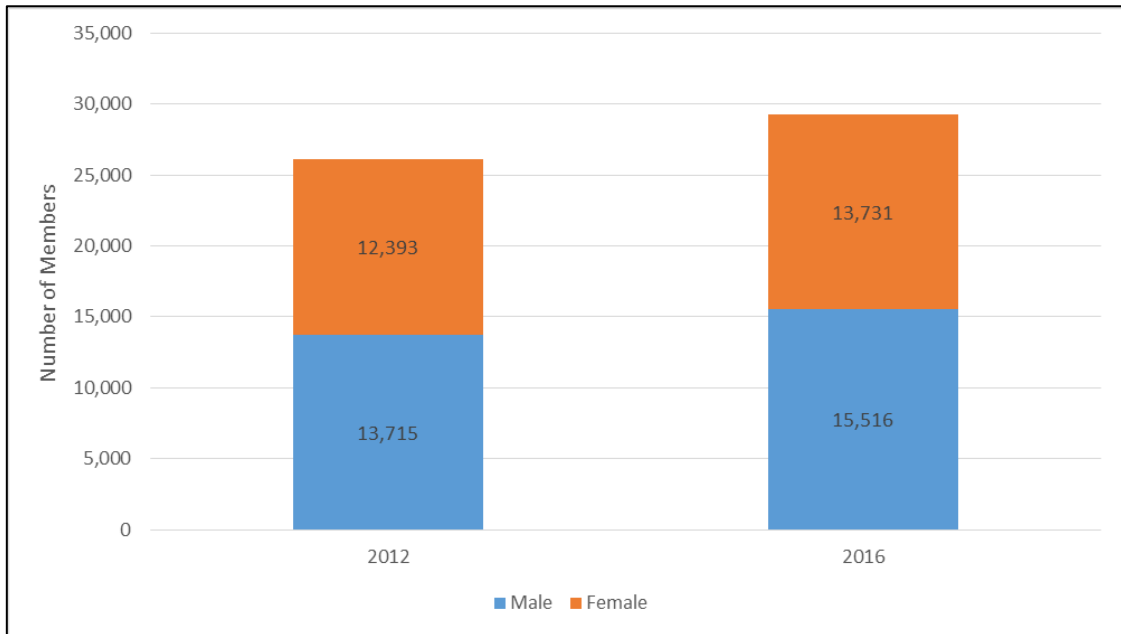
Graph 2.4: Total deferred pension



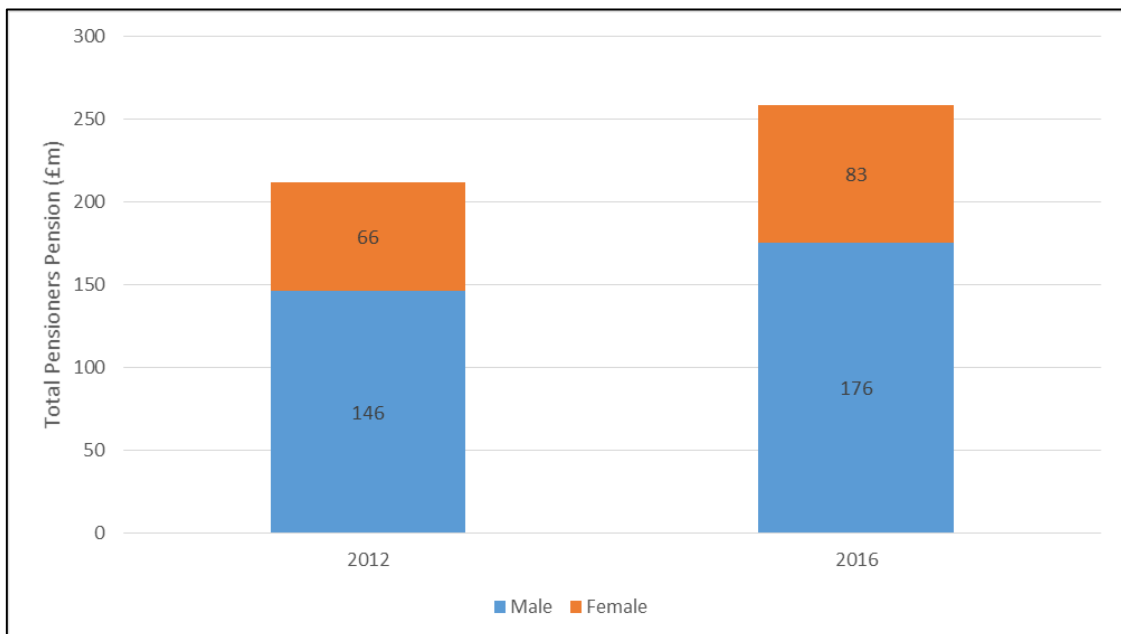
2012 pension amount includes the increase applied in April 2012



Graph 2.5: Number of pensioners and dependents



Graph 2.6: Total pension in payment (pensioners and dependents)



2012 pension amount includes the increase applied in April 2012

- 2.2 The graphs above show an increase between 2012 and 2016 in the pensioner and deferred membership by both headcount and total pension roll. Active membership decreased over the same period, by both headcount and total salary. The reduction in active membership of the scheme (and increase in deferred and pensioner membership) can mostly be attributed to the large redundancy exercises during the inter-valuation period, the most significant of which were in 2015-16.



- 2.3 Around 69,800 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.
- 2.4 Some adjustments were made to active member records where reasonable estimates of missing or unreliable data could be made. Adjustments were made to around 40% of the active member records. Further details of these amendments are provided in section 3 and Appendix E.
- 2.5 Where reasonable estimates could not be made, records with key data items either missing or unreliable were excluded for valuation calculation purposes and calculations for remaining members were uprated on a headcount basis. 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	1.01	1.01
Deferred members	1.01	n/a	1.02
Pensioner members	1.00	n/a	1.01
Total membership	1.04	n/a	1.01

- 2.6 Making assumptions about missing data and allowing for known members with unusable data by uprating introduces uncertainty into the valuation results. Appendix F gives an indication of the potential level of uncertainty introduced by the approach taken to missing or unreliable data.
- 2.7 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 F) should be noted, and we recommend identified issues are rectified before subsequent data extracts are commissioned.

Movements data 31 March 2012 to 31 March 2016

- 2.8 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 cost cap net leavers liability ('CCNLL'). The graphs 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 F: gives an indication of the potential level of uncertainty introduced into the valuation results owing to missing or unreliable movements data.



Graph 2.7: Active membership reconciliation



- 2.9 The number of age retirements included in the above reconciliation do not include around 1,075 partial retirements (as these do not result in exit from active status).
- 2.10 New entrants in the above reconciliation include re-entrants from deferred status. Where a member has had multiple exits from active status only a single exit is counted in the reconciliation (and no entrant is recorded for those in service prior to 31 March 2012). Where members joined and left within the inter-valuation period (and so are not present in the active data at 2012 or 2016), or left and rejoined over the inter-valuation period (and so were active members in both 2012 and 2016), their movements are excluded from the reconciliation. This approach may be different to any member reconciliations shown in the Schemes' annual accounts, as we would generally expect these to show all movements (i.e. including multiple exits and movements for those that enter and exit over the inter-valuation period).
- 2.11 Redundancy exercises over the inter-valuation period have had a significant impact on the number of exits from active membership, particularly in 2015-16. Table 2.2 below sets out the number of age retirements and withdrawals in each year of the inter-valuation period which include withdrawals and retirements due to redundancy.

Table 2.2: Number of age retirements and withdrawals by scheme year

	2012-13	2013-14	2014-15	2015-16
Age retirements	529	555	429	1,948
Withdrawals	233	216	164	1,853

- 2.12 It has not been possible to reliably separate out age retirements and withdrawals which have arisen due to the redundancies over this period, and as such any analysis of age retirement and withdrawal experience over the period will be of limited use in setting a long term assumption about future behaviours.



Graph 2.8: Pensioner membership reconciliation



2.13 The reconciliation above illustrates there is some discrepancy (449) between the number of expected pensioners at 2016 and those within the valuation dataset. In this case we have less members within the valuation dataset at the valuation date than suggested by the movements data. Although this could suggest the number of deaths is understated, it is also possible that both the number of new pensioners and number of deaths are unreliable to some extent.



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 active 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 C. The graph below shows the total number of records provided, the total number of valid records* (records that should be included in the final valuation data - after removing duplicate records, suspended records, no liability records, etc.), the total number of records after exclusions (those that are valid and pass our checks on the data), and the total number of records after we have rated up for the excluded records. Further details are set out in Appendix E.

*For active members, valid records for this purpose includes around 12,000 records where GAD have made estimates of individual data items as set out in Appendix E.

Graph 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 40% of the active member records. The checks and adjustments applied are summarised in Appendix E.



- 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 (i.e. those that are not excluded based on our checks). Implicitly this uprating approach assumes that excluded records have the same average profile (i.e. age, pay and service) as included records. Tables 3.2 and 3.3 shows the derivation of the uprating factors¹.

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

31 March 2016	Number of valid records (A)	Number of exclusions that are rated up	Number of members after exclusions (B)	Uprating factor (A/B)	Number of records after rate ups*
Active members	30,652	2,388	28,264	1.08	30,648*
Deferred members	9,412	78	9,334	1.01	9,412
Pensioners	29,247	35	29,212	1.00	29,247
Total membership	69,311	2,501	66,810	1.04	69,307

* Four records could not be uprated for the Active membership – all records within their respective group were excluded so no remaining record could be uprated.

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

31 March 2015	Number of valid records (A)	Number of exclusions that are rated up	Number of members after exclusions (B)	Uprating factor (A/B)	Global uprating factor*	Number of records after rate ups
Active members	32,769	222	32,547	1.01	1.01	33,210

*Uprating for missing data for one employer (442 members)

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 (i.e. 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 members' future behaviours should be set for the valuation. The key data items provided for member movements are set out in Appendix D: .
- 3.6 Limited checks were applied to movements data and records were only excluded if key missing data materially impacted the analysis being undertaken.

¹ In practice uprating factors are determined for each identifiable membership group



Accounting information

- 3.7 Published resource accounts were available for the full inter-valuation 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 E.

Benefit information

- 3.8 A summary of the benefits provided to members of the Scheme is given in Appendix G.



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)

Gender	31 March 2012					31 March 2016					
	Number of members	Total Full time equivalent salary (£m)	Average full time equivalent salary (£)	Average age (i)	Average service (ii) (years)	Number of members	Total Actual pay (£m)	Total Full time equivalent salary (£m)	Average full time equivalent salary (£)	Average age (i)	Average service (iii) (years)
Male	16,695	465.1	28,085	46.6	16.6	14,617	413.4	429.2	29,366	46.7	15.3
Female	17,665	440.3	24,824	43.4	15.2	16,031	394.1	438.4	27,344	45.2	15.1
Total	34,361	905.3	26,409	45.1	15.9	30,648	807.5	867.6	28,308	46.0	15.2

(i) Weighted by full time equivalent pay

(ii) Average reckonable service in 2012 data summary includes qualifying service for Nuvos members.

(iii) Average reckonable service in 2016 data summary includes reckonable service for final salary sections only (i.e. Nuvos and Alpha members are excluded)



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

	31 March 2015					
Scheme	Number of members	Actual pay (£m)	Full time equivalent pay (£m)	Average actual pay (£)	Average age (i)	Average service (ii) (years)
Classic	20,526	553.6	597.7	26,971	49.8	22.1
Premium	6,303	162.6	171.0	25,801	40.6	10.5
Classic Plus	278	8.3	8.9	29,730	48.7	20.7
Nuvos	6,103	149.0	152.8	24,422	36.7	1.2
Total	33,210	873.5	930.3	26,304	45.9	16.1

- (i) Weighted by full time equivalent pensionable salary
(ii) Reckonable service for final salary sections only



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

	Protection status	Number of Members	Actual Pay (£m)	Full time equivalent pay (£m)	Average full time equivalent pay (£)	Average Age (i)	Average reckonable Service (ii)	Average Nuvos pension (£)	Average Alpha pension (£) (iii)
Classic	Protected / tapered	7,661	231.9	239.8	31,306	55.4	29.1	n/a	490
	Unprotected	9,566	248.1	267.8	27,993	43.8	18.3	n/a	604
Premium	Protected / tapered	1,869	40.9	53.7	28,711	57.7	6.3	n/a	526
	Unprotected	5,148	130.4	140.5	27,300	38.3	10.0	n/a	600
Classic Plus	Protected / tapered	183	4.0	5.2	28,435	58.0	8.3	n/a	368
	Unprotected	171	4.6	5.0	29,072	43.6	17.4	n/a	624
Nuvos	Protected / tapered	208	5.6	5.9	28,425	59.5	n/a	3,626	570
	Unprotected	5,526	135.1	141.4	25,583	36.6	n/a	2,045	567
Alpha	n/a	316	6.9	8.3	26,301	40.1	n/a	n/a	452
Total		30,648	807.5	867.6	28,308	46.0	15.2	2,102	590

(i) Weighted by full time equivalent pensionable salary

(ii) Reckonable service for final salary sections only

(iii) Average Alpha pension for the protected / tapered group relates only to tapered members that have transferred into Alpha since 1 April 2015.



Table A4: Comparison of deferred membership as at 31 March 2012 and 31 March 2016 (final datasets after rating up)

Gender	31 March 2012				31 March 2016			
	Number of members	Total deferred pension (i) (£m pa)	Average deferred pension (i) (£ pa)	Average age (ii)	Number of members	Total deferred pension (i) (£m pa)	Average deferred pension (i) (£ pa)	Average age (ii)
Male	4,261	13.8	3,236	50.3	4,335	14.9	3,429	50.4
Female	4,439	9.4	2,109	48.5	5,077	14.6	2,869	48.8
Total	8,700	23.2	2,661	49.6	9,412	29.4	3,127	49.6

(i) Including pension increases awarded in April following extract date

(ii) Weighted by pension



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

		31 March 2012				31 March 2016			
Type of Pensioner	Gender	Number of members	Total pension (i) (£m pa)	Average pension (i) (£ pa)	Average age (ii)	Number of members	Total pension (i) (£m pa)	Average pension (i) (£ pa)	Average age (ii)
Age and early retirement	Male	10,032	119.9	11,950	69.4	11,628	143.9	12,377	70.0
	Female	5,235	33.1	6,319	69.6	6,661	45.4	6,811	68.4
Ill health retirement	Male	3,201	25.4	7,944	63.7	3,338	30.6	9,178	65.2
	Female	2,325	14.4	6,206	61.0	2,420	17.2	7,096	62.7
Dependants	Male	482	0.9	1,967	53.7	550	1.2	2,188	57.1
	Female	4,833	18.2	3,759	74.6	4,650	20.3	4,369	75.7
Total		26,108	211.9	8,118	68.5	29,247	258.6	8,843	69.0

(i) Including pension increases awarded in April following extract date

(ii) Weighted by pension



Chart A6: Active Members full-time equivalent (FTE) pensionable pay by age

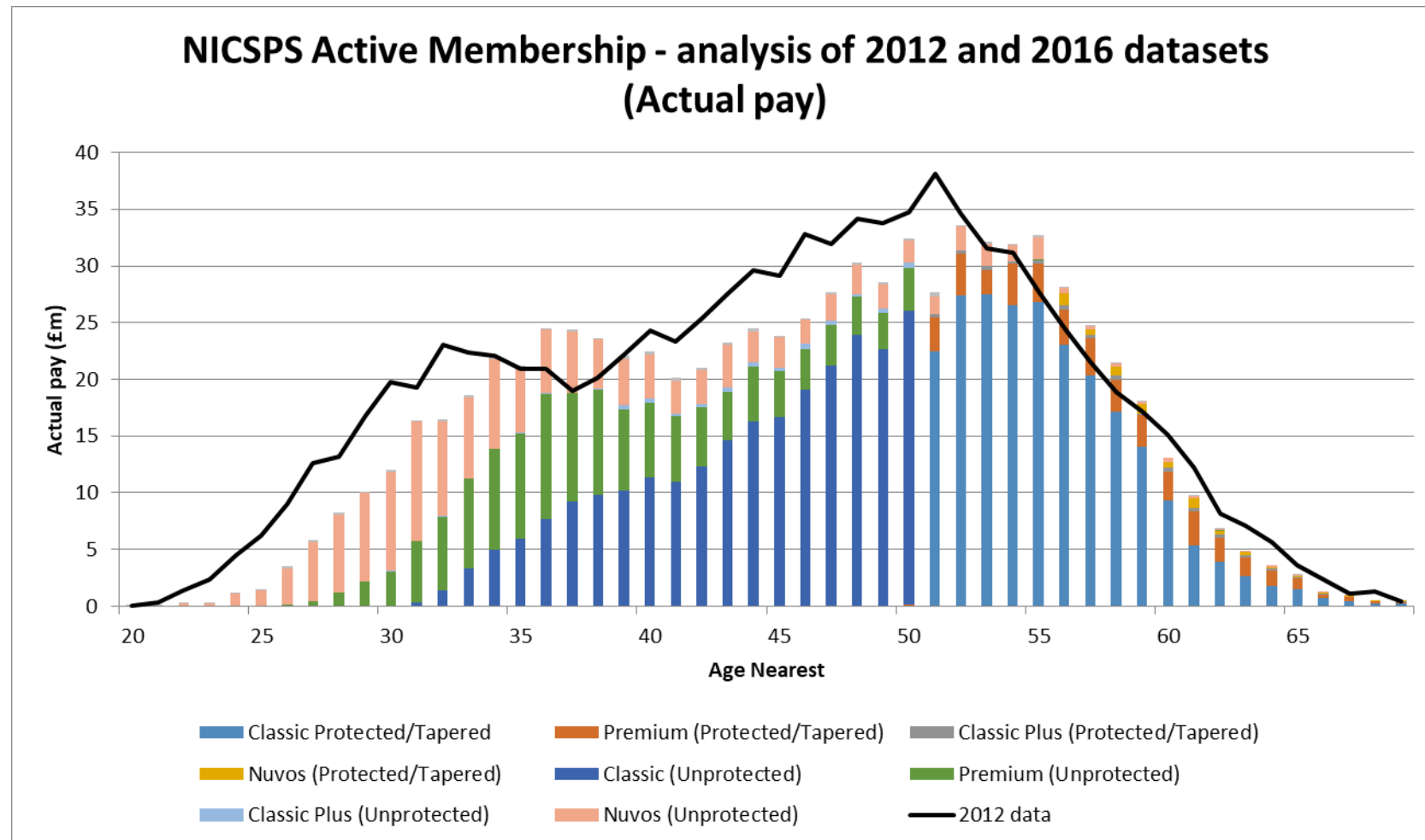




Chart A7: Deferred pension data by age

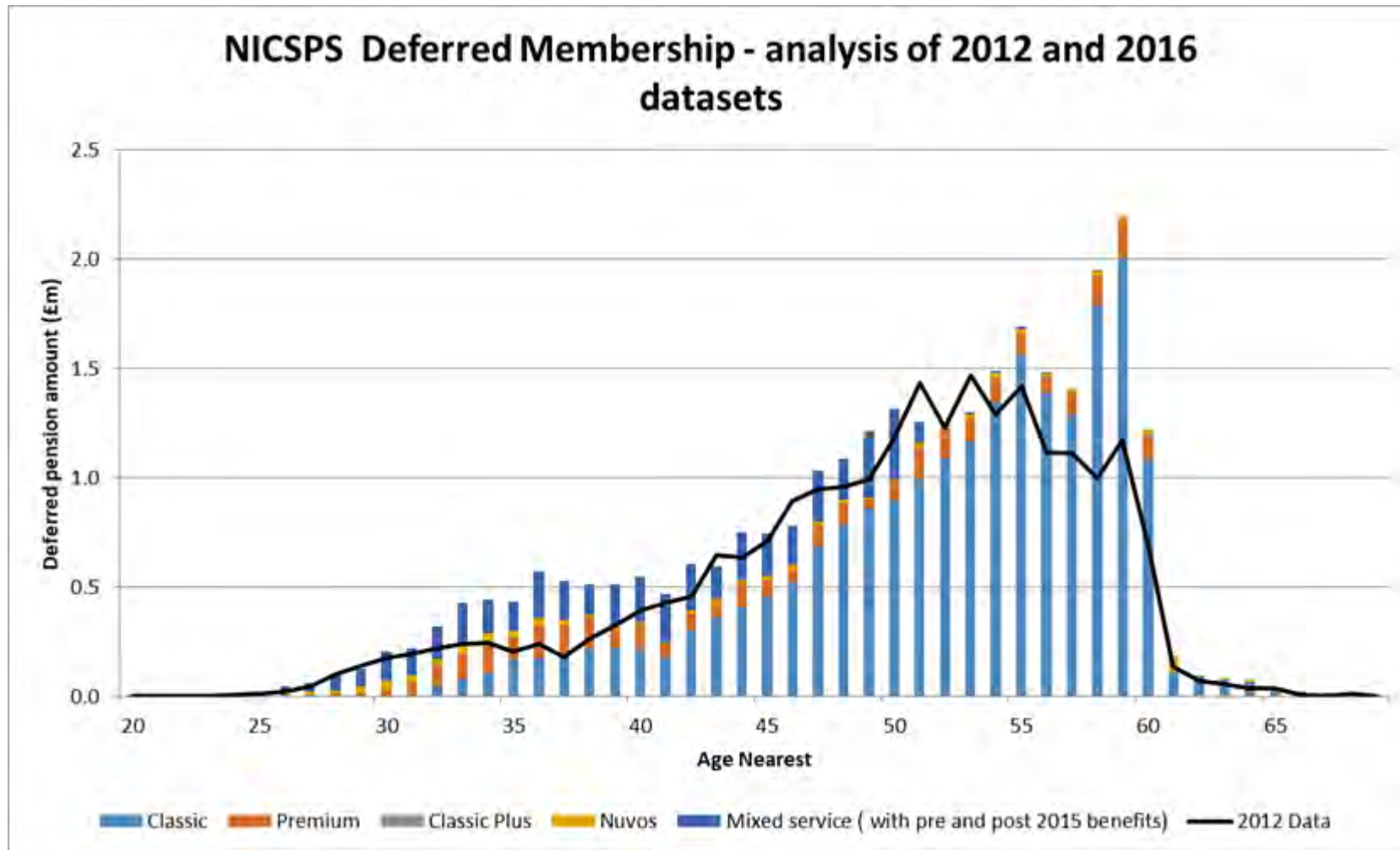




Chart A8: Summary of pension amount by age

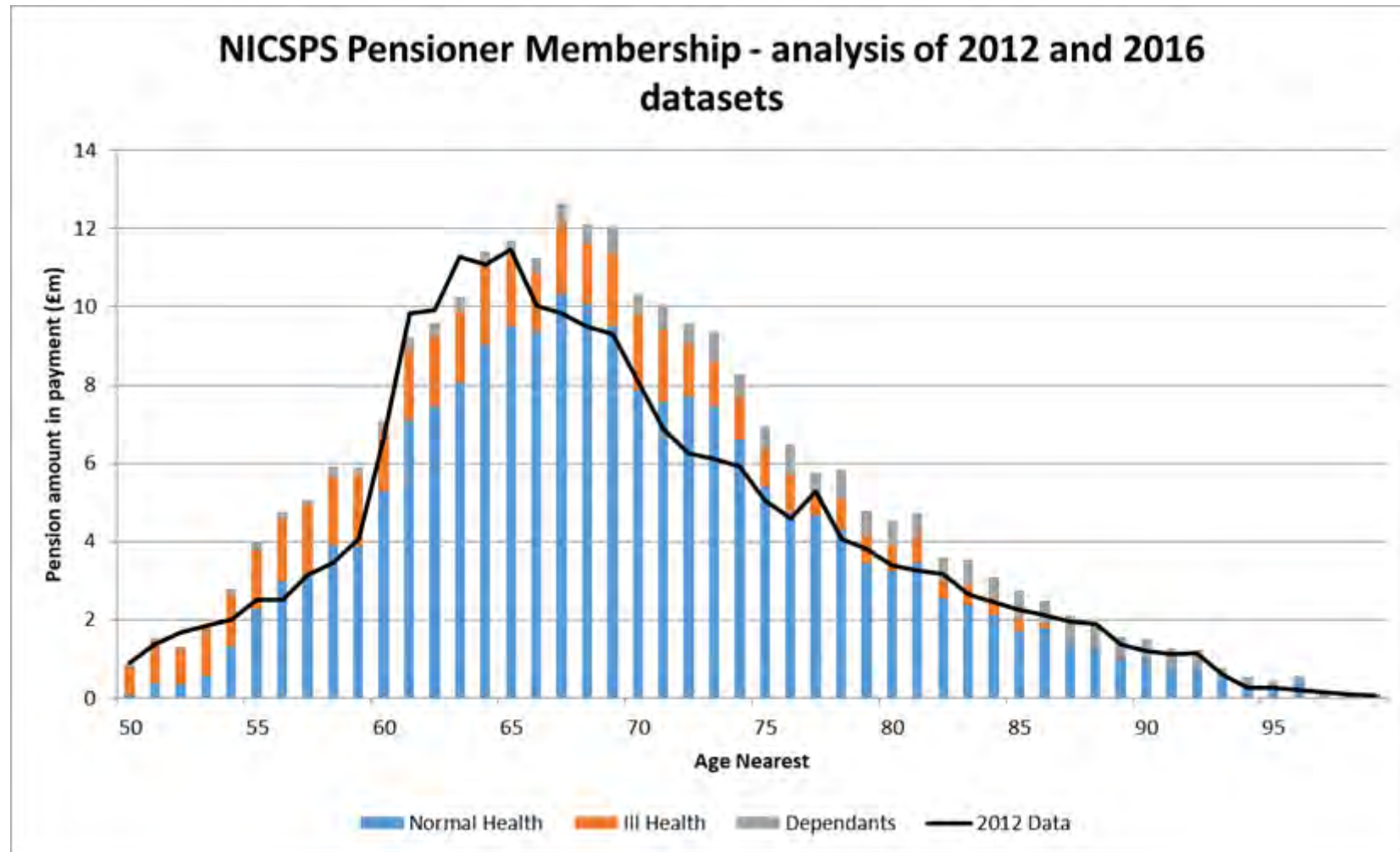




Chart A9: Active membership: Distribution of whole time equivalent pensionable pay as at 31 March 2016

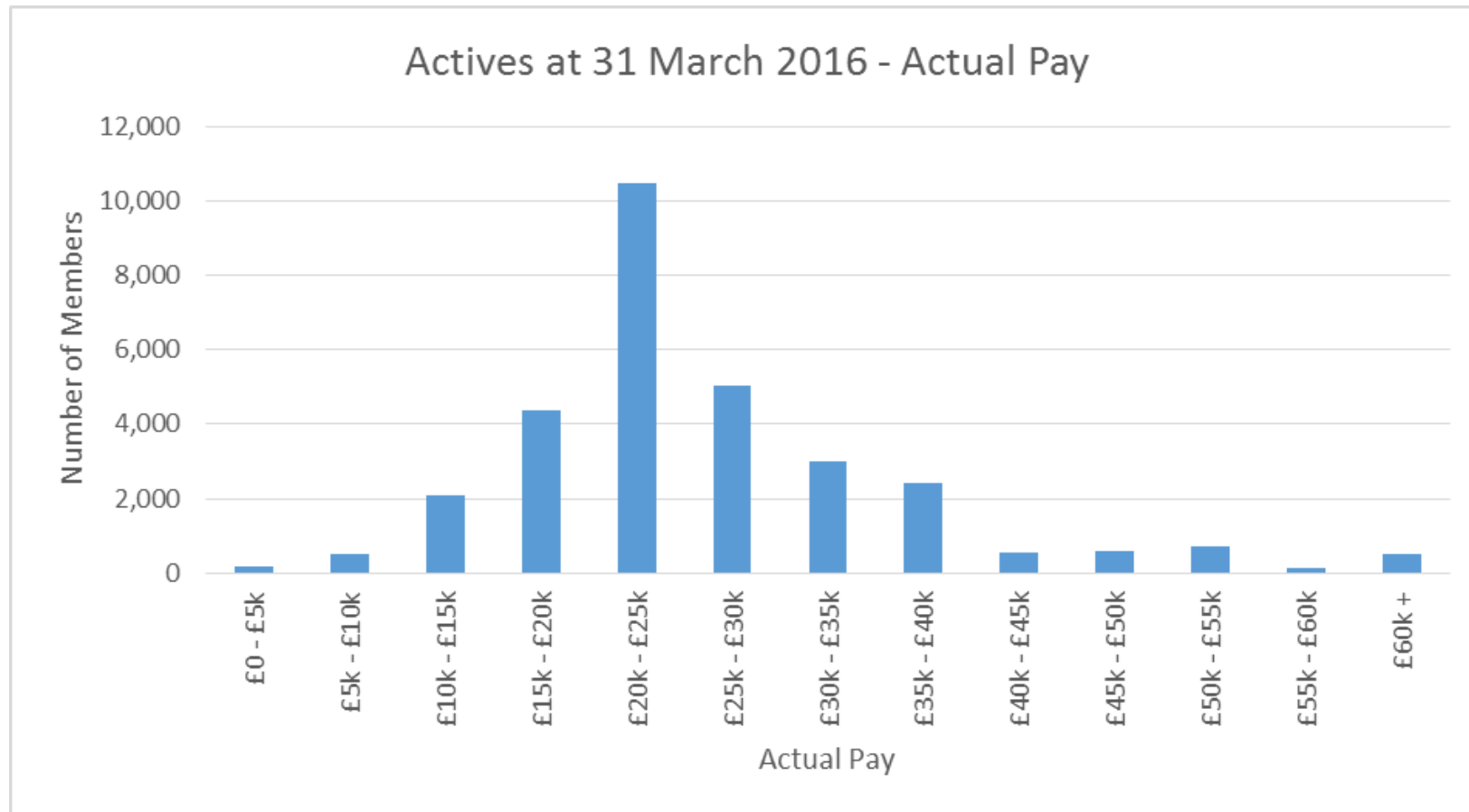
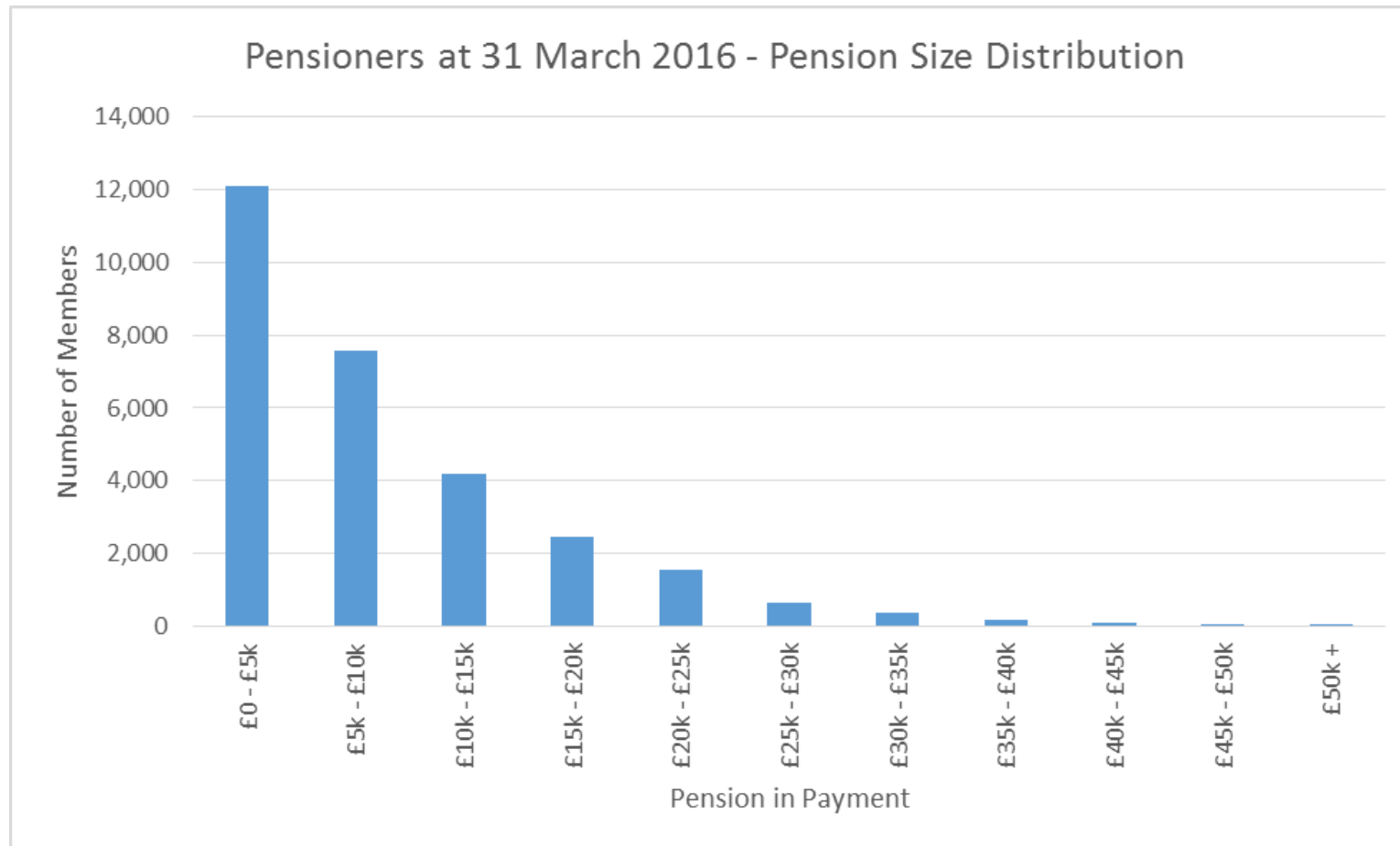




Chart A10: Pensioner membership: Distribution of pension as at 31 March 2016





Appendix B: Summary of movements data 2012-2016

Table B1: Reconciliation of active membership over the inter-valuation period (2012-16) and the prior inter-valuation period (2010-12)

	Reconciliation of membership over inter-valuation period 2012-2016 000s	Prior inter-valuation period 2010-2012 000s
Actives		
Number at 31/3/12	34,361	*33,882
Additions		
• New entrants	2,929	1,584
Deductions:		
• Deaths	(85)	(54)
• Retirements	(3,905)	(994)
• Withdrawals	(2,466)	^(417)
• Other	(15)	-
Number expected at 31/3/16	30,819	*34,001
Valuation data at 2016	30,648	*34,361

* Numbers quoted at 31 March 2010

* Numbers quoted at 31 March 2012

^ Net of rejoiners from deferred status

B.1 The number of retirements in normal health included in the above reconciliation do not include around 1,075 partial retirements (as these do not result in exit from active status).

Table B2: Reconciliation of pensioner membership over the inter-valuation period (2012-16) and the prior inter-valuation period (2010-12)

	Reconciliation of membership over inter-valuation period 2012-2016 000s	Prior inter-valuation period 2010-2012 000s
Pensioners and Dependants		
Number at 31/3/12	26,108	*25,041
Additions		
• New pensioners including new dependants	7,455	2,994
Deductions:		
• Deaths	(3,813)	(1,758)
• Other cessations ^β	(54)	
Number expected at 31/3/16	29,696	*26,277
Valuation data at 2016	29,247	*26,108

* Numbers quoted at 31 March 2010

* Numbers quoted at 31 March 2012



- B.2 The number of pensioners within each pensioner type (i.e. normal health and ill health) did not reconcile well due to deaths of ill health pensioners being recorded as deaths of normal health pensioners, and therefore for the analysis of pensioner mortality the normal health and ill health experience has been combined.

Table B3: Summary of active exits experience

Movement Type	Number of movements	Average age of movement
New entrants	2,929	34.5
Death	85	52.5
Ill Health Retirement	444	52.8
Normal Health Retirement	3,461	59.3
Partial retirements	1,075	57.7
Withdrawal	2,466	41.5
Other	15	34.5

Table B4: Summary of pensioner exits experience

Movement Type	Number of movements	Average age of movement
New entrants	7,455	
Member death	2,584	80.0
Dependant death	1,229	86.3
Other (from pensioner status)	36	
Other (dependant data cleanse)	18	



Appendix C: 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

- a. identifier;
- b. date of birth;
- c. gender;
- d. protection status;
- e. current member section (Classic, Premium, Classic Plus, Nuvos or Alpha);
- f. previous member section (Classic, Premium, Classic Plus, Nuvos) [only required for members in service before 1 April 2015];
- g. full-time equivalent pensionable pay at the extract date;
- h. actual annual pensionable pay at the extract date;
- i. final pay at the extract date;
- j. total 80ths reckonable service for member's benefits;
- k. total 80ths reckonable service counting for spouse's pension;
- l. total 60ths reckonable service for member's benefits;
- m. total 60ths reckonable service counting for spouse's pension;
- n. accrued Nuvos pension at extract date;
- o. accrued Alpha pension at extract date;
- p. Normal Pension Age (NPA) under the old Scheme sections.

Pensioners and Dependants

- a. identifier;
- b. date of birth;
- c. gender;
- d. pensioner group;
- e. protection status (only expected for retirements after 31 March 2015);
- f. PCSPS section at date of last retirement (Classic, Premium, Classic plus Nuvos or Alpha);
- g. date PCSPS pension payment commenced;
- h. total PCSPS pension in payment including pension increases awarded to the extract date;
- i. total PCSPS contingent spouse's pension;
- j. date Alpha pension payment commenced;
- k. total Alpha pension in payment, including pension increases awarded to extract date;
- l. total Alpha contingent spouse's pension;



m. currency of pension payments.

Deferred pensioners

- a. identifier;
- b. date of birth;
- c. gender;
- d. protection status (only expected for leavers after 31 March 2015);
- e. NICSPS section at date of leaving (Classic, Premium, Classic Plus, Nuvos or Alpha);
- f. PCSPS Scheme section (Classic, Premium, Classic Plus or Nuvos);
- g. date of transfer to 2015 Scheme;
- h. date of most recent exit from active service;
- i. date deemed for deferred pension increases;
- j. PCSPS preserved pension at date of leaving;
- k. PCSPS preserved lump sum (Classic / Classic Plus only) at date of leaving;
- l. Alpha preserved pension at date of leaving;
- m. Pension credit member;
- n. Normal Pension Age (NPA) under the old Scheme sections.



Appendix D: 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 or left the Scheme during that year:

- a. unique identifier;
- b. gender;
- c. date of birth;
- d. protection status;
- e. PCSPS member section (Classic, Premium, Classic Plus, Nuvos) [only required for members in service before 1 April 2015];
- f. method of entry/exit;
- g. date of entry/exit;
- h. date of prior exit for rejoiners with service aggregated;
- i. reckonable service at entry for rejoiners;
- j. (for exits only) calendar service at exit (for most recent period of service);
- k. (for exits only) total non-retirement related lump sum benefits payments from PCSPS;
- l. (for exits only) total non-retirement related lump sum benefits payments from Alpha;
- m. Employer;
- n. pre-fresh start prison officer indicator [Y/N].

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 for individual;
- b. gender;
- c. date of birth;
- d. protection status (only expected for leavers after 31 March 2015);
- e. PCSPS member section (Classic, Premium, Classic plus, Nuvos) [only required for members in service before 1 April 2015];
- f. reason for entry to/exit from deferred status;
- g. date of entry to/exit from deferred status;
- h. date of last exit from active service;
- i. total non-retirement related lump sum benefits payments from PCSPS (for exits only);
- j. total non-retirement related lump sum benefits payments from Alpha (for exits only);
- k. pension credit member indicator [Y/N].



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 for individual;
- b. for dependents, the unique identifier of the member;
- c. gender;
- d. date of birth;
- e. protection status (only expected for leavers after 31 March 2015);
- f. PCSPS member section (Classic, Premium, Classic Plus, Nuvos) [only required for members in service before 1 April 2015];
- g. pensioner group;
- h. reason for entry to/exit from pensioner status;
- i. date of pension commencing/ceasing;
- j. PCSPS pension coming into payment before commutation, at date of pension commencement (not abated and long-term amounts);
- k. PCSPS pension coming into payment after commutation, at date of pension commencement (not abated and long-term amounts);
- l. Alpha pension coming into payment before commutation, at date of pension commencement;
- m. Alpha pension coming into payment after commutation, at date of pension commencement;
- n. lump sum paid from PCSPS Scheme which is not as a result of commutation (Classic or pre-2002 members only);
- o. lump sum paid from PCSPS Scheme as a result of commutation;
- p. lump sum paid from Alpha as a result of commutation;
- q. PCSPS pension at date of exit;
- r. Alpha pension at date of exit;
- s. proportion of PCSPS pension taken on partial retirement;
- t. proportion of Alpha pension taken on partial retirement;
- u. date of birth of spouse or partner where a dependent's pension comes into payment;
- v. total pensioner related lump sum payments from PCSPS (for exits only);
- w. total pensioner related lump sum payments from Alpha (for exits only).



Appendix E: Checks and adjustments applied to the membership data

Checks and exclusion

Exclusions and upratings were identified as follows.

Table E1 – Active members as at 31 March 2016

Reason for Exclusion	Number of exclusions ^β
Actual pay missing	406
Pay outside of the reasonable range	1,833
Alpha pension outside of the reasonable range or missing	217
Nuvos pension outside of the reasonable range	415
Reckonable service outside the reasonable range	179
No liability members excluded (in Partnership or are non-members)	96
Total number of exclusions*	2,488
Total exclusions for rating up*	2,388

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

* Totals only count failed records once (i.e. they ignore multiple failures). Therefore, the total number of exclusions is not the sum of the number of exclusions for each reason.

Table E2 – Active members as at 31 March 2015

Reason for Exclusion	Number of exclusions ^β
Data format inconsistent with main dataset	422
Actual pay missing	72
Pay outside of the reasonable range	21
Reckonable service was outside the reasonable range	178
Date joined scheme missing	87
Total number of exclusions*	644
Total exclusions for rating up*	644

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

* Totals only count failed records once (i.e. they ignore multiple failures). Therefore, the total number of exclusions is not the sum of the number of exclusions for each reason.



Table E3 – Deferred members as at 31 March 2016

Reason for Exclusion	Number of exclusions ^β
Left active service after valuation date	8
Age at leaving service outside reasonable range (16 to 75)	3
Blank pension field, or pension of £0 and duplicate ID	7
Dummy data (records with same identifier that has the same, nil or missing pension)	3
Member pension outside reasonable range (less than £100 pa)	93
Other	4
Total number of exclusions*	99
Total exclusions for rating up*	78

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

* Totals only count failed records once (i.e. they ignore multiple failures). Therefore, the total number of exclusions is not the sum of the number of exclusions for each reason.

Table E4 – Pensioners as at 31 March 2016

Reason for Exclusion	Number of exclusions ^β
Pension below £100 or missing	34
Identified a dependant member with the same NI number & DOB, but a pension commencing sometime after the member's pension commenced	383
Total number of exclusions*	422
Total exclusions for rating up*	35

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

* Totals only count failed records once (i.e. they ignores multiple failures). Therefore, the total number of exclusions is not the sum of the number of exclusions for each reason.

Table E5 – Summary of total exclusions for data as at 31 March 2016

	Total number of excluded records (valid and no liability)	Total number of valid records excluded
Actives	2,488	2,388
Deferreds	99	78
Pensioners	422	35
Total exclusions	3,009	2,501



Table E6: Total data supplied as at 31 March 2016

31 March 2016	Total number of records provided	Invalid records excluded	Valid records	Number of records after rate ups
Actives	30,748	100	30,648	30,648
Deferreds	9,433	21	9,412	9,412
Pensioners	29,634	387	29,247	29,247

Table E7: Total data supplied (31 March 2015)

31 March 2015	Total number of records provided	Invalid records excluded	Valid records	Number of records after rate ups
Actives	33,191	422	32,769	33,210

Table E8: Derivation of uprating factors (31 March 2016)

31 March 2016	Number of valid records (A)	Number of exclusions that are rated up	Number of members after exclusions (B)	Uprating factor (A/B)
Active members	30,648	2,388	28,260	1.08
Deferred members	9,412	78	9,334	1.01
Pensioners	29,247	35	29,212	1.00
Total membership	69,307	2,501	66,806	1.04

Table E9: Derivation of uprating factors (active membership 31 March 2015)

31 March 2015	Number of valid records (A)	Number of exclusions that are rated up	Number of members after exclusions (B)	Uprating factor (A/B)	Global uprating factor	Number of records after rate ups
Active members	32,769	222	32,547	1.01	1.01	33,210

Adjustments applied to data for included members

Actives

A number of erroneous data fields were identified by DoF NI in the 2016 actives data when supplied to GAD, which we understand resulted from issues with the data extract software used to produce the valuation extract. Given that the issues identified only affected certain data fields, it was agreed that GAD would amend the affected data fields in order to avoid the need to exclude a significant proportion of the data. Overall around 40% of the original raw records were amended in some respect, and the most significant of these data adjustments are set out below. Many of these adjustments relate to overstating members' pay, missing or blank data and 20 employers whose data was known to be out of date. The sensitivity of the results to the assumptions used when making these amendments are set out in Appendix F.



Amendments to 2016 actives data:

- > Where full time equivalent (FTE) pay is not up-to-date or known to be incorrect, this has been replaced with the member's pay as at 31 March 2015 increased in line with the August 2015 general award of 1.1% plus an assumed average promotional increase of 0.7%. This applied to 5,079 members with either out of date pay or who were flagged as on an unpaid break.
- > Actual pay has been replaced with FTE pay multiplied by part time proportion for 11,576 members whose actual pay is known to be out of date, blank or incorrect.
- > Where reckonable service is out of date or missing (and the member is protected or has taper protection), it has been replaced with the member's reckonable service as at 31 March 2015, increased by 1 year (or period to taper protection end date) multiplied by part time proportion. This applied to 7,111 members.
- > Nuvos pension at March 2016 was replaced for 1,323 members with an amount determined from the member's Nuvos pension as at 31 March 2015 and actual pay.
- > Alpha pension at March 2016 was estimated for 6,516 members as their actual pay as at 31 March 2016 multiplied by 2.32%.

Deferreds

The most significant data adjustments made to the deferred data are set out below.

- > Pension Increases were applied to deferred pensions from date of Most Recent Exit from Active Service to valuation date. Where the date of Most Recent Exit from Active Service was before 01/04/1940 or after 31/03/2016, the member's record is excluded and remaining valid records are later rated-up for these excluded members.
- > Where the member's PCSPS Scheme section is missing, the scheme the member was in at Date of Leaving has been used.

Pensioners

The most significant data adjustments made to the pensioners data are set out below.

- > Where the members' pension group is not provided in the 2016 data it has been determined using information provided in the 2015 data where possible.
- > There are 2,132 members for whom no pension group information was provided in the 2016 data. These members are also not in the 2015 data set. Members who retired prior to age 50 have been assumed to be ill-health retirements, whereas members who retired aged over 50 have been assumed to be normal health retirements.
- > Pension Credit members have been classified as dependants.
- > For Normal Health members under the age of 55 at the valuation date, pension increases have been applied between the date pension commenced and the valuation date.



- > Where data on the PCSPS Scheme section is missing, it has been assumed that the member was in the Classic Scheme section.

Checks on updated dataset

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

Actives – as at 31 March 2016

For actives the total pensionable payroll in the adjusted 2016 actives data (£807.5m) was compared with pensionable pay as supplied by DoF NI for the Scheme's 2016-17 accounts (£796.7m). The pensionable payroll from the data is fairly close (1.4% higher) to that in the accounts.

Actives – as at 31 March 2015

The total pensionable payroll in the adjusted 2015 actives data (£873.5m) was compared with pensionable pay estimated from total pensionable pay during 2014-15 and 2015-16 as supplied by DoF NI for the Scheme's accounts (£884m and £854m respectively). The pensionable payroll from the data is reasonably close (0.5% higher) to our estimated pensionable payroll of £869.1m.

Pensioners – as at 31 March 2016

For pensioners the total pensioner payroll in the adjusted pensioner data (£258.6m) was compared with total pensions paid during 2015/16 and 2016/17 recorded in the resource accounts (£246.7m and £261.9m respectively). The pensioner payroll from the data is 1.7% higher than our estimated pensioner payroll of £254.3m (which is the average of the total pensions paid in 2015-16 and 2016-17).

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



Appendix F: 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 excluded member is in fact under/overstated by 10%.

Table F1: Impact of error in assumption for excluded data

	Uncorrected employer contribution rate	Employer contribution correction cost
2016 Actives (uprating applied: 8%)	0.3%	0.3%
2015 Actives (uprating applied: 1%)	nil	nil
Deferreds (uprating applied: 1%)	nil	nil
Pensioners (uprating applied: 0%)	nil	nil

As set out in Appendix E adjustments were also applied to 'correct' identified issues with the 2016 Actives data. The table below illustrates the extent to which the valuation results might be incorrect owing to the amendments applied as set out in Appendix E.

Table F2: Impact of error in assumptions used for amendments to 2016 actives data

	Uncorrected employer contribution rate	Employer contribution correction cost
FTE pay estimated from 2015 data for 5,079 members. Impact of correct pay being 2% higher or lower than estimated.	0.1%	0.1%
Actual pay estimated for 11,576 members. Impact of actual pay being 2% higher or lower than estimated.	nil	nil
Reckonable service estimated for 7,111 members. Impact of reckonable service being 0.2 years more or less than estimated (on average).	0.1%	0.1%

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 “Northern Ireland Civil Service Pension Schemes: Actuarial Valuation at 31 March 2016: Advice on Assumptions” report dated today.

Cost Cap Net Leavers Liability (CCNLL)

The CCNLL 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 CCNLL in accordance with the directions requires full movement data for all members who were active in 2015 and are no longer active at the 2016 valuation. Further details on the approach taken to determining CCNLL in the absence of fully complete data is provided in the Assumptions Report.



Appendix G: Summary of benefits

The Directions require the PCSPS and Alpha to be taken into account in aggregate for the purposes of the 2016 valuation. The summary of benefits provided is shown separately for the PCSPS and Alpha. The criteria by which scheme membership will be determined from 1 April 2015 are also shown.

PCSPS

The main benefit provisions of the PCSPS for each category of member are shown in Table G1, and the main benefits of the Alpha scheme are set out in table G2. Members of the Classic Plus section have some benefits which were accrued in the Classic section but they are now accruing the same benefits as members of the Premium section. Pre-Fresh Start Prison Officers are entitled to a modified version of the benefit structures set out below. In particular, unreduced pensions are payable from age 55 and service after 20 years counts double.



Table G1: Main benefit provisions of PCSPS

	Classic	Premium	Nuvos
Basis of provision	Final salary	Final salary	Career average
Contracted out/in prior to 2016⁺	Contracted out	Contracted out	Contracted out
Normal Pension Age (NPA)	60	60	65
Pension accrual rate	1/80	1/60	2.3%
Retirement lump sum accrual rate	3 x pension plus commutation at £12:£1pa	Cash by commutation only (£12: £1pa)	Cash by commutation only (£12: £1pa)
Final Pensionable pay	Best 12 months in last 3 years	Better of: a) last 12 months' pensionable pay b) best pensionable pay in last 4 scheme years c) average of best 3 consecutive years' pensionable pay in last 13 years (revalued in line with the PI Act to date of exit)	Nuvos is CARE rather than final salary scheme with revaluation in service using the same increase as produced by the PI Act (currently CPI)
Dependant benefits	50% of member pension (pre-commutation)	37.5% of member pension (pre-commutation)	37.5% of member pension (pre-commutation)
Ill health pension	Benefits payable immediately without reduction for early retirement. Benefits are based on enhanced service as follows: Actual service: 2 to 5 years – no enhancement 5 to 10 years – service doubled (subject to maximum of potential service to 65) More than 10 years – greater of 6 and 2/3 years (subject to maximum of potential service to 60) or service enhanced to 20 years (subject to maximum of potential service to 65)	Benefits payable immediately without reduction for early retirement. Benefits are based on enhanced service as follows: Lower tier (likely to be able to work in some employment): 2-5 years – service doubled 5 to 10 years – service enhanced to 10 years Over 10 years – no enhancement Upper tier (unlikely to work in any capacity in future): full potential service to age 60 Subject in all cases to a maximum enhancement of ½ potential service to 60	Benefits payable immediately without reduction for early retirement. Benefits are based on enhanced service as follows: Lower tier (likely to be able to work in some employment): Accrued pension only Upper tier (unlikely to work in any capacity in future): Enhancement = (accrued pension/contributing years) x (years to age 65)
Pension increases	In payment – increased in line with the PI Act (currently CPI), on excess over GMP In deferment – total pension increased in line with the PI Act (currently CPI)		



Alpha

The main benefit provisions of the Alpha scheme are shown in Table G2.

Table G2 - Main benefit provisions of Alpha

Alpha	
Basis of provision	Career average with revaluation each year whilst in service in line with prices as defined by HMT Order (currently CPI)
Contracted out/in prior to 2016⁺	Contracted out
Normal Pension Age (NPA)	Higher of a member's State Pension Age and 65
Pension accrual rate	2.32% each year
Retirement lump sum accrual rate	Cash by commutation only (£12: £1pa)
Final Pensionable pay	Not applicable
Dependant benefits	37.5% of member pension (pre-commutation)
Ill health pension	Consistent with the benefits on ill health retirement in the Nuvos section of PCSPS
Early Retirement	Benefits reduced for early payment. The reduction is actuarially neutral on a deferred benefit basis.
Pension increases	In payment – increased in line with the PI Act (currently CPI), on excess over GMP In deferment – total pension increased in line with the PI Act (currently CPI)

⁺benefits unaffected by contracting-out status

Criteria for scheme membership from 1 April 2015

Protected Members

All active members who, as at 1 April 2012, had 10 years or less to their current NPA (i.e. Classic, Premium and Classic Plus section members who are aged 50 and over on 1 April 2012, and Nuvos section members who are aged 55 or over on 1 April 2012) will remain in the PCSPS until they retire.



Tapered Members

Active members who, as at 1 April 2012, were between 10 and 13½ years from their NPA (i.e. Classic, Premium and Classic Plus section members who were aged between 46½ and 50 on 1 April 2012, and Nuvos section members who were aged between 51½ and 55 on 1 April 2012) had the option to remain in their current scheme with linear tapering so that for every month of age that they are beyond 10 years from their NPA, they lose two months of protection. At the end of the protected period, they will be transferred into Alpha. Alternatively, these members could opt to transfer into Alpha with effect from 1 April 2015.

Unprotected members

All other active members will be transferred to the new arrangements on 1 April 2015.