

Government Actuary's Department

Police Pension Schemes (England & Wales)

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Actuarial valuation as at 31 March 2016 Report on membership data

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1 Introduction

- 1.1 This report is addressed to the Home Office. It is also being made available to the Police Advisory Board for England and Wales as part of the consultation process relating to the actuarial valuation which is being carried out as at 31 March 2016.
- 1.2 Pension scheme membership data for the members of the 1987 Scheme, 2006 Scheme and 2015 Scheme, referred to collectively in this report as 'the Schemes', is required for the actuarial valuation of the Scheme as at 31 March 2016, carried out in accordance with The Public Service Pensions (Valuations and Employer Cost Cap) Directions 2014 (as amended) ('the 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 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.
- 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 to GAD either directly by the individual police forces or via their appointed administrators. Supplementary financial information for the Schemes has been provided by the Home Office for independent checking purposes.
- 1.7 In preparing this report, GAD has relied on data and other information supplied by the police forces 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 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.
- 1.12 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 data 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)











¹ Including pension increases awarded in April following extract date.



Chart 2.5: Number of pensioners and dependants





2.2 The graphs above show a decrease between 2012 and 2016 in the active headcount and total salary roll. There has been an increase between 2012 and 2016 in the deferred, pensioner and dependent membership by both headcount and total pension.

² Including pension increases awarded in April following extract date.

2.3 Around 300,000 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, where appropriate. 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.

Table 2.1: Uprating factors

	Uprating factor	Uprating factor
	2016	2015
Active members	1.02718	1.00180
Deferred members	1.00827	n/a
Pensioners	1.00364	n/a
Total membership	1.01340	1.00180

2.4 Making assumptions about missing data and allowing for known members with unusable data by uprating introduces uncertainty into the valuation results. In my opinion the data used as summarised above is adequate for the purposes of the valuation.

Movements data 31 March 2012 to 31 March 2016

2.5 The movements data provided is used for the purposes of informing the demographic assumptions to be used for the 2016 valuation. The graphs below show a reconciliation of the movements between 2012 and 2016. The underlying numbers and some further information are set out in Appendix B.



Chart 2.7: Active membership reconciliation

Chart 2.8: Deferred membership reconciliation





Chart 2.9: 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 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. Each of the 43 police forces in England and Wales, plus the organisations Her Majesty's Inspectorate of Constabulary (HMIC) and National Crime Agency (NCA) have provided data for all individual members of the schemes as at 31 March 2016. The graph 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.



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. Most police forces were able to provide most of the data items requested.
- 3.3 Based on the checks applied some records were excluded from the dataset for valuation purposes. Uprating factors were determined for each membership category equal to the ratio of known valid records and the number of records with adequate data. Implicitly this uprating approach assumes that excluded records have the same average profile (ie age, sex, pay, service) as included records. Tables 3.1 and 3.2 shows the derivation of the uprating factors³.

³ In practice uprating factors are determined for each identifiable valuation group.

31 March 2016	Number of valid records (A)	Number of exclusions	Number of members after exclusions (B)	Uprating factor (A/B)
Active members	120,673	3,193	117,480	1.02718
Deferred members	27,786	228	27,558	1.00827
Pensioners	152,020	551	151,469	1.00364
Total membership	300,479	3,972	296,507	1.01340

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

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

31 March 2015		Number of exclusions	Number of members after exclusions (B)	Uprating factor (A/B)
Active members	125,045	225	124,820	1.00180

Movements data - 31 March 2012 to 31 March 2016

3.4 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 D.

Independent data check

3.5 The Home Office provided financial data for the Schemes which has been used to perform independent checks on the dataset supplied. These checks and the data used are set out in Appendix E.

Benefit information

3.6 A summary of the benefits provided to members of the Schemes is given in Appendix H. The only uncertainty about the form of benefits that the Schemes are 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

Actives

Table A1: Summary data for 1987 Scheme actives members as at 31 March 2016: split by protection status

Protection (i)	Gender	Number of members	Total Pensionable Salary (FTE⁴) £m	Average Pensionable Salary (FTE) £	Total Actual Pay £m	Average Age (ii) years	Average Service (iii) years	Total 2015 Scheme pension £000
Protected	Male	23,154	997.0	43,057	996.5	50.2	25.3	2
	Female	6,145	252.5	41,099	250.0	49.7	24.8	5
	Total	29,299	1,249.5	42,646	1,246.5	50.1	25.2	7
Taper	Male	10,076	415.9	41,274	415.4	45.8	19.7	416
-	Female	3,972	154.2	38,816	149.9	45.6	20.0	163
	Total	14,048	570.1	40,579	565.3	45.7	19.8	579
Unprotected	Male	26,511	1,045.5	39,437	1,044.0	38.7	13.7	16,324
	Female	12,410	464.7	37,449	436.7	38.3	13.3	6,517
	Total	38,921	1,510.3	38,803	1,480.7	38.6	13.5	22,841
All 1987 Members	Total	82,268	3,329.8	40,475	3,292.5	44.1	18.8	23,427

i. This table includes tapered protection and unprotected members who had moved to the 2015 Scheme by 31 March 2016. The final column shows the total 2015 Scheme pension accrued for these members.

ii. Weighted by actual salary.

iii. Final salary service up to date of transition to the 2015 scheme in calendar years, including transferred in service.

⁴ Full time equivalent.

Table A2: Summary data for 2006 Scheme actives members as at 31 March 2016: split by protection status

Protection (i)	Gender	Number of members	Total Pensionable Salary (FTE) £m	Average Pensionable Salary (FTE) £	Total Actual Pay £m	Average Age (ii) years	Average Service (iii) years	Total 2015 Scheme pension £000
Protected	Male	808	28.6	35,463	28.6	51.9	11.6	4
	Female	326	11.3	34,522	11.1	52.0	10.9	2
	Total	1,134	39.9	35,192	39.7	51.9	11.4	6
Taper	Male	797	27.3	34,285	27.3	46.8	10.7	36
-	Female	461	15.5	33,657	15.3	46.8	10.3	20
	Total	1,258	42.8	34,055	42.6	46.8	10.6	56
Unprotected	Male	21,023	654.9	31,153	654.6	32.7	5.6	10,233
	Female	11,446	353.9	30,914	344.1	32.5	5.9	5,217
	Total	32,469	1,008.8	31,069	998.7	32.6	5.7	15,450
All 2006 Members	Total	34,861	1,091.5	31,310	1,081.0	33.9	6.1	15,512

i. This table includes tapered protection and unprotected members who had moved to the 2015 Scheme by 31 March 2016. The final column shows the total 2015 Scheme pension accrued for these members.

ii. Weighted by actual salary.

iii. Final salary service up to date of transition to the 2015 scheme in calendar years, including transferred in service.

Table A3: Summary data for 2015 Scheme actives members (new joiners since 1 April 2015) as at 31 March 2016

Protection	Gender	Number of members	Total Pensionable Salary (FTE) £m (i)	Average Pensionable Salary (FTE) £ (i)	Total Actual Pay £m	Average Age (ii) years	Average Service (iii) years	Total 2015 Scheme pension £000
New joiners	Male	2,379	n/a	n/a	45.4	28.4	0.5	427
	Female	1,165	n/a	n/a	22.0	28.3	0.5	222
All 2015 Members	Total	3,544	n/a	n/a	67.4	28.4	0.5	649

i. A full time equivalent pensionable salary is not used for the valuation of 2015 Scheme benefits.

ii. Weighted by actual salary.

iii. Final salary service up to valuation date in calendar years, including transferred in service.

Table A4: 1987 Scheme actives data as at 31 March 2016: Comparison with data as at 31 March 2012

	2012					2016						
	Number of members	Total Pensionable Salary £m (FTE)	Averag e Salary (FTE) £	Average Age (i) years	Average Service (ii) years	Number of members	Total Pensionable Salary (FTE) £m	Average Salary (FTE) £	Average Age (iii) years	Average Service (iv) years	Total 2015 Scheme Pension £m	Total Actual Pay £m
Male	80,368	3,208.6	39,924	42.6	17.6	59,742	2,458.4	41,150	44.6	19.2	16.7	2,455.9
Female	27,861	1,063.9	38,186	39.9	14.3	22,526	871.4	38,686	43.0	17.6	6.7	836.6
Total	108,229	4,272.5	39,476	41.9	16.7	82,268	3,329.8	40,475	44.1	18.8	23.4	3,292.5

i. Weighted by full-time equivalent pensionable pay at the relevant date.

ii. Active service in the scheme plus transferred-in service.

iii. Weighted by actual salary.

iv. Final salary service up to date of transition to the 2015 scheme in calendar years, including transferred in service.

Table A5: 2006 Scheme actives data as at 31 March 2016: Comparison with data as at 31 March 2012

	2012					2016	2016						
	Number of members	Total Pensionable Salary (FTE) £m	Average Salary (FTE) £	Average Age (i) years	Average Service (ii) years	Number of members	Total Pensionable Salary (FTE) £m	Average Salary (FTE) £	Average Age (iii) years	Average Service (iv) years	Total 2015 Scheme Pension £m	Total Actual Pay £m	
Male	16,530	496.1	30,012	31.9	4.6	22,627	710.9	31,417	34.0	6.0	10.3	710.5	
Female	9,644	288.8	29,946	31.6	4.6	12,234	380.6	31,114	33.7	6.2	5.2	370.5	
Total	26,174	784.4	29,969	31.7	4.6	34,861	1,091.5	31,310	33.9	6.1	15.5	1,081.0	

i. Weighted by full-time equivalent pensionable pay at the relevant date.

ii. Active service in the scheme plus transferred-in service.

iii. Weighted by actual salary.

iv. Final salary service up to date of transition to the 2015 scheme in calendar years, including transferred in service.

Table A6: 2015 Scheme actives data as at 31 March 2016: Comparison with data as at 31 March 2012

	2012					2016							
	Number of members (i)	Total Pensionable Salary	Average Salary	Average Age	Average Service	Number of members	Total Pensionable Salary (FTE) (ii) £m	Average Salary (FTE) £ (ii)	Average Age (iii) years	Average Service (iv) years	Total 2015 Scheme Pension £m	Total Actual Pay £m	
Male	-	-	-	-	-	2,379	n/a	n/a	28.4	0.5	0.4	45.4	
Female	-	-	-	-	-	1,165	n/a	n/a	28.3	0.5	0.2	22.0	
Total	-	-	-	-	-	3,544	n/a	n/a	28.4	0.5	0.6	67.4	

i. There were no 2015 Scheme members in 2012.

ii. A full time equivalent pensionable salary is not used for the valuation of 2015 Scheme benefits.

iii. Weighted by actual salary.

iv. Active service up to valuation date in calendar years, including transferred in service.

Table A7: Summary data for all active members as at 31 March 2016: Comparison with data as at 31 March 2012

	2012					2016	2016						
	Number of members	Total Pensionable Salary (FTE) £m	Average Salary (FTE) £	Average Age (i) years	Average Service (ii) years	Number of members	Total Pensionable Salary (FTE) £m (iii)	Average Salary (FTE) £ (iii)	Average Age (iv) years	Average Service (v) years	Total 2015 Scheme Pension £m	Total Actual Pay £m	
Male	96,898	3,704.7	38,233	41.2	15.4	84,748	3,190.3	37,396	42.0	15.7	27.4	3,211.8	
Female	37,505	1,352.7	36,067	38.1	11.8	35,925	1,263.7	34,853	39.9	13.8	12.1	1,299.1	
Total	134,403	5,057.4	37,629	40.3	14.4	120,673	4,454.0	36,802	41.4	15.2	39.6	4,441.0	

Weighted by full-time equivalent pensionable pay at the relevant date. Active service in the scheme plus transferred-in service. i.

ii.

These figures exclude 2015 Scheme members who joined since 1 April 2015. iii.

Weighted by actual salary. iv.

Active service up to valuation date in calendar years, including transferred in service. ٧.

Table A8: Summary data for active members as at 31 March 2015

Protection	Gender	Number of members	Total Pensionable Salary (FTE) £m	Average Pensionable Salary (FTE) £	Total Actual Pay £m	Average Age (i) years	Average Service (ii) years
Protected (iii)	Male	39,870	1,661.6	41,675	1,660.4	48.3	22.7
	Female	11,974	465.7	38,895	458.3	47.5	21.3
	Total	51,844	2,127.3	41,033	2,118.8	48.1	22.4
Unprotected	Male	48,501	1,671.5	34,463	1,669.5	35.5	9.7
	Female	24,700	813.4	32,930	780.3	34.8	9.3
	Total	73,201	2,484.9	33,946	2,449.8	35.2	9.6
All Members	Total	125,045	4,612.2	36,884	4,568.6	41.2	14.9

i. Weighted by actual salary.

ii. Final salary service up to valuation date, including transferred in service.

iii. Includes tapered members.

Deferreds

Table A9: 1987 Scheme deferred data as at 31 March 2016: Comparison with data as at 31 March 2012

	2012				2016				
	Number of members	Total Deferred Pension (i) £m	Average Pension £	Average Age (ii) years	Number of members	Total Deferred Pension (i) £m	Average Pension £	Average Age (ii) years	Total 2015 Scheme Pension £000s
Male	13,420	103.9	7,742	47.9	14,152	119.0	8,411	48.3	108.8
Female	8,652	52.6	6,080	47.7	9,942	69.4	6,981	48.7	43.5
Total	22,072	156.5	7,090	47.8	24,094	188.4	7,821	48.5	152.4

i. Including pension increases awarded in April following the valuation date.

ii. Weighted by deferred pension.

Table A10: 2006 Scheme deferred data as at 31 March 2016: Comparison with data as at 31 March 2012

	2012				2016				
	Number of members	Total Deferred Pension (i) £m	Average Pension £	Average Age (ii) years	Number of members	Total Deferred Pension (i) £m	Average Pension £	Average Age (ii) years	Total 2015 Scheme Pension £000s
Male	690	1.2	1,739	35.8	2,230	5.6	2,496	36.9	77.5
Female	399	0.6	1,504	35.4	1,462	3.6	2,434	36.4	47.8
Total	1,089	1.8	1,653	35.7	3,692	9.1	2,472	36.7	125.3

i. Including pension increases awarded in April following the valuation date.

ii. Weighted by deferred pension.

Table A11: Summary data for all deferred members as at 31 March 2016: Comparison with data as at 31 March 2012

	2012				2016				
	Number of members	Total Deferred Pension (i) £m	Average Pension £	Average Age (ii) years	Number of members	Total Deferred Pension (i) £m	Average Pension £	Average Age (ii) years	Total 2015 Scheme Pension £000s
Male	14,110	105.1	7,449	47.7	16,382	124.6	7,605	47.8	186.4
Female	9,051	53.3	5,889	47.6	11,404	73.0	6,398	48.1	91.3
Total	23,161	158.4	6,839	47.7	27,786	197.6	7,110	47.9	277.7

i. Including pension increases awarded in April following the valuation date.

ii. Weighted by deferred pension.

Pensioners

Table A12: Summary data for all pensioner members as at 31 March 2016: Comparison with data as at 31 March 2012

		2012				2016				
		Number of members	Total Pension (i) £m	Average Pension £	Average Age (ii) years	Number of members	Total Pension (i) £m	Average Pension £	Average Age (ii) years	Total 2015 Scheme Pension £000s (iii)
Age	Male	78,817	1,557.6	19,762	63.9	88,441	1,897.0	21,453	64.7	-
Retirement	Female	4,122	73.2	17,758	57.9	7,160	130.2	18,192	58.7	-
	Total	82,939	1,630.8	19,663	63.6	95,601	2,027.2	21,209	64.3	-
III-Health	Male	26,019	382.4	14,697	64.0	25,552	396.2	15,506	66.2	29.0
Retirement	Female	6,034	58.2	9,645	53.6	6,887	72.7	10,550	55.4	59.8
	Total	32,053	440.6	13,746	62.6	32,439	468.9	14,454	64.5	88.8
Dependants	Male	202	1.2	5,941	59.2	231	1.5	6,651	58.4	-
(iv)	Female	21,882	177.7	8,121	74.1	22,433	212.3	9,465	75.3	10.0
	Children	1,430	4.8	3,357	18.4	1,316	4.5	3,396	18.8	11.2
	Total	23,514	183.8	7,817	72.5	23,980	218.3	9,105	74.0	21.3
All	Male	105,708	1,943.5	18,386	63.8	114,863	2,296.9	19,997	64.9	37.9
	Female Total	32,798 138,506	311.7 2,255.2	9,504 16,282	66.0 64.1	37,155 152,020	417.4 2,714.4	11,235 17,856	66.3 65.1	71.5 110.0

i. Including pension increases awarded in April following the valuation date, where applicable.

ii. Weighted by pension.

iii. Included in Total Pension.

iv. Including pension credit members.

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Police Pension Schemes (England & Wales): Actuarial valuation as at 31 March 2016 Report on membership data

Chart A1: Active Members actual pay by age



Government	Police Pension Schemes (England & Wales):
Actuary's	Actuarial valuation as at 31 March 2016
Department	Report on membership data

Chart A2: Deferred pension data by age



Chart A3: Summary of pension in payment amount by age



Government	Police Pension Schemes (England & Wales):
Actuary's	Actuarial valuation as at 31 March 2016
Department	Report on membership data





Government	
Actuary's	
Department	

Chart A5: Pensioner membership: Distribution of pension in payment as at 31 March 2016 (excluding dependants)



Appendix B: Summary of movements data

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

the prior intervaluation period	Reconcilation of membership over intervaluation period 2012-2016 000s	Prior intervaluation period 2008-2012 000s
	Actives	
Number at 31/3/12	134.4	-
Additions		-
New entrants	16.0	-
Deductions:		
Deaths	(0.1)	(0.3)
Retirements	(17.3)	(17.4)
Withdrawals	(9.9)	(6.6)
Other exits	(2.5)	(0.1)
Number expected at 31/3/16	120.5	-
Valuation data at 2016	120.7	-
	Deferreds ⁵	
Number at 31/3/12	23.2	-
Additions		
New deferreds	9.0	-
Deductions:		
Deaths	(0.1)	(0.1)
Retirements	(2.3)	(1.5)
Rejoiners to active	(0)	(0)
Other exits	(1.2)	(1.3)
Number expected at 31/3/16	28.5	-
Valuation data at 2016	27.8	-
	Pensioners	
Number at 31/3/12	115.0	-
Additions		
New pensioners	21.2	-
Deductions:		
Deaths	(8)	(7.5)
Other cessations	(0.2)	(0)
Number expected at 31/3/16	128.0	-
Valuation data at 2016	128.3	-
	Dependants	
Number at 31/3/12	23.5	-
Additions		
New dependants	6.5	-
Deductions:		
Deaths	(4.6)	(3.9)
Other cessations	(0.7)	(0.6)
Number expected at 31/3/16	24.7	-
Valuation data at 2016	23.7	-

⁵ Includes pension credit members.

The analaysis of the movement data excluded data from police forces for which the movement data either:

- > did not appear credible; or
- > did not show a reasonable reconciliation with the member data as at 2012 and 2016.

Further details of the exclusions that were made is shown in Appendix F.

Movement Type	Number of movements	Average Age of movement	
Entrant	15,981	29.0	
Death	141	45.8	
III Health Retirement	2,304	47.0	
Normal Health Retirement	14,980	52.7	
Withdrawal	9,931	37.4	
Other ¹	2,523	60.2	

¹This includes 1,696 records without an exit code. The average age of these members was 68.8 years.

Number of movements	Average Age of movement		
8,992	39.0		
905	40.9		
76	52.4		
173	48.4		
2,154	56.3		
252	46.4		
70	58.5		
9	34.8		
	movements 8,992 905 76 173 2,154 252 70		

Table B3: Summary of Deferred Pensioner Experience

Table B4: Summary of Pensioner Experience

Movement Type	Number of movements	Average Age of movement	
Entrant	21,228	53.8	
Death (Unknown dependant status)	61	77.4	
Death (no dependant)	5,631	79.1	
Death (w dependant)	2,327	78.2	
Trivial Commutation	6	70.8	
Other ¹	202	81.9	

¹This includes 56 movements without an exit code with an average age of 84.0 years.

Movement Type	Number of movements	Average Age of movement
Entrant	6,513	67.4
Death	4,631	87.1
Age Limit Attained	127	27.5
Education Ceased	442	22.7
Remarriage	77	56.6
Trivial Commutation	22	64.8
Other	25	21.0

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

- > NI number
- > Previous final salary scheme (if any)
- > Gender
- > Date of Birth
- > Date Joined Scheme
- Pensionable Salary (final salary scheme) (Annual rate of full-time equivalent pensionable pay in respect of final salary benefits at valuation date)
- > Average Pensionable Pay (Average full-time equivalent pensionable pay received in year to valuation date. Annualised equivalent for those not in service the full year)
- > Active Service (final salary scheme) (Pensionable service in final salary scheme to valuation date excluding doubling, transferred-in service and added years).
- Active Service on full-time basis (final salary scheme) (As active service (final salary scheme), but part-time service reckoned as full-time)
- > Transferred-in Service (final salary scheme)
- > Part-time proportion
- > Current scheme (member is accruing benefits in)
- > Actual rate of pensionable earnings (Police 2015 scheme)
- > Annual rate of pensionable earnings (Police 2015 Scheme)
- > Accrued 2015 scheme pension at extract date
- > Public Sector Transfer Club (PSTC) transfer in indicator
- > 2015 scheme (Club) pension subject to CPI + 0% increases
- > 2015 scheme (Club) pension subject to CPI + 1.25% increases
- > 2015 scheme (Club) pension subject to CPI +1.5% increases
- > 2015 scheme (Club) pension subject to CPI + 1.6% increases
- > 2015 scheme (Club) pension subject to earnings increases
- > Active service on full-time basis (2015 scheme)

Notes

Pensionable Salary: Where an individual is in receipt of a lower level of remuneration for any reason (eg maternity leave, sick leave etc) forces were asked to provide a notional "normal" pensionable salary.

Part time working: For future service calculations we assume part-time staff will continue to work the same proportion of full time hours as they are working at 31 March 2016 (part-time proportion data item).



Deferred pensioners

- > NI number
- > Previous final salary scheme (if any)
- > Gender
- > Date of Birth
- > Rank
- Current Deferred Pension (final salary scheme) (Includes transferred in service and added years)
- > Date Payable
- Current Deferred Pension (2015 Scheme) (Includes transferred in service and added years)

Pensioners

- > NI number
- > Previous final salary scheme (if any)
- > Gender
- > Date of Birth
- > Rank
- > Date Joined Scheme
- Date final salary pension began
- > Type of Pension
- > Member's Current Pension (final salary scheme)
- > Abated Pension
- > Pension Increases
- > Injury Award
- > Members Current Pension (2015 scheme)
- > Date 2015 scheme pension began
- > Member's pre-commutation pension (final salary scheme)

Dependants

- > NI number
- > Final salary scheme (if any)
- > Gender
- > Date of Birth
- > Dependant Type
- > Dependant Date
- > Dependant's final salary pension
- > Dependant's Current Injury Award
- > Dependant's 2015 scheme pension



Added years

- > NI number
- > Scheme contract relates to
- > Gender
- > Date of Birth
- > Purchase type
- > Purchase start date
- > Cessation date
- > Contract in force
- > Added years
- Added 2015 scheme pension
- > Added 2015 scheme partner's pension

Pension debit

- > NI number
- > Scheme
- > Gender
- > Date of Birth
- > Current final salary pension debit
- > Current 2015 scheme pension debit

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 left the Scheme during that year:

- > NI number
- > Scheme
- > Gender
- > Date of Birth
- > Date Joined Scheme
- > Date Left
- > Reason Ceased
- > Part-time
- > Service at Leaving
- > Previous final salary scheme (if any)
- > Total non-retirement related lump sum benefits payments from 2015 scheme
- > Total retirement related lump sum benefits payments from 1987 scheme
- > Total retirement related lump sum benefits payments from 2006 scheme
- > Total retirement related lump sum benefits payments from 2015 scheme

Deferreds

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

- > NI number
- > Scheme
- > Gender
- > Date of Birth
- > Date Left
- > Date Ceased
- > Reason Ceased
- > Total non-retirement related lump sum benefits payments from 2015 scheme
- > Total retirement related lump sum benefits payments from 2015 scheme



Pensioners

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

- > NI number
- > Scheme
- > Gender
- > Date of Birth
- > Date Ceased
- > Reason Ceased
- > Dependant Date of Birth
- > Dependant NI number
- > Total pension in payment at death
- > Type of pension
- > Total pensioner related lump sum payments in 2015 scheme

Dependants

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

- > NI number
- > Scheme
- > Gender
- > Date of Birth
- > Dependant Type
- > Date Ceased
- > Reason Ceased
- > Total pension in payment at death

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
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Reason for Exclusion	Number of exclusions+	
Final salary section pay missing or outside reasonable range (£0-£270,000)	1,004	
Actual salary missing or outside reasonable range (£0- £270,000)	1,042	
Past service salary missing or outside reasonable range (£0-£270,000)	983	
Part time proportion outside acceptable range (0-100%)	3	
Full-time service record inconsistent with scheme section	1,342	
Full-time service record including transferred in service inconsistent with scheme section	1,064	
Age at joining outside reasonable range (18-60)	1,005	
Member could not be categorised	41	
No date of birth	1	
Post-2015 pension missing or outside reasonable range (£0-£4,890pa)	168	
Total number of exclusions	3,246	
Total exclusions for rating up	3,193	

* If a record fails for more than one reason it is included multiple times in the breakdowns shown and therefore the total exlusions may not be exactly the same as the sum of the components shown

Table E2 – Active members as at 31 March 2015

Reason for Exclusion	Number of exclusions+	
Actual salary missing or outside reasonable range (£0- £270,000)	179	
Part time proportion outside acceptable range (0-100%)	9	
Full-time service record inconsistent with scheme section	23	
Age at joining outside reasonable range (18-60)	28	
Age outside the appropriate range (18-120)	2	
No date joined scheme	11	
Duplicate records removed	70	
Total number of exclusions	306	
Total exclusions for rating up	225	

+ If a record fails for more than one reason it is included multiple times in the breakdowns shown and therefore the total exlusions may not be exactly the same as the sum of the components shown

Table E3 – Deferred members

Reason for Exclusion	Number of exclusions+
Age outside the appropriate range (18-80)	4
Member could not be categorised	36
Date of deferment was after the valuation date	9
Deferred pension missing or outside reasonable range (£0-£180,000)	229
Total number of exclusions	275
Total exclusions for rating up	228

* If a record fails for more than one reason it is included multiple times in the breakdowns shown and therefore the total exlusions may not be exactly the same as the sum of the components shown

Table E4 – Pensioners

Reason for Exclusion	Number of exclusions+
Member could not be categorised	8
Members aged below 16 or above 120 at the valuation date	7
Date of retirement was after the valuation date	2
Total pension was outside reasonable range 542	
Post 2015 pension was outside reasonable range	8
Total number of exclusions	566
Total exclusions for rating up	551

+ If a record fails for more than one reason it is included multiple times in the breakdowns shown and therefore the total exlusions may not be exactly the same as the sum of the components shown

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

	Total number of excluded records (valid and no liability ⁶)	Total number of valid records excluded
Actives	3,246	3,193
Deferreds	275	228
Pensioners	566	551
Total exclusions	4,087	3,972

Table E6: Total data supplied (31 March 2016)

31 March 2016	Total number of records provided	Notified immediate exclusions	Valid records
Actives	120,725	52	120,673
Deferreds	27,833	47	27,786
Pensioners	152,035	15	152,020

Table E7: Total data supplied (31 March 2015)

31 March 2015	Total number of records provided	Notified immediate exclusions	Valid records
Actives	125,128	83	125,045

⁶ Indicates initial exclusions which are assumed to have no attaching liability and therefore we have not uprated for these members (ie invalid records).

31 March 2016	Number of valid records (A)	Number of exclusions	Number of members after exclusions (B)	Uprating factor (A/B)
Active members	120,673	3,193	117,480	1.03
Deferred members	27,786	228	27,558	1.01
Pensioners	152,020	551	151,469	1.00
Total membership	300,479	3,972	296,507	1.01

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

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

31 March 2015	Number of valid records (A)	Number of exclusions	Number of members after exclusions (B)	Uprating factor (A/B)
Active members	125,045	225	124,820	1.00

Checks on uprated dataset

Information taken from an independent source of data gathered by the Home Office was used to perform independent checks on the dataset supplied.

For actives, the total pensionable payroll in the adjusted actives data (\pounds 4.44bn) was compared with pensionable pay derived from employer contribution payments as provided in the independent source of data gathered by the Home Office (\pounds 4.46bn). The pensionable payroll from the data is fairly close (0.4% lower) to that implied from employer contributions. Since membership has fallen over 2015-2016 we would expect the independent data source to give a higher figure than the membership data. This result does not look unreasonable.

For pensioners and dependants, the total pensioner payroll in the adjusted pensioner data (£2.71bn) was compared with total pensions paid over 2015/16 as recorded in the independent data sources gathered by the Home Office (£2.67 bn). Over recent years, in real terms, the pensioner payroll has been growing by 4% each year. Allowing for this rate of change would suggest that the pensioner payroll provided in the data is around 0.3% lower than that implied by the independent data source. This result does not look unreasonable.

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

The active movements data is used to analyse experience of members who retire, die or leave active service. 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.

Table F1 – Active members

Reason for Exclusion	Number of exclusions ⁺
Removed assumed duplicates and other multiple records	80
Removed records where movements dates do not fall within the	392
intervaluation period or is missing	
Removed records which were inter-force transfers	1,939
Total number of members removed	2,411

⁺ If a record fails for more than one reason it is included multiple times in the breakdowns shown and therefore the total exlusions may not be exactly the same as the sum of the components shown

Table F2 – Deferreds

Reason for Exclusion	Number of exclusions ⁺
Removed records where either movements dates do not fall within the intervaluation period or had a missing movement date	162
Removed records where movements were duplicated	106
Total number of members removed	268

* If a record fails for more than one reason it is included multiple times in the breakdowns shown and therefore the total exlusions may not be exactly the same as the sum of the components shown

The pensioner movements data was used to analyse mortality experience, family statistics and commutation of pension. 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.

Table F3 – Pensioners

Reason for Exclusion	Number of
	exclusions⁺
Removed records where either movements dates do not fall within the	52
intervaluation period or had a missing movement date	
Removed records where movements were duplicated	1,143
Total number of members removed	1,195

* If a record fails for more than one reason it is included multiple times in the breakdowns shown and therefore the total exlusions may not be exactly the same as the sum of the components shown

Table F4 – Dependants

Reason for Exclusion	Number of exclusions⁺
Removed records where either movements dates do not fall within the intervaluation period	43
Removed records where movement date or date of birth is missing	16
Removed records where movements were duplicated	1,322
Total number of members removed	1,381

+ If a record fails for more than one reason it is included multiple times in the breakdowns shown and therefore the total exlusions may not be exactly the same as the sum of the components shown

After the records described above were removed, further exclusions were made for the purposes of the experience analysis to exclude data from police forces for which the movement data either:

- > did not appear credible; or
- > did not show a reasonable reconciliation with the membership data as at 2012 and 2016.

The detail of the number of police forces excluded from the analysis and the proportion of membership excluded is set out in Table F5.

Table F5 – Number of police forces excluded from each analysis
--

Movement data item	Police forces excluded	
Active movements – Deaths before retirement, III-health retirement and withdrawals	17 police forces were excluded representing approximately 24% of the active membership	
Active movements – Age/normal health retirement *	22 police forces were excluded representing approximately 35% of the active membership	
Pensioner movements - member deaths	16 police forces were excluded representing approximately 27% of the pensioner membership	
Pensioner movements - dependant deaths	25 police forces were excluded representing approximately 42% of the dependant membership	

* Service data was also required to analyse age retirements, meaning that more police forces were excluded where this data was incomplete.

Appendix G: Uncertainty in valuation results arising from data deficiencies

The table below indicates the extent to which the valuation results might be incorrect owing to the approach taken to dealing with data deficiencies. 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 (as % of pay)		
	Uncorrected employer Employer contribution		
	contribution rate	correction cost	
Actives (uprating applied: 2.7%)	0.1%	0.1%	
Deferreds (uprating applied: 0.8%)	Not material	Not material	
Pensioners (uprating applied: 0.4%	Not material	Not material	

More detail on the uncertainties arising from data deficiencies can be found in Appendix C of our report *Police pension schemes (England & Wales) Actuarial valuation at 31 March 2016: Advice on assumptions* dated today.

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 our report *Police pension schemes (England & Wales) Actuarial valuation at 31 March 2016: Advice on assumptions* dated today.

Cost Cap Net Leavers Liability (CCNLL)

2. 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.



- 3. 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.
- 4. We expect that the uncertainty introduced by the approach above is not more than ¼% of pay. Although it should be noted that the deficiencies in the membership data discussed above could compound this scale of uncertainty.

Government	Police Pension Schemes (England & Wales):
Actuary's	Actuarial valuation as at 31 March 2016
Department	Report on membership data

Appendix H: Summary of benefits

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

		1987 Scheme	2006 Scheme	2015 Scheme
1.	Type of Scheme	Final Salary	Final Salary	Career Average Revalued Earnings
2.	Contracted out/in prior to 2016	Contracted out	Contracted out	Contracted out
3.	Employees Covered			
	Before 1 April 2015	Members who joined before 6 April 2006.	New entrants joining between 6 April 2006 and 31 March 2015	N/A
	On or after 1 April 2015	Protected 1987 Scheme members ⁷	Protected 2006 Scheme members ⁵	New entrants joining on or after 1 April 2015 and unprotected members ⁵
4.	Normal Pension Age (NPA) After 30 years' service at any age, or after 25 years' service at age 50 and above, or otherwise at age 55 (some senior officers have higher retirement ages)		55	60
			Flexible retirement from age 55 subject to benefits being actuarially reduced	

⁷ Details of criteria for protection are set out at the end of this Appendix

		1987 Scheme	2006 Scheme	2015 Scheme
		NB: Deferred pension age 60	NB: Deferred pension age 65	NB: Deferred pension age equal to State Pension Age
5.	Pensionable Pay (PP)	Basic Salary plus competency related threshold payment and London weighting (but not including any other allowances)	Basic Salary plus competency related threshold payment and London weighting (but not including any other allowances)	Basic Salary plus competency related threshold payment and London weighting (but not including any other allowances)
6.	Final Pensionable Pay (FPP)	Highest of 1 year average of PP in last 3 years	 Highest of: 1 year average of PP in last 3 years 3 year average of PP in last 10 years 	Not required
7.	Member's Contributions	Contribution scale tiered by PP	Contribution scale tiered by PP	Contribution scale tiered by PP
8.	Normal Retirement			
	Pension to Member	1/60 th for first 20 years of actual service plus 2/60 per year of service in excess of 20 years, subject to a maximum of 30 years of actual service.	1/70 th per year of actual service subject to a maximum of 35 years.	1/55.3 th of earnings in each year, revalued in line with the Consumer Prices Index (CPI) + 1.25% No cap on service

		1987 Scheme	2006 Scheme	2015 Scheme
	Lump Sum	By commutation at actuarially neutral	4/70 th per year of actual service subject	By commutation at £12:£1.
		rates	to a maximum of 35 years	In accordance with HMRC limits and
		Generally option to commute up to 25% of pension	Option to exchange lump sum for additional pension	regulations
	Spouse's Pension	50% of member's pre-commutation pension	50% of member's pension (excluding amounts awarded in place of lump sum)	50% of member's pre-commutation pension
		The pension paid to female officer's surviving spouses may be reduced in respect of periods of service before 1990 and for male officers in respect of service before 1972		
).	Pension Increases	Governed by Pensions (Increase) Act	Governed by Pensions (Increase) Act	Governed by Pensions (Increase) Act
10.	III Health Retirement	Single tier – unable to perform ordinary duties	Two tier	Two tier ⁸
		No reduction for early payment	Lower tier – unable to perform ordinary	Lower tier – unable to perform norma
		Service enhanced:	duties	duties
		< 5 years – no uplift	No reduction for early payment	No reduction
		5-10 years – pensionable service doubled	No enhancement to service	No enhancement to service

⁸ In addition to the 2015 scheme benefits, former members of the 1987 Scheme will receive ill health benefits under the 1987 scheme (based on service to 31 March 2015). Former members of the 2006 Scheme will also receive a lower tier ill health pension under the 2006 scheme.

		1987 Scheme	2006 Scheme	2015 Scheme
		10-13 years – pensionable service increased to 20 years	Higher tier – unable to engage in any regular employment	
		> 13 years – pensionable service increased by 7 years (at 1/60 th accrual)	No reduction for early payment Service enhanced:	Higher tier – unable to engage in any regular employment
			< 5 years – pensionable service plus	No reduction
			 the lower of: total accrued service multiplied by 3 half of prospective service from date of retirement to earliest of NRA or 35 years' service 5 years – pensionable service increased by half prospective service from date of retirement to NPA or 35 years' service, whichever is the earlier 	Lower tier benefit plus half of prospective service to 60 multiplied by 1/55.3 of the members' annual full-time equivalent rate of PP
11.	Dependant's Pension on Death in Service	50% x III-health Pension	50% of Higher tier III-health Pension	50% of Higher tier III-health Pension ⁹
		Maximum 33% x EPP	Maximum 25% x FPP	Maximum 25% x FPP
		Pension paid to female officer's surviving spouses may be reduced in respect of periods of service before 1990 and for male officers in respect of service before 1972		

⁹ In addition to the 2015 scheme benefits, surviving eligible dependants of former members of the 1987 Scheme will receive a pension based on ill health benefits under the 1987 scheme (based on service to 31 March 2015). Surviving eligible dependants of former members of the 2006 Scheme will also receive a pension based on the lower tier ill health pension under the 2006 scheme.

		1987 Scheme	2006 Scheme	2015 Scheme
12.	Dependant's Short Term Pension			
	Death in Service	13 weeks' full pay	None in excess of the long-term level of pension	None in excess of the long-term level of pension
	Death after Retirement	13 weeks' at member's rate	None in excess of the long-term level of pension	None in excess of the long-term level of pension
13.	Lump Sum Death Benefits			
	Death in Service	2 x PP	3 x PP	3 x PP
		In addition, there is an employee contributions underpin	In addition, there is an employee contributions underpin	In addition, there is an employee contributions underpin
	Death after Retirement	There is an employee contributions underpin	There is an employee contributions underpin	There is an employee contributions underpin
14.	Children's Pensions	Child must be under 16 years of age or under 23 and in full-time education or	Child must be under 19 years of age or under 23 and in full-time education	Child must be under 19 years of age or under 23 and in full-time education
		full-time training	25% x member's current/deferred pension or higher tier ill-health pension, in the case of death in service, for up to 2 children*	25% x member's current/deferred pension or higher tier ill-health pension, in the case of death in service, for up to 2 children*
		18.75% x member's current/deferred pension or ill-health pension, in the case of death in service, for up to 2 children*		
		*If there are more than 2 children then 37.5% will be shared equally	* If there are more than 2 children then 50% will be shared equally	* If there are more than 2 children then 50% will be shared equally

		1987 Scheme	2006 Scheme	2015 Scheme
15.	'Dependant' provision	Widow(er)	Widow(er)	Widow(er)
		Civil partners	Civil partners	Civil partners
		Children – including stepchildren/adopted children/other children dependant at time of death	Unmarried partners (subject to certain conditions)	Unmarried partners (subject to certain conditions)
			Children – including stepchildren/adopted children/other children dependant at time of death	Children – including stepchildren/adopted children/other children dependant at time of death
16.	Withdrawal Benefits on Leaving			
	At least 2 Years' Total Reckonable Service	Deferred pension is payable from 60	Deferred pension is payable from age 65	Deferred pension is payable from State Pension Age
	Preserved Benefits	Generally proportionate to the pension based on service to age 55 – accrual between 1/60 and 1/45	1/70 + 4/70 lump sum	1/55.3 of earnings in each year, revalued in line with CPI + 1.25% in service
		If >25 years' service, accrued pension from age 50		
	Increases before retirement	Governed by Pensions (Increase) Act	Governed by Pensions (Increase) Act	Governed by Pensions (Increase) Act
	Death before retirement	50% of member's deferred pension	50% of member's deferred pension	50% of member's deferred pension
	Transfer Value	Yes	Yes	Yes

Police Pension Schemes (England & Wales): Actuarial valuation as at 31 March 2016 Report on membership data

		1987 Scheme	2006 Scheme	2015 Scheme
	Less than 2 Years' Total Reckonable Service	If the member has at least three months' service they may opt for a cash equivalent transfer value to be paid into another pension scheme. Otherwise, an immediate refund of their contributions (less the cost of reinstatement into S2P) is paid.	If the member has at least three months' service they may opt for a cash equivalent transfer value to be paid into another pension scheme. Otherwise, an immediate refund of their contributions (less the cost of reinstatement into S2P) is paid.	If the member has at least three months' service they may opt for a cash equivalent transfer value to be paid into another pension scheme. Otherwise, an immediate refund of their contributions (less the cost of reinstatement into S2P) is paid.
17.	Cessation on remarriage or cohabitation	Yes	No	No

Criteria for scheme membership after 31 March 2015

Protected and tapered Members

Statutory based transitional protections exist for certain members as follows:

- 1. All active 2006 Scheme members who, as of 1 April 2012, have 10 years or less to their current Normal Pension Age (i.e. age 55) will see no change in when they can retire, nor any decrease in the amount of pension they receive at their current Normal Pension Age. This protection will be achieved by the member remaining in their current scheme until they retire.
- 2. All active 1987 Scheme members who, as of 1 April 2012, have 10 years or less to age 55 or have 10 years or less to age 48 and are 10 years or less from a maximum unreduced pension, will see no change in when they can retire, nor any decrease in the amount of pension they receive at their current Normal Pension Age. This protection will be achieved by the member remaining in their current scheme until they retire.
- 3. There will be a further period of tapered protection for up to 4 years for scheme members. Members who are within 4 years of qualifying for transitional protection, as of 1 April 2012, will have limited protection so that on average for every month closer to qualifying for transitional protection they gain about 53 days of protection. The period of protected service for any member under these tapering arrangements will have finished by 31 March 2022. At the end of the protected period, they will be transferred into the 2015 scheme. These members fall into four categories:
 - (a) 1987 or 2006 Scheme members who on 1 April 2012 are aged 41 45 years with less than 20 years service;
 - (b) 1987 Scheme members who on 1 April 2012 are aged 34 38 years with more than 20 years service;
 - (c) 1987 Scheme members who on 1 April 2012 are aged over 38 years with 16 20 years service; and
 - (d) 1987 Scheme members who on 1 April 2012 are aged 34 38 years with 16 20 years service whose age plus service is at least 54 years.

Where a member falls into both categories (a) and (c), the greater number of days of protection will be given.

For further details, see

https://www.gov.uk/government/publications/police-pension-reform-design-framework