



# Government Actuary's Department

## **Police pension schemes (England and Wales)**

Actuarial valuation as at 31 March 2012  
Report on data used for experience analysis

Date: 11 December 2014

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## 1 Introduction

- 1.1 This report is addressed to the Home Office. It was also made available in draft to the Police Negotiating Board as part of the consultation process relating to the actuarial valuation of the Police Pension Scheme (PPS), the New Police Pension Scheme (NPPS) and the 2015 scheme, referred to collectively in this report as the police pension schemes (the Schemes), which is being carried out as at 31 March 2012. 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.
- 1.2 The purposes of this report are:
- > to discuss and summarise the member experience data provided and to be used for the purposes of analysing the Schemes' experience over the four-year period 1 April 2008 to 31 March 2012
  - > to ensure that users of the valuation report understand the issues relating to the data used and in particular those issues that may have a material impact on the valuation result
- 1.3 Membership data used for the actuarial valuation calculations are the subject of a separate report.
- 1.4 All data provided and discussed in this report were supplied either directly by the individual police forces or via their appointed administrators.
- 1.5 In preparing this report, GAD has relied on data and other information supplied by the police forces as described in this report. Any checks that GAD has made on this information are limited to those described in this 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. In particular, GAD has relied on the general completeness and accuracy of the information supplied without independent verification.
- 1.6 The contents of this report have been discussed and agreed with the Home Office, which has confirmed that it is content that the resulting data is appropriate for use in the 2012 actuarial review of the Schemes.



## 2 Summary of data provided

### Movement data

- 2.1 Out of the 46<sup>1</sup> police forces in England and Wales, 45 provided some data in the form of individual member records for those leaving each membership category of the Schemes over the inter-valuation period. The one remaining force (Staffordshire) was unable to provide any such movement data due to their system capabilities.
- 2.2 The table below summarises the information provided, before any adjustments were made. The data items provided for each member in the initial data are set out in Annexes A to D.

**Table 2.1: Summary of original movement data provided**

<b>Membership category</b>	<b>Movement</b>	<b>Number</b>
<b>Active</b>	Retirement due to age	16,022
	Withdrawal	6,632
	Inter-authority transfer	2,468
	Retirement due to ill-health	1,349
	Death	286
	Other <sup>2</sup>	51
	<b>Total</b>	<b>26,808</b>
<b>Deferred</b>	Retirement due to age	1,377
	Transfer	912
	Retirement due to ill-health	125
	Death	95
	Pension credit came into payment	79
	Re-entered active membership	33
	Other <sup>2</sup>	262
<b>Total</b>	<b>2,883</b>	
<b>Pensioner</b>	Death	7,500
	Other <sup>2</sup>	17
	<b>Total</b>	<b>7,517</b>
<b>Dependant</b>	Death	3,904
	Remarriage	131
	Other <sup>2</sup>	458
	<b>Total</b>	<b>4,493</b>

<sup>1</sup> 43 police forces plus the organisations; Her Majesty's Inspectorate of Constabulary (HMIC), National Policing Improvement Agency (NPIA) and College of Policing (CoP).

<sup>2</sup> Includes movements that were not used in the analyses of experience, for example no longer being eligible for benefits and unknown movements.



- 2.3 Durham and Hertfordshire were unable to provide complete movement data (i.e. covering the entire inter-valuation period), so data from these forces were excluded from all analyses of experience.

**Year-end data**

- 2.4 We have also been provided with details of active members' individual salaries as at 31 March 2012. This data was used for the analysis of promotional salary scales.
- 2.5 The promotional salary scale analysis is based on two components of the year end data: the member's reckonable service and salary. Reckonable service is taken as the sum of the accrued service and transferred-in service data fields. Salary is taken as the member's full-time equivalent annual rate of pay at 31 March 2012.
- 2.6 Data from all forces was used for the promotional salary scale analysis.



### 3 Adjustments to active movements data

- 3.1 The data items provided for each member are set out in Appendix A.
- 3.2 As noted in Section 2, data from 43 forces was considered for use in the analyses of experience of active members, subject to the changes detailed below.
- 3.3 Checks were performed on the overall active movements for each individual force, including a reconciliation from the number of active members provided in data for the 2008 valuation to those provided for the 2012 valuation. Some discrepancies were identified at this individual force level and where they were greater than 5%, the force was contacted to provide further explanation (5 forces). The explanations received (including additional data for some forces) enabled reconciliation of the number of active members to 5% for all forces. Table 3.1 shows all movement data received.
- 3.4 121 movements (0.5% of the total active movements) were in respect of individuals who were new pension credit recipients (ex-spouses of active members) and who should not be recorded in the active movement data. These were excluded from the analyses of experience of active members.
- 3.5 14 movements (0.1% of the total active movements) occurred outside the inter-valuation period so were excluded from the analyses.
- 3.6 We found 17 members (0.1% of the total active movements) with a movement whose reason ceased was not given. These movements were excluded from our analyses of experience.
- 3.7 We found 184 members (0.7% of the total active movements) whose movement record stated they became deferred members, but our checks implied that the movement was, instead, an inter-authority transfer (IAT). This is because these members were found in the active member snapshot data for a different police force with either the same date joined scheme or date joined the new force the same as or one day after the date of leaving the previous force. For these members we changed the reason ceased in the movement data to show IAT. The effect of this data change is to reduce the number of experienced withdrawals in our analysis.
- 3.8 We found 12 members (less than 0.1% of the total active movements) whose movement record stated they became normal-health pensioners, but our checks implied that the movement was, instead, an ill-health retirement. This is because these members were showing in the pensioner member snapshot data as receiving an ill-health pension and their age and service at leaving was consistent with an ill-health pensioner. For these members we changed the reason ceased in the movement data to show ill-health retirement. The effect of this data change is to reduce the number of experienced retirements in normal health and increase the number of experienced retirements in ill-health in our age and ill-health retirement analyses.



- 3.9 In performing our checks, we also found a small number of members falling into the groups set out below. Despite this data not appearing to be accurate, no adjustments have been made in respect of these groups because there is insufficient evidence on which to justify a change or there would not be a material impact on our analyses:
- > members whose movement record stated they became deferred members but who were also present in the actives snapshot data with the same force and same date joined scheme;
  - > members whose movement record stated they had retired in normal health and were shown as receiving an ordinary pension in the pensioners data but whose age and service at leaving were consistent with someone receiving an ill-health pension;
  - > members whose movement record stated they had retired in normal health but who did not appear in either the pensioner movements nor pensioner snapshot data;
  - > members whose movement record stated they had retired in ill-health but were over their voluntary retirement age, so had potentially retired in normal health;
  - > members whose movement record stated they had retired in ill-health but who did not appear in either the pensioner movements nor pensioner snapshot data;
  - > there were some members appearing in the active movement data more than once. We have assumed that both movements are genuine (as can be the case if a member has an IAT followed by subsequent withdrawal or retirement).
- 3.10 Our analyses of retirement in normal health and withdrawal require information about the service of members at leaving. We also analysed the members' 'service at date of leaving' data field and adjustments were made as follows:
- > For the Metropolitan, Surrey and Warwickshire forces, the field was complete for the majority of members but was blank for a low proportion of members (representing a quarter of these three forces' normal health retirement and withdrawal movements). We estimated the service at leaving where the field was blank, calculating this as the difference between the stated date of joining the scheme and date of leaving. This estimation would miss transferred-in service, but was considered reasonable.
  - > For all members recorded as being part-time (3% of the movements), the field was replaced with the same estimation as above, as the entries submitted appeared to consistently show the reckonable service. As the Schemes' rules on eligibility for age retirement are based on calendar years' service it is most appropriate to use this measure of service for the analyses of experience.
  - > For the Kent police force, the service at leaving field appeared to reflect the doubling of accrual for PPS members with over 20 years' service. We halved any service recorded in this field over 20 years.



- 3.11 For the analyses of age retirement and withdrawal experience, we excluded data for the Hampshire, Northamptonshire, Northumbria, North Wales and West Midlands forces due to the service at leaving data field being blank or appearing inaccurate for the majority of their members.
- 3.12 The finalised movements data used for the analyses of experience of active members is set out in the table below. Please note that the sum of the adjustments detailed above may not exactly correlate with the total in the table below, as there is an element of double counting with some excluded movements falling into more than one category.

**Table 3.1: Summary of movement data used in analyses of experience for actives**

<b>Movement</b>	<b>Number</b>
Retirement due to age	13,506
Withdrawal	5,506
Inter-authority transfer	2,619
Retirement due to ill-health	1,356
Death	283
Other	17
<b>Total</b>	<b>23,287</b>

- 3.13 It is possible that the results of the analysis could be materially different if the movement data provided is inaccurate (eg incorrect movement description) or incomplete.



## **4 Adjustments to deferred movements data**

- 4.1 The data items provided for each member are set out in Appendix B.
- 4.2 The number of new deferred members was compared with the number of reported withdrawals from active members by force. The data appeared broadly consistent in general.
- 4.3 No amendments were made to the deferred movements data as no experience analysis is carried out for this category of member.



## 5 Adjustments to pensioner movements data

- 5.1 The data items provided for each member are set out in Appendix C.
- 5.2 As noted in Section 2, data from 43 forces was considered for use in the analyses of experience of pensioner members, subject to the changes detailed below.
- 5.3 Of the 43 sets of pensioner movements data included in the analysis, three forces reported no movements (CoP, HMIC and NPIA).
- 5.4 We traced pensioners provided in the 2008 valuation data to the 2012 pensioner data or movement data. As a result of our checks, some additional queries were raised with individual forces. This resulted in the removal of 36 movements (0.5% of the total pensioner movements) as they were erroneously included in the initial data provided to us.
- 5.5 8 pensioner movements (0.1% of the total pensioner movements) were in relation to members in receipt of pension credits. These were excluded from the analysis.
- 5.6 55 of the movements (representing 0.7% of the total pensioner movements) were duplicates and were excluded.
- 5.7 A further 4 movements (0.1% of the total pensioner movements) were excluded as they occurred outside of the inter-valuation period.
- 5.8 The number of new pensioners was compared with the number of reported retirements from active and deferred members by force. The data appeared broadly consistent in general.
- 5.9 Details of the type of pension (eg normal-health, ill-health) before the movement occurred were not requested in the original movement data specification, but were required for an analysis of the pensioner mortality. This data item was populated by searching for the member in the 2008 pensioner snapshot data using their national insurance number (where provided). For pensioners who had retired after 31 March 2008, we assigned the type of pension by matching the member to a movement record in the 2012 active and deferred movement data.



- 5.10 There were 258 pensioners (3.4% of the total pensioner movements) for whom no pension type was found using the approach set out in paragraph 5.9 above. These members were assigned to normal and ill-health types as follows:
- > 75 PPS members who had completed at least 30 years' service at their date of leaving the scheme were assumed to have retired in normal health;
  - > 43 PPS members who had completed between 1 and 25 years' service at their date of leaving and retired below age 55 were assumed to have retired due to ill-health; and
  - > For the remaining 140 PPS members, those who retired below age 50 (54 members) were assumed to have retired due to ill health and those who retired at age 50 or above (86 members) were assumed to have retired in normal health.
- 5.11 The finalised movements data used for the analysis of pensioner mortality experience is set out in the table below. Please note that the sum of the adjustments detailed above may not exactly correlate with the total in the table below, as there is an element of double counting with some excluded movements falling into more than one category.

**Table 5.1: Summary of movement data used in experience analysis of pensioner mortality**

<b>Movement</b>	<b>Number</b>
Death	
Retirement due to ill-health	1,784
Retirement due to age	5,499
Other	
Retirement due to ill-health	3
Retirement due to age	7
<b>Total</b>	<b>7,293</b>



- 5.12 Further adjustments, which are not shown in Table 5.1, were made to the pensioner movements data for the purpose of analysing family statistics:
- > Some information about surviving dependants was recorded for members with the death decode "D" (which was described as a death without a dependant). Where the force appeared to have assigned all deaths to the "D" decode with no use of the "P" decode (death with adult dependant) but with seemingly accurate dependant National Insurance and date of birth information we interpreted these members as death with dependant and altered their decode to "P". There were 498 such changes to member records.
  - > 13 forces' data was excluded from the proportion of members with a dependant analysis as they provided data for one type of movement only (eg no information on deaths of members with a dependant).
  - > Independently from the above change, 16 forces' data was excluded from the member/dependant age gap analysis as all the force's deaths listed as death with a dependant failed to provide details of the dependant's date of birth.
  - > The above exclusions are reflected in the numbers in Tables 5.2 and 5.3 below, which summarise the data used for the two family statistics analyses.
  - > The family statistics analyses were performed on movements relating to male PPS members only.

**Table 5.2: Summary of movement data used in experience analysis of proportion of members with dependant at member's death**

<b>Movement</b>	<b>Number</b>
Death with a dependant	3,087
Death with no dependant	1,759
<b>Total deaths used</b>	<b>4,846</b>

**Table 5.3: Summary of movement data used in experience analysis of member/dependant age gap**

<b>Movement</b>	<b>Number</b>
Death with a dependant	2,577
<b>Total deaths used</b>	<b>2,577</b>

- 5.13 It is possible that the results of the analysis could be materially different if the movement data provided is inaccurate (eg incorrect movement description) or if the data from the subset of forces used is not representative of the overall scheme membership.



## 6 Adjustments to dependant movements data

- 6.1 The data items provided for each member are set out in Appendix D.
- 6.2 As noted in Section 2, data from 43 forces was considered for use in the analyses of experience of dependant members, subject to the changes detailed below.
- 6.3 Of the 43 sets of deferred movements data included in the analysis, three forces reported no movements (CoP, SOCA and NPIA).
- 6.4 Checks were performed on the overall dependant movements for each individual force, including a reconciliation from the number of dependant members provided in data for the 2008 valuation to those provided for the 2012 valuation. Some discrepancies were identified at this individual force level, but when taken in combination, the overall discrepancy between 2008 and 2012 dependant data was small and not investigated further. The overall impact on the valuation results is not expected to be material. It is possible that the results of the analyses could be materially different if the movement data provided is inaccurate (eg incomplete or incorrect movement description).
- 6.5 As a result, no amendments were made to the dependant movements data for the 43 forces considered. The table below summarises the data.

**Table 6.1: Summary of movement data used in analyses of experience for dependants**

<b>Movement</b>	<b>Number</b>
Death	3,875
Remarriage	131
Other	458
<b>Total</b>	<b>4,464</b>



## **7 Limitations of analysis based on data**

- 7.1 The data described in this report is to be used to inform the process of setting assumptions for the valuation to be undertaken as at 31 March 2012. Past experience over a particular period does not necessarily correlate to an exact expectation for a particular future period. Therefore the weight that is attached to the precise outcome of the inter-valuation experience analysis depends on the analysis itself and an assessment of the extent to which recent experience is a guide to the future.
- 7.2 Where other information is considered as part of the process of agreeing assumptions for the valuation such information will be discussed within the report providing our advice on those assumptions.



## Appendix A: Actives movement data

The following data was provided for the inter-valuation period. Key data items are shown in bold. These are the items where a valid and reasonable data item is required to enable experience analyses to be carried out:

- a. NI number
- b. Scheme**
- c. Gender**
- d. Date of birth**
- e. Marital status
- f. Rank
- g. Date joined scheme
- h. Date left**
- i. Reason ceased**
- j. Part-time
- k. Service at leaving



## Appendix B: Deferreds movement data

The following data was provided for the inter-valuation period. Key data items are shown in bold. These are the items where a valid and reasonable data item is required to enable experience analyses to be carried out:

- a. NI number
- b. Scheme
- c. Gender**
- d. Date of birth**
- e. Marital status
- f. Rank
- g. Date joined scheme
- h. Date left
- i. Date ceased**
- j. Reason ceased**
- k. Part-time



## Appendix C: Pensioners movement data

The following data was provided for the inter-valuation period. Key data items are shown in bold. These are the items where a valid and reasonable data item is required to enable experience analyses to be carried out:

- a. NI number
- b. Scheme
- c. Gender**
- d. Date of birth**
- e. Marital status
- f. Rank
- g. Date joined scheme
- h. Date left
- i. Date ceased**
- j. Reason ceased**
- k. Part-time
- l. Dependant DoB**
- m. Dependant NI No**



## Appendix D: Dependants movement data

The following data was provided for the inter-valuation period. Key data items are shown in bold. These are the items where a valid and reasonable data item is required to enable experience analyses to be carried out:

- a. NI number
- b. Scheme
- c. Gender**
- d. Date of birth**
- e. Dependant type
- f. Dependant date
- g. Date ceased**
- h. Reason ceased**



## Appendix E: Record of changes since 4 October 2013 draft

E.1 This advice was issued in draft on 4 October 2013. The table below records the changes made since that draft.

Reference	Change
Title	Changed to be in line with other valuation reports.
Various	Minor drafting changes to correct spelling, grammatical and other errors or to clarify previous wording.