



Government Actuary's Department

Armed Forces pension arrangements: Valuation as at 31 March 2012

Advice on assumptions

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1 Executive summary

This report contains our recommendations for the best estimate assumptions to be set by the Secretary of State for the 2012 valuation of the Armed Forces pension arrangements.

- 1.1 HM Treasury's *Public Service Pensions (Valuations and Employer Cost Cap) Directions 2014* require that a valuation of the 2015 scheme, together with the Armed Forces Pension Scheme 75 and 05 (AFPS 75 and AFPS 05) and other connected schemes, is carried out as at 31 March 2012. The assumptions to be adopted for this valuation will be set by the Secretary of State, having obtained advice from the scheme actuary. The assumptions must be the Secretary of State's best estimates and not include margins for prudence or optimism.
- 1.2 This report sets out GAD's formal advice to the Secretary of State on the actuarial assumptions to be adopted. The advice covers the main assumptions to be set by the Secretary of State and is summarised in Table 1. Assumptions may also be required in other areas and we will provide separate advice on additional assumptions as required.
- 1.3 Unless noted otherwise, we have assumed that recent experience will provide the most reliable evidence when determining best estimates of future experience.
- 1.4 There is little or no recent experience available to determine some assumptions. In these cases we have recommended assumptions having regard to assumptions adopted previously and/or other relevant data, as set out in Table 1.
- 1.5 An actuarial assessment of the Armed Forces pension arrangements was carried out as at 31 March 2005. Many of the assumptions put forward in this report differ from those adopted for the 2005 assessment. The most significant changes are:
 - > Changes in post-retirement mortality assumptions¹
 - > Changes in withdrawal assumptions
 - > Changes to promotional salary scales
 - > New age retirement assumptions for members joining or moving to the 2015 scheme
 - > A specific commutation assumption in the 2015 scheme²
- 1.6 The following chapters and appendices provide more detail on the advice, the supporting analysis and approximate indications of the financial impact of the assumptions on the results. They also contain important background information about the context of this advice and its limitations.

¹ The allowance for future improvements in mortality is specified in the Directions.

² The commutation assumption for the 2015 scheme is specified in the Directions.



- 1.7 The Secretary of State is now asked to set the actuarial assumptions to be adopted for the valuation as required by the Directions, consulting with HM Treasury as appropriate, and to confirm those assumptions to GAD. We would be happy to provide further analysis to the Secretary of State, if required.



Table 1: Summary of recommended assumptions consistent with the 'best estimate' requirement

Assumption	Summary of recommended assumptions	Rationale for recommendation	Approximate impact on total contribution rate of change from 2005 assessment	
			Past service ³	SCR (2015-19) ⁴
Pensioner baseline mortality⁵	Aligned to standard SAPS table ^{6, 7}			
Normal health	Officers			
Ill-health (current)	88% of S1NMA (males)	Based on overall 2005-2012 experience ¹⁰ . Differential between officers and other ranks based on analysis from 2005 actuarial assessment.	5.4% ⁸	1.0% ⁹
Ill-health (future)	88% of S1NFA (females)			
Dependants	Other ranks 118% of S1NMA (males) 118% of S1NFA (females)			

³ Deficit contribution required over 15 years from 2015. These are approximate indications only and do not allow for the pre-2001 pensioner exclusion in the Directions.

⁴ Cost of future service benefits, in existing schemes for those in 10 year protected group and in 2015 scheme for others. Approximate indications only.

⁵ As required in Directions, improvements in mortality from 2012 are assumed to be in line with those underlying the most recent ONS population projections.

⁶ SAPS tables are published by the Actuarial Profession and based on the experience of self-administered pension schemes over the period 2000 to 2006. The 'S1' series includes separate standard tables based on experience of members retiring in normal health and in ill health and for female dependants.

⁷ Adjusted to 2012 to take account of improvements in population mortality using rates derived from the ONS's UK Interim Life Tables.

⁸ Includes the baseline changes for all pensioner groups and the change to future mortality improvements.

⁹ Changes are considered immaterial if their expected impact on the contribution rate is less than 0.05%.

¹⁰ Scheme experience was compared to relevant SAPS tables adjusted to take account of improvements in population mortality between 2002 (the base year for the tables) and 2008 (the central year of our period of analysis).



Assumption	Summary of recommended assumptions	Rationale for recommendation	Approximate impact on total contribution rate of change from 2005 assessment	
			Past service ³	SCR (2015-19) ⁴
Age retirement				
AFPS 75/05 and other: transitionally protected members	Age-based rates, with significant allowance for retirements at IP/EDP points and all retiring by age 55	As adopted for 2005 actuarial assessment. Supported by 2005-12 experience for AFPS 75. <i>see graphs D1 and D2, page 46</i>	No change in assumption	
New entrants from 2015	Age-based rates, with significant allowance for retirements at EDP point and all retiring by age 60	No relevant evidence. Proposal is in line with assumptions adopted for 2005 actuarial assessment, adjusted for changes to EDP qualification and normal pension age.	No past service	New assumption
AFPS 75/05 and other: unprotected members	Gradual change between protected and new entrant patterns above.	Reasonable approach given uncertainty.	New assumption	



Assumption	Summary of recommended assumptions	Rationale for recommendation	Approximate impact on total contribution rate of change from 2005 assessment	
			Past service ³	SCR (2015-19) ⁴
Ill-health retirement				
Incidence	Increasing by age: for officers around 0.2% at age 25 and 0.3% at age 45; for other ranks around 0.7% at age 25 and 0.8% at age 45.	As adopted for 2005 actuarial assessment. Reflects 2005-2012 experience in AFPS 75 and subsequent trends. <i>see graphs E1 and E2, page 49</i>		
Split by tier ¹¹	40% on Tier 1; 20% on Tier 2; 40% on Tier 3	Previous assumed split of 20%/30%/50% respectively, partially adjusted to allow for experience from 2005-12 which showed around 70% Tier 1 (split of Tiers 2 and 3 was not available). ¹²	Not material	Not material
Withdrawal¹³	Age-based rates across all schemes: for officers around 5% at age 24 decreasing to zero at age 40; for other ranks around 25% at age 19 decreasing to zero at age 40	In line with 2005-2012 experience. ¹⁴ <i>see graphs F1-F4, pages 52-53</i>	0.7%	0.8%

¹¹ Ill-health benefits in AFPS 05 (and in the 2015 scheme) operate on a three-tier basis. Ill-health benefits in AFPS 75 operate on a single tier.

¹² The value of the 2005-12 experience for assessing ill-health tiering is diluted as AFPS 05 membership consisted only of new joiners since 2005 and transferees from AFPS 75.

¹³ Note that rates for younger ages are no longer relevant for AFPS 75 which closed to new members in 2005.

¹⁴ AFPS 05 officer experience was not used as membership was distorted by transferees from AFPS 75 as part of the 2005 Offer to Transfer exercise. AFPS 05 other rank experience was only used for those exiting within 4 years, as there was insufficient experience for longer servers.



Assumption	Summary of recommended assumptions	Rationale for recommendation	Approximate impact on total contribution rate of change from 2005 assessment	
			Past service ³	SCR (2015-19) ⁴
Death before retirement	Aligned to UK Interim Life Tables 2008-2010 ('ONS tables')	In line with 2012-13 deaths from hostile action and 2004-2013 deaths from other causes as reported by Defence Statistics ¹⁵ , not adjusted for future improvements in mortality. <i>see graphs G1 and G2, pages 56-57</i>	Not material	Not material
Males	70% of ONS tables			
Females	70% of ONS tables			

¹⁵ See https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/295835/20140327_UKAF_deaths_National_Statistic_2013.pdf



Assumption	Summary of recommended assumptions	Rationale for recommendation	Approximate impact on total contribution rate of change from 2005 assessment	
			Past service ³	SCR (2015-19) ⁴
Promotional salary scale	<p>Steeper up to around age 40 (around 5% a year on average for both officers and other ranks). Thereafter around 1.5% a year on average for officers and 0.5% a year for other ranks.</p> <p>Separate scale for 'representative pay' used to calculate AFPS 75 benefits – around 2% a year on average for officers and 1% for other ranks.</p>	<p>Based on age and salary profile of 2012 valuation data <i>see graphs H1-H4, pages 59 and 60</i></p>	0.1%	Not material
Commutation				
New entrants from 2015	<p>15% of pension commuted.</p> <p>No inverse commutation of EDP lump sum</p>	<p>Directions</p> <p>Inverse commutation of EDP lump sum is cost neutral</p>	No past service	New assumption
AFPS 75 and AFPS 05 unprotected	<p>15% of 2015 scheme pension commuted and 0% of AFPS 75 and AFPS 05 pension commuted.</p> <p>No inverse commutation of EDP lump sum</p>	<p>Directions for 2015 scheme</p> <p>Commutation unavailable in AFPS 75 and AFPS 05, except for life and resettlement commutation where terms are set to be cost neutral</p> <p>Terms for inverse commutation of EDP lump sum are set to be cost neutral</p>	No change	New assumption



Assumption	Summary of recommended assumptions	Rationale for recommendation	Approximate impact on total contribution rate of change from 2005 assessment	
			Past service ³	SCR (2015-19) ⁴
Family statistics				
Proportion married	Officers: 90% (M), 65% (F) at retirement Other ranks: 85% (M), 60% (F) at retirement (consistent assumptions for existing pensioners)	Rates at retirement based on 2012 scheme data for active members. <i>see graphs I1 and I2, pages 62 and 63</i> Rates at subsequent ages (for existing pensioners) based on comparative level of scheme experience against ONS statistics	0.7% ¹⁶	0.1%
Proportion married/partnered ¹⁷	All percentages above increased by 5% at retirement (consistent assumptions for existing pensioners)	Adjustment based on ONS statistics		
Age difference	Males 3 years older than partners Females 3 years younger than partners	Based on experience for UK population and other occupational pension schemes	Not material	Not material
Remarriage (AFPS 75) ¹⁸ and children's pensions	No allowance	Simplification on grounds of materiality	Not material	Not material

¹⁶ Combined impacts of changes to proportions married and partnered.

¹⁷ In AFPS 75, dependants' benefits are only paid to legal spouses. In AFPS 05 and the 2015 scheme, benefits may also be paid to other cohabiting partners who were financially dependent or interdependent.

¹⁸ On 8 November 2014 the government announced a change of policy effective from 1 April 2015 in respect of remarriage cessation for AFPS 75. Remarriages after that date will no longer result in cessation of spouses' pensions, and applications for ceased pensions to be restored will no longer be subject to a means test.



2 Introduction

This report contains our advice to the Secretary of State but will be of interest to other parties who should note the limitations.

- 2.1 HM Treasury's *Public Service Pensions (Valuations and Employer Cost Cap) Directions 2014* require that a valuation of the 2015 scheme, together with AFPS 75, AFPS 05 and other connected schemes, referred to jointly in this report as 'the Schemes', is carried out as at 31 March 2012. The assumptions to be adopted for this valuation will be set by the Secretary of State, having obtained advice from the scheme actuary. The assumptions must be the Secretary of State's best estimates and not include margins for prudence or optimism.
- 2.2 GAD is the appointed scheme actuary to the Schemes. This report is addressed to the Secretary of State and contains our formal advice on the appropriate assumptions to be adopted for the 2012 valuation, as required by the Directions. The purpose of this advice is to enable the Secretary of State to determine the required best estimate assumptions.
- 2.3 The advice is provided in accordance with the Directions. Our advice might change if there are any changes to the Directions. We may also revise this advice if new material evidence comes to light.
- 2.4 The advice also has regard to HMT's suggested approach¹⁹ for setting assumptions in the absence of direct evidence.
- 2.5 The advice covers the main assumptions to be set by the Secretary of State. In particular, we consider eight sets of assumptions in this report:
- > Pensioner mortality
 - > Age retirement from service
 - > Ill-health retirement from service
 - > Voluntary withdrawal from service
 - > Death before retirement
 - > Promotional pay progression
 - > Commutation of pension for cash at retirement
 - > Family statistics.

¹⁹ Set out in Annex A of HM Treasury's *Public service pensions: actuarial valuations and the employer cost cap mechanism* dated March 2014.



- 2.6 Assumptions may also be required in other areas, eg relating to the projection of the membership to 2015. We will provide separate advice on additional assumptions as required.
- 2.7 The Secretary of State is now asked to set the actuarial assumptions (listed in paragraph 2.5) to be adopted for the valuation as required by the Directions, consulting with HMT as appropriate, and to confirm those assumptions to GAD. We would be happy to provide further advice to the Secretary of State, if required.
- 2.8 Defence Business Services (DBS), the Schemes' administrator, provided us with data on the Schemes' membership as at 31 March 2012 and their experience over the seven year period to 31 March 2012. We have used this data to analyse the Schemes' experience in order to develop our advice on these assumptions. Our report, *Armed Forces pension arrangements: Actuarial valuation as at 31 March 2012: Report on data used for experience analysis* dated 24 February 2015 provides information about this data and should be read in conjunction with this advice. The report includes details of the checks carried out on the data, the amendments made to the data and our residual concerns about the quality of the data. In preparing our advice, we have relied upon the general completeness and accuracy of the data provided.
- 2.9 Unless noted otherwise, we have assumed that recent experience will provide the most reliable evidence when determining best estimates of future experience and have adopted this approach throughout this advice unless noted otherwise. The Secretary of State should consider whether there is any reason why this approach would be inappropriate. We would be happy to revisit our advice to take account of any evidence relevant to the expected future experience of the Schemes' membership.
- 2.10 The report is also being made available to HMT as part of the process for granting their approval to the assumptions proposed by the Secretary of State.
- 2.11 We are content for the Secretary of State to release this report to third parties, provided that:
- > it is released in full,
 - > the advice is not quoted selectively or partially,
 - > GAD is identified as the source of the report, and
 - > GAD is notified of such release.
- 2.12 Third parties whose interests may differ from those of the Secretary of State should be encouraged to seek their own actuarial advice where appropriate. Other than the Secretary of State, GAD has no liability to any person or third party for any act or omission taken, either in whole or in part, on the basis of this report.



3 General considerations

This chapter sets out a number of general considerations common to the setting of the different assumptions considered in this report.

- 3.1 The key considerations taken into account in formulating the advice in this paper are explained in this section.

Directions

- 3.2 The advice in this report reflects the requirements of the Directions that assumptions should be set as the Secretary of State's 'best estimates' of future experience and should contain no margin for prudence or optimism. They should be set having regard to the:
- > assumptions set for the previous valuation
 - > analysis of demographic experience up to the valuation date, taken as experience over the seven year period up to the valuation date for the purposes of our advice
 - > historic long-term trends and emerging evidence which may illustrate long-term trends in the future

Setting assumptions where there is insufficient evidence

- 3.3 Since all the reformed public service schemes have certain characteristics for which there is no, or insufficient, direct evidence on which to base assumptions, HMT issued a document setting out the approach that schemes should take when setting these assumptions.²⁰

Different populations

- 3.4 Section 11 of the *Public Service Pensions Act 2013* requires actuarial valuations to be undertaken in accordance with the Directions and to cover both the new schemes established under the Act and any existing schemes which are connected to it. This means the 2012 valuation needs to consider assumptions appropriate to both the existing schemes and the new scheme. It also needs to cover the assessment of the employer contribution rate payable over the period 2015 to 2019 and the employer cost cap. Setting the employer contribution rate requires assumptions about anticipated member behaviour and characteristics during 2015 to 2019 as well as assumptions about member behaviour and characteristics in the longer term.

²⁰ Set out in Annex A of HM Treasury's *Public service pensions: actuarial valuations and the employer cost cap mechanism* dated March 2014



- 3.5 From 2015 there will be 3 distinct groups of members.
- > Those with 10 year transitional protection and thus remaining in one of the existing schemes to exit. The introduction of the 2015 scheme is not expected to have any impact on this group's behaviours.
 - > New members to the 2015 scheme joining after 31 March 2015. These members' behaviours are expected to be influenced by the provisions of the new scheme.
 - > Members with service in both the existing and 2015 schemes. Over time, as the proportion of 2015 scheme service increases, the behaviours are expected to become increasingly influenced by the provisions of that scheme.

Relative importance of assumptions

- 3.6 The Directions require the employer contribution rate and employer cost cap to be determined to the nearest 0.1% of pensionable payroll. This is a required level of accuracy for a particular calculation and based on a particular set of assumptions. In each of the remaining chapters in this report we conclude by providing an indication of the impact on results of the change being recommended to the assumptions²¹ and, in some cases, possible alternative assumptions. These figures also indicate the potential magnitude of future changes in calculated employer contribution rates and the employer cost cap which may emerge if experience indicates the assumptions should be amended. The figures are approximate and are not independent so the impact of multiple changes will not necessarily be the sum of the individual impacts. Changes are considered immaterial if their expected impact on the contribution rate is less than 0.05%.
- 3.7 Where relevant, we also indicate in each of the following chapters the relative importance of each set of assumptions to each of the three groups of members identified in paragraph 3.5.

²¹ In many cases we show the impact of the recommended assumptions relative to those adopted for the previous actuarial assessment as at 31 March 2005.



4 Pensioner mortality

This chapter sets out our recommendation for the pensioner mortality assumptions, the rationale for those assumptions and their financial impact.

Proposed assumptions for 2012 valuation

- 4.1 The assumptions we recommend for baseline pensioner mortality for the 2012 valuation may be summarised as follows:

Table 4.1: Recommended mortality assumptions (expressed as adjustments to standard tables²²)

Group	Officers	Other ranks
Normal health pensioners	88% of S1NXA ²³	118% of S1NXA
Existing ill-health pensioners	88% of S1NXA	118% of S1NXA
Future ill-health pensioners	88% of S1NXA	118% of S1NXA
Dependants	88% of S1NXA	118% of S1NXA

- 4.2 As specified in the Directions, future improvements in post-retirement mortality will be assumed to be in line with those underlying the ONS 2012-based population projections.

Previous valuation assumptions

- 4.3 At the 2005 assessment, baseline mortality was similarly based on adjusted standard tables, with future improvements based on the '92 series' improvements published by the CMI. Separate tables were adopted for officers and other ranks, and for normal and ill-health pensioners.

²² From the 'S1' series of standard tables published by the CMI and based on the experience of self-administered pension schemes over the period 2000 to 2006. Separate tables are available based on experience of members retiring in normal health (S1NXA) and ill health (S1IXA) and for dependants (S1DFA).

²³ Here 'X' means 'M' for males and 'F' for females, ie S1NMA and S1NFA tables respectively.



Comparison of expected pensioner longevity

- 4.4 The tables below give a comparison of the resulting life expectancies²⁴ adopted for the 2005 assessment and recommended for the 2012 valuation.

Table 4.2: Comparison of life expectancies (years)

	2005 valuation ²⁵	2012 valuation
Officers		
Current pensioners		
Male aged 55	31.0	34.3
Male aged 65	21.0	24.3
Female aged 55	34.0	36.9
Female aged 65	24.0	26.8
Future pensioners - current age 40		
Male life expectancy from age 55	31.9	36.2
Male life expectancy from age 65	22.3	27.0
Female life expectancy from age 55	34.9	38.7
Female life expectancy from age 65	25.3	29.5
Other Ranks		
Current pensioners		
Male aged 55	29.1	31.5
Male aged 65	19.2	21.7
Female aged 55	32.1	34.0
Female aged 65	22.2	24.2
Future pensioners - current age 40		
Male life expectancy from age 55	30.0	33.4
Male life expectancy from age 65	20.5	24.4
Female life expectancy from age 55	32.9	35.8
Female life expectancy from age 65	23.4	26.9

Use of the assumption

- 4.5 Pensioner mortality is a key valuation assumption and is a measure of how long members retiring in normal or ill-health, or their dependants, expect to live and receive benefits.

²⁴ Cohort life expectancies based on the ages shown as at the valuation date, allowing for future mortality improvements as adopted for the relevant valuation.

²⁵ These relate to normal health pensioners.



Results of analysis

- 4.6 The proposed assumptions are based on analysis of past mortality experience for AFPS 75, AFPS 05, Reserve Forces Pension Scheme 2005 (RFPS) and Full Time Reserve Service Pension Scheme 1997 (FTRSPPS). We have analysed the pensioner mortality experience over the seven-year period to 31 March 2012 on a 'lives' basis. An 'amounts' basis would normally be used – this gives more weight to the mortality experience for those with larger pensions, while a lives basis gives equal weight to each death. However, suitable pension amounts were not obtainable and so a lives basis has been used. Further information on the data analysed and the results of that analysis are shown in Appendix C.
- 4.7 In order to make a recommendation of the most appropriate baseline assumption for pensioner mortality we have compared the actual mortality experience over the seven year period with that expected based on S1 standard tables²⁶.
- 4.8 The relevant indicators in the data provided were not sufficiently reliable to support separate analysis by normal health/ill health, males/females or officers/other ranks. Instead, aggregate analysis was carried out to determine an overall percentage adjustment to the standard tables. The same percentage adjustment is recommended for males/females (using male and female standard tables respectively) and for normal health/ill-health.
- 4.9 Separate employer contribution rates are required for officers and other ranks. In the absence of sufficiently reliable information provided for the 2012 valuation, we have referred to the analysis from the 2005 actuarial assessment, which showed a reasonably credible split between officer and other rank experience. We have assumed that the differential between officer and other rank mortality rates from the 2005 assessment continues to apply, and used this to derive separate officer and other rank percentage adjustments (chosen to leave the overall assumed mortality rates across the whole population unchanged). The results are as shown in paragraph 4.1.
- 4.10 We note that there is a possibility that changes to employment patterns in the Armed Forces as a result of deployment characteristics and the introduction of the 2015 scheme and New Employment Model may affect the rates of mortality experienced by future pensioners. However, in the absence of any concrete evidence no allowance has been made for any such effects at this stage.

²⁶ Adjusted to the period the deaths occurred by applying adjustments broadly in line with the improvements applying to the UK population over the relevant period derived using rates from the UK Interim Life Tables.



Financial impact

- 4.11 The approximate financial impact of the proposed change to the mortality basis (both baseline and update of the improvement basis) compared to that used in the 2005 assessment is set out in Table 4.3.

Table 4.3: Approximate financial impact of proposed change in assumptions

	Past service effect*	Cost of accrual in existing scheme	Cost of accrual in 2015 scheme
Changes in mortality assumptions (baseline and improvements) from 2005 to 2012 proposed assumptions	5.4%	1.0%	1.0%

*(adjustment to contribution rate for 15 years from 2015)

- 4.12 The overall impact of the changes in mortality assumptions is a significant increase in cost. This is primarily driven by the change in projected improvements, from the '92' series improvements to the ONS 2012-based population projections. The change in baseline mortality tables has relatively little effect.



5 Age retirement from service

This chapter sets out our recommendation for the assumed patterns of retirement on grounds other than ill-health, the rationale for those assumptions and their financial impact.

Proposed assumptions for 2012 valuation

- 5.1 We recommend that rates of age retirement are set separately for members who will continue in the existing schemes after April 2015, for new entrants after 2015 and for those who will have service in the existing and 2015 schemes. Sample age retirement rates are provided in Appendix B.
- 5.2 The proposed assumptions are age-related, but in deriving them we have allowed for the fact that the qualification points for immediate pension and early departure payments (IP/EDP) are age- and service- related. For this purpose average entry ages of 24 for officers and 19 for other ranks have been assumed, based on analysis of entry ages and trends from the 2012 active membership data.

Members remaining in the existing schemes

- 5.3 We recommend that protected members are assumed to retire in line with the assumptions adopted at the 2005 actuarial assessment (for AFPS 75/FTRSPS) and for 2015 scheme design work (for AFPS 05/RFPS). These assumptions are supported by retirement experience over the period 2005-12. A significant proportion of members are assumed to retire on reaching the IP/EDP qualification point and all are assumed to retire by age 55.

New entrants after April 2015

- 5.4 We recommend that new entrants are assumed to retire in a similar pattern to protected members, but adjusted using a simple approach to reflect the 20/40 EDP qualification point and normal pension age of 60.
- 5.5 In the 2015 scheme, an actuarial uplift will be applied to the pension payable on retirement after age 60. Therefore, no allowance is required for late retirement after age 60. (No allowance was made for late retirement in the 2005 assessment as relatively few members were expected to retire after age 55.)



Unprotected members with service in AFPS 75 or 05²⁷ and the 2015 scheme

- 5.6 We recommend assuming a gradual change between the patterns of retirement for members remaining in the existing scheme and those applying to new entrants to the 2015 scheme. To allow for reasonable implementation, we propose to assume that the assumptions for AFPS 75 / 2015 scheme members are weighted 75% towards AFPS 75, and the assumptions for AFPS 05 / 2015 scheme members are weighted 25% towards AFPS 05. This reflects the average proportion of service which these members are expected to have in their current schemes on age retirement. (After age 55 the 2015 scheme assumptions are assumed to apply.)

Previous valuation assumptions

- 5.7 For members of AFPS 75 and FTRSPS, the proposed assumptions are the same as those adopted for the 2005 actuarial assessment.
- 5.8 For members of AFPS 05 and RFPS, the proposed assumptions are the same as those adopted when carrying out 2015 scheme design work. These were broadly based on the AFPS 75 assumptions from the 2005 assessment, adjusted to reflect the 18/40 EDP qualification point.

Use of the assumption

- 5.9 Age retirement rates specify the rate at which members are assumed to retire on grounds other than ill-health.
- 5.10 Relatively few service personnel remain in service up to their normal pension age. Most service personnel either withdraw before reaching their IP/EDP point or exit with an IP/EDP before normal pension age. The assumptions for retirement around the IP/EDP point are therefore more financially significant than the assumptions for retirement close to normal pension age.

Results of analysis

- 5.11 To set recommended assumptions for members remaining in the existing schemes, we analysed the pattern of age retirements from active membership over the seven year period to 31 March 2012 for members of AFPS 75/FTRSPS. There was insufficient data to perform a credible analysis of the AFPS 05/RFPS experience. In total we analysed around 38,000 age retirements from AFPS 75/FTRSPS over the period. The analysis compared the numbers of actual retirements to the expected numbers of retirements under the 2005 assumptions. Further information on the data analysed and the results of that analysis are shown in Appendix D.
- 5.12 The analysis showed that experience over the period has been broadly in line with the assumptions adopted for the 2005 assessment.

²⁷ Here 'AFPS 75' is taken to include FTRSPS and 'AFPS 05' is taken to include RFPS.



Other information

- 5.13 We have been informed by MoD that there is considerable uncertainty in relation to future age retirement patterns, due to the introduction of the 2015 scheme and of the MoD's New Employment Model, and to the increase in numbers of volunteer reserves. However, at this stage there is insufficient evidence about the nature of any future changes to support specific changes in the proposed assumptions. The recommended assumptions have therefore been based on the results of our analysis of experience. These results are supported by analysis from MoD's single service manpower models (produced independently for MoD by Defence Statistics).

Financial impact

- 5.14 The approximate financial impact of higher retirement assumptions is set out in Table 5.1.

Table 5.1: Approximate financial impact of variation in assumed rate of age retirements

	Past service effect*	Cost of accrual in existing scheme	Cost of accrual in 2015 scheme
5% increase in number of new joiners assumed to reach IP/EDP qualification point	0.3%	1.0%	0.4%

*(adjustment to contribution rate for 15 years from 2015)



6 Ill-health retirement from service (non-attributable)

This chapter sets out our recommendation for the assumed rates of retirement on grounds of ill-health, the rationale for those assumptions and their financial impact.

Proposed assumptions for 2012 valuation

- 6.1 We recommend that separate sets of unisex assumptions for officers and other ranks are used to allow for the incidence of non-attributable ill-health retirement (and 'Tier 1' lump sums in AFPS 05 and the 2015 scheme), applying both to those members who remain in the existing schemes and to those who join the new scheme. Assumed rates of ill-health retirement increase with age but no more than around 1% of members are assumed to retire on ill-health grounds each year, even at the highest ages. Sample rates are provided in Annex B.
- 6.2 We also recommend assuming that of those exiting AFPS 05 and the 2015 scheme on ill-health grounds, 40% will receive Tier 1 benefits, 20% will receive Tier 2 benefits and 40% will receive Tier 3 benefits.

Previous valuation assumptions

- 6.3 The proposed assumptions for the overall incidence of ill-health retirement/Tier 1 lump sums are the same as those adopted for the 2005 actuarial assessment.
- 6.4 For the 2005 assessment it was assumed that 20% would receive Tier 1 benefits, 30% would receive Tier 2 benefits and 50% would receive Tier 3 benefits.

Use of the assumptions

- 6.5 Ill-health retirement rates specify the rate at which members are assumed to retire on grounds of ill health. The assumed eligibility for Tier 1, 2 or 3 awards specifies the benefits which will be provided. The rates of mortality experienced after ill-health retirement are also relevant to the valuation calculations. Post-retirement mortality is addressed in Chapter 4.
- 6.6 Benefits on attributable ill-health retirement in relation to conditions or events after 5 April 2005 are provided under the Armed Forces Compensation Scheme (AFCS), and those in relation to conditions or events before 6 April 2005 are provided under the War Pension Scheme (WPS) or the attributable benefit provisions of AFPS 75. Attributable benefits are outside the scope of this valuation.

Results of analysis

- 6.7 We analysed around 6,300 ill-health retirements over the seven year period to 31 March 2012 from AFPS 75, AFPS 05, RFPS and FTRSPS. The analysis compared the numbers of actual retirements to the expected number of retirements under the 2005 assumptions. Details of the analysis are shown in Appendix E.



Ill-health retirement rates

- 6.8 For AFPS 75 and FTRSPS the analysis showed fewer ill-health retirements than expected under the 2005 assumptions both for officers and other ranks (around 72% and 83% respectively), although the distribution by age was broadly consistent with the 2005 assumptions. There was insufficient data to carry out a credible analysis for AFPS 05 and RFPS members although some analysis of tiering was possible.
- 6.9 The number of ill-health retirements in the data received for women was not high enough to give credible support to separate rates for men and women, which has led to our recommendation to retain unisex tables.
- 6.10 There was no clear trend in the numbers of ill-health retirements each year in the data received for the period 2005-12.
- 6.11 However, levels of medical discharge in the Army as reported by Defence Statistics have shown a steep rise from 2012 to 2014.²⁸ (Levels of medical discharge in the Naval Service and RAF have fallen slightly in the same period, but the majority of discharges are from the Army so this trend is more significant in overall terms.)
- 6.12 According to the Defence Statistics report, the rise in levels of medical discharge in the Army is likely to reflect 'changes in policy and practices in the management of the recovery pathway and the medical boarding process'. The Army's long term planning assumption is that medical discharges will decline to some extent but will settle at an elevated steady state which is significantly higher than the average level during the intervaluation period (2005-12).
- 6.13 Taking into account experience in the intervaluation period, subsequent trends and uncertainty about the future (for example deployment characteristics), MoD's view is that it is appropriate to retain the same assumptions as adopted for the 2005 assessment, to be kept under review at future valuations. For the 2015 scheme the rates have been extended to older ages (assuming no change in rates between age 55 and 60).

Split between tiers

- 6.14 The data available from AFPS 05 and RFPS retirements from 2005-12 showed around 70% of retirements on Tier 1. This is significantly higher than the initial assumption of 20%. (No data on the split between Tier 2 and 3 was obtainable.)
- 6.15 We note that the profile of AFPS 05 membership in 2005-12 was not representative of a stable population, as it consisted of transferees from AFPS 75, together with new joiners since 2005. We therefore recommend that the assumed Tier 1 proportion is adjusted from 20% to 40% to partially reflect recent experience, and that this assumption is kept under review in future as further evidence emerges.

²⁸ See

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/328699/medical_discharges_1_apr_09_31_mar_14_.pdf



Financial impact

- 6.16 The approximate financial impact of alternative ill-health retirement assumptions is set out in Table 6.1.

Table 6.1: Approximate financial impact of alternative ill-health retirement assumptions

	Past service effect*	Cost of accrual in existing scheme	Cost of accrual in 2015 scheme
20% reduction in assumed rates of ill-health retirement at all ages	0.2%	-0.3%	-0.7%

* (adjustment to contribution rate for 15 years from 2015)



7 Withdrawal from service (without entitlement to immediate benefits)

This chapter sets out our recommendation for the assumed rates of withdrawal from active service, the rationale for those assumptions and their financial impact.

Proposed assumptions for 2012 valuation

- 7.1 We recommend that separate sets of unisex assumptions for officers and other ranks are used for the purposes of the valuation, applying equally to those members who remain in the existing schemes and those who join the new scheme. The recommended rates decrease with age and are assumed to be zero from the IP/EDP qualification point (around age 40). Sample rates are provided in Appendix B.

Previous assumptions

- 7.2 The 2005 assumptions were in the same format as the proposed 2012 assumptions. The 2012 assumptions are generally slightly lower, reflecting experience from 2005-12.

Use of the assumption

- 7.3 Withdrawal rates specify the rate at which members are assumed to leave before normal pension age or IP or EDP point, becoming entitled to either deferred benefits or, for those with less than two years' service, a refund of contributions or a transfer value.
- 7.4 There is very little evidence of members rejoining the Schemes after leaving. For the avoidance of doubt, all members assumed to withdraw are assumed not to rejoin.

Results of analysis

- 7.5 We have analysed the pattern of withdrawals from active membership over the seven year period to 31 March 2012 for AFPS 75 and AFPS 05 combined. In total there were about 115,000 withdrawals over the period.
- 7.6 Further information on the data analysed and the results of that analysis are shown in Annex F.



Other information

- 7.7 We have been informed by MoD that there is considerable uncertainty in relation to future withdrawal and rejoiner patterns, due to the introduction of the 2015 scheme and the MoD's New Employment Model, the increase in volunteer reserves, any redundancy programmes, and general economic factors. In particular, it is possible that given the introduction of a 20 year service requirement to receive EDP benefits in the 2015 scheme, more active members may choose to withdraw before reaching this point. However, at this stage there is insufficient evidence about the nature of any future changes to support specific changes in the proposed assumptions. The recommended assumptions have therefore been based on the results of our analysis of experience.

Financial impact

- 7.8 The approximate financial impact of the change to the withdrawal rates compared to the 2005 assessment and the impact of higher withdrawal rates are set out in Table 7.1.

Table 7.1: Approximate financial impact of proposed change in withdrawal assumptions

	Past service effect*	Cost of accrual in existing scheme	Cost of accrual in 2015 scheme
Changes from 2005 to 2012 proposed assumptions	0.7%	1.8%	0.8%
25% higher withdrawals assumed at all ages	-0.5%	-1.3%	-0.5%

*(adjustment to contribution rate for 15 years from 2015)



8 Death before retirement

This chapter sets out our recommendation for the assumed rates of death before retirement, the rationale for those assumptions and their financial impact.

Proposed assumptions for 2012 valuation

- 8.1 We recommend a single set of assumptions (separate for men and women) is used to allow for the possibility of death before retirement, ie applying equally to those members who remain in the existing schemes and those who join the new scheme. Assumed rates of death before retirement increase with age but less than 1% of members are assumed to die each year, even at the highest ages. Sample rates are provided in Appendix B.

Previous assumptions

- 8.2 Unisex rates (separate for officers and other ranks) were adopted for the 2005 assessment to allow for the possibility of death before retirement. The rates were based on experience prior to 2005 and were higher than those recommended for the 2012 valuation. The 2012 rates are approximately 80% of the 2005 rates overall.

Use of the assumption

- 8.3 Death before retirement rates are used to allow for the possibility of deaths whilst in active service or during the period between leaving service and drawing benefits. The numbers of deaths observed annually, and the recommended rates to be assumed, are low and thus this assumption has relatively little financial significance.

Results of analysis

- 8.4 Deaths of active or deferred members were not separately identifiable from the experience data received. We have therefore relied on the Defence Statistics publication 'Deaths in the UK Regular Armed Forces 2013'²⁹. This publication provides information on total deaths of active members in the calendar years 2004 to 2013. It also includes Standardised Mortality Ratios (SMRs) which compare the deaths experience in the regular Armed Forces to those in the general UK population, correcting for age, gender and timing. Further information on the data analysed and the results of that analysis are shown in Appendix G.

²⁹ See

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/295835/20140327_UKAF_deaths_National_Statistic_2013.pdf



- 8.5 We note that the number of deaths has fluctuated significantly during the 10 year period of the Defence Statistics report, mainly driven by deaths owing to hostile action. In the view of MoD, the average level of future deaths owing to hostile action is more likely to reflect the lower level experienced in the years 2012-13, rather than the average level over 2004-13. The recommended assumptions are therefore based on average mortality rates excluding deaths from hostile action over 2004-13, plus average mortality rates from hostile action over 2012-13, with no further allowance for future trends.

Financial impact

- 8.6 The approximate financial impact of the proposed change to assumed rates of death before retirement is set out in Table 8.1.

Table 8.1: Approximate financial impact of proposed change in death before retirement assumptions

	Past service effect*	Cost of accrual in existing scheme	Cost of accrual in 2015 scheme
Changes from 2005 to 2012 proposed assumptions	Not material	Not material	Not material

* (adjustment to contribution rate for 15 years from 2015)



9 Promotional pay increases

This chapter sets out our recommendation for the assumed promotional pay increases of active members, the rationale for those assumptions and their financial impact.

Proposed assumptions

- 9.1 Members' salaries can be considered to increase through a combination of annual general pay awards and promotional/progression pay increases. To calculate an estimate of the level of benefit payable in the future requires assumptions for both these components. The assumption for general pay awards is set out in the Directions. The assumption for promotional pay increases is set by the Secretary of State.
- 9.2 We recommend that separate sets of unisex assumptions for officers and other ranks are used for the purposes of the valuation, applying equally to those members who remain in the existing schemes and those who join the new scheme. The increases are dependent on members' age and are steeper at younger ages. Sample values from the scales are provided in Appendix B.
- 9.3 Separate assumptions are needed for pensionable pay (used to determine employer contributions for all schemes and benefits for AFPS 05/RFPS/senior officers in AFPS 75), and 'representative pay' (used to determine pension benefits based on rank for AFPS 75/FTRSPPS except for senior officers).

Previous valuation assumptions

- 9.4 For officers the recommended promotional assumptions for representative pay are broadly consistent with those adopted for the 2005 assessment, and the recommended promotional assumptions for pensionable pay are lower overall than those adopted for the 2005 assessment.
- 9.5 For other ranks the recommended promotional assumptions for representative pay are lower overall than those adopted for the 2005 assessment, and the recommended promotional assumptions for pensionable pay are higher overall.

Use of the assumption

- 9.6 For the existing schemes, benefits are linked to salary at, or near, retirement. Members with 10 year transitional protection will remain in the existing schemes beyond 31 March 2015 and will therefore continue to have benefits linked to final pensionable pay/representative pay for service beyond this date. Unprotected members will start to accrue service in the 2015 scheme from 1 April 2015. However, their pre-2015 benefits will still be linked to their final pensionable pay/representative pay while they are an active member of the scheme.



- 9.7 Future pay progression will be more significant (in terms of expected pension) for those members with 10 year transitional protection because they will continue to have benefits linked to final pensionable pay for service beyond 31 March 2015. The impact of experience differing from the assumptions used is likely to be most material over the next couple of valuation cycles as it relates to older existing members. This experience will impact future employer contribution rates and the cost cap mechanism.

Results of analysis

- 9.8 We analysed the promotional increases implied by the current pay structure of the membership. Details of the analysis are contained in Appendix H.
- 9.9 The analysis of the pay structure of the membership as at 31 March 2012 suggested that promotional pay increases had been higher overall than assumed (pensionable pay for other ranks), broadly similar to assumed (representative pay for officers), and lower overall than assumed (pensionable pay for officers and representative pay for other ranks). The recommended scales for the 2012 valuation have been based on the observed rates in the 2012 analysis.
- 9.10 The results of this analysis should be treated with some caution, as the analysis is affected by the mixture of members at each age. However, the Armed Forces has reasonably homogeneous patterns of joining and progression by age. In our opinion this analysis therefore gives a reasonable basis for setting assumptions.
- 9.11 A new Armed Forces pay model is due to be implemented from 2016 as part of the New Employment Model. We have been informed by MoD that while this may lead to changes in the timings of promotions and progressions, there is no clear evidence to suggest that overall promotional increases over typical full career paths will change significantly as a result. We have therefore based the proposed assumptions on our analysis of past experience as described above.

Financial impact

- 9.12 The approximate financial impacts of the change to promotional salary increase assumptions compared to those adopted for the 2005 assessment and the impact of higher promotional assumptions are set out in Table 9.1.

Table 9.1: Approximate impact of proposed change in promotional salary increase assumption

	Past service effect*	Cost of accrual in existing scheme	Cost of accrual in 2015 scheme
Changes from 2005 to 2012 proposed assumptions	0.1%	-0.4%	Not a feature of the scheme
Promotional pay increases 1% a year higher than proposed for 2012	2.7%	4.0%	Not a feature of the scheme

* (adjustment to contribution rate for 15 years from 2015)



10 Commutation of pension for cash at retirement

This chapter sets out our recommendation for the assumed levels of pension commutation at retirement, the rationale for those assumptions and their financial impact.

Proposed assumptions for 2012 valuation

- 10.1 Members of the 2015 scheme will be assumed to commute 15% of their 2015 scheme pensions for cash³⁰.
- 10.2 Other forms of commutation available to members include:
- > In AFPS 75, resettlement commutation and life commutation
 - > In AFPS 05, inverse commutation of scale lump sum for pension
 - > In AFPS 15, inverse commutation of EDP lump sum for EDP income.

Terms for these forms of commutation are set to be cost-neutral to the schemes and so no explicit allowance is proposed.

Previous assumptions

- 10.3 In AFPS 75 and AFPS 05, separate lump sums have formed part of the benefit structure and there has been no comparable option to commute retirement pension, so previous assumptions for commutation of pension have not been required.
- 10.4 In the 2005 assessment no explicit allowance was made for the other forms of commutation set out in paragraph 10.2 above (same approach as recommended for 2012 valuation).

Use of the assumption

- 10.5 In the 2015 scheme, members may commute part of their pension for a lump sum at a rate of £12 for each £1 of pension given up. In this scheme, the assumption about the amount of pension commuted is important because the value of the pension given up, as assessed using the actuarial assumptions underlying the valuation is, on average, more than £12 and so commutation has an impact on contribution rates and the cost cap. Differences between assumed and actual commutation experience in the 2015 scheme will feed through into the cost cap fund.

³⁰ Specified by Directions



11 Family statistics

This chapter sets out our recommendation for the assumptions around dependants' pensions, the rationale for those assumptions and their financial impact.

Proposed assumptions for 2012 valuation

11.1 We recommend the following assumptions.

- > For officers, 90% of men and 65% of women are assumed to be married at retirement with consistent assumptions for current pensioners.
- > For other ranks, 85% of men and 60% of women are assumed to be married at retirement with consistent assumptions for current pensioners.
- > For AFPS 05, RFPS and the 2015 scheme where dependants' benefits are payable to qualifying partners rather than just legal spouses, an additional 5% of members are assumed to have a qualifying dependant at retirement, with consistent assumptions for current pensioners.
- > Men are assumed to be three years older than their partners and women are assumed to be three years younger than their partners.
- > On the grounds of materiality, no allowance is made for remarriage or for dependent children's benefits.

Previous assumptions

- 11.2 Assumptions for proportions married/partnered were previously framed around the members' circumstances at death, with separate assumptions for each age. The recommended approach for the 2012 valuation is simpler, which is justified given the relatively minor importance of these assumptions financially.
- 11.3 The recommended assumed proportions married/partnered are slightly lower than adopted for the 2005 assessment.
- 11.4 Men were assumed to be two years older than their partners at younger ages and three years older than their partners at older ages in the 2005 assessment.
- 11.5 Small allowances were made for remarriage for AFPS 75 members and for dependent children's benefits in the 2005 assessment.



Use of the assumption

- 11.6 Dependants' pensions are provided to qualifying dependants on the death of a member. In some connected schemes, notably AFPS 75, dependants' pensions are payable to legal spouses only. In other connected schemes such as AFPS 05 and the 2015 scheme, dependants' pensions are payable to qualifying partners as well as to legal spouses. Assumptions are required for the proportion of members who are married or partnered to determine how many dependants' pensions will be paid. Assumptions are required about age differences between members and partners as this affects how long dependants' pensions will be paid for.
- 11.7 In AFPS 75, a surviving dependant's pension used to cease upon remarriage. On 8 November 2014 the government announced a change of policy effective from 1 April 2015 in respect of remarriage cessation for AFPS 75. Remarriages after that date will no longer result in cessation of spouses' pensions, and applications for ceased pensions to be restored will no longer be subject to a means test.
- 11.8 In AFPS 05 and the 2015 scheme benefits continue to be paid following remarriage.
- 11.9 Benefits may also be payable to dependent children.

Results of analysis

- 11.10 No data was available about the married or partnered status of recent pensioner deaths. However, marital status indicators were available for the 2012 active membership. We analysed this information to derive assumed proportions married at retirement. Details of the analysis are contained in Appendix I. We note that while the implied proportions married for women are considerably lower than those for men, the experience for women is relatively limited.
- 11.11 To formulate a recommended assumption at older ages (for current pensioners) we compared the proportions married at retirement from scheme experience with population proportions married³¹. We then assumed that at older ages the same relationship between scheme and population proportions married would hold. One particular advantage of this approach is that it leads to a straightforward way of setting the assumption for the proportion married or partnered (required for AFPS 05 and 2015 scheme members) by making use of the ONS statistics on cohabitation.
- 11.12 No data was obtainable on age differences between members and their spouses or partners. The recommended assumption is based on experience in the general population and other occupational pension schemes. We do not expect this assumption to have a material effect on the valuation results.

³¹ Published by the Office for National Statistics (ONS)



11.13 No data was obtainable for the 2012 valuation on remarriage experience. We understand from MoD that cessations of pension on remarriage in AFPS 75 have typically numbered less than 100 per year in recent years. Given the November 2014 changes to remarriage cessation (see paragraph 11.7) and the low numbers of historic cessations, we recommend that no allowance is made for remarriage cessation as we do not expect this to have a material effect on the valuation results.

11.14 No data was obtainable for the 2012 valuation on children's pension experience. However we understand from MoD that the number of children's pension awards has been relatively low in recent years. We recommend that no allowance is made for children's benefits as we do not expect this to have a material effect on the valuation results.

Financial impact

11.15 The approximate financial impact of the proposed changes to the family statistics assumptions compared to the 2005 assumptions is set out in Table 11.2.

Table 11.2: Approximate financial impact of proposed changes in family statistics assumptions

	Past service effect*	Cost of accrual in existing scheme	Cost of accrual in 2015 scheme
Change in proportion married/partnered	-0.7%	-0.1%	-0.1%
Change in age difference	Not material	Not material	Not material
No allowance for remarriage or children's benefits	Not material	Not material	Not material

* (adjustment to contribution rate for 15 years from 2015)



Appendix A: Summary of assumptions

Table A1: Summary of recommended assumptions consistent with the 'best estimate' requirement

Assumption	Summary of recommended assumptions	Rationale for recommendation	Approximate impact on total contribution rate of change from 2005 assessment	
			Past service ³²	SCR (2015-19) ³³
Pensioner baseline mortality³⁴	Aligned to standard SAPS table ^{35, 36}			
Normal health	Officers			
Ill-health (current)	88% of S1NMA (males)	Based on overall 2005-2012 experience ³⁹ . Differential between officers and other ranks based on analysis from 2005 actuarial assessment.	5.4% ³⁷	1.0% ³⁸
Ill-health (future)	88% of S1NFA (females)			
	Other ranks			
Dependants	118% of S1NMA (males) 118% of S1NFA (females)			

³² Deficit contribution required over 15 years from 2015. These are approximate indications only and do not allow for the pre-2001 pensioner exclusion in the Directions.

³³ Cost of future service benefits, in existing schemes for those in 10 year protected group and in 2015 scheme for others. Approximate indications only.

³⁴ As required by Directions, improvements in mortality from 2012 are assumed to be in line with those underlying the most recent ONS population projections.

³⁵ SAPS tables are published by the Actuarial Profession and based on the experience of self-administered pension schemes over the period 2000 to 2006. The 'S1' series includes separate standard tables based on experience of members retiring in normal health and in ill health and for female dependants.

³⁶ Adjusted to 2012 to take account of improvements in population mortality using rates derived from the ONS's UK Interim Life Tables.

³⁷ Includes the baseline changes for all pensioner groups and the change to future mortality improvements.

³⁸ Changes are considered immaterial if their expected impact on the contribution rate is less than 0.05%.

³⁹ Scheme experience was compared to relevant SAPS tables adjusted to take account of improvements in population mortality between 2002 (the base year for the tables) and 2008 (the central year of our period of analysis).



Assumption	Summary of recommended assumptions	Rationale for recommendation	Approximate impact on total contribution rate of change from 2005 assessment	
			Past service ³²	SCR (2015-19) ³³
Age retirement				
AFPS 75/05 and other: transitionally protected members	Age-based rates, with significant allowance for retirements at IP/EDP points and all retiring by age 55	As adopted for 2005 actuarial assessment. Supported by 2005-12 experience for AFPS 75. <i>see graphs D1 and D2, page 46</i>	No change in assumption	
New entrants from 2015	Age-based rates, with significant allowance for retirements at EDP point and all retiring by age 60	No relevant evidence. Proposal is in line with assumptions adopted for 2005 actuarial assessment, adjusted for changes to EDP qualification and normal pension age.	No past service	New assumption
AFPS 75/05 and other: unprotected members	Gradual change between protected and new entrant patterns above.	Reasonable approach given uncertainty.	New assumption	



Assumption	Summary of recommended assumptions	Rationale for recommendation	Approximate impact on total contribution rate of change from 2005 assessment	
			Past service ³²	SCR (2015-19) ³³
Ill-health retirement				
Incidence	Increasing by age: for officers around 0.2% at age 25 and 0.3% at age 45; for other ranks around 0.7% at age 25 and 0.8% at age 45.	As adopted for 2005 actuarial assessment. Reflects 2005-2012 experience in AFPS 75 and subsequent trends. <i>see graphs E1 and E2, page 49</i>		
Split by tier ⁴⁰	40% on Tier 1; 20% on Tier 2; 40% on Tier 3	Previous assumed split of 20%/30%/50% respectively, partially adjusted to allow for experience from 2005-12 which showed around 70% Tier 1 (split of Tiers 2 and 3 was not available). ⁴¹	Not material	Not material
Withdrawal⁴²	Age-based rates across all schemes: for officers around 5% at age 24 decreasing to zero at age 40; for other ranks around 25% at age 19 decreasing to zero at age 40	In line with 2005-2012 experience. ⁴³ <i>see graphs F1-F4, pages 52-53</i>	0.7%	0.8%

⁴⁰ Ill-health benefits in AFPS 05 (and in the 2015 scheme) operate on a three-tier basis. Ill-health benefits in AFPS 75 operate on a single tier.

⁴¹ The value of the 2005-12 experience for assessing ill-health tiering is diluted as AFPS 05 membership consisted only of new joiners since 2005 and transferees from AFPS 75.

⁴² Note that rates for younger ages are no longer relevant for AFPS 75 which closed to new members in 2005.

⁴³ AFPS 05 officer experience was not used as membership was distorted by transferees from AFPS 75 as part of the 2005 Offer to Transfer exercise. AFPS 05 other rank experience was only used for those exiting within 4 years, as there was insufficient experience for longer servers.



Assumption	Summary of recommended assumptions	Rationale for recommendation	Approximate impact on total contribution rate of change from 2005 assessment	
			Past service ³²	SCR (2015-19) ³³
Death before retirement	Aligned to UK Interim Life Tables 2008-2010 ('ONS tables')	In line with 2012-13 deaths from hostile action and 2004-2013 deaths from other causes as reported by Defence Statistics ⁴⁴ , not adjusted for future improvements in mortality. <i>see graphs G1 and G2, pages 56-57</i>	Not material	Not material
Males	70% of ONS tables			
Females	70% of ONS tables			

⁴⁴ See https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/295835/20140327_UKAF_deaths_National_Statistic_2013.pdf



Assumption	Summary of recommended assumptions	Rationale for recommendation	Approximate impact on total contribution rate of change from 2005 assessment	
			Past service ³²	SCR (2015-19) ³³
Promotional salary scale	<p>Steeper up to around age 40 (around 5% a year on average for both officers and other ranks). Thereafter around 1.5% a year on average for officers and 0.5% a year for other ranks.</p> <p>Separate scale for 'representative pay' used to calculate AFPS 75 benefits – around 2% a year on average for officers and 1% for other ranks.</p>	<p>Based on age and salary profile of 2012 valuation data <i>see graphs H1-H4, pages 59-60</i></p>	0.1%	Not material
Commutation				
New entrants from 2015	<p>15% of pension commuted. No inverse commutation of EDP lump sum</p>	<p>Directions Inverse commutation of EDP lump sum is cost neutral</p>	No past service	New assumption
AFPS 75 and AFPS 05 unprotected	<p>15% of 2015 scheme pension commuted and 0% of AFPS 75 and AFPS 05 pension commuted. No inverse commutation of EDP lump sum</p>	<p>Directions for 2015 scheme Commutation unavailable in AFPS 75 and AFPS 05, except for life and resettlement commutation where terms are set to be cost neutral Terms for inverse commutation of EDP lump sum are set to be cost neutral</p>	No change	New assumption



Assumption	Summary of recommended assumptions	Rationale for recommendation	Approximate impact on total contribution rate of change from 2005 assessment	
			Past service ³²	SCR (2015-19) ³³
Family statistics				
Proportion married	Officers: 90% (M), 65% (F) at retirement Other ranks: 85% (M), 60% (F) at retirement (consistent assumptions for existing pensioners)	Rates at retirement based on 2012 scheme data for active members. <i>see graphs I1 and I2, pages 62-63</i> Rates at subsequent ages (for existing pensioners) based on comparative level of scheme experience against ONS statistics	0.7% ⁴⁵	0.1%
Proportion married/partnered ⁴⁶	All percentages above increased by 5% at retirement (consistent assumptions for existing pensioners)	Adjustment based on ONS statistics		
Age difference	Males 3 years older than partners Females 3 years younger than partners	Based on experience for UK population and other occupational pension schemes	Not material	Not material
Remarriage (AFPS 75) ⁴⁷ and children's pensions	No allowance	Simplification on grounds of materiality	Not material	Not material

⁴⁵ Combined impacts of changes to proportions married and partnered.

⁴⁶ In AFPS 75, dependants' benefits are only paid to legal spouses. In AFPS 05 and the 2015 scheme, benefits may also be paid to other cohabiting partners who were financially dependent or interdependent.

⁴⁷ On 8 November 2014 the government announced a change of policy effective from 1 April 2015 in respect of remarriage cessation for AFPS 75. Remarriages after that date will no longer result in cessation of spouses' pensions, and applications for ceased pensions to be restored will no longer be subject to a means test.



Appendix B: Detailed assumptions

B1 This appendix contains details of the recommended assumptions including sample rates and values. If not otherwise stated, tables are unisex.

Pensioner mortality

Table B1: Baseline mortality assumptions

Group	Officers	Other ranks
Normal health pensioners	88% of S1NXA ⁴⁸	118% of S1NXA
Existing ill-health pensioners	88% of S1NXA	118% of S1NXA
Future ill-health pensioners	88% of S1NXA	118% of S1NXA
Dependants	88% of S1NXA	118% of S1NXA

B2 As specified by HM Treasury, future improvements in mortality will be assumed to be in line with those underlying the 2012-based ONS population projections.

⁴⁸ Here 'X' means 'M' for males and 'F' for females, ie S1NMA and S1NFA tables respectively.



Age retirement from service

Table B2: Age retirement rates for members with 10 year transitional protection

Age	AFPS 75 officers	AFPS 75 other ranks	AFPS 05 officers	AFPS 05 other ranks
40	0.100	0.000	0.000	0.500
41	0.070	0.500	0.000	0.200
42	0.060	0.200	0.230	0.200
43	0.050	0.200	0.050	0.200
44	0.050	0.200	0.050	0.200
45	0.050	0.150	0.050	0.150
46	0.050	0.150	0.050	0.150
47	0.050	0.150	0.050	0.150
48	0.050	0.150	0.050	0.150
49	0.100	0.150	0.100	0.150
50	0.150	0.150	0.150	0.150
51	0.150	0.200	0.150	0.200
52	0.150	0.150	0.150	0.150
53	0.150	0.150	0.150	0.150
54	0.200	0.200	0.200	0.200
55	1.000	1.000	1.000	1.000



Table B3: Age retirement rates for new entrants after 31 March 2015 joining the 2015 scheme

Age	Officers	Other ranks
40	0.000	0.500
41	0.000	0.200
42	0.000	0.200
43	0.000	0.200
44	0.307	0.200
45	0.050	0.150
46	0.050	0.150
47	0.050	0.150
48	0.050	0.150
49	0.100	0.150
50	0.150	0.150
51	0.150	0.200
52	0.150	0.150
53	0.150	0.150
54	0.200	0.200
55	0.200	0.200
56	0.200	0.200
57	0.200	0.200
58	0.200	0.200
59	0.200	0.200
60	1.000	1.000



Table B4: Age retirement rates for members with service in both AFPS 75 and the 2015 scheme

Age	Officers	Other ranks
40	0.075	0.125
41	0.053	0.425
42	0.045	0.200
43	0.038	0.200
44	0.114	0.200
45	0.050	0.150
46	0.050	0.150
47	0.050	0.150
48	0.050	0.150
49	0.100	0.150
50	0.150	0.150
51	0.150	0.200
52	0.150	0.150
53	0.150	0.150
54	0.200	0.200
55	0.800	0.800
56	0.200	0.200
57	0.200	0.200
58	0.200	0.200
59	0.200	0.200
60	1.000	1.000



Table B5: Age retirement rates for members with service in both AFPS 05 and the 2015 scheme

Age	Officers	Other ranks
40	0.000	0.500
41	0.000	0.200
42	0.058	0.200
43	0.013	0.200
44	0.243	0.200
45	0.050	0.150
46	0.050	0.150
47	0.050	0.150
48	0.050	0.150
49	0.100	0.150
50	0.150	0.150
51	0.150	0.200
52	0.150	0.150
53	0.150	0.150
54	0.200	0.200
55	0.400	0.400
56	0.200	0.200
57	0.200	0.200
58	0.200	0.200
59	0.200	0.200
60	1.000	1.000



III-health retirement from service (non-attributable)

Table B6: III-health retirement rates (non-attributable) for all members

Age	Officers	Other ranks
20	0.000	0.006
25	0.002	0.007
30	0.002	0.007
35	0.002	0.007
40	0.002	0.007
45	0.003	0.008
50	0.004	0.010
55	0.005	0.011

B.3 For AFPS 05 and 2015 scheme ill-health retirements, 40% are assumed to be on Tier 1, 20% on Tier 2 and 40% on Tier 3.

Withdrawal from service (without entitlement to immediate benefits)

Table B7: Withdrawal rates for all members

Age	Officers	Other ranks
20	0.000	0.125
25	0.020	0.105
30	0.045	0.045
35	0.025	0.020
40	0.005 ⁴⁹	0.010 ⁵⁰
45+	0.000	0.000

⁴⁹ 0.000 for AFPS 75 members due to IP entitlement

⁵⁰ 0.000 for AFPS 05 and AFPS 15 members due to EDP entitlement



Death before retirement

Table B8: Death before retirement rates for all members

Age	Males	Females
20	0.0004	0.0002
25	0.0005	0.0002
30	0.0006	0.0003
35	0.0009	0.0004
40	0.0012	0.0007
45	0.0017	0.0010
50	0.0025	0.0017
55	0.0040	0.0025

Promotional pay increases

Table B9: Promotional salary scales for all members

B.4 The salary scale shows assumed pay progression in excess of general wage inflation in comparison to an index base of 100 at entry (age 24 for officers and 19 for other ranks).

Age	AFPS 05, 2015 scheme and AFPS 75 pensionable pay		AFPS 75 representative pay	
	Officers	Other ranks	Officers	Other ranks
20		116		100
25	116	165	100	104
30	161	205	102	117
35	193	237	114	128
40	218	269	126	141
45	236	271	139	145
50	266	286	159	153
55	280	298	177	153
60	280	298	177	153



Commutation of pension for cash at retirement

B.5 Members of the 2015 scheme are assumed to commute 15% of their 2015 scheme pension for cash. No allowance is made for any other commutation options.

Family statistics

Table B10: Recommended proportion married at retirement for future pensioners in AFPS 75

	Officers	Other ranks
Males	90%	85%
Females	65%	60%

Table B11: Recommended proportion married for current pensioners (at the valuation date) in AFPS 75

Age	Officers		Other ranks	
	Males	Females	Males	Females
50	89%	60%	80%	54%
60	94%	65%	88%	60%
70	93%	52%	88%	48%
80	78%	26%	73%	24%
90	44%	8%	42%	7%

B.6 Proportions partnered (for AFPS 05 and the 2015 scheme) are assumed to be 5% higher than proportions married at retirement, with consistent assumptions for current pensioners.

B.7 Men are assumed to be three years older than their partners and women are assumed to be three years younger than their partners.



Appendix C: Analysis of pensioner mortality

Type of analysis

- C1 Provided adequate data is available, mortality can be analysed on either a 'lives' basis or an 'amounts' basis:
- > A 'lives' basis gives an equal weighting to every member of the population being analysed.
 - > An 'amounts' basis weights the experience by the size of each member's pension (with the longevity of those with larger pensions given more of a weighting).
- C2 There is much evidence⁵¹ to demonstrate that the size of pension is positively correlated with longevity, ie on average those with bigger pensions live longer. For a population with significant variation in the characteristics of the membership and in the amounts of pension being paid, an 'amounts' mortality analysis is generally expected to show lower rates of mortality than a corresponding 'lives' analysis.
- C3 The information supplied for the purpose of this valuation provided data on the number of deaths that occurred during the inter-valuation period, but did not include the pension amounts at death (which would be needed for an 'amounts' analysis). Hence, we have carried out our analysis on a 'lives' basis. If amounts data were available it is likely that analysis would lead to different mortality rates. However, we note that adopting separate assumptions for officers and other ranks will mitigate this to some extent.

Data issues

- C4 There were a number of issues with the mortality experience data obtainable for the 2012 valuation which affected the scope of analysis we were able to carry out. These are described below.
- C5 The information provided as to whether deaths were of normal or ill-health pensioners was incomplete. We have therefore analysed all deaths together and derived mortality rates based on the combined experience of normal and ill-health pensioners.
- C6 The reports provided showing the number of pensioners between 2005-12 were not sufficiently reliable for use in our analysis. Instead we have taken the 2012 pensioner membership data and rated this up to cover the period 2005-12 allowing for the change in pensioner numbers over the period. This has been compared with the deaths data provided for the same period. This approach implicitly assumes a stable pensioner profile over that period, which in our opinion is a reasonable assumption.
- C7 The death data supplied did not have a reliable member/dependant indicator. We were therefore unable to carry out separate analysis for members and dependants. In the absence of any evidence to the contrary we recommend adopting the same assumptions for dependants as for members of the same gender.
- C8 The indicators in the data supplied for males/females and officers/other ranks did not appear to be sufficiently reliable to support analysis split by these indicators.

⁵¹ For example see CMI self-administered Pension Schemes Mortality Committee, Working Paper 65: *Analysis of the mortality experience of pensioners of self-administered pension schemes for the period 2004 to 2011*, April 2013.



Method of analysis and setting of assumptions

- C9 Given the data issues described above, our approach has been to analyse the number of total deaths for AFPS 75, AFPS 05, RFPS and FTRSPS in the period 2005-12, which DBS believes to be reasonable, by reference to the number of pensioners in the population in that period derived as described in paragraph C5 above. In our opinion this should result in baseline mortality assumptions which in overall terms reflect a best estimate of the level of mortality in the population.
- C10 We have compared the aggregate mortality experience between 1 April 2005 and 31 March 2012 with that of appropriate S1 tables and with the assumptions used for the 2005 actuarial assessment, which were based on previous (PA92) standard tables. Since the S1 tables do not include allowance for improvements in mortality, in comparing with the Schemes' experience we have adjusted the standard tables to be applicable to those applicable to the period the deaths occurred. The adjustments applied are broadly in line with the improvements applying to the UK population over the relevant period derived using mortality rates from the UK Interim Life Tables.
- C11 The results of this analysis are shown in table C1 below. The figures shown in the table are the aggregate number of deaths compared to the expected number of deaths under certain sets of assumptions.
- C12 We note that separate employer contribution rates will be calculated for officers and other ranks. It is therefore appropriate to allow for the differential in mortality rates between these groups. As discussed in paragraph C7 above, the data provided for the 2012 valuation was not sufficiently reliable to calculate this differential. Instead, we have looked back to the analysis of mortality experience which was carried out as part of the 2005 actuarial assessment. In the absence of any more recent evidence, we have assumed that the differential between officers and other ranks derived in the 2005 analysis remains appropriate going forward.

Results of analysis

- C13 The aggregate number of deaths in 2005-12 has been compared with the number expected under the 'S1NXA' tables (ie the S1NMA tables for men and the S1NFA tables for women), weighted by the total numbers of men and women in the 2012 pensioner data, and with the number expected under the 2005 assumptions (PMA92 tables with -1 year age adjustment for officers and +2 year adjustment for other ranks).

Table C1: Aggregate mortality experience 2005-2012

	Number of deaths	Experience relative to the assumptions
Actual experience	65,545	-
2005 valuation assumptions	67,478	97%
S1NXA tables	59,606	110%

- C14 We recommend adopting assumptions of baseline pensioner mortality which are equivalent in aggregate to 110% of the S1NXA tables, for all pensioners and dependants.



C15 Based on the overall differential between other ranks and officers mortality derived in the 2005 assessment, we recommend assumptions of 88% of the S1NXA tables for officers and 118% for other ranks, which for this population are equivalent overall to 110% of the S1NXA tables. These tables are to be applied to all pensioners and dependants.



Appendix D: Analysis of age retirement from service (with immediate benefits)

Process for setting assumptions

D1 The process we have followed is:

- > Set assumptions for members with transitional protection by reference to recent retirement experience in the Schemes and expected future trends.
- > Set assumptions for new entrants to the 2015 scheme by considering any relevant evidence. This is not simple. The available experience in the Schemes relates to benefits with different payment ages:
 - In the 2015 scheme, EDPs will be available after 20 years' service from age 40. In AFPS 75 and AFPS 05, there are respectively IPs available after 16 years' service from age 21 for officers and 22 years' service from age 18 for other ranks, and EDPs available after 18 years' service from age 40.
 - In the 2015 scheme, normal pension age will be 60. In the existing schemes it is generally 55.
- > Set assumptions for members with mixed service (ie service in one of the existing schemes and the 2015 scheme) relative to the assumptions for members with service in only one of the schemes. Again this is not a simple task because there are many factors that could affect the relative behaviours of the groups.

D2 We have carried out our analysis on a unisex basis, as the experience for females is less statistically credible and we are not aware of any significant differences in expected exit profiles for males and females.

Members with transitional protection

D3 We have analysed the pattern of age retirements from active membership over the inter-valuation period for members of AFPS 75 and FTRSPS. The analysis compares the actual rates of age retirement to the expected rates under the assumptions adopted for the 2005 assessment. Analysis has been carried out separately for officers and other ranks.

D4 Insufficient data exists to perform a credible analysis of AFPS 05 and RFPS experience. Previous AFPS 05 and RFPS assumptions were derived by amending the AFPS 75 assumptions to reflect the different qualification points for EDPs/IPs. A similar approach has been adopted in the proposed AFPS 05 and RFPS assumptions for the 2012 valuation.

D5 The graphs below show the actual rate of age retirements for officers and other ranks in AFPS 75 and FTRSPS (grouped by age) compared with the previous assumptions. They also show the size of the population from which the experience was derived – this is the shaded area and corresponds to the right hand vertical axis.

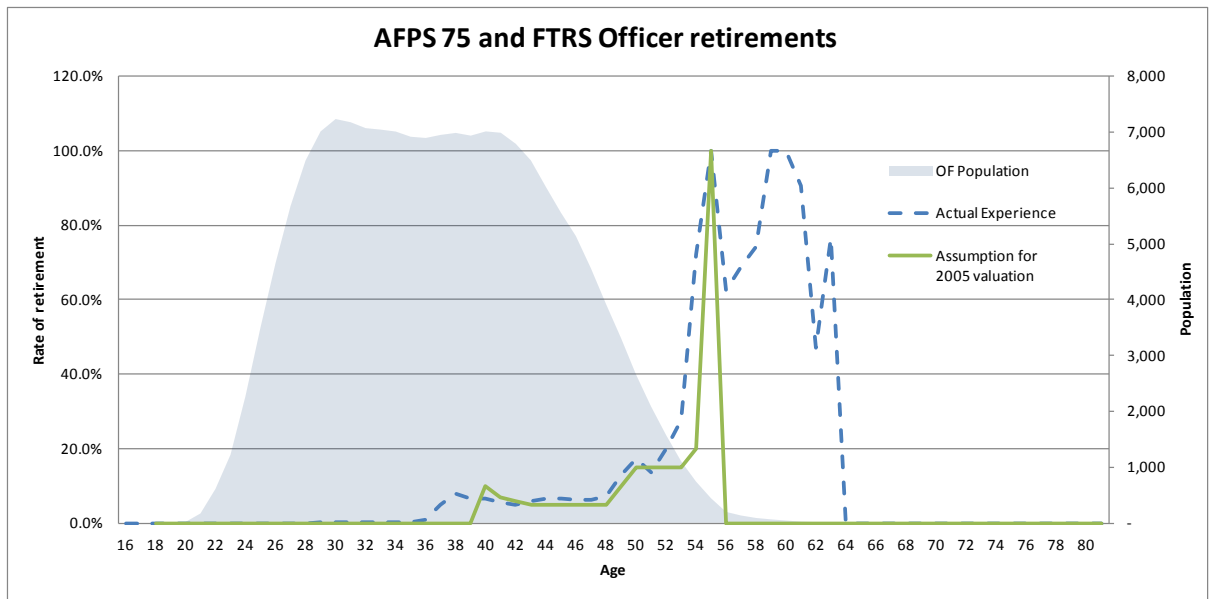
D6 Where the underlying population is sufficiently large (and hence the analysis credible) the experience over the period has been broadly in line with the previous assumptions.

D7 Further analysis showed that there were no discernible trends over the analysis period (2005-2012).

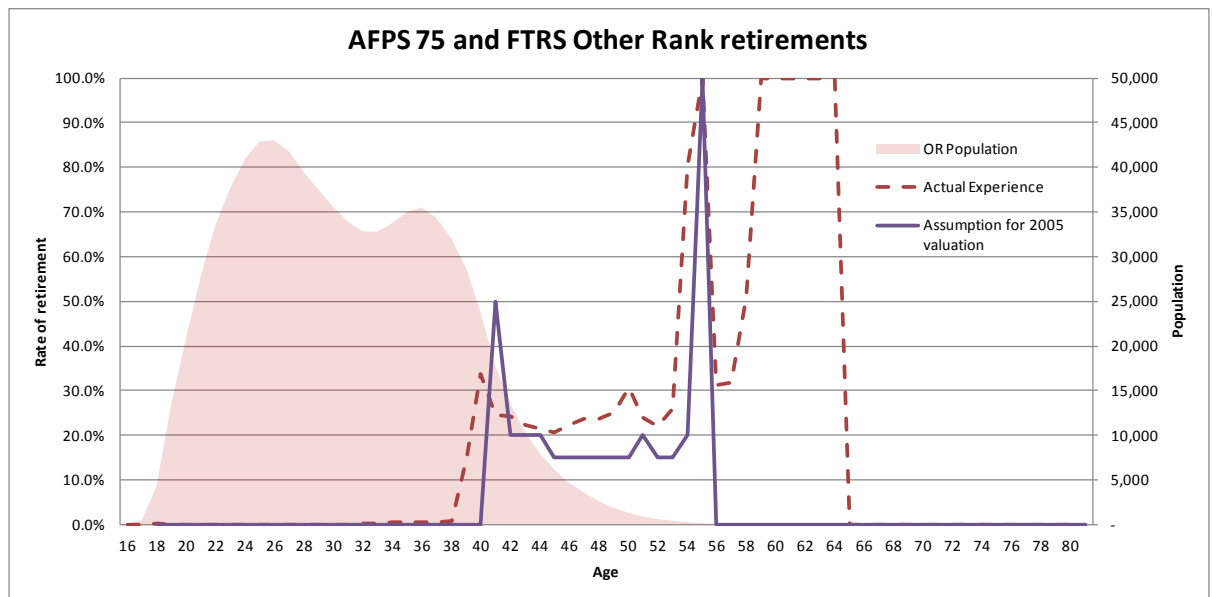


D8 The recommended 2012 assumptions for members of AFPS 75 and FTRSPS with transitional protection are therefore identical to those used in the 2005 assessment.

Graph D1: Age retirement rates for AFPS 75/FTRSPS officers (males and females)



Graph D2: Age retirement rates for AFPS 75/FTRSPS other ranks (males and females)





D9 In the absence of credible evidence in AFPS 05 and RFPS, the recommended 2012 assumptions for members of those schemes with transitional protection are also unchanged from the previous assumptions.

New entrants to the 2015 scheme

D10 In the absence of directly relevant experience, a pragmatic approach to setting this assumption is required.

D11 The view of MoD is that it would be reasonable to adopt a similar approach as for 2015 scheme design work. This approach is:

- > to assume that the proportions of the overall population taking EDP, and those staying in service until normal pension age, would be similar to AFPS 05 members with transitional protection, and
- > to allow for the bulk of EDP retirements and retirements at normal pension age to shift to slightly older ages/longer periods of service to allow for the change in EDP qualification to 20 years and the increase in normal pension age from 55 to 60.

D12 As experience in the 2015 scheme develops, the assumptions will be reviewed.

Members with service in the existing schemes and the 2015 scheme

D13 HMT advice is to assume that retirement patterns will change smoothly and gradually over time. It is not clear that this will be the case – there are a number of specific considerations in relation to the Schemes, notably the IP/EDP qualification points for the various groups of members and the introduction of the New Employment Model. However, the view of MoD is that there is no clear evidence to suggest an alternative approach at this stage. The recommended approach is therefore to assume smooth and gradual transition.

D14 Applying this directly would result in very complicated assumptions. To allow for reasonable implementation, we propose to assume that the assumptions for AFPS 75 / 2015 scheme members are weighted 75% towards AFPS 75, and the assumptions for AFPS 05 / 2015 scheme members are weighted 25% towards AFPS 05. This reflects the average proportions of service which these members are expected to have in their current schemes on age retirement. These assumptions will be reviewed at subsequent valuations as experience develops.



Appendix E: Analysis of ill-health retirement from service (non-attributable)

Rates of ill-health retirement

- E1 We have considered the experience of ill-health retirements (and 'Tier 1' lump sums) over the inter-valuation period for AFPS 75, AFPS 05, FTRSPS and RFPS. The analysis compares the actual rate of ill-health retirements to the expected rate of ill-health retirements based on the assumptions adopted for the 2005 assessment.
- E2 The tables below show the actual number of ill-health retirements in the schemes under consideration, compared with the expected number of ill-health retirements based on the 2005 assumptions.

Table E1: Ill-health retirement experience 2005-12 (AFPS 75 and FTRSPS)

	Actual retirements	Expected retirements	Actual/Expected
Officers	298	415	72%
Other ranks	4,886	5,874	83%

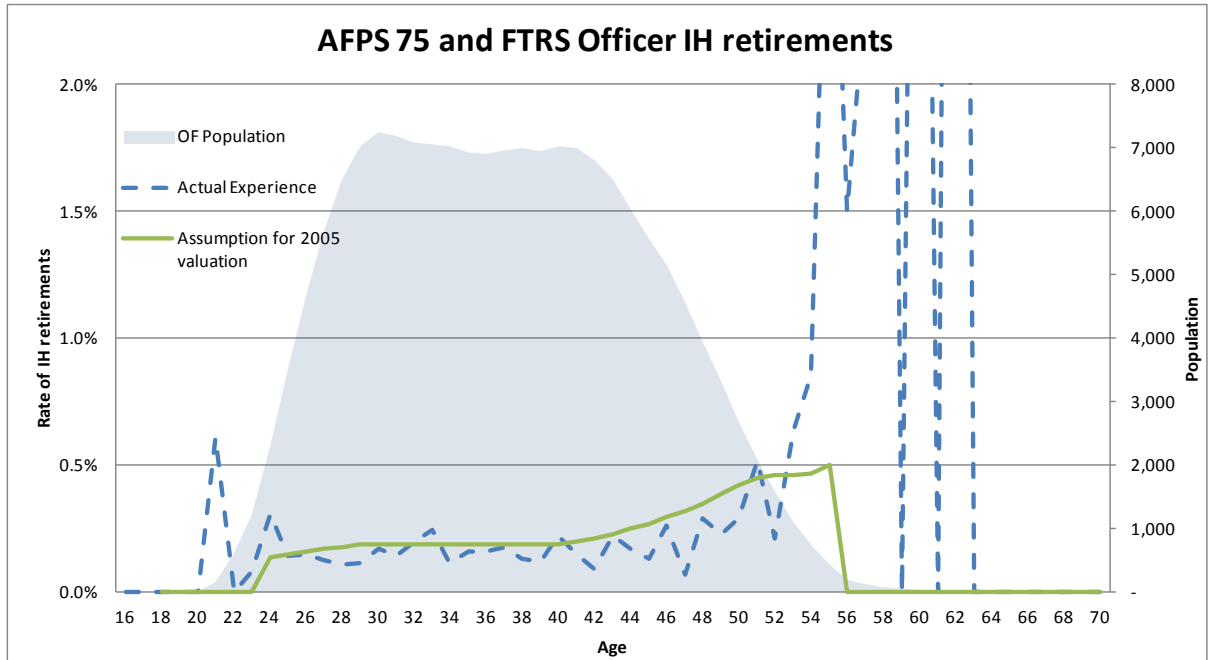
Table E2: Ill-health retirement experience 2005-12 (AFPS 05 and RFPS)

	Actual retirements	Expected retirements	Actual/Expected
Officers	48	152	32%
Other ranks	1,065	2,374	45%

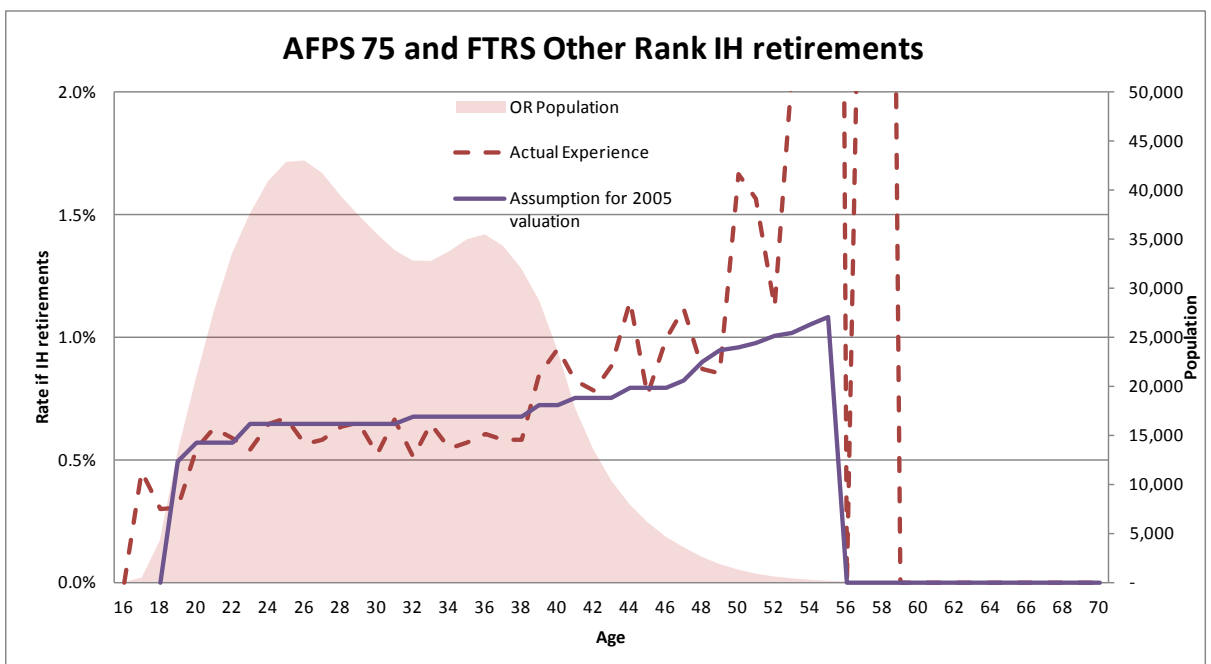
- E3 The number of ill-health retirements among women was not high enough to give credible support to separate rates for men and women. Accordingly our analysis was carried out on a unisex basis. We are not aware of any evidence to suggest significant differentials in non-attributable AFPS ill-health retirement between men and women.
- E4 For AFPS 05 and RFPS, there is insufficient evidence to support a credible analysis. This is because the membership is made up of new joiners since 2005 together with a small group of officers who transferred from AFPS 75 to AFPS 05 and so does not provide enough relevant experience across different ages.
- E5 The graphs below show the actual rates of ill-health retirements of AFPS 75 and FTRSPS members by age compared with the 2005 assumptions. The graphs show that the general pattern of ill-health retirement rates by age is similar to the 2005 assumptions but the actual rates of ill-health retirements have been lower.



Graph E1: AFPS 75 and FTRSPS Officers ill-health retirement experience 2005-12



Graph E2: AFPS 75 and FTRSPS Other Ranks ill-health retirement experience 2005-12





- E6 Table E3 shows the number of ill-health retirements observed in each year of the analysis. Although the number of retirements is highest in the first and last years, there is not a clear trend in the pattern of retirement.

Table E3: Ill-health retirement experience 2005-12 (AFPS 75, AFPS 05, FTRSPS, RFPS)

Year	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12
Number of retirements	1,075	856	899	792	577	864	1,234

- E7 However, levels of medical discharge in the Army as reported by Defence Statistics⁵² have shown a steep rise from 2012 to 2014, and the Army's long term planning assumption is that medical discharges will decline to some extent but will settle at an elevated steady state which is significantly higher than the average level during the intervaluation period (2005-12).
- E8 Taking into account experience in the intervaluation period, subsequent trends and uncertainty about the future (for example deployment characteristics), MoD's view is that it is appropriate to retain the same assumptions as adopted for the 2005 assessment, to be kept under review at future valuations.
- E9 The structure and eligibility requirements of the ill-health retirement benefits provided by the 2015 scheme are broadly similar to those under AFPS 05. We therefore recommend adopting the same assumptions for the 2015 scheme as for AFPS 05, extending the age 54 assumption unchanged to ages 55-59 to accommodate the change in normal pension age from 55 to 60.

Proportion of Tier 1, 2 and 3 ill-health benefit awards

- E10 In AFPS 05 and RFPS, and in the 2015 scheme, there are three tiers of ill-health benefits. A list of Tier 1 ill-health retirements (the lowest level, where members receive a lump sum but no pension enhancement) was provided, but no breakdown between Tiers 2 and 3 was provided.
- E11 Based on the information provided, of the 1,113 ill-health retirements of AFPS 05 and RFPS members over the seven year period to 31 March 2012, 794 were Tier 1 and 319 were Tiers 2 or 3. This equates to around 70% Tier 1 benefits.
- E12 The assumption adopted for 2015 scheme design purposes was that 20% of AFPS 05 and RFPS ill-health retirements would receive Tier 1 benefits, 30% Tier 2 and 50% Tier 3.

⁵² See

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/328699/medical_discharges_1_apr_09_31_mar_14_.pdf



- E13 We note that the profile of AFPS 05 membership in 2005-12 was not representative of a stable population, as it consisted of a significant number of transferees from AFPS 75, together with new joiners since 2005. We therefore recommend that only partial allowance for recent experience is made, by increasing the assumed Tier 1 proportion from 20% to 40%, with the other tier proportions reduced by 10% each, and that this assumption is kept under review in future as further evidence emerges.



Appendix F: Analysis of withdrawal from service (without entitlement to immediate benefits)

Comparison of numbers of withdrawals with 2005 assumption

- F1 We have analysed the pattern of withdrawals from the active membership over the seven year period to 31 March 2012 for AFPS 75, AFPS 05, FTRSPS and RFPS. We have carried out our analysis on a unisex basis, as the experience for females is not statistically credible and we are not aware of any significant differences in expected exit profiles for males and females.
- F2 The profile of withdrawals will be influenced by the profile of age retirements and so the assumptions made for each should be consistent. A service-based analysis has been used to derive withdrawal assumptions. However, for consistency with other assumptions and ease of understanding, the proposed assumptions have then been expressed by reference to age. This approach is consistent with the 2005 assessment. In practice the majority of Armed Forces personnel commence service at broadly similar ages and so we do not expect this approach to have a material impact on the valuation results.
- F3 To express service-based rates by reference to age, we have assumed single entry ages of 19 for other ranks and 24 for officers. These reflect average entry ages derived from the 2012 active membership data. These assumed entry ages are the same as those assumed in the 2005 assessment.
- F4 Table F1 below shows the number of actual withdrawals with the expected number of withdrawals based on the 2005 assumptions (unisex). 'Withdrawal' refers to leaving service without entitlement to immediate benefits (eg AFPS 75 immediate pension or AFPS 05 early departure payments).

Table F1: Withdrawals without immediate benefits over the period 2005-12

Member category	Actual number (A)	Expected number (E)	A/E
AFPS 75 and FTRSPS			
Officers	3,446	3,568	97%
Other ranks	52,546	57,803	91%
AFPS 05 and RFPS			
Officers	5,293	1,108	478%
Other ranks	53,299	30,517	175%

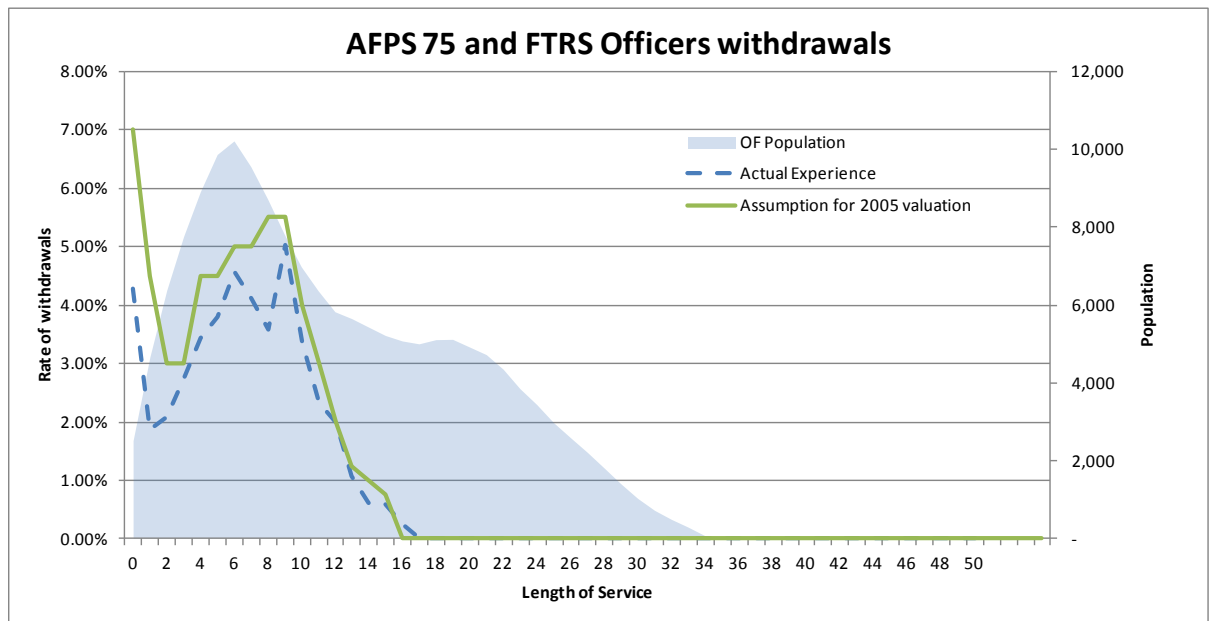
- F5 The table above indicates that the observed withdrawal experience is slightly lower than expected for members of AFPS 75 and FTRSPS, but substantially higher for members of AFPS 05 and RFPS, under the assumptions adopted for the 2005 assessment. We note that the experience for AFPS 05 is of limited value because the population was made up of transferees from AFPS 75 together with new entrants and its withdrawal experience has therefore not been typical of a stable population.



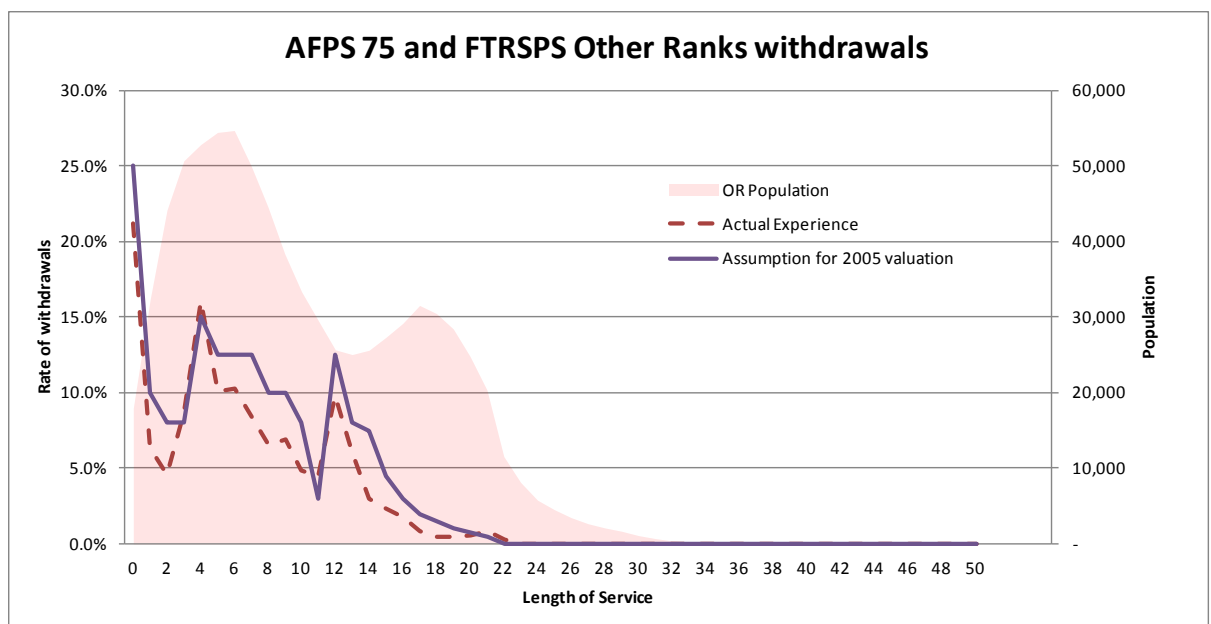
Comparison of observed withdrawal rates 2005-12 with the 2005 assumptions

F6 The graphs below show a comparison of observed rates of withdrawals over 2005-12 with the 2005 assumptions, split into officers and other ranks and shown by reference to length of service. They also show the size of the population from which the experience was derived - this is the shaded area and corresponds to the right hand vertical axis.

Graph F1: Withdrawal rates over 2005-12 – AFPS 75/FTRSPS officers

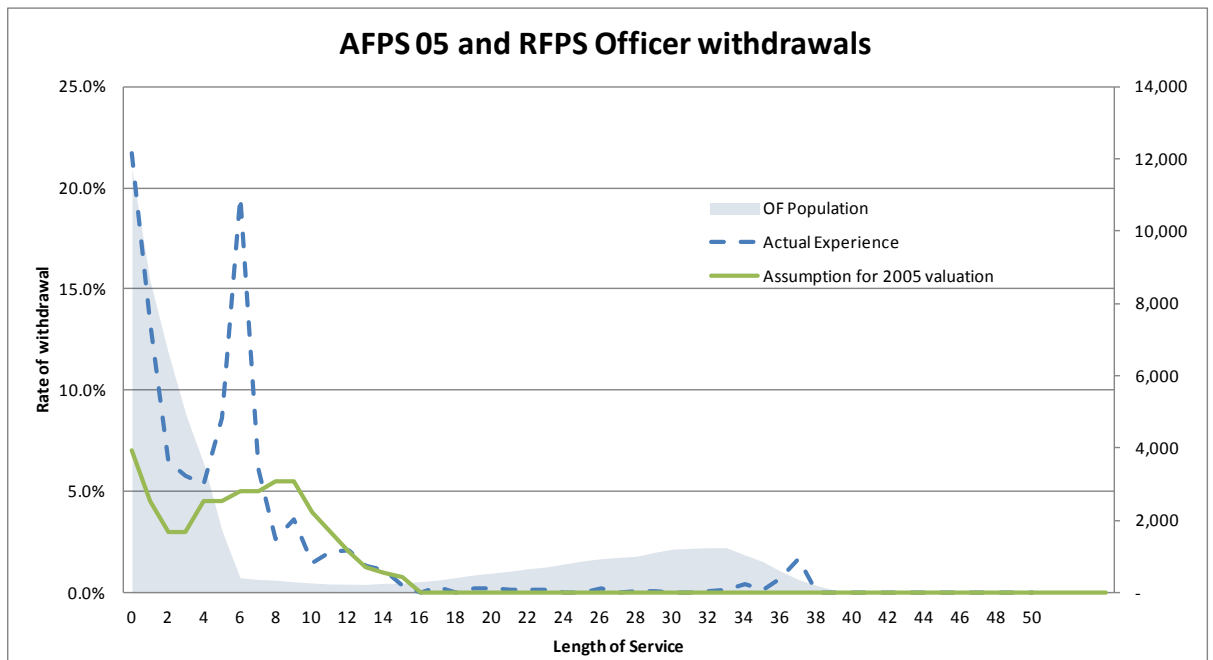


Graph F2: Withdrawal rates over 2005-12 – AFPS 75/FTRSPS other ranks

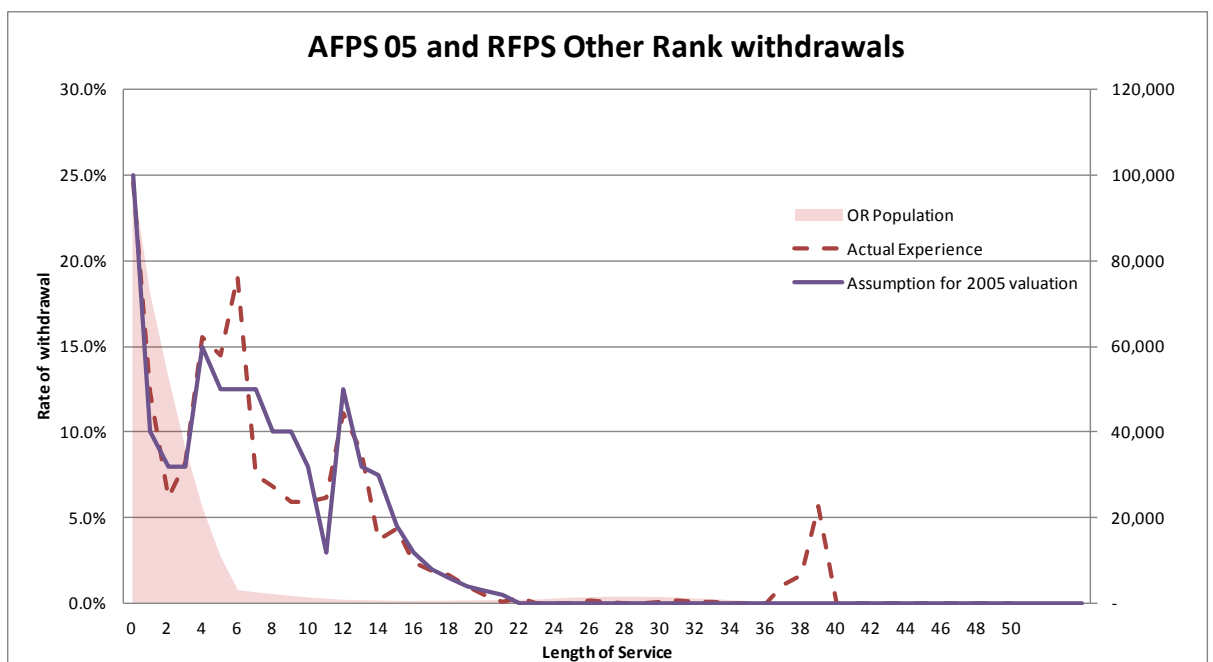




Graph F3: Withdrawal rates over 2005-12 – AFPS 05/RFPS officers



Graph F4: Withdrawal rates over 2005-12 – AFPS 05/RFPS other ranks





Method for setting assumptions

- F7 We are not aware of any evidence to suggest that AFPS 75 and AFPS 05 members should experience significantly different rates of withdrawal. We therefore recommend a single set of assumptions (separate for officers and other ranks) across all schemes. This approach is the same as for the 2005 assumptions.
- F8 The most credible experience for officers relates to AFPS 75/FTRSPS experience. This is because for AFPS 05/RFPS, the experience is skewed by those officers who transferred from AFPS 75.
- F9 The most credible experience for other ranks relates to AFPS 05/RFPS up to the 4 years' service point (as this captures new entrants since 2005), and to AFPS 75/FTRSPS from the 5 years' service point onwards.

Proposed assumptions for 2012 valuation

- F10 The recommended assumptions are based on the most credible experience from the 2005-12 analysis as described above. The same assumptions are proposed for the 2015 scheme.
- F11 For consistency with the age retirement assumptions, we recommend that no allowance is made for withdrawal after service personnel reach the point at which they would become entitled to immediate benefits in AFPS 75, AFPS 05 or the 2015 scheme. This is consistent with the 2005 assumptions.



Appendix G: Analysis of death in service

- G1 The death data received for the purpose of the valuation did not provide identifiers to distinguish active or deferred members from others such as ill-health pensioners. We have therefore not been able to use this data to analyse the experience of death in service or deferment over the inter-valuation period.
- G2 However, information on total deaths in service of regular service personnel in the calendar years 2004 to 2013 is available in the Defence Statistics publication 'Deaths in the UK Regular Armed Forces 2013'⁵³. This publication also includes Standardised Mortality Ratios (SMRs) which compare the deaths experience in the regular Armed Forces to those in the general UK population, correcting for age, gender and timing.
- G3 The table below shows the number of actual deaths in service, death rates and SMRs from Defence Statistics over the ten calendar years 2004 to 2013, together with a comparison with the assumptions for the 2005 assessment. This shows that the actual number of deaths was slightly lower than those expected on the 2005 assumptions. It also shows that the SMRs were below 100 in each year, indicating that the regular Armed Forces experienced fewer deaths than the UK population as a whole.

Table G1: Death in service experience in regular Armed Forces for calendar years 2004-13 (all except last two columns from Defence Statistics)

Year	Total deaths	Death rate per 100,000 strength	SMR	Expected deaths on 2005 assumptions	Actual/Expected
2004	170	82	76	n/a	n/a
2005	160	82	75	189	85%
2006	191	98	87	186	103%
2007	204	106	96	143	110%
2008	137	74	65	195	70%
2009	205	107	99	202	101%
2010	187	97	94	209	89%
2011	132	69	71	207	64%
2012	129	71	75	n/a	n/a
2013	86	50	53	n/a	n/a

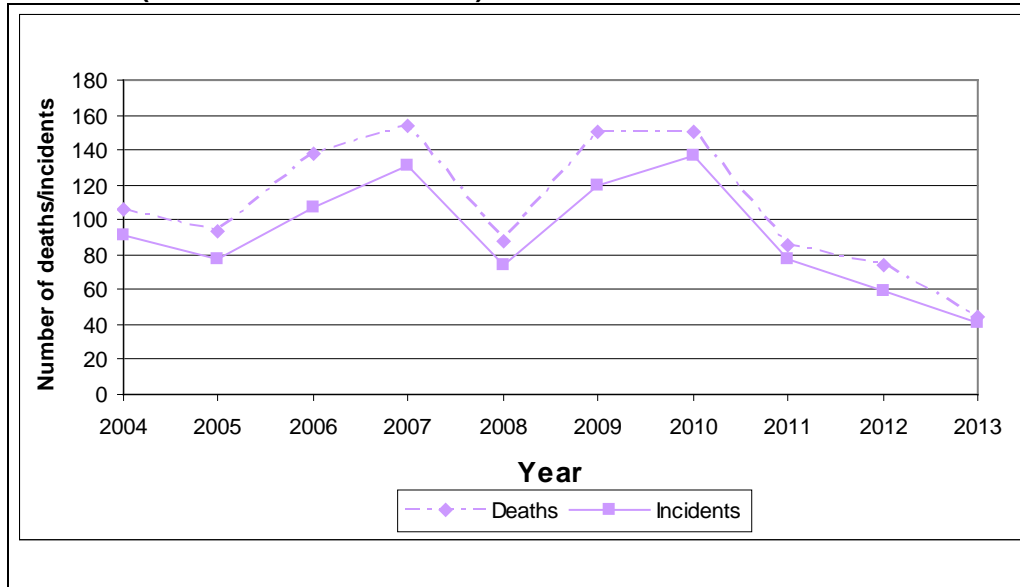
⁵³ Available at the following link:

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/295835/20140327_UKAF_deaths_National_Statistic_2013.pdf



G4 The graph below illustrates the variation in deaths and fatal incidents over this period.

Graph G1: UK regular Armed Forces deaths and fatal incidents, 2004-2013, numbers (from Defence Statistics)



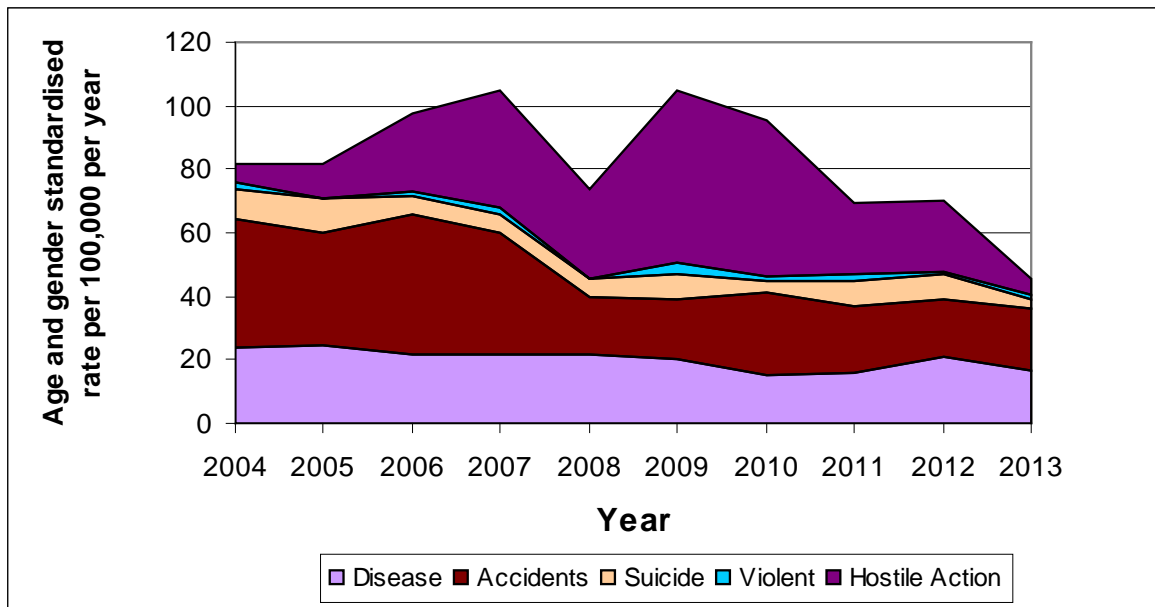
G5 The Defence Statistics data also provides a breakdown by cause of death. This is summarised in the following table and graph.

Table G2: Death rates per 100,000 strength by cause in regular Armed Forces (from Defence Statistics) (totals include unknown causes)

Cause	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Disease	24	25	22	21	22	20	15	16	21	17
Accidents	40	35	44	39	18	19	27	20	18	19
Suicide	9	10	6	5	6	8	3	8	8	3
Violent	3	0	1	2		3	1	2	1	1
Hostile Action	5	10	25	37	28	54	49	23	22	5
Total	82	82	98	106	74	107	97	69	71	50



Graph G2: UK regular Armed Forces deaths by cause, 2004-2013, rates (from Defence Statistics)



- G6 Table G2 and Graph G2 show that deaths owing to hostile action have fluctuated significantly, presumably owing to the deployment characteristics of the Armed Forces over this period.
- G7 In the view of MoD, the average level of future deaths owing to hostile action is more likely to reflect the lower level experienced in the years 2012-13, rather than the average level over 2004-13. The recommended assumptions are therefore based on average mortality rates excluding deaths from hostile action over 2004-13, plus average mortality rates from hostile action over 2012-13, with no further allowance for future trends.
- G8 Using the above approach, the average SMR weighted by number of deaths, was around 70%, suggesting aggregate death in service rates for the Armed Forces of around 70% of the rates in the overall UK population. We therefore recommend assuming death rates equal to 70% of the rates from the ONS 2008-10 UK Interim Life Tables, both for males and females.
- G9 We also recommend the same rates are assumed for death in deferment and for reservists. These assumptions would not be expected to have a material impact on the valuation results.



Appendix H: Analysis of promotional pay increases

Approach to the analysis

- H1 Promotional pay increases were analysed for members of AFPS 75, AFPS 05, FTRSPPS and RFPS.
- H2 Two separate analyses are required. To determine benefits for members of AFPS 75 and FTRSPPS, representative pay for the individual's rank is used. To determine benefits for members of AFPS 05 and RFPS, and contributions to all schemes, actual pensionable pay is used.
- H3 For each analysis we analysed the profile of the relevant active membership as at 31 March 2012 in terms of average pay by age ('profile analysis'). This approach is explained below.
- H4 A supplementary method of analysis would have been to track the pensionable pay progression of individual members who were in active service during the analysis period ('annual increase analysis'). However, individual data to allow this method of analysis to be used was not obtainable.

Profile analysis

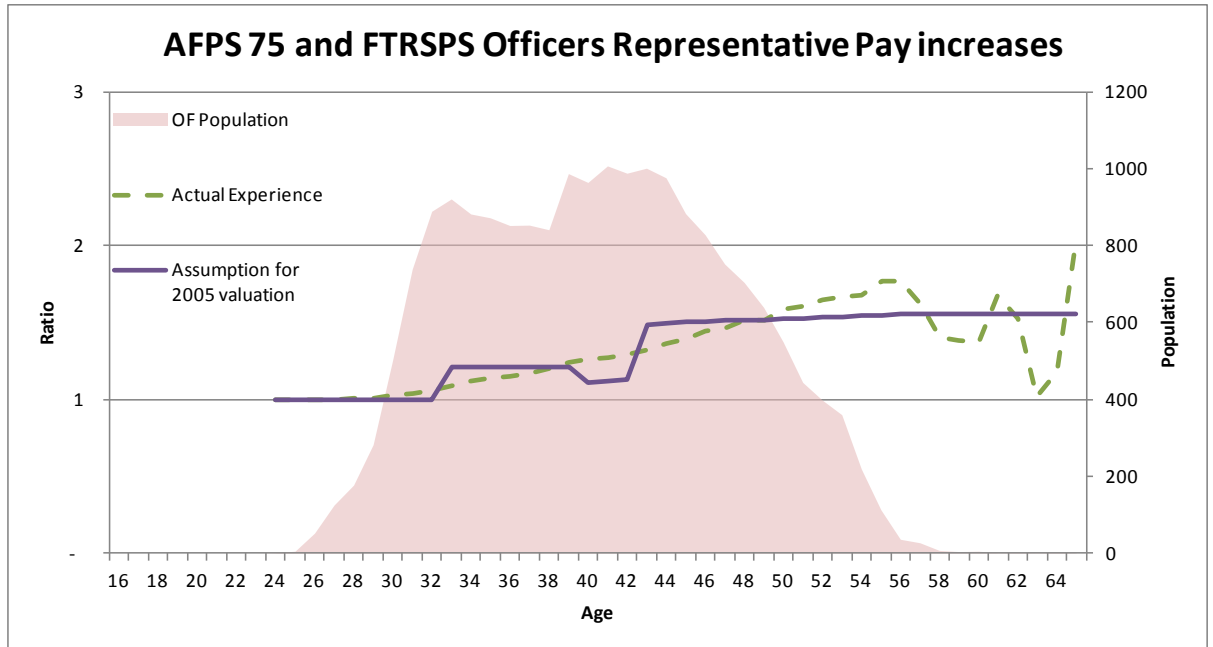
- H5 We calculated the implied promotional pay increases by comparing the average pay (representative and pensionable respectively) for each age as at 31 March 2012 to the corresponding average at the next age. These differences are then compared to the assumed promotional increases adopted for the 2005 assessment.
- H6 We have made no allowance for the current period of pay restraint in our analysis as we understand promotional/progression increases have not been significantly affected by this.

Results of 2005-12 experience analysis

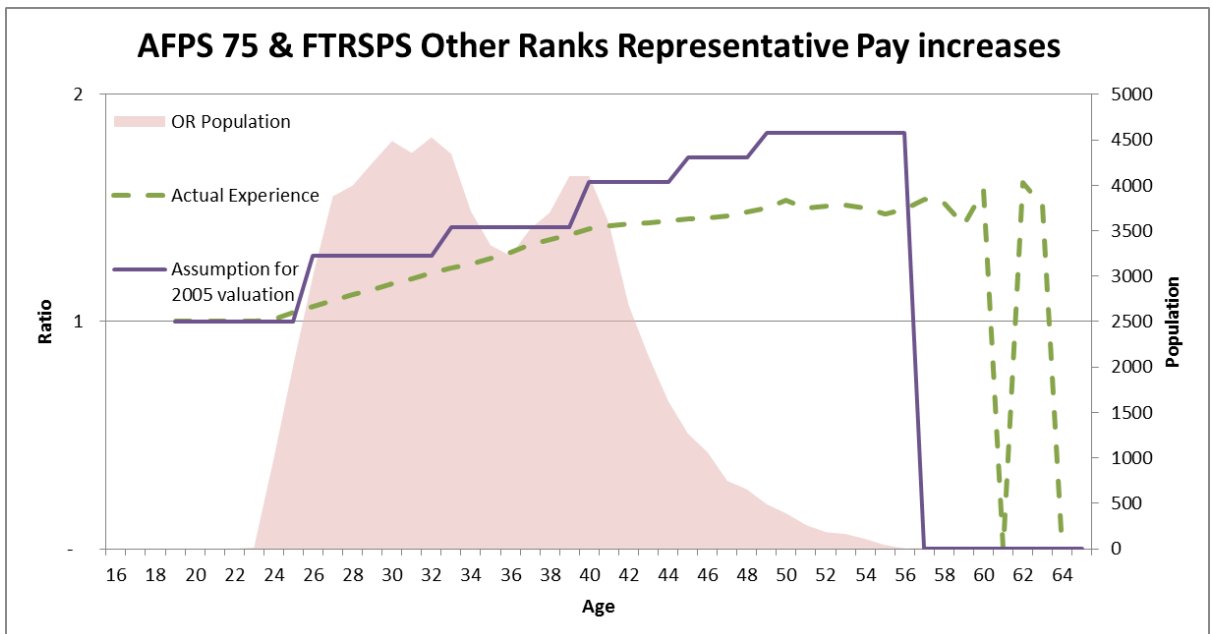
- H7 We have separately analysed officer and other rank data. We carried out the analysis on a unisex basis as the evidence for women was less statistically credible and we are not aware of any evidence to suggest significant differences between male and female pay profiles overall.
- H8 The graphs below shows the implied and expected annual increases in promotional pay. The implied promotional pay increases are derived using the profile analysis explained above.



Graph H1: AFPS 75 and FTRSPS officers: representative pay increases

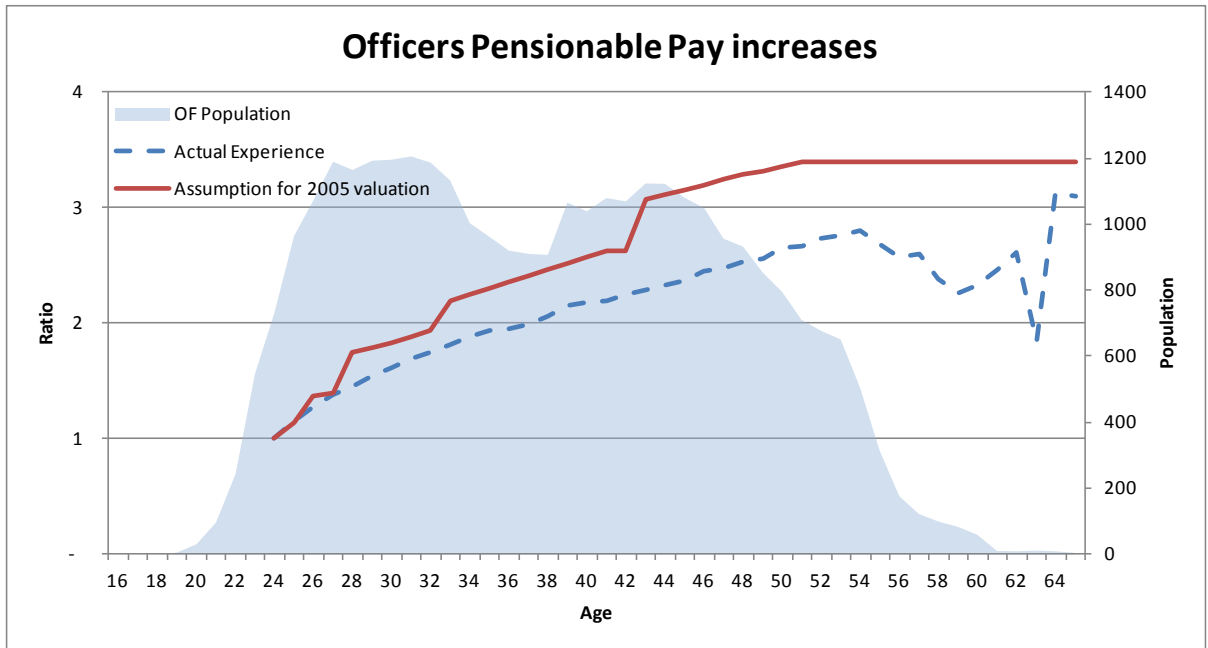


Graph H2: AFPS 75 and FTRSPS other ranks: representative pay increases

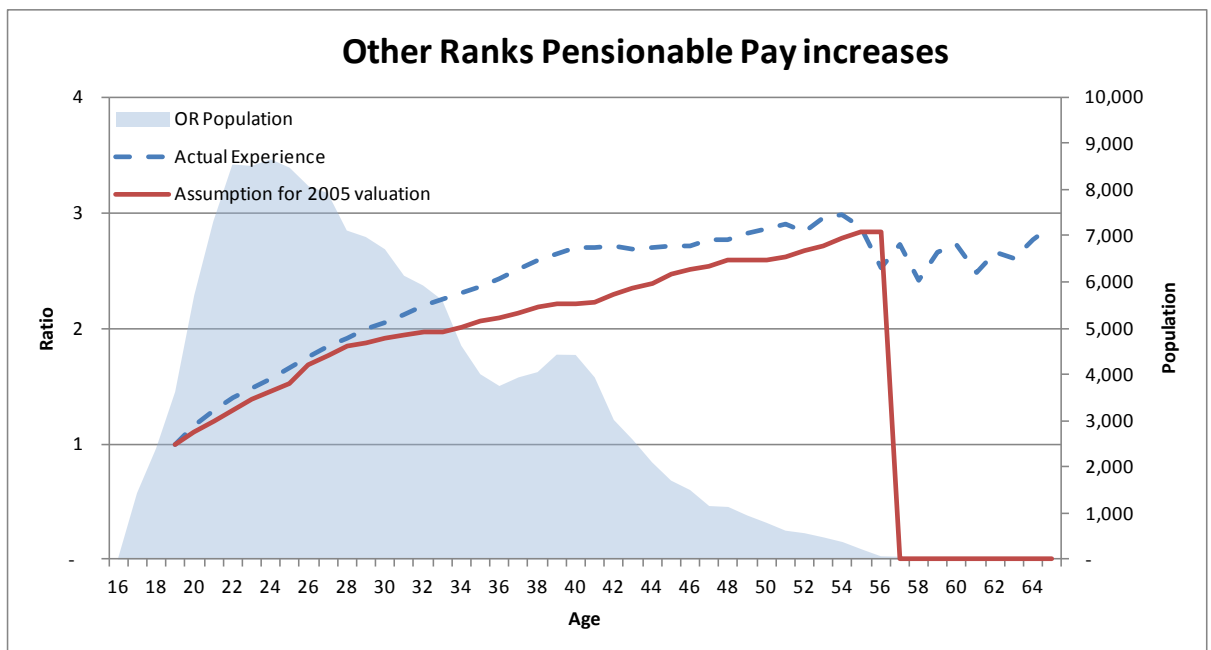




Graph H3: Officers: pensionable pay increases



Graph H4: Other Ranks: pensionable pay increases





H9 The graphs above show that the patterns of promotional increases implied by the membership profile as at 31 March 2012 as at actual experience were similar to the 2005 assumptions. However, the implied overall increases were higher than the 2005 assumptions for other ranks' pensionable pay, and lower for officers' pensionable pay and other ranks' representative pay.

H10 The results of this analysis should be treated with some caution, as the analysis is affected by the mixture of members at each age. However, the Armed Forces has reasonably homogeneous patterns of joining and progression by age. In our opinion this analysis therefore gives a reasonable basis for setting assumptions.

Future changes to pay arrangements

H11 A new Armed Forces pay model is due to be implemented from 2016 as part of the New Employment Model. We have been informed by MoD that while this may lead to changes in the timings of promotions and progressions, there is no clear evidence to suggest that overall promotional increases over typical full career paths will change significantly as a result. We have therefore based the proposed assumptions on our analysis of past experience as described above.

Recommended assumptions

H12 The recommended promotional scales are based on the profiles as at 31 March 2012.

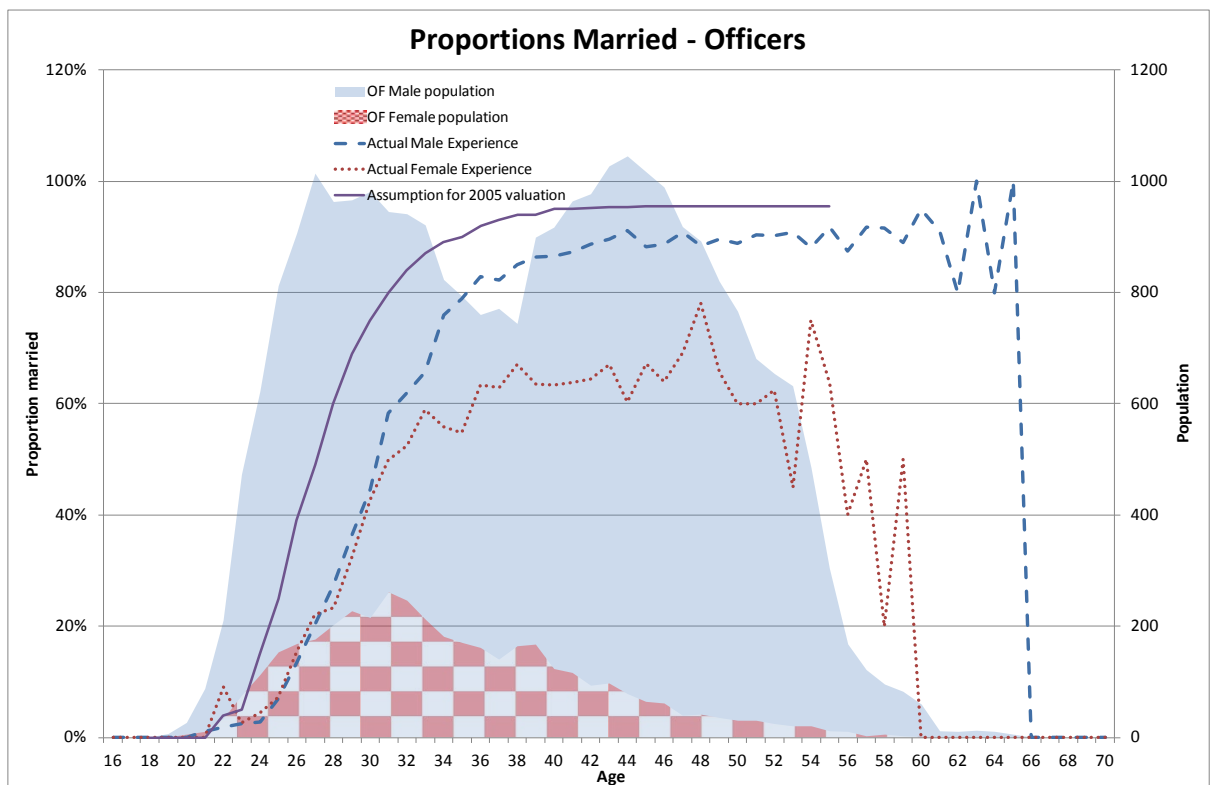


Appendix I: Analysis of family statistics

Proportions married/partnered

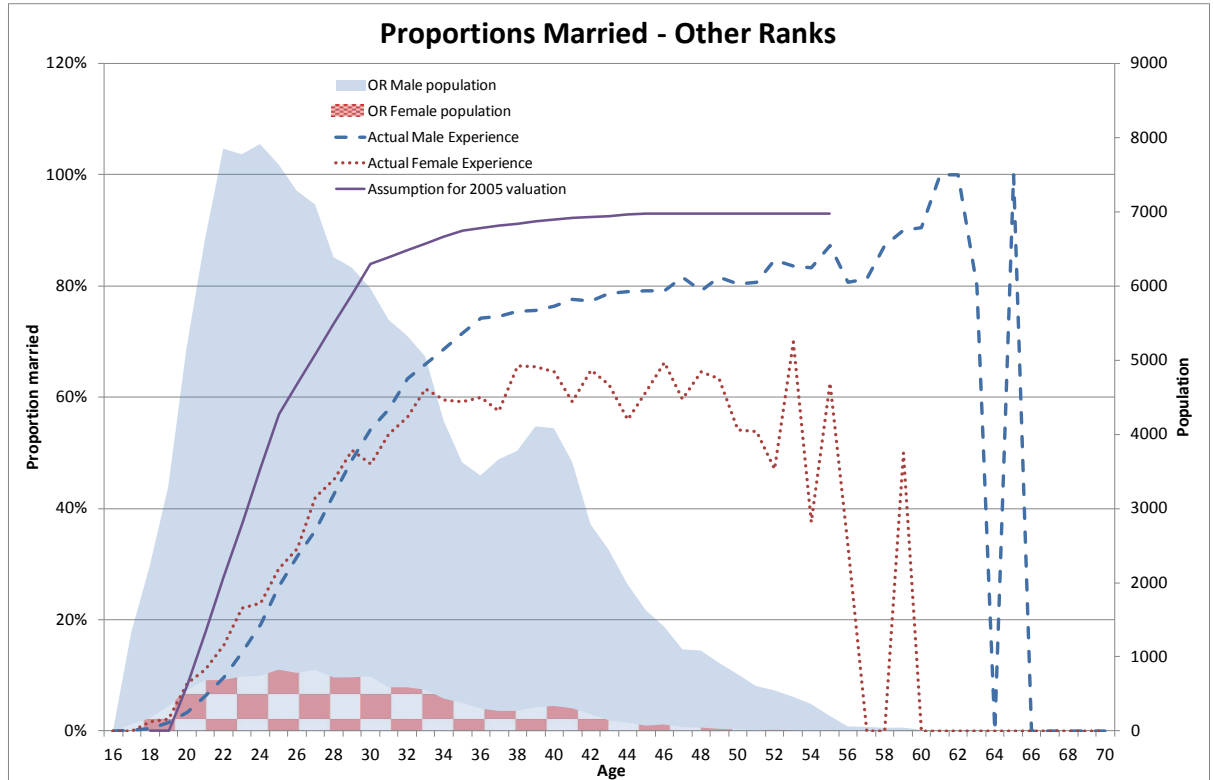
- I.1 The data received in respect of deaths in the inter-valuation period did not include a married/partnered status indicator. However, the 31 March 2012 active membership data did include a marital status indicator. We understand that this indicator may be expected to be accurate for active members retiring, because it is used to determine the entitlement to certain in-service allowances.
- I.2 Our analysis looked at the marital status of active members of AFPS 75, AFPS 05, FTRSPS and RFPS as at 31 March 2012 by age. Separate analysis was carried out for men and women, and for officers and other ranks. The results of our analysis are shown in the graphs below, together with the corresponding 2005 assumptions.

Graph I1: Proportions married for Officers





Graph I2: Proportions married for Other Ranks



- I.3 The graphs above show that for the active membership as at 31 March 2012, the proportions married were generally slightly lower than in the 2005 assumptions. We note that while the implied proportions for women are considerably lower than for men, the experience for women is relatively limited.

Setting assumptions

- I.4 For future pensioners we have recommended proportions married at retirement based on the implied peak proportions from the graphs above.
- I.5 The Office for National Statistics (ONS) publishes England & Wales population data on the proportions of people at various ages that are married, cohabiting or 'other' (ie living alone and not married). To formulate a recommended assumption for proportions married at older ages (for current pensioners) we compared the recommended proportions married at retirement from scheme experience with the peak ONS population proportions married. We then assumed that at older ages the same relationship between scheme and population proportions married would hold.



- I.6 One particular advantage of this approach is that it leads to a straightforward way of setting the assumption for the proportion married or partnered (required for AFPS 05 and 2015 scheme members) by making use of the ONS statistics on cohabitation. We have assumed that the proportions partnered at retirement are 5% higher than the proportions married for all groups, with consistent uplifts at older ages (for current pensioners).
- I.7 The table below sets out the recommended assumed proportions married and partnered at retirement together with the relevant peak proportions from the ONS data.

Table I1: Proposed proportions married at retirement, with corresponding peak proportions from ONS data

	Assumed proportion married based on analysis	Assumed proportion partnered based on analysis and ONS data	ONS proportion married	ONS proportion married or cohabiting
Male officers	90%	95%	76%	80%
Female officers	65%	70%	70%	75%
Male other ranks	85%	90%	76%	80%
Female other ranks	60%	65%	70%	75%

- I.8 The adjustments to ONS data used to derive proportions married for older ages (based on the figures in Table I1) are as follows:
- > Male officers: 118% of ONS proportions married
 - > Female officers: 93% of ONS proportions married
 - > Male other ranks: 112% of ONS proportions married
 - > Female other ranks: 86% of ONS proportions married.

Age differences

- I.9 No data was provided on age differences between members and their spouses or partners. The recommended assumption is based on experience in the general population and other occupational pension schemes. We do not expect this assumption to have a material effect on the valuation results.



Remarriage and children's pensions

- I.10 No data was obtainable for the 2012 valuation on remarriage experience. We understand from MoD that cessations of pension on remarriage in AFPS 75 have typically numbered less than 100 per year in recent years. Given the November 2014 changes to remarriage cessation (see paragraph 11.7) and the low numbers of historic cessations, we recommend that no allowance is made for remarriage cessation as we do not expect this to have a material effect on the valuation results.
- I.11 No data was obtainable for the 2012 valuation on children's pension experience. However we understand from MoD that the number of children's pension awards has been relatively low in recent years. We recommend that no allowance is made for children's benefits as we do not expect this to have a material effect on the valuation results.