Government Actuary's Department

Local Government Pension Scheme (Scotland)

Actuarial valuation as at 31 March 2014: Advice on demographic assumptions

Date: 4 January 2016

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Contents

1 Executive summary

This report contains our recommendations for the best estimate demographic assumptions to be set by Scottish Ministers for the 2014 actuarial valuation of the Local Government Pension Scheme (Scotland).

1.1 This report provides advice to Scottish Ministers on determining the best estimate demographic assumptions to be used for the actuarial valuation of the Local Government Pension Scheme (Scotland) ("LGPS" or "the Scheme") as at 31 March 2014.

1.2 In general, we consider that recent experience generally provides the most reliable evidence when determining best estimates of future experience and we have adopted this approach throughout this advice unless noted otherwise.

1.3 When considering a choice of demographic assumptions, decision makers and other stakeholders often find it useful to compare proposed assumptions to those adopted for similar previous exercises. However, this is the first actuarial valuation of the Scheme as a whole, so there are no earlier valuation assumptions to compare against the proposals set out in this report. For the purposes of illustration, where broadly relevant, we have compared our proposed assumptions to those adopted elsewhere:

- in the funding valuations as at 31 March 2014 for selected Council funds within LGPS (Scotland)
- in the national valuation as at 31 March 2013 for LGPS (England & Wales)
- the mortality experience of the Scottish population as a whole, as recorded by the Office for National Statistics
- the analysis undertaken in 2013 as part of the discussions on a reformed benefit design for LGPS (Scotland). All references to assumptions and calculations, etc., in 2013 in this report are references to this reform analysis ("the 2013 Analysis").

1.4 Please note that the assumptions adopted in these other situations are cited to provide context for the discussions in this note. They are not necessarily persuasive for the assumptions that should be adopted for the 2014 valuation of LGPS (Scotland). For the 2014 valuation, the objective is to select assumptions which are believed to be the current best estimate of the future demographic experience of this Scheme.

1.5 In particular, it should be noted that the analysis presented in this report is much more extensive than the analysis performed in 2013 for the discussions on the reform of the benefit design for LGPS (Scotland). While the 2013 analysis was considered appropriate for the discussions then, the analysis undertaken now and set out in this report is appropriate for the 2014 valuation.

1.6 The following chapters and annexes provide more detail on the advice, supporting analysis and the financial impact of the assumptions on the results. They also contain important background information about the context of this advice and its limitations.

1.7 The following charts illustrate the assumptions proposed for this valuation, and the subsequent table provides further detail and gives an estimated impact on the Employer cost cap relative to the assumptions adopted in the 2013 Analysis.

Chart 1.1

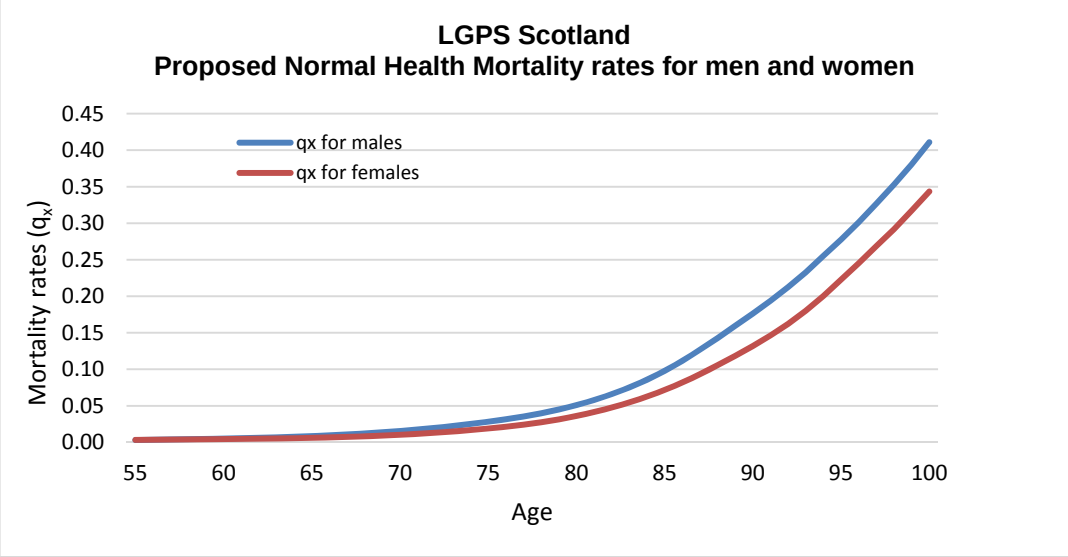


Chart 1.2

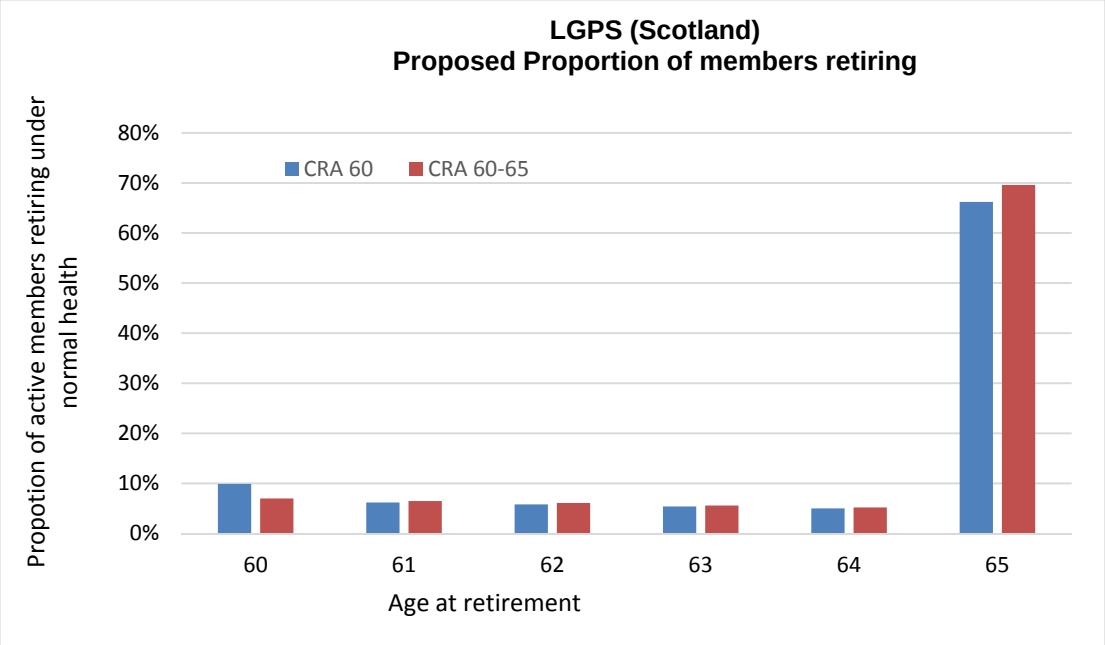


Chart 1.3

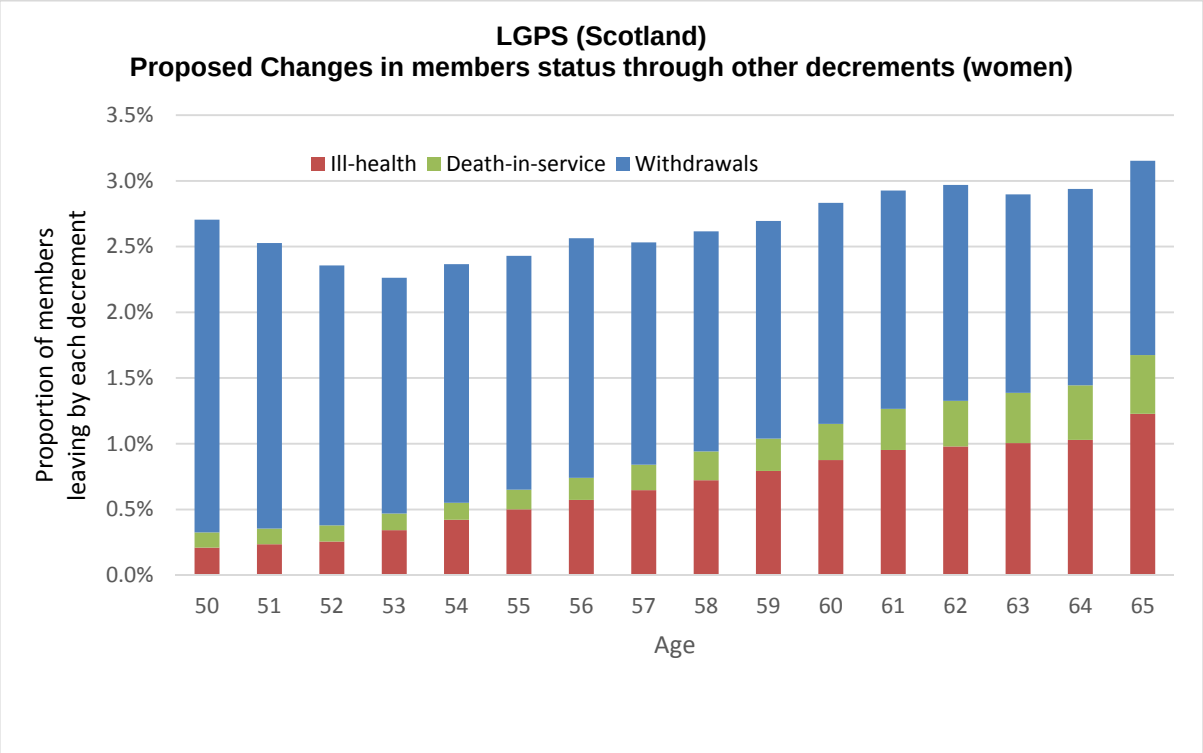


Chart 1.4

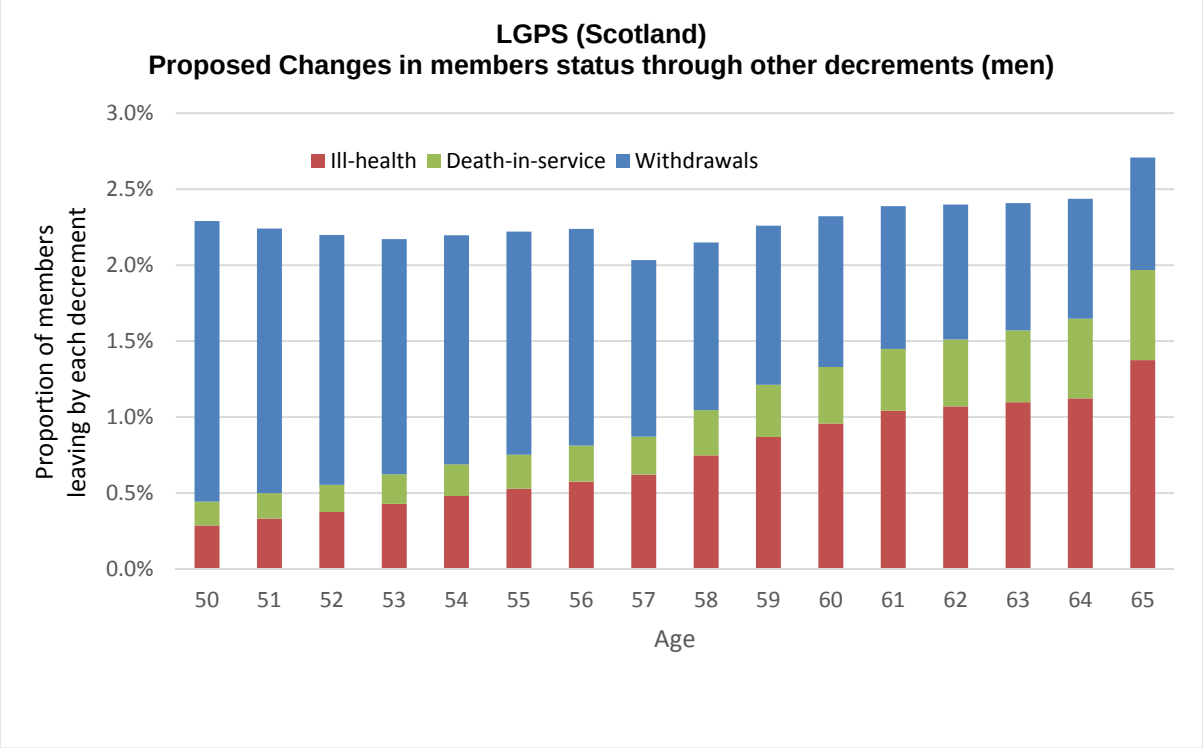


Chart 1.5

Chart 1.6

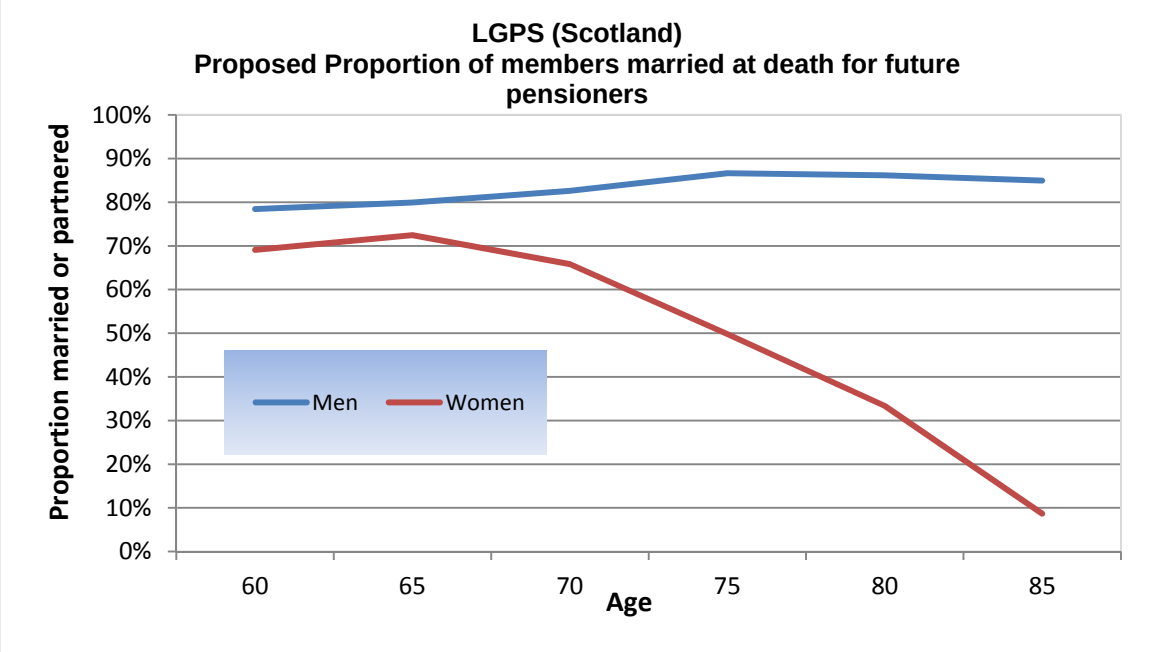


Table 1.1 Assumptions detail and impact on cost cap

Assumption	**Recommended assumption**		**Section in report and Comment**	**Impact on Employer cost cap**
	Men *(cf 2013 Analysis assumptions)*	Women *(cf 2013 Analysis assumptions)*		
Pensioner mortality	Life expectancies for current pensioners at 65	Life expectancies for current pensioners at 65	**Section 4**	
Normal health	22.2 *(22.1)* years	24.8 *(24.8)* years	Life expectancy has marginally increased since 2013 Analysis .	+0.4%
Ill health	17.7 *(17.3)* years	21.4 *(21.1)* years		
Dependants	21.6 *(20.7)* years	23.4 *(23.5)* years		
Age retirement from service	Unisex retirement patterns depend on "critical retirement age" and normal pension age. *(2013: all retirements at earliest age benefits can be taken unreduced)*	Unisex retirement patterns depend on "critical retirement age" and normal pension age. *(2013: all retirements at earliest age benefits can be taken unreduced)*	**Section 5** No material impact on cost cap.	0%

Assumption	Recommended assumption		Section in report and Comment	Impact on Employer cost cap
	Men *(cf 2013 Analysis assumptions)*	Women *(cf 2013 Analysis assumptions)*		
Ill-health retirement from service	Rates increasing with age. At age 50 29 per 10,000. On average slightly higher incidence for men than women. *(Approx 100% of expected rate in 2013).* 70% Tier 1, 30% Tier 2. (*unchanged from 2013)*	Rates increasing with age. At age 50 22 per 10,000 *(Approx 70% of expected rate in 2013.)* 70% Tier 1, 30% Tier 2. (*unchanged from 2013)*	**Section 6** Lower incidence of ill-health retirement for women will reduce cost cap.	-0.3%
Voluntary withdrawal for members with over 2 years' service	Rates declining with age, 10% rejoin within 5 years. At age 40, 323 per 10,000 *(2013 assumptions: 809 per 10,000)*	Rates declining with age, 10% rejoin within 5 years. At age 40, 343 per 10,000 *(2013 assumptions: 921 per 10,000)*	**Section 7** No material impact on cost cap.	0%
Death before retirement	Rates increasing with age. At age 40, 6 per 10,000 *(17% lower than in 2013)*	Rates increasing with age. At age 40, 5 per 10,000 (24% lower than in2013)	**Section 8** No material impact on cost cap	0%

Assumption	Recommended assumption		Section in report and Comment	Impact on Employer cost cap
	Men *(cf 2013 Analysis assumptions)*	Women *(cf 2013 Analysis assumptions)*		
Promotional pay increases	Unisex age related promotional increase rates. At age 30, 1.7% pa *(2013 :3.4% pa)*	Unisex age related promotional increase rates. At age 30, 1.7% pa *(2013 :2.7% pa)*	**Section 9** No material impact on cost cap.	0%
Commutation of pension for cash at retirement – pre 2009 service	10% of pension commuted, in addition to automatic lump sum. *(2013: N/A)*	10% of pension commuted, in addition to automatic lump sum. *(2013: N/A)*	**Section 10** Scottish Ministers are responsible for the assumption for pre-2009 service only, which does not affect the employer cost cap. HMT directions specify that 15% of post 2009 service is commuted	N/A
Family Statistics	Around 80% partnered at all ages above 60, declining after 80. Men three years older than their partner. *(2013:90% at 60 declining to 80% at 80)*	Around 70% partnered at 60 declining below 40% at 80. Women three years younger than their partner. *(2013:85% at 60 declining to 60% at 80)*	**Section 11** No material impact on cost cap.	0%

1.8 In the table above, a +1% impact on the Employer cost cap would mean that the cost cap would be 1% of pensionable pay higher using the proposed assumptions rather than the 2013 assumptions.

1.9 Many of the assumptions put forward in this report differ from those used in 2013 (but not all changes materially affect the results). The most significant impact are :

- Changes in mortality will increase the Cost Cap by 0.4% p.a.; and
- Reduction in rates assumed for ill-health retirement from service will reduce the Cost Cap by 0.3% p.a.

The above changes do impact on the Cost Cap (albeit in offsetting ways).

There are other assumptions and benefit that will impact the Cost Cap but they are outside of the scope of this report.

2 Introduction

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

2.1 GAD has been appointed by the Scottish Ministers to carry out an actuarial valuation of the LGPS as at 31 March 2014.

2.2 Under section 12 of the Public Service Pensions Act 2013 ('the 2013 Act'), scheme regulations must set an "employer cost cap". This is a rate, expressed as a percentage of pensionable earnings of members of the scheme, to be used for the purpose of measuring changes in the value of the scheme benefits.

2.3 HM Treasury's *The Public Service Pensions (Valuation and Employer Cost Cap) Directions 2014* dated 11 March 2014 (as amended)[1] (HMT Directions) require that a valuation of the LGPS is carried out as at 31 March 2014 for the purpose of setting the employer cost cap.

2.4 HMT Directions also require an assessment of the Scheme's accrued past service liabilities to be made and an employer contribution rate to be calculated, to enable comparisons between different public sector pension schemes on a consistent basis. However neither of these will affect the operation of the cost control mechanism, and the actual employer contributions will be paid in accordance with each administering authority's rates and adjustments certificate issued under regulation 60 of the Local Government Pension Scheme Regulations (Scotland) 2014. The calculation of the "employer cost cap" at this valuation is therefore the most significant outcome in relation to the operation of the Scheme.

2.5 HMT Directions require that the assumptions to be adopted for this valuation, except for those assumptions specified elsewhere in the Directions, will be set by the Scottish Ministers, having obtained advice from the scheme actuary [direction 19(a)]. They also require that the assumptions must be the Scottish Ministers' best estimates and not include margins for prudence or optimism [direction 19(c)].

2.6 The advice is provided in accordance with HMT Directions. We may revise this advice if material new evidence comes to light.

[1] https://www.gov.uk/government/publications/public-service-pensions-actuarial-valuations-and-the-employer-cost-cap-mechanism

2.7 This report is addressed to Scottish Ministers. The purpose of this advice is to enable Scottish Ministers to determine the required best estimate assumptions for the main assumptions to be set by them. 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

2.8 Assumptions may also be relevant to other areas, eg relating to the projections of the membership to 2017-2020.

2.9 Scottish Ministers are now asked to set the demographic assumptions (listed above) to be adopted for the valuation as required by HMT Directions, consulting with stakeholders and HM Treasury as appropriate, and to confirm those assumptions to GAD. We would be happy to provide further analysis to Scottish Ministers, if required.

2.10 Our report LGPS Scotland 31 March 2014 Valuation data report dated 4 January 2016 details sources and our comments on the data provided.

2.11 Scottish Ministers may wish to make this report available to:

- The Scheme Advisory Board as part of the consultation process relating to the valuation of the LGPS; and
- HMT as part of the process for granting their approval to the assumptions proposed by Scottish Ministers.

2.12 This report must not be reproduced, distributed or communicated in whole or in part to any other person without GAD's prior written permission.

2.13 Third parties whose interests may differ from those of Scottish Ministers should be encouraged to seek their own actuarial advice where appropriate. Other than Scottish Ministers, 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 report are explained in this section.

HMT Directions

3.2 The advice in this report reflects the requirements of HMT Directions that assumptions should be set as Scottish Ministers' 'best estimates' of future experience and should not contain margins for prudence or optimism. They should be set having regard to:

- previous valuation assumptions
- the analysis of demographic experience up to the valuation date, taken as experience over the three-year period up to the valuation date for the purposes of our advice
- relevant data from any other source
- emerging evidence about historic long-term trends
- any emerging evidence which may illustrate long-term trends expected 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 has issued a document setting out the approach that schemes should take when setting these assumptions. See Annex A of the HMT paper "Public service pensions: actuarial valuations and the employer cost cap mechanism" dated March 2014[2]. This advice also has regard to that Annex.

Different populations

3.4 HMT Directions require the valuation to cover both the new scheme established under the 2013 Act (the 2015 Scheme) and any existing schemes which are connected to it. This means the 2014 valuation needs to consider assumptions appropriate to both new entrants to the 2015 Scheme and existing members with membership accrued in the Earlier Schemes (as defined in the Local Government Pension Scheme (Transitional Provisions and Savings) (Scotland) Regulations 2014).

[2] https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/289366/public_service_pensions_actuarial_valuations_130314.pdf

3.5 The 'rule of 85' applies to members who joined prior to 30 November 2006. It specifies that a member can take their benefits unreduced if their age and scheme membership add up to 85 or more (part years are ignored). This is a right after the member reaches age 60, and can be between ages 55 and 60, at the discretion of the employer. The rule of 85 applies to service up to 31 March 2008, or service up to 31 March 2020 for members who will be 60 or over by that date.

3.6 From 2015 there will be 3 distinct groups of members.

- Existing members with membership accrued in the existing scheme for whom the rule of 85 continues to apply for service up to 1 April 2020 and who are expect to retire by that date: the introduction of the 2015 Scheme is not expected to have any impact on this group's behaviour.
- New members to the 2015 Scheme. These members' behaviours, in particular retirement patterns, are expected to be influenced only by the provisions of the 2015 Scheme.
- Members who have both service before 1 April 2015 and service after 1 April 2015 without 85 year rule protection. Over time, as the proportion of 2015 Scheme service increases, the behaviour is expected to become increasingly influenced by the provisions of that scheme.

For the newly introduced 2015 Scheme, we expect that member behaviour will be influenced by the new benefit structure. However, we consider that the most relevant experience in determining assumptions is the experience of existing scheme members.

Work on LGPS (Scotland) in 2013

3.7 In 2013 GAD was engaged by Scottish Ministers to support the Scottish Local Government Pensions Advisory Group (SLOGPAG) in its discussions on a new benefit design for LGPS (Scotland).

3.8 Our report of 3 April 2013 discussed appropriate assumptions for that work, including the options to perform a full analysis of experience or to following the assumptions used by local actuaries for Scottish local authorities. SLOGPAG directed that the assumptions for that work should follow those adopted for the largest Scottish authority, Strathclyde with some adjustments.

3.9 For this valuation, the HMT Directions require us to do a full analysis of the demographic experience of the LGPS (Scotland) between 2011 and 2014. A number of the assumptions proposed in this report therefore differ from those used in 2013.

Employer Cost Cap

3.10 The employer cost cap calculated in the 2014 valuation will depend on the 2015 scheme benefit design, the data, the methodology and the assumptions set in HMT Directions, as well as on the assumptions determined by the Scottish Ministers which are the focus of this paper.

Relative importance of assumptions

3.11 HMT Directions require the employer cost cap to be determined to the nearest 0.1% of pensionable payroll. This is the required level of accuracy for the calculations based on a particular set of assumptions, rather than the allowable variation from what experience will show to be the correct result. In each of the remaining chapters in this report we conclude by providing an indication of the impact on the employer cost cap of the change being recommended to the assumptions, by reference to the assumptions used in 2013. This illustrates the significance of each assumption in the calculation of the cost cap. Further analysis of the sensitivity of the results of the valuation to the assumptions adopted will be provided in our report on the valuation results.

3.12 The figures have been calculated using approximate methods and should be used as a guide to the broad magnitude of the impact of the change being considered. Furthermore the impacts of different changes are not independent so the impact of multiple changes will not necessarily be the sum of the individual impacts. Changes are not considered material if their expected impact on the contribution rate is less than 0.05%.

3.13 The assumptions will be used in the assessment of the Scheme's accrued past service liabilities and the calculation of an employer contribution rate. However, as the employer contribution rate will not be implemented we have not illustrated the impact of the assumptions on the employer contribution rate.

3.14 The assumptions for this valuation will be used in the 2017 valuation to calculate the prior value of the cost cap fund as at 31 March 2015 [Direction 30]. These assumptions will, therefore, have an impact on the future operation of the employer cost cap mechanism.

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 the 2014 valuation

4.1 The assumptions we recommend for baseline pensioner mortality for the 2014 valuation may be summarised as follows:

Table 4.1: Recommended mortality assumptions

Baseline mortality	Standard table[3]	Adjustment
Men		
Retirements in normal health	S2NMA	120%
Current and future ill-health pensioners	S2IMA	132%
Dependants	S2NMA	130%
Women		
Retirements in normal health	S2NFA	114%
Current and future ill-health pensioners	S2IFA	127%
Dependants	S2DFA	128%

4.2 As directed by HM Treasury, future changes in post-retirement mortality will be assumed to be in line with those underlying the 2012 principal population projections published by the Office for National Statistics (ONS).

[3] SAPS tables are published by the Actuarial Profession and based on the experience of self-administered pension schemes over the period 2004 to 2011. The 'S2' series has separate standard tables based on experience of members retiring in normal health (S2NXA) and in ill health (S2IXA) and for dependant women (S2DFA).

2013 assumptions

4.3 In the 2013 calculations, baseline mortality was based on earlier standard tables (the 'S1' series of SAPS tables) with future improvements based on the then most recent ONS population projections. A combined assumption of 130% of S1 normal mortality tables was used for all categories of member, consistent with the assumption adopted for Strathclyde, based on an analysis of average mortality for both men and women in both normal and ill health.

4.4 For this valuation we have adopted a separate assumption for each member category. Had we followed the same approach, the equivalent assumption would be approximately 130% of S1 normal mortality. This in turn is equivalent to around 135% of S2 normal mortality.

4.5 This indicates that on average mortality has not changed significantly since 2013. This is shown in the comparison of life expectancies in the table below.

Comparison of expected pensioner longevity

4.6 The table below gives a comparison of the resulting life expectancies[4] recommended for the 2014 valuation, adopted for the 2013 work in Scotland, and adopted for the 2013 valuation in England and Wales.

Table 4.2: Comparison of normal health life expectancies - Current Pensioners (years)

	2014 Valuation (proposed)	2013 analysis	2013 England & Wales valuation
Current normal health pensioners			
Men aged 60	27.0	26.9	28.3
Men aged 65	22.2	22.1	23.4
Women aged 60	29.7	29.7	31.4
Women aged 65	24.8	24.8	26.4

[4] Cohort life expectancies based on the ages shown as at the valuation date, i.e. allowing for future mortality improvement.

Table 4.3: Comparison of normal health life expectancies – Future Pensioners (years)

	2014 Valuation (Proposed)	2013 Analysis	2013 England & Wales valuation
Future normal health pensioners – current age 45			
Men from age 60	28.7	28.6	30.0
Men from age 65	24.3	24.3	25.6
Women from age 60	31.3	31.5	33.1
Women from age 65	26.9	27.0	28.6

Table 4.4: Comparison of ill health life expectancies – Current Pensioners (years)

	2014 Valuation (Proposed)	2013 Analysis	2013 England & Wales valuation
Current ill-health pensioners			
Men aged 60	21.5	21.1	24.0
Men aged 65	17.7	17.3	19.9
Women aged 60	25.5	25.4	27.7
Women aged 65	21.4	21.1	23.2

Table 4.5: Comparison of ill health life expectancies – Dependants (years)

	2014 Valuation (Proposed)	2013 Analysis	2013 England & Wales valuation
Current dependants			
Men aged 60	26.3	25.4	26.5
Men aged 65	21.6	20.7	21.7
Women aged 60	28.0	28.3	30.6
Women aged 65	23.4	23.5	25.7

4.7 Relative to the 2013 Analysis assumptions, life expectancy for men is slightly longer, whereas life expectancy for women is largely unchanged. Relative to the England & Wales 2013 valuation, life expectancy of scheme members is shorter by around a year and a half. Although a combined assumption covering normal health, ill health and dependants was adopted in 2013, the life expectancies were analysed separately for these categories.

4.8 Relative to the local actuaries' assumptions, we have compared proposed normal health life expectancies for current and future pensioners (both men and women) with the largest authorities (Strathclyde and Lothian) and two of the smaller authorities (Fife and Falkirk) as reported in their respective valuation reports. This comparison suggests that the proposed mortality assumption is in line with the local actuaries' assumptions for men, and that our analysis suggests a slightly lighter mortality is appropriate for women (particularly those who are current pensioners).

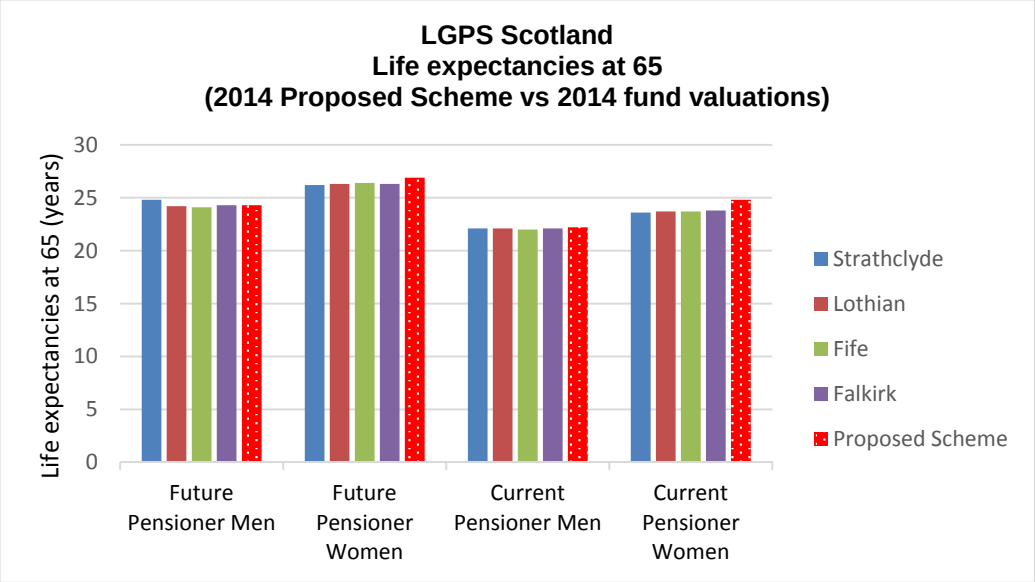
The Scheme's mortality experience is lighter than the general population of Scotland. In general members of the Scheme are/have been employed. This leads to lower mortality rates than the population as a whole. To illustrate this, a comparison of the life expectancies of a current normal health pensioner aged 65 is set out in the table below.

Table 4.6: Comparison of normal health life expectancies against Scotland population (years)

	2014 Valuation (Proposed)	Scotland[5]
Current normal health pensioners – current age 65		
Men	22.2	20.1
Women	24.8	22.7

[5] Source: ONS - http://www.ons.gov.uk/ons/publications/re-reference-tables.html?edition=tcm%3A77-355125

Chart 4.1



Use of the assumption

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

Analysis

4.10 The proposed assumptions are based on an analysis of past mortality experience for the Scheme.

4.11 In order to make a recommendation of the most appropriate base table for pensioner mortality we have compared the actual mortality experience over the three-year period 2011-2014 with that expected based on the most appropriate S2 standard table[6]. This comparison considers the key age ranges for the various types of death and identifies what adjustment to the standard table is required to provide the closest comparison with actual experience. The proposed assumptions are shown in table 4.1.

4.12 The experience of pensioners has been analysed for three distinct groups: pensioners who retired in normal health; pensioners who retired in ill-health; and pensioners whose pension derived from the death of a Scheme member or pensioner (dependants). These analyses are discussed separately below, and the discussions are followed by consideration of improvements in the life expectancy of pensioners.

4.13 Mortality can be analysed on either a 'lives' basis or an 'amounts' basis:

[6] Adjusted from the base year for the SAPS 'S2' series standard tables (2007) to those applicable to the period the deaths occurred (2011-2014) by applying adjustments broadly in line with the improvements applying to the UK population over the relevant period.

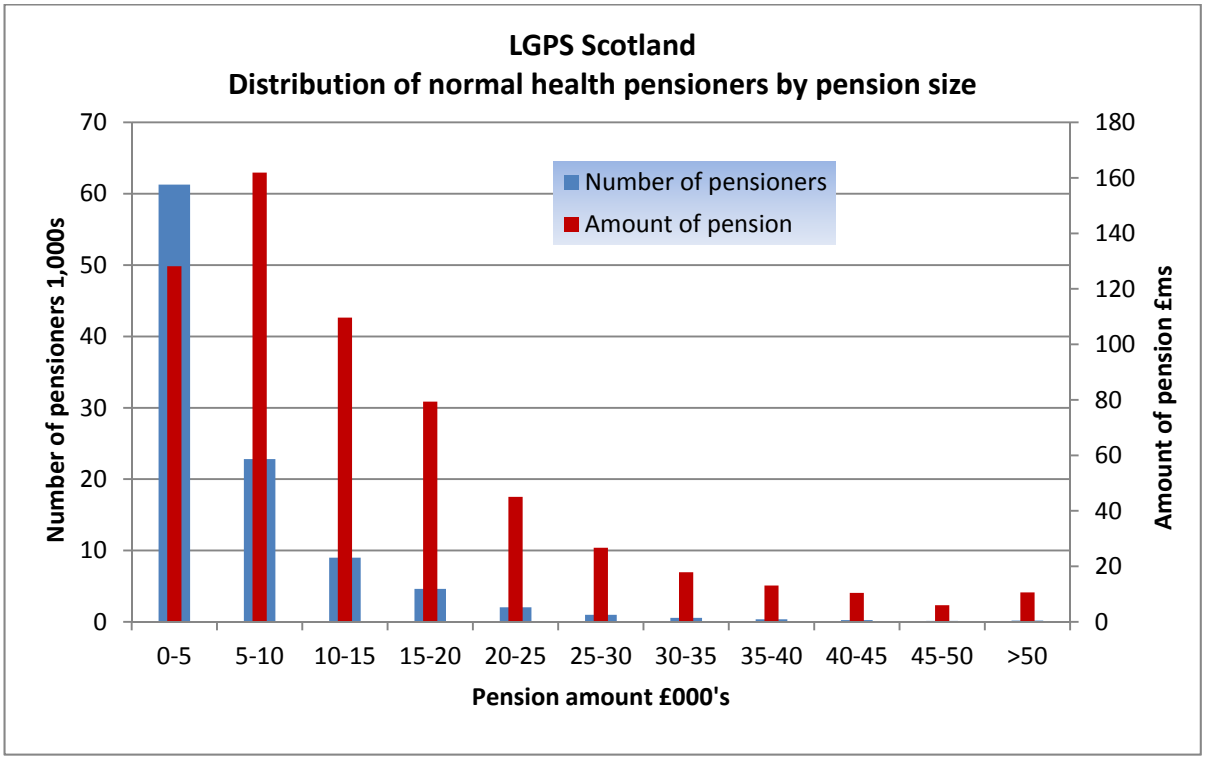
- A 'lives' basis gives an equal weighting to every member of the population being analysed.
- An 'amounts' basis weights the experience by the size of each member's pension (with the longevity of those with larger pensions given more of a weighting).

4.14 There is much evidence to demonstrate that the size of pension is positively correlated with longevity, ie on average those with bigger pensions live longer.

4.15 Actuarial valuations are concerned with overall financial impacts and so it is appropriate to set mortality assumptions on an amounts basis where sufficient data is available. Our advice on mortality assumptions for this valuation is based on an amounts analysis.

4.16 The following chart illustrates the difference between a 'lives' analysis and an 'amounts' analysis. The blue bars show the distribution of the number of pensioners, by pension amount. The red bars show the total amount of pension payable to these pensioners.

Chart 4.2



4.17 For example, the first pair of bars shows that there are 61,000 members (from the axis on the left of the chart) with pension in the range £0 to £5,000. The sum of all the pensions in the range £0 to £5,000 comes to £128 million (from the axis on the right of the chart). These members are a large proportion of the total number of pensioners so would be very significant in a 'lives' analysis, but they represent a much smaller proportion of the total amount of pension, so are less significant financially and in an 'amounts' analysis.

4.18 We have compared the mortality experience of the Scheme in the three-year period to 31 March 2014 with the SAPS tables published by the Actuarial Profession and based on the experience of self-administered pension schemes over the period 2004 to 2011 adjusted in line with the improvements applying to the UK population over the relevant period.

4.19 We have also compared the mortality experience of the Scheme in the three-year period to 31 March 2014 with the assumptions used in 2013 with an adjustment to the standard tables reflecting expected improvements in mortality in the intervening period in line with the rate of improvement assumed in 2013.

4.20 The results of this analysis are shown in tables and graphs below. The figures shown in the tables are the total pension amounts ceasing in respect of deaths and the ratios of actual total pension ceasing to the expected amount of pension ceasing under certain sets of assumptions. The number of deaths provides some context to the experience. Where there are more deaths, the experience will be more credible for setting assumptions.

4.21 In analysing mortality after retirement, the pension figures that were provided for pensioners were as at the date of death and did not include the pension increases that would have applied subsequently. Hence, in our analysis we have applied increases to pension data from the date of death to the data of valuation.

4.22 The total numbers of actual deaths of each type analysed over the three-year period are as shown in Table 4.7 below.

Table 4.7 - Number of pensioner deaths over 3 year period ending 31 March 2014

	Normal health pensioners	Ill-health pensioners	Dependants
Men	4,260	2,044	514
Women	3,210	1,816	3,132

Profile of pensioner population and deaths by age

4.23 When considering mortality experience it is helpful to understand the age profile of the pensioner population and thus the relative importance that may be attributed to deaths observed at different ages.

4.24 The charts below show, for normal health pensioners, the distribution of total pension by age as at 31 March 2014 (chart 4.3A) and total pension cessation (chart 4.3B) over the three-year period 2011 to 2014. These illustrate that the highest level of pensions are being paid to pensioners in the age range 60 to 70. The highest level of deaths have occurred in the age range 70 to 90. When considering the appropriate mortality basis, the experience over both these age ranges should be considered.

Chart 4.3A

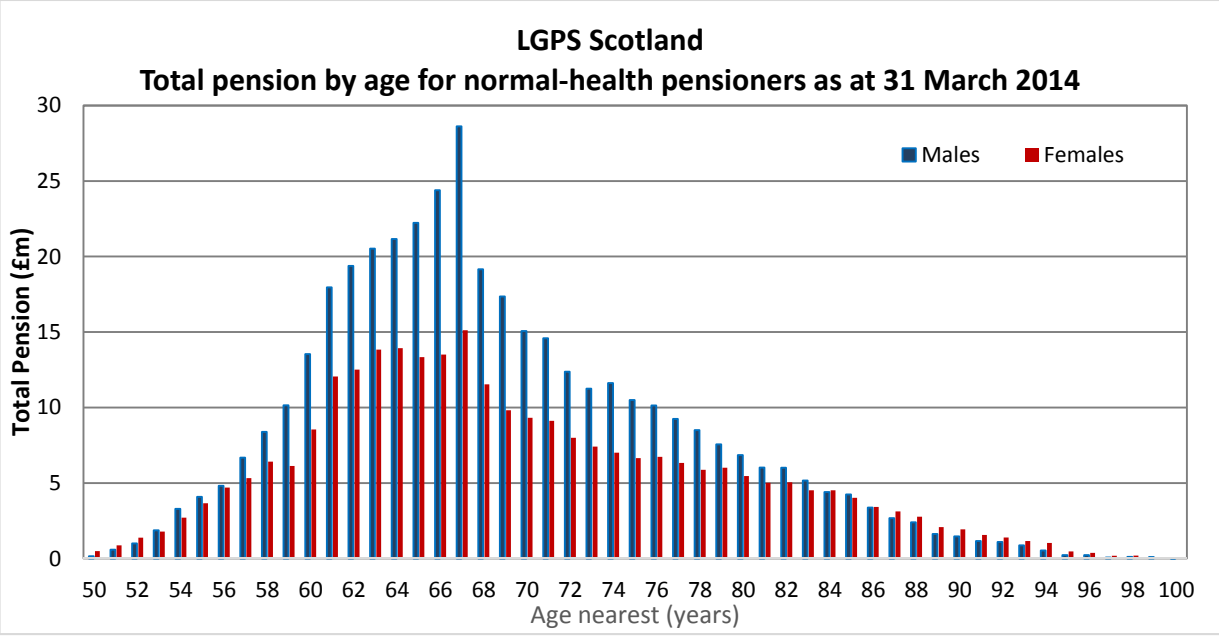
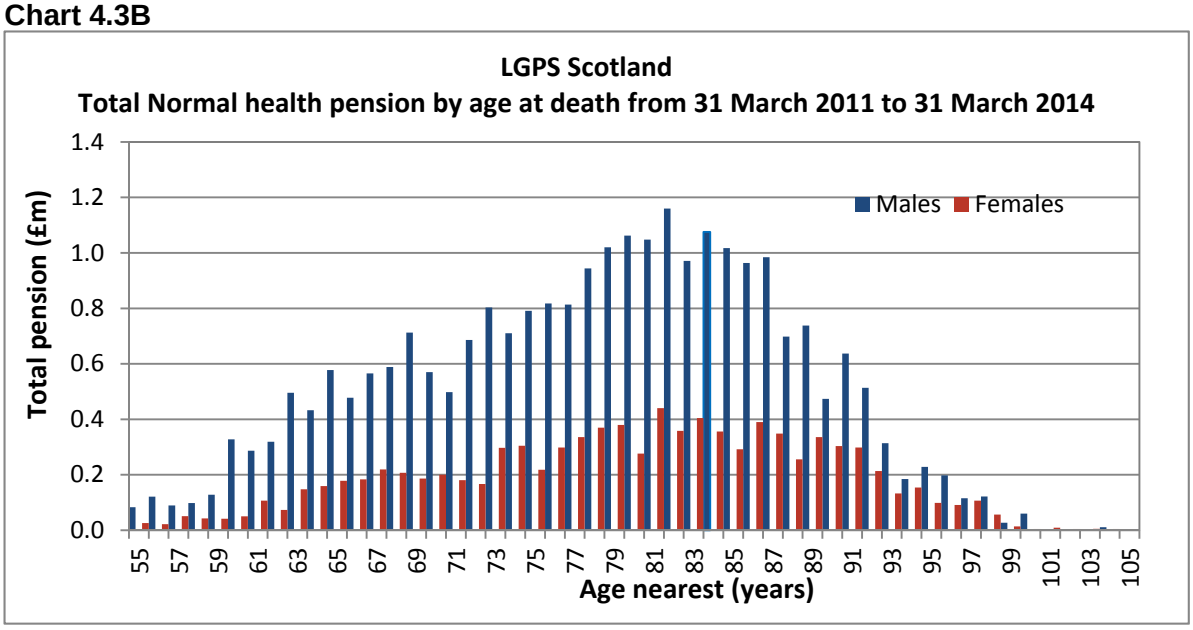
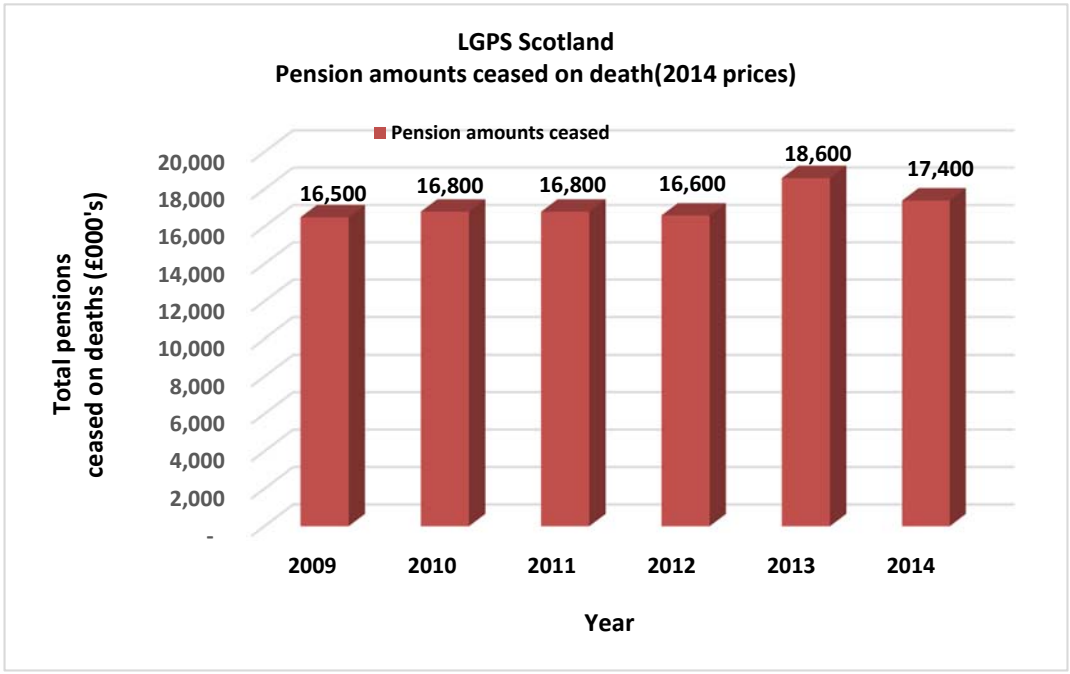


Chart 4.3B



4.25 In doing our analysis, we looked at overall pension amounts ceasing due to death on a scheme year basis. There was a noticeable increase in that statistic in the year to 31 March 2013. This can be seen in chart 4.4 below.

Chart 4.4



4.26 We investigated further into the data and concluded that there was a spike of reported deaths in January 2013. This could be as a consequence of a bad winter period. There was a small spike in Scottish national mortality statistics at that time, but not as significant as our data suggests. We also asked local actuaries if they had noted this, but they had not. The increase was across all local authorities.

4.27 We asked the data providers to clarify whether there was any change in the recording process around this time, or a catch-up in processing. They have confirmed there was no such event but have observed an increase in death notifications as a result of initiatives such as National Fraud Initiative (NFI) – which could have led to the cessation of pension to pensioners who had died some time previously.

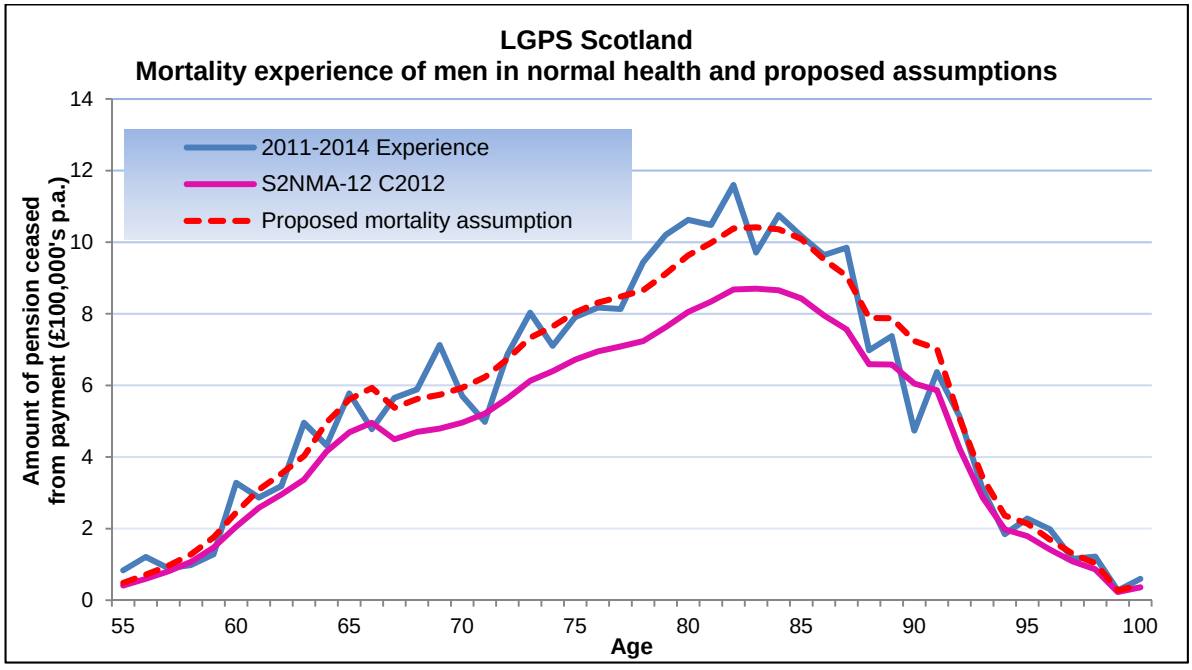
4.28 Although the spike in deaths in 2013 looks unusual, we do not have any evidence that it is a data error. We have not adjusted our analysis as a result – that is, the data from 2013 have been included in the analysis unadjusted.

Normal Health Pensioners

Mortality analysis on an amounts basis: comparison of experience and 'best fit' against S2NXA tables

4.29 The charts below compare the actual mortality experience over the three-year period 2011-2014 with the SAPS 'S2' series standard table. We have proposed a valuation assumption based on the Scheme's own experience based on an adjustment to the standard S2 table.

Chart 4.5A



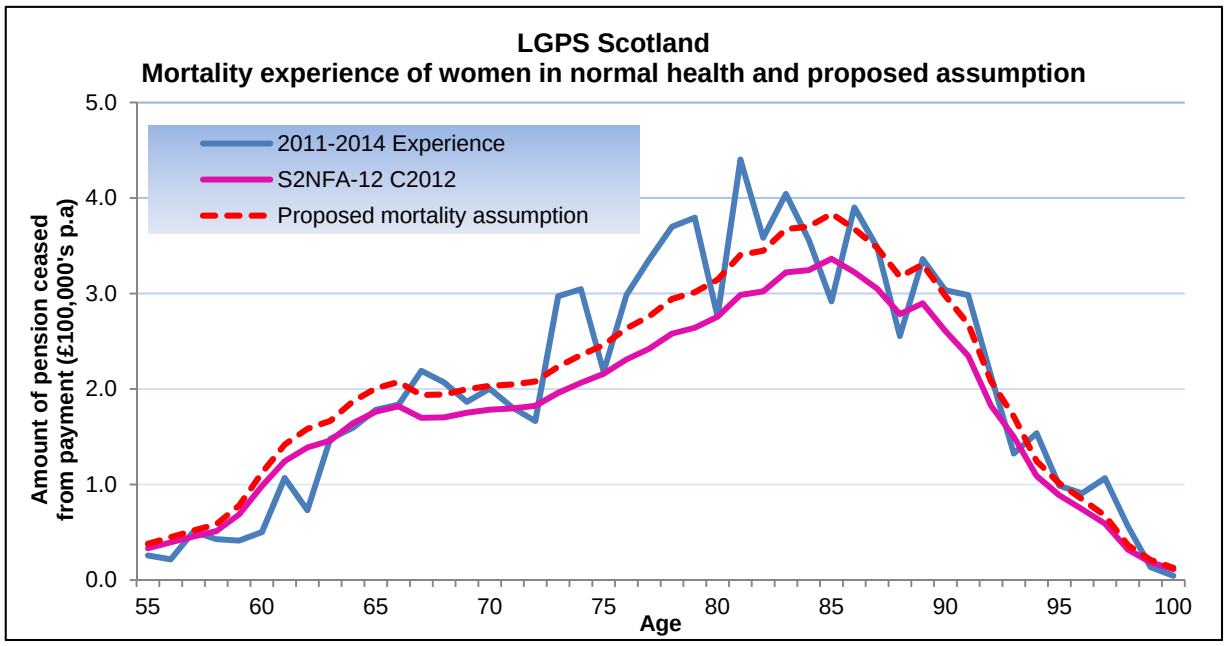


Chart 4.5B

Table 4.8A – analysis of pensioners who retired in normal health - men

	Pension amounts ceasing due to deaths 2011-14			Ratio of actual to expected	
Age group	**Actual experience (£000's p.a.)**	**Expected, based on underlying 2013 assumptions (£000's p.a.)**	**Expected, based on SAPS S2NMA standard table (£000's p.a.)**	**Based on underlying 2013 assumptions**	**Based on SAPS S2NMA standard table**
55 to 59	520	553	436	94%	119%
60 to 64	1,862	1,856	1,511	100%	123%
65 to 69	2,922	2,923	2,363	100%	124%
70 to 74	3,268	3,295	2,833	99%	115%
75 to 79	4,386	4,155	3,561	106%	123%
80 to 84	5,317	5,101	4,243	104%	125%
85 to 89	4,401	4,153	3,712	106%	119%
90 to 94	2,123	2,244	2,102	95%	101%
95 to 99	691	571	539	121%	128%
100 +	70	63	58	112%	121%
Overall	**25,561**	**24,914**	**21,360**	**103%**	**120%**

Proposed assumption is 120% of S2NMA.

Table 4.8B – analysis of pensioners who retired in normal health - women

	Pension amounts ceasing due to deaths 2011-14			Ratio of actual to expected	
Age group	**Actual experience (£000's p.a.)**	**Expected, based on underlying 2013 assumptions (£000's p.a.)**	**Expected, based on SAPS S2NFA standard table (£000's p.a.)**	**Based on underlying 2013 assumptions**	**Based on SAPS S2NFA standard table**
55 to 59	182	263	238	69%	76%
60 to 64	537	760	672	71%	80%
65 to 69	974	1,015	873	96%	112%
70 to 74	1,149	1,059	943	109%	122%
75 to 79	1,601	1,378	1,212	116%	132%
80 to 84	1,835	1,739	1,523	106%	120%
85 to 89	1,622	1,636	1,532	99%	106%
90 to 94	1,102	973	937	113%	118%
95 to 99	366	279	284	131%	129%
100 +	30	39	26	77%	116%
Overall	**9,400**	**9,142**	**8,240**	**103%**	**114%**

4.30 Proposed assumption is 114% of S2NFA.

On average mortality rates are around 80-82% of those assumed in 2013, but for that review, an overall assumption covering normal health, ill health and dependant mortality was used. The underlying normal health assumption was effectively very similar to the proposed assumption for 2015 (as shown in the life expectancy comparisons in table 4.2).

Comparison with England & Wales

4.31 Based on our analysis, mortality rates are heavier in LGPS Scotland than LGPS E&W. The rates are on average 15% and 19% higher than E&W for men and women respectively. This leads to a life expectancy for LGPS Scotland members of approximately 1.5 years less than their England & Wales counterparts.

Ill Health Pensioners

Chart 4.6A

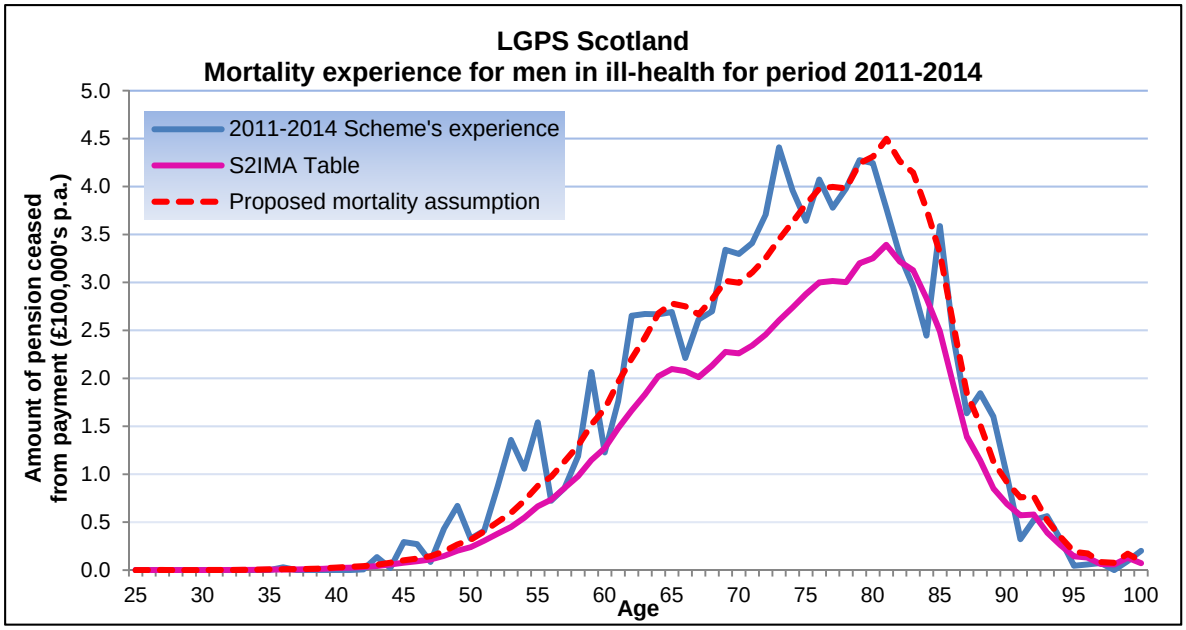


Chart 4.6B

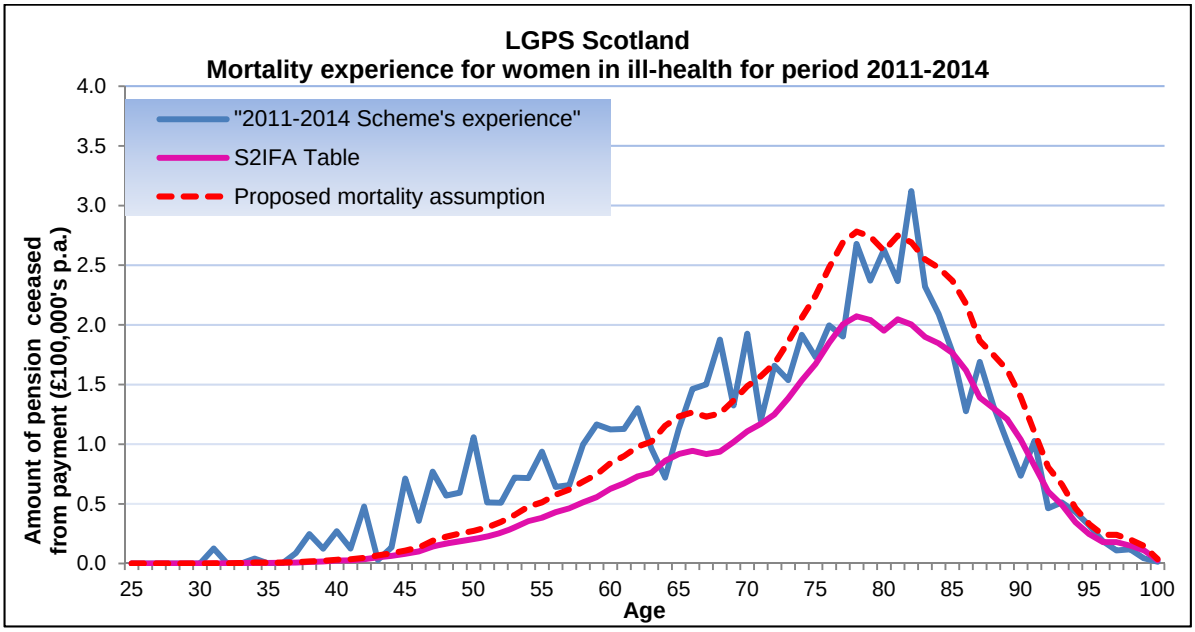


Table 4.9A – analysis of pensioners who retired in ill-health - men

	Pension amounts ceasing due to deaths 2011-14			Ratio to actual to expected	
Age group	**Actual experience (£000's p.a.)**	**Expected, based on 2013 assumptions (£000's p.a.)**	**Expected, based on SAPS S2IMA standard table (£000's p.a.)**	**Based on 2013 assumptions**	**Based on SAPS S2IMA standard table**
50 to 54	402	67	192	604%	209%
55 to 59	637	180	438	354%	145%
60 to 64	1098	466	827	236%	133%
65 to 69	1355	744	1059	182%	128%
70 to 74	1878	966	1240	194%	151%
75 to 79	1975	1414	1510	140%	131%
80 to 84	1671	1698	1583	98%	106%
85 to 89	1110	843	781	132%	142%
90 to 94	272	295	249	92%	109%
95 to 99	27	68	53	40%	52%
100 +	20	9	7	219%	282%
Overall (based on members aged 50 and above)				**155%**	**132%**

4.32 Proposed assumption is 132% of S2IMA.

On average mortality rates are around 155% of those assumed in 2013, but for that review, an overall assumption covering normal health, ill health and dependant mortality was used.

Table 4.9B – analysis of pensioners who retired in ill-health - women

	Pension amounts ceasing due to deaths 2011-14			Ratio to actual to expected	
Age group	**Actual experience (£000's p.a.)**	**Expected, based on 2103 assumptions (£000's p.a.)**	**Expected, based on SAPS S2IFA standard table (£000's p.a.)**	**Based on 2013 assumptions**	**Based on SAPS S2IFA standard table**
50 to 54	351	48	135	739%	260%
55 to 59	440	107	234	409%	188%
60 to 64	524	222	365	236%	143%
65 to 69	729	372	473	196%	154%
70 to 74	824	596	645	138%	128%
75 to 79	1068	1043	964	102%	111%
80 to 84	1253	1094	974	114%	129%
85 to 89	708	801	729	88%	97%
90 to 94	317	399	330	80%	96%
95 to 99	78	116	87	67%	90%
100 +	11	13	9	89%	120%
Overall (based on members aged 50 and above)				**131%**	**127%**

4.33 Proposed assumption is 127% of S2IFA.

On average mortality rates are around 131% of those assumed in 2013, but for that review, an overall assumption covering normal health, ill health and dependant mortality was used.

4.34 For ill-health pensioners, an assumption has been derived by fitting the 2010-2013 experience to a standard table for ages 50 and upwards only. This was because the experience data at ages below age 50 did not give a satisfactory fit against a standard table, especially for women. The impact of the difference between the 2010-2013 experience and the standard tables is relatively minor, however, and is not a matter we consider is worth pursuing further since we expect any impact on the valuation results would be immaterial.

Comparison with England & Wales

4.35 Our analysis indicates that mortality rates for ill-health men and women are approximately 30% heavier than their E&W counterparts.

Dependants

Chart 4.7A

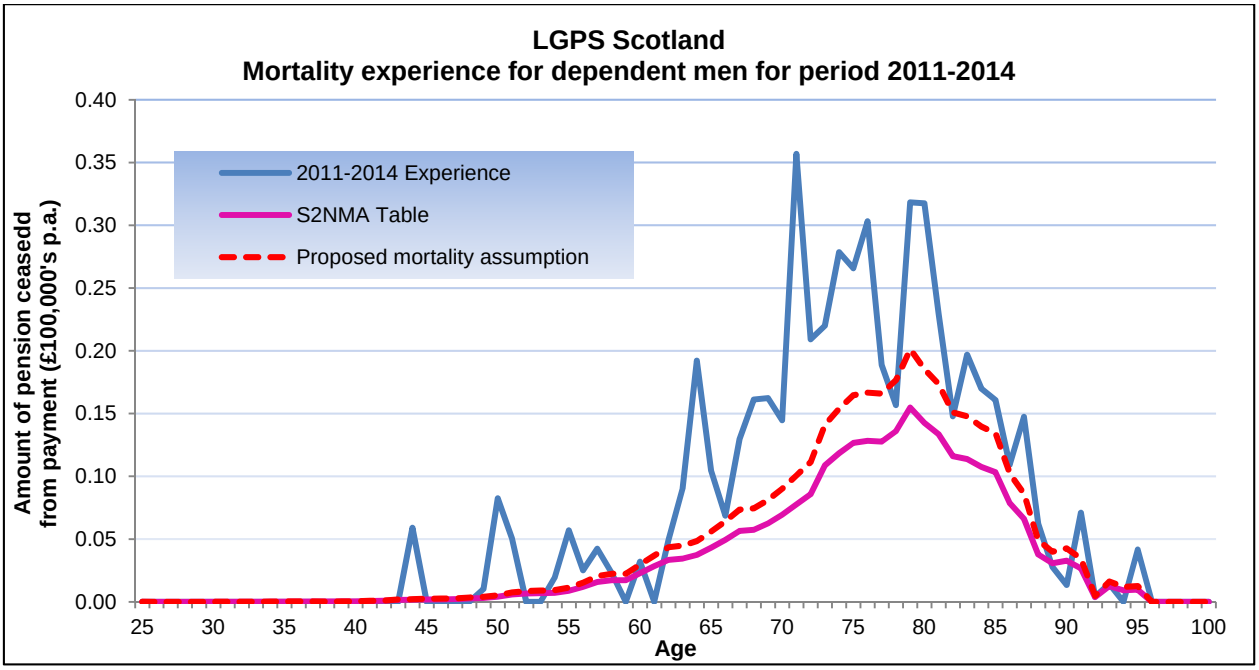


Chart 4.7B

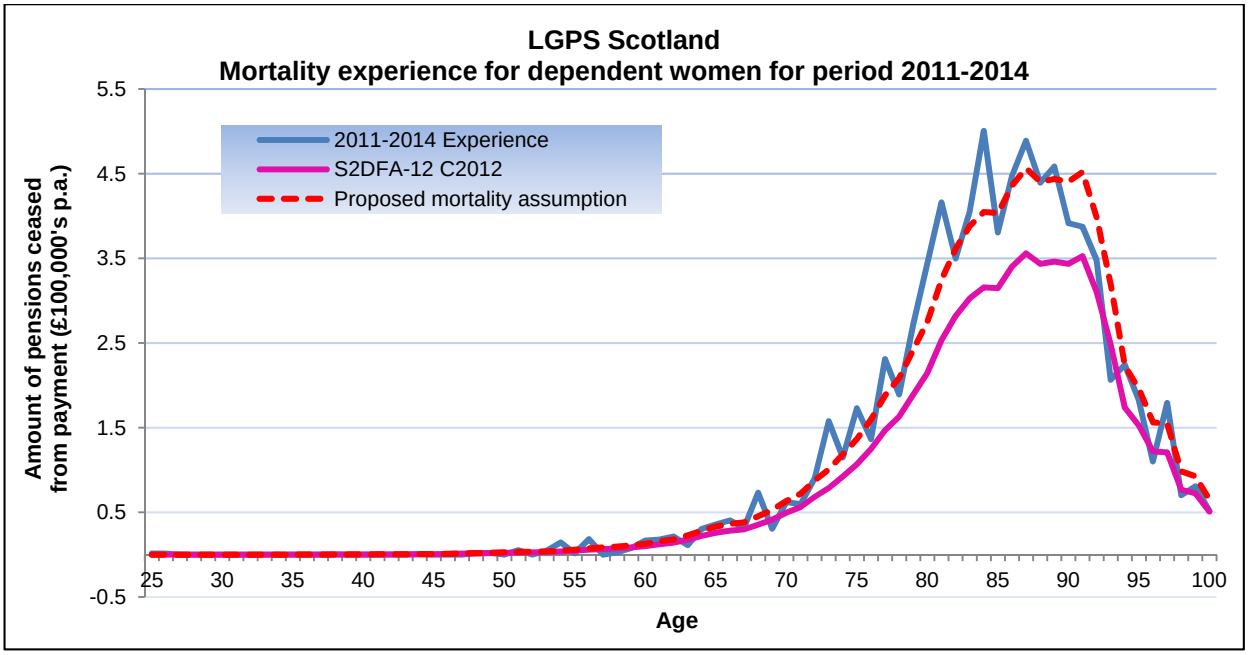


Table 4.10A – analysis of dependent pensioners - men

	Pension amounts ceasing due to deaths 2011-14			Ratio of actual to expected	
Age group	**Actual experience (£000's p.a.)**	**Expected, based on 2013 assumptions (£000's p.a.)**	**Expected, based on SAPS S2NMA standard table (£000's p.a.)**	**Based on 2013 assumptions**	**Based on SAPS S2NMA standard table**
50 to 54	15	5	3	284%	496%
55 to 59	15	11	7	138%	208%
60 to 64	36	24	16	152%	232%
65 to 69	63	41	27	152%	233%
70 to 74	121	66	46	184%	263%
75 to 79	123	101	67	122%	183%
80 to 84	106	94	61	113%	173%
85 to 89	51	44	32	116%	160%
90 to 94	10	12	8	90%	121%
95 to 99	4	1	1	317%	432%
100 +	0	0	0	0%	0%
Overall (based on members aged 50 and above)				**137%**	**203%**

4.36 On average mortality rates for dependent men are around 137% of those assumed in 2013, but for that review, an overall assumption covering normal health, ill health and dependant mortality was used.

4.37 There is no standard table for male dependants, therefore we have based our assumption on the table for male normal health pensioners (S2NMA). Furthermore, volumes of data were relatively low and the very heavy experience reported (203% of S2NMA) is not convincing. One authority speculated that an anti-fraud initiative might have resulted in 'catching up' on non-reported deaths and so over-reporting of dependant deaths in the data.

4.38 On the basis of concerns about the data and the unusual result for dependent men, we have considered the difference between dependent and normal health pensioner mortality in England and Wales, which indicates that dependants' mortality is approx. 10% heavier than pensioners' mortality.

Proposed assumption is 130% of S2NMA (10% higher than pensioner mortality for men in normal health).

Table 4.10B – analysis of dependent pensioners - women

	Pension amounts ceasing due to deaths 2011-14			Ratio of actual to expected	
Age group	**Actual experience (£000's p.a.)**	**Expected, based on 2013 assumptions (£000's p.a.)**	**Expected, based on SAPS S2DFA standard table (£000's p.a.)**	**Based on 2013 assumptions**	**Based on SAPS S2DFA standard table**
50 to 54	24	16	14	151%	168%
55 to 59	31	38	33	81%	92%
60 to 64	98	86	77	114%	128%
65 to 69	212	184	161	115%	132%
70 to 74	485	412	345	118%	140%
75 to 79	1,002	1,025	730	98%	137%
80 to 84	2,016	2,042	1,368	99%	147%
85 to 89	2,214	2,411	1,700	92%	130%
90 to 94	1,558	1,986	1,429	78%	109%
95 to 99	623	707	545	88%	114%
100 +	125	171	135	73%	92%
Overall (based on members aged 50 and above)				**92%**	**128%**

4.39 On average mortality rates are around 92% of those assumed in the 2013 Analysis, but for that review, an overall assumption covering normal health, ill health and dependant mortality was used. For dependent women, S2DFA table does exist and volumes of data were a little greater than for dependent men.

Proposed assumption is 128% of S2DFA.

Comparison with England & Wales

4.40 Not enough data exists to be able to compare dependent men with their England and Wales counterparts. For women, the data indicate that Scottish dependant mortality is approximately 20% higher than England and Wales dependants.

Financial impact

4.41 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 2013 Analysis is set out in Table 4.5.

Table 4.11: Approximate financial impact of proposed change in mortality assumptions

	Employer cost cap
Change in mortality basis (baseline and improvements) from 2013 to that recommended for 2014	+0.4%

5 Age retirement from service

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

Proposed assumptions for 2014 valuation

5.1 We recommend that unisex rates of age retirement are set separately for different categories of members, for ages from 55 to NPA. In practice very few members take benefits before age 60. The retirement rates for different categories of members are described below. The rule of 85 is defined in paragraph 3.5.

5.2 The rates below are intended to exclude the incidence of early retirement occurring as a result of redundancy (which is taken as including business efficiency or any similar circumstance in which the employment termination and early payment of benefits is supported by the employer under regulation 29(7) of the 2014 regulations).

New entrants to the 2015 Scheme

5.3 We recommend a spread of retirement ages between age 55 and 2015 Scheme NPA, based on early retirements in 2011-2014, expressed in terms of number of years before NPA so as to accommodate the higher NPAs under the 2015 Scheme.

Members not entitled to unreduced benefits before age 65 under the rule of 85

5.4 This includes all members joining on or after 1 December 2006, and those members who joined before 1 December 2006 but are not entitled to unreduced benefits before age 65 under the rule of 85[7]. For these members we recommend the same assumptions as for new entrants to the 2015 Scheme. The fact that these members have some benefits payable unreduced from age 65 (rather than NPA) might mean they retire a little earlier than new entrants to the 2015 Scheme, but this has a relatively slight financial impact because early and late retirement factors that are broadly financially neutral apply to service both before and after 2015.

[7] We have coined the term "Critical Retirement Age" (CRA) to mean the earliest age a member can take unreduced benefits, for example under the rule of 85.

Members entitled to unreduced benefits at or below age 60 under the rule of 85

5.5 For members with 2015 Scheme NPA of 65 or 66 (ie those born before 6 Apr 1960), we recommend a spread of retirement ages before and after age 60, based on retirements in 2011-2014. These members have a right to take their benefits from age 60 but the 2011-2014 experience indicates that a significant proportion of such members do not, in fact, elect to do so. To the extent that they defer their retirement after age 60, the scheme's financial position is improved because no late retirement factors apply on retirement before age 65, and the assumptions will anticipate this effect for the proportions of members assumed to retire after age 60.

5.6 For a member with 2015 Scheme NPA greater than 66 (ie born after 6 April 1960), we recommend retirement rates which are intermediate between those applying to members born before 6 April 1960 (paragraph 5.5 above) and those applying to new entrants to the 2015 Scheme (paragraph 5.3 above). This reflects such a member's retirement age being influenced by both the 2015 Scheme and the existing scheme.

Members entitled to unreduced benefits between 60 and 65 under the rule of 85

5.7 We recommend rates that are consistent with those applying to members not entitled to unreduced benefits before age 65 (paragraph 5.4) based on experience that shows these members tend to retire later than their CRA.

Flexible retirements

5.8 Flexible retirements are not currently a significant feature of the scheme. In the absence of any evidence of increased uptake of flexible retirement we do not recommend an explicit assumption for such events. Scottish Ministers, the Scheme Advisory Board, and other stakeholders may have a view on the likelihood of such an increase and Scottish Ministers may wish to make an allowance on the basis of their evidence. GAD would be happy to analyse any evidence provided. However, it is likely to require a significant uptake of the option before any appreciable financial impact is observed.

Previous assumptions

5.9 In 2013 it was assumed that all members would retire at the earliest date at which their benefits could be taken unreduced as of right. However, the experience over the period 2011-2014 indicates that a significant proportion of members do not take their benefits at the earliest date they are available unreduced.

5.10 The rates we have proposed are based on recent experience, which may be impacted by prevailing economic conditions. For example people may feel more able to retire early if economic conditions are positive. However, as we have only three years' worth of data we were not able to analyse this impact, so our proposed best estimate assumption is based on the experience available.

Use of the assumption

5.11 Age retirement rates specify the rate at which members are assumed to retire on grounds other than ill health and therefore potentially include allowance for retirements before and after NPA.

5.12 An actuarial reduction is applied to the pension payable on retirement before NPA: the actuarial reduction is set to give the early retirement pension broadly the same value as the deferred benefits payable following withdrawal at the same age.

5.13 An actuarial uplift is applied for retirement after NPA in the 2015 Scheme, and for retirements after 65 in the existing scheme.

Financial effect of early and late retirement

5.14 The early retirement reductions and late retirement uplifts which apply in the Scheme are intended to mean that, on average, the timing of a given member's retirement does not affect the cost to the scheme of providing their benefits. However this is not true in all circumstances, and so having an explicit assumption for the spread of retirements will provide a (materially) more accurate reflection of the cost of the Scheme so long as future experience is in line with the assumptions.

5.15 There are three principal ways in which the spread of retirements (on grounds other than ill health) affects the financial position of the Scheme (and ultimately the cost cap mechanism). These are:

- Members who retire after their CRA but before 65 do not receive an uplift for late retirement. This will (all other things being equal) reduce the cost to the Scheme of providing their benefits.
- All members with final salary service in the existing schemes who retire early effectively give up future salary increases net of inflation (CPI). As we would generally expect average salary increases to be greater than inflation over the long term this also reduces the cost to the Scheme.
- Finally, if a member retires early subject to a reduction and also takes cash by commutation, then (because the commutation terms are the same at all ages and so the reduction is not cost neutral with respect to cash) this also reduces the cost to the Scheme.

5.16 Note that only the third of these effects will directly affect setting the level of the cost cap. However the other two will affect the operation of the cost cap fund so will have an effect on the cost cap mechanism and hence, potentially, on members' future benefits.

5.17 The financial effect of late retirement (ie after Normal Pension Age under the 2015 Scheme, and after age 65 under the Earlier Schemes) is much less material and we do not propose to model it explicitly.

Results of analysis

5.18 We analysed the age retirement rates over 2011-2014 and the results are shown in the charts below for those who were entitled to take unreduced benefits from age 60 due to the rule of 85 (or earlier in certain circumstances, with the employer's consent) ('CRA 60') and those with who did not benefit from the rule of 85 and so could take unreduced benefits from age 65 ('CRA 65'), separately for men and women. Retirements are shown up to age 65 in each case.

5.19 This analysis excludes early retirements due to redundancies. This is on the basis that, in the event of early retirement in circumstances of redundancy, the employer funds the cost of early retirement on a "past service reserve" basis, which broadly equates to the level of assets required to support the member's rights if he/she were to remain in employment. Local fund actuaries have confirmed that the costs are assessed and met on the past service reserve basis, and so no allowance for retirements arising from redundancy is appropriate.

5.20 The 2013 assumption was that members retire at the earliest age at which they can retire as of right without any reduction to their benefits.

5.21 The charts in this section include members whose CRA was 60 or 65 to the nearest whole age: we have not undertaken a separate analysis for members whose CRA was between 61 and 64: there are significantly fewer such cases and we would not expect the pattern to be dissimilar to that brought out by the CRA 60 charts. These members have been treated as having a CRA of 65 as noted in paragraph 5.7.

5.22 The charts below indicate a significant rise in incidence of retirement in the year prior to age 65. However, this appears to be a distortion arising from the data grouping (for example of retirements very close to, but just below, age 65) rather than a genuine feature of the scheme's experience.

5.23 **Chart 5.1A**

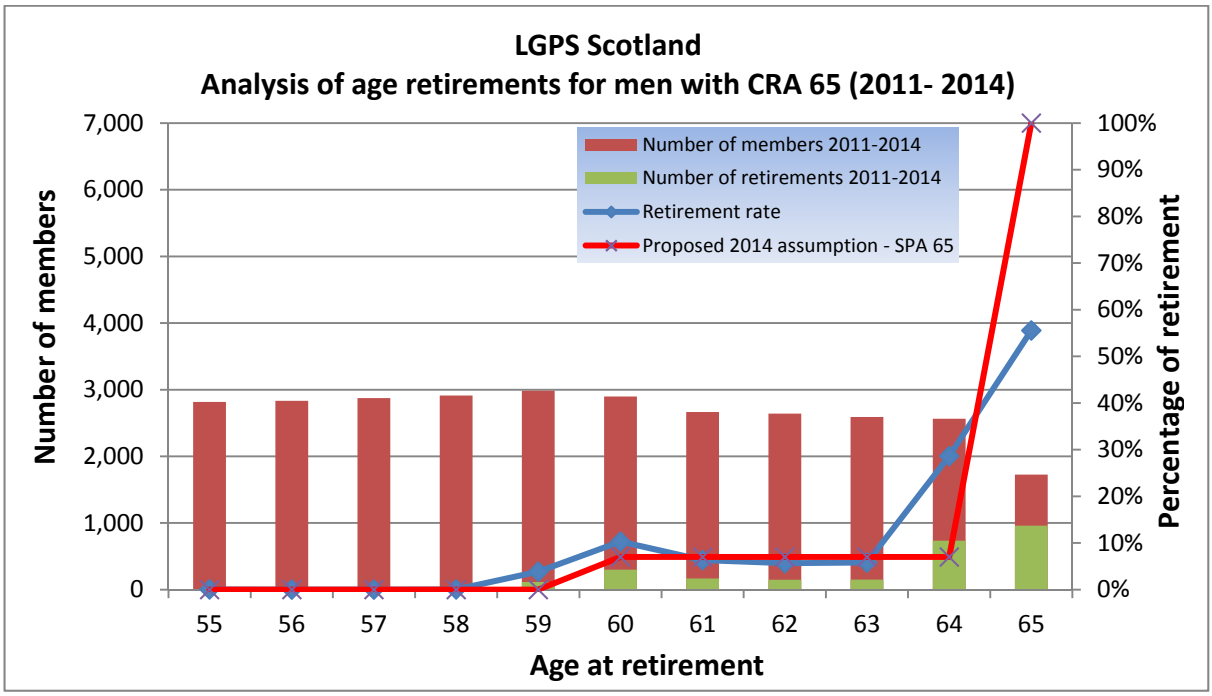


Chart 5.1B

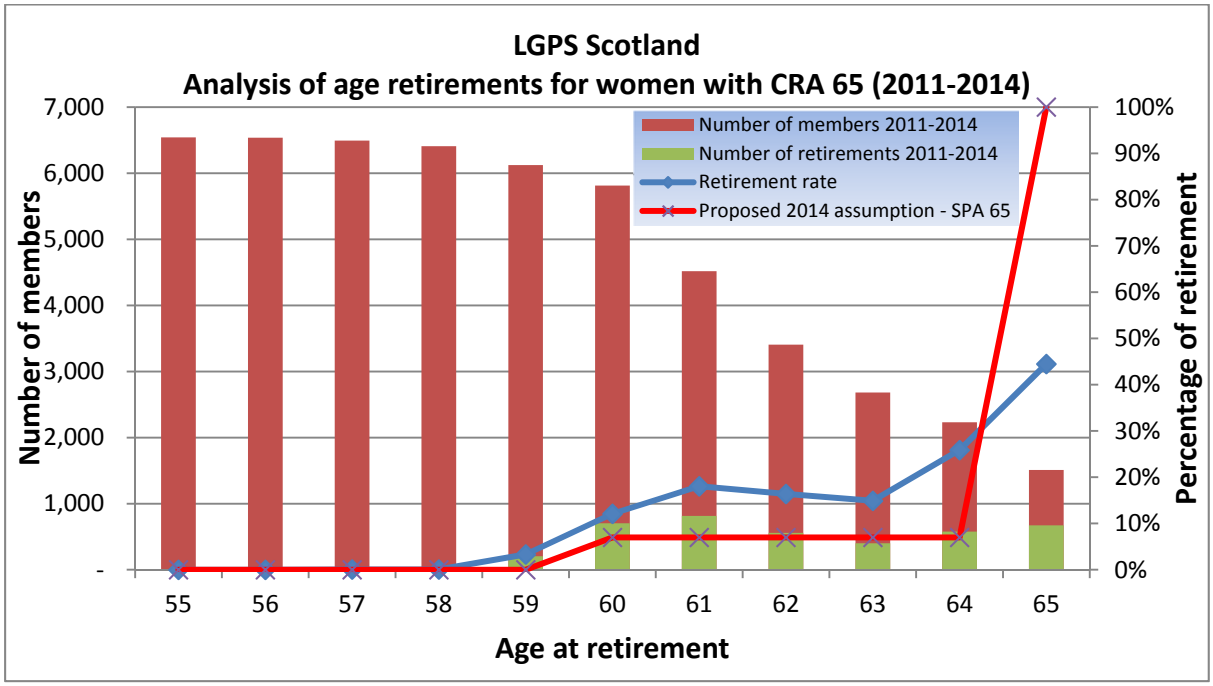


Chart 5.2A

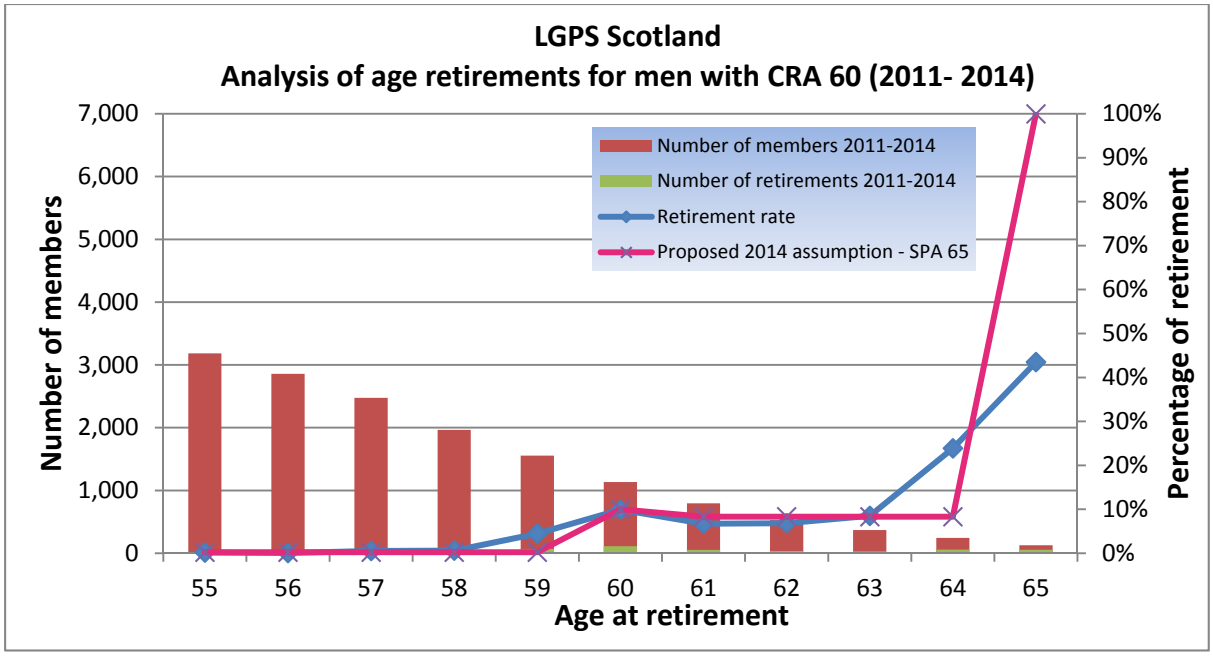
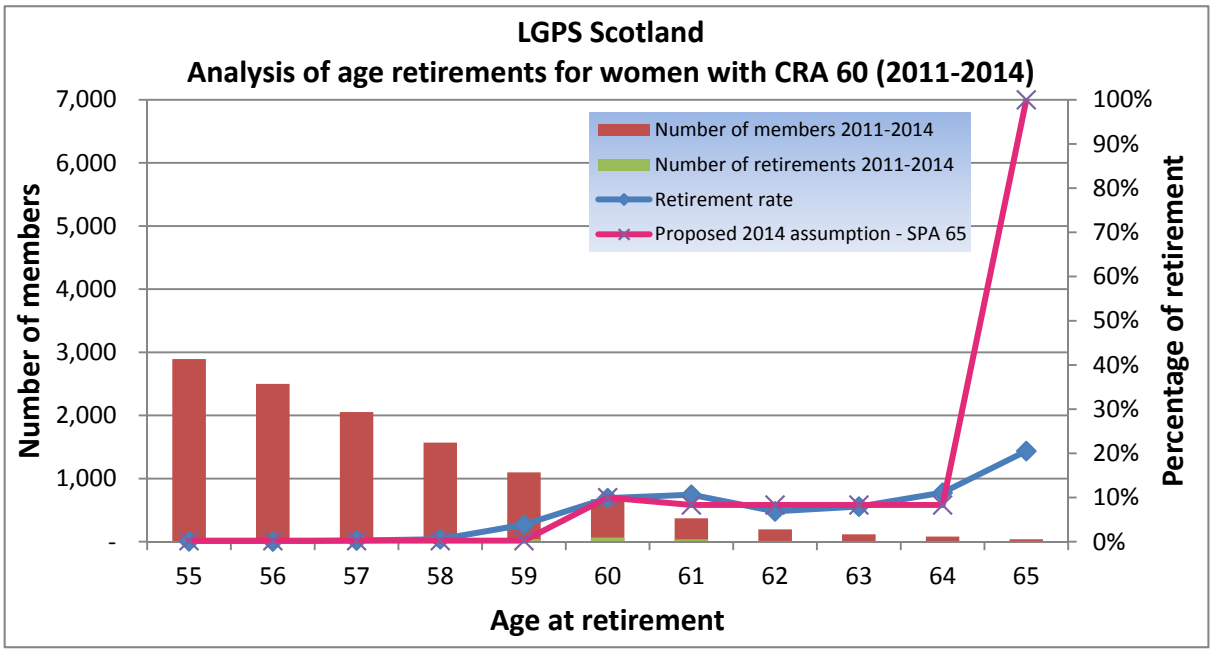


Chart 5.2B



5.24 The proposed unisex retirement assumption for Men and Women with CRA 60 is based on the experience of Men and Women with CRA 60. The proposed unisex retirement assumption for Men and Women with CRA 65 is based on the experience of Men with CRA 65 only. As can be seen in Chart 5.1B, the experienced retirement rate of Women over the period 2011-14 was higher than this assumption. However during the period Women's State Pension Age was below age 65, which may have encouraged earlier retirement. In future Women's SPA will be 65 or higher, so we have not reflected this feature in our recommended assumptions for future retirements.

5.25 Experience for women appears to show that more people with CRA 65 are retiring before 65 than those with CRA 60. However, we have not given high credibility to this, as it coincides with a period when SPA was changing to 65 for women. The estimated average age at retirement for men and women are set out in the tables below. Our analysis shows that in Scotland, people with CRA less than 65 tend to work beyond the age at which they can take their benefits unreduced. In particular, those with CRA between 60 and 65 have been combined with those with CRA 65.

Men and Women

Critical Retirement Age (for Pre 2015 Service)	Member's age and normal pension age			
	20-38 (NPA 68)	38-55 (NPA 67)	55-62 (NPA 66)	62+ (NPA 65)
60	66	65	64	63
65	67	66	65	64

Financial impact

5.26 The approximate financial impact of the proposed change to the age retirement assumptions compared to those used in 2013 is set out in Table 5.1.

Table 5.1: Approximate financial impact of proposed change in age retirement assumptions

	Employer cost cap
Change in age retirement assumptions from 2013 to those recommended for 2014	Not material

5.27 The age retirement assumptions do not have a material impact on the employer cost cap because of the design of the 2015 Scheme, which includes actuarially neutral early and late retirement factors. The age retirement assumptions are more significant for the calculation of the liabilities of active members in respect of service before 1 April 2015, and will have an impact on the initial value of the cost cap fund and hence on the future operation of the cost cap mechanism.

6 Ill-health retirement from service

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 2014 valuation

6.1 We recommend that a single set of assumptions (separate for men and women) is used to allow for the incidence of ill-health retirement, i.e. applying both to members who have been members of the existing scheme and to those who join the 2015 Scheme without having any existing Scheme membership. Assumed rates of ill-health retirement increase with age but fewer than 2% of members are assumed to retire on ill-health grounds each year, even at the highest ages. Sample rates are provided in Appendix B.

6.2 We also recommend assuming that 70% of members (both men and women) retiring on ill-health grounds will receive Tier 1 benefits and 30% will receive Tier 2 benefits. (Tier 1 provides a higher level of benefit than Tier 2.) This assumption is unchanged from 2013.

2013 assumptions

6.3 The 2014 assumptions for incidence of ill-health early retirement are approximately 100% and 70% of the 2013 assumptions for men and women respectively.

Local actuaries assumptions

6.4 We have compared ill health rates with local actuaries' rates. Local actuaries provide separate assumptions for rates of ill health retirement under Tier 1 and Tier 2. We did not find adequate data to support a different pattern of retirements for the two Tiers, and have therefore proposed a combined rate of ill health retirement, with 70% going to Tier 1 and 30% going to Tier 2. This is illustrated by the following charts for women retiring due to ill health under Tier 1 and Tier 2. Local actuaries have used identical assumptions for Strathclyde and Lothian, and also for Falkirk and Fife. These are illustrated for women manual workers in charts 6.1 and 6.2 as an example.

6.5 The proposed assumption for women reflects recent experience of considerably lower ill health incidence than implied by the local actuaries' assumptions for manual workers that represent the majority of members even though local actuaries have reduced their ill health incidence rates for the 2014 valuations. In 2013, SLOGPAG directed an assumption of 50% of the ill health rates assumed by local actuaries in relation to the Strathclyde and Lothian Pension Funds as at 31 March 2011 and our analysis suggests the experience is even lighter than this for women.

Chart 6.1

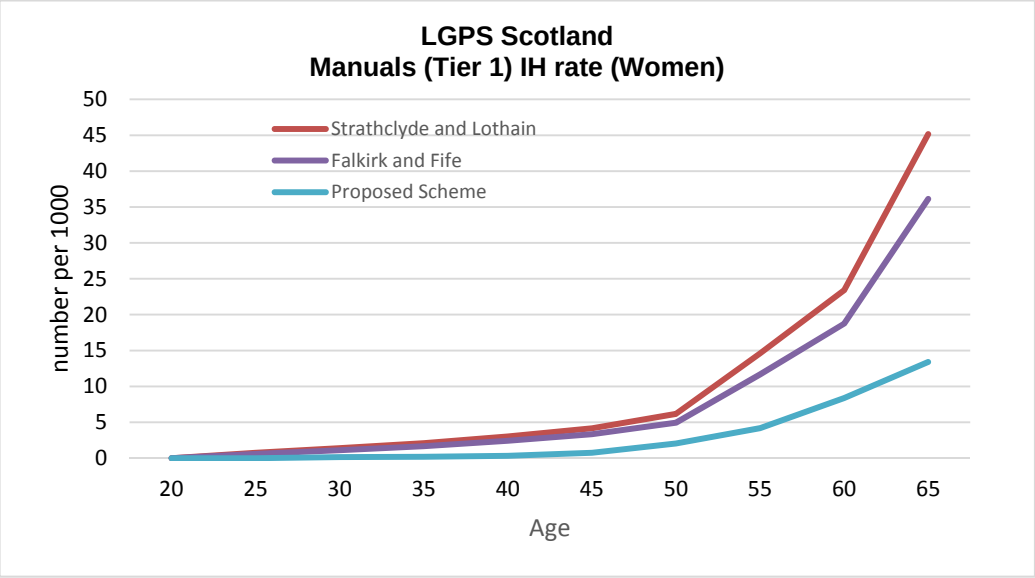
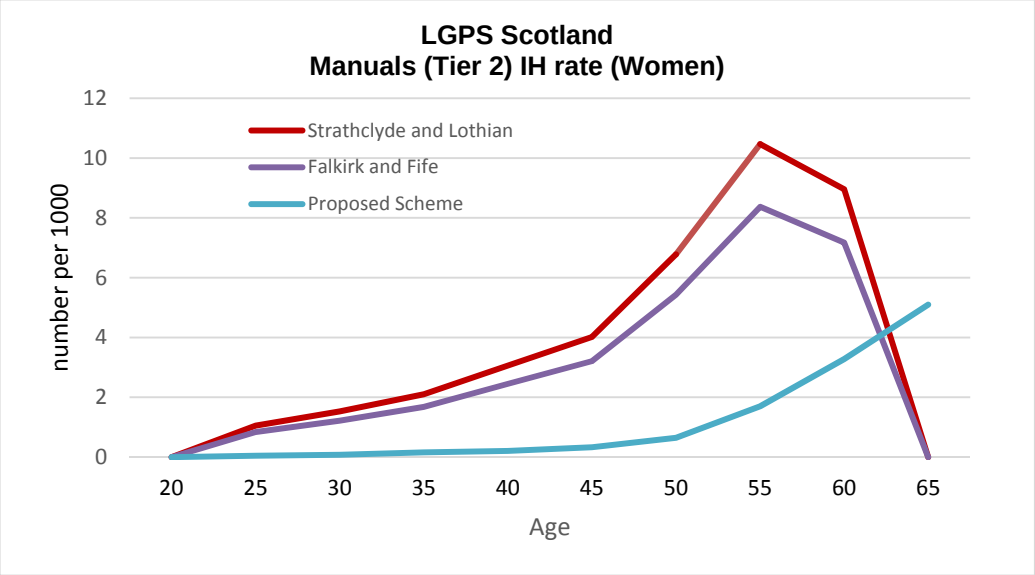


Chart 6.2



Use of the assumptions

6.6 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 or 2 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.

Results of analysis

6.7 We analysed around 1,800 ill-health retirements over the three-year period to 31 March 2014. The analysis compared the numbers of actual retirements to the expected number of retirements under the 2013 assumptions. Details of the analysis are shown below.

Rates of ill-health retirement

6.8 We have analysed the pattern of ill-health retirements over the three-year period to 31 March 2014. The analysis compares the actual rate of ill-health retirements to the expected rate of ill-health retirements based on the assumptions in 2013.

6.9 The tables below show the actual number of ill-health retirements compared with the expected number of ill-health retirements based on the 2013 assumptions, in 5-year age bands.

Table 6.1 – Actual versus expected numbers of ill-health retirements among active men

Age group	Expected number of ill-health retirements 2011-2014	Actual number of ill-health retirements 2011-2014	Ratio of actual to expected ill-health retirements (%)
25 to 29	0	0	0%
30 to 34	3	4	121%
35 to 39	6	16	264%
40 to 44	19	26	134%
45 to 49	63	69	109%
50 to 54	164	154	94%
55 to 59	253	209	83%
60 to 64	257	285	111%
Overall	**766**	**763**	**100%**

Table 6.2 – Actual versus expected numbers of ill-health retirements among active women

Age group	Expected number of ill-health retirements 2011-2014	Actual number of ill-health retirements 2011-2014	Ratio of actual to expected ill-health retirements (%)
25 to 29	6	1	18%
30 to 34	17	15	91%
35 to 39	34	24	71%
40 to 44	68	59	87%
45 to 49	152	128	84%
50 to 54	308	212	69%
55 to 59	551	344	62%
60 to 64	356	273	77%
Overall	**1,491**	**1,056**	**71%**

6.10 The charts below show the actual rates of ill-health retirements of members by age for men and women respectively. The general pattern of ill-health retirement rates by age is similar to the previous assumptions but the actual rates of ill-health retirements have been lower than expected for women, particularly at older ages.

Chart 6.3

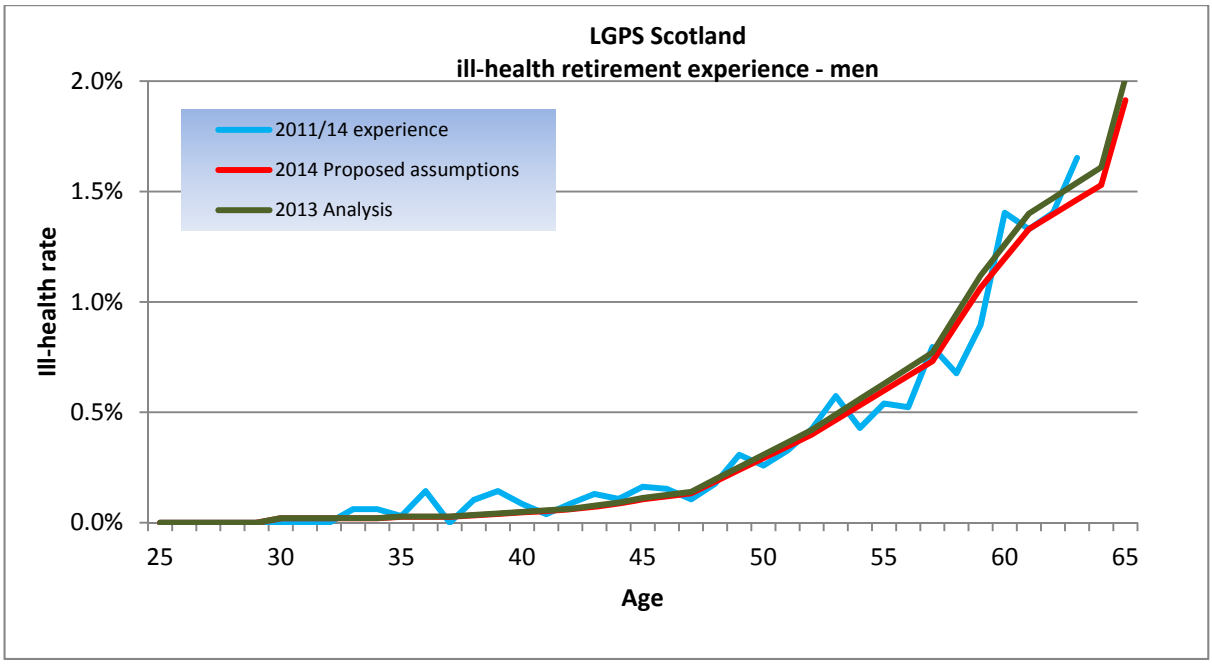
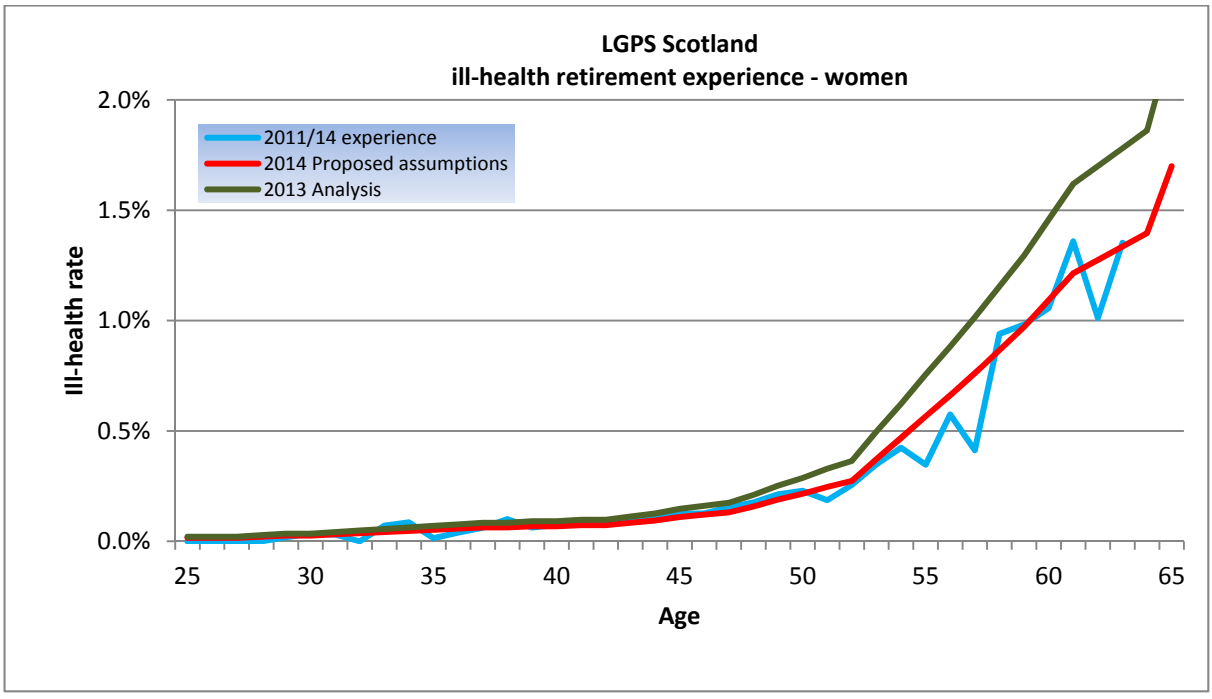


Chart 6.4



6.11 Our recommended assumption is that rates of ill-health retirement are in line with recent experience. This will lead to the model predicting lower incidence of ill health retirement for women than in 2013. The financial impact of this is discussed below in paragraph 6.16.

Comparison with England and Wales

6.12 The rate of ill-health retirement experience for the Scheme is approximately 20% and 40% higher for men and women respectively compared to England and Wales counterparts.

Distribution of benefit Tier on ill-health retirement

6.13 The assumption used in the 2013 Analysis was that 70% of ill-health retirees retire on Tier 1 ill-health and 30% retire on Tier 2.

6.14 The actual percentages of ill-health retirements in each Tier during the years 2011-2014 are shown in Table 6.3 below.

Table 6.3 – Percentage of ill-health retirement in Tiers 1, 2 and 3 by year

Year	Tier 1	Tier 2
2011/12	69%	31%
2011/12	73%	27%
2012/13	70%	30%
Weighted average 2011-2014	71%	29%
2014 Proposed assumption	**70%**	**30%**

6.15 Over the period 2011-2014 the level of ill-health retirements in Tier 1 has remained stable relative to retirement in Tier 2. Men and women exhibit substantially the same ratio. We recommend no change to the assumption made in 2013..

Financial impact

6.16 The approximate financial impact of the proposed change to the ill-health retirement assumptions compared to those used in 2013 is set out in Table 6.4. A lower incidence for women of ill health is indicated, and this leads to a reduction in the employer cost cap.

Table 6.4: Approximate financial impact of proposed change in ill-health retirement assumptions

	Employer cost cap
Change in ill-health assumptions from 2013 to those recommended for 2014	-0.3%

7 Voluntary withdrawal from service

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 2014 valuation

7.1 We recommend that a single set of rates of withdrawal (separate for men and women) is used for the purposes of the valuation i.e. applying both to existing members who have been members of the existing scheme and to those who join the 2015 Scheme without having any existing scheme membership. The recommended rates are net of re-entry within five years. The same withdrawal rates are proposed regardless of the length of the member's service. Sample rates are provided in Appendix B.

2013 assumptions

7.2 In 2013 for the assumed withdrawal rates did not make explicit allowance for re-entry. The rates are not, therefore, directly comparable to the recommended 2014 assumptions. The change to the net withdrawal approach ties in with the provisions for re-linking service to salary after re-entry in the existing scheme[8]. The 2014 ultimate assumptions are approximately 48% of the 2013 assumptions for both men and women, before any adjustment is made for re-entry to the scheme.

Local actuaries assumptions

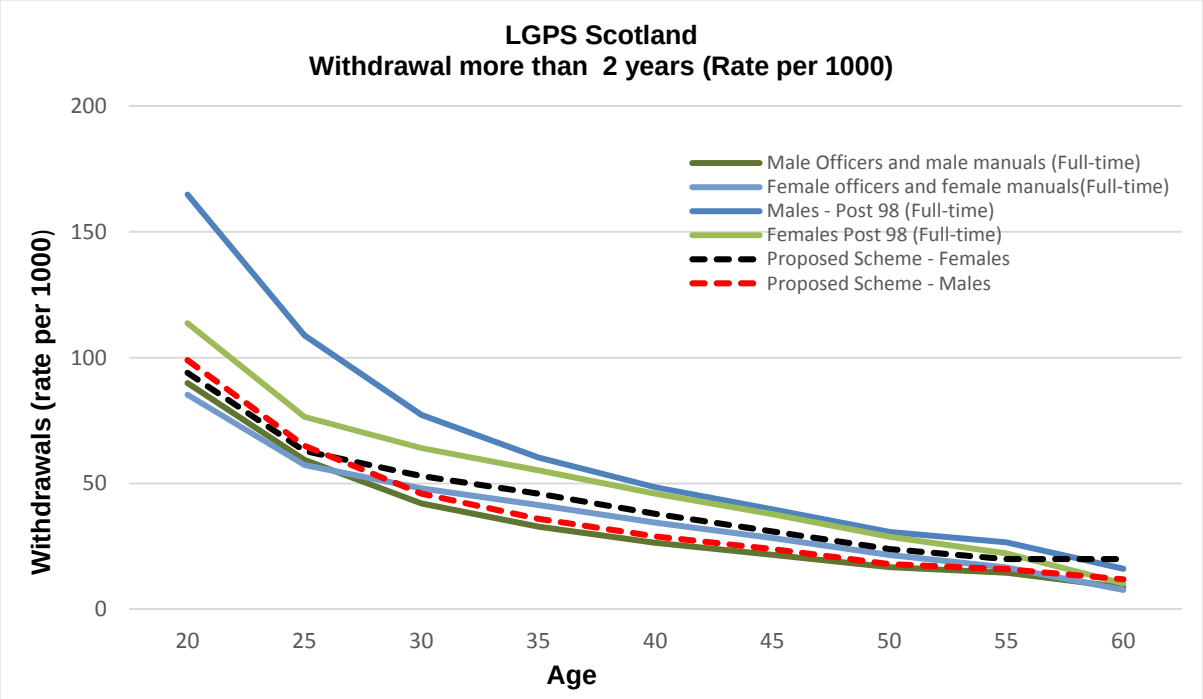
7.3 We have compared proposed withdrawal rates with the assumptions adopted by local actuaries for Strathclyde, Lothian, Falkirk and Fife. Local actuaries have split withdrawal rates between less than 2 years' service and more than 2 years' service, and have considered full-time and part-time members separately. In our opinion the volume of data did not justify this, and the impact on the employer cost cap and past service liability is not material.

7.4 The proposed withdrawal assumptions for over 2 years' service are within the range of assumptions adopted by the local actuaries. For illustration we have compared the rates with the assumption made for the valuation of the Strathclyde Pension Fund for full time members. This is shown in the following chart.

7.5 The rates we have proposed are based on recent experience, which may be impacted by prevailing economic conditions. For example people may feel more able to change employer if economic conditions are positive. However, low and reducing withdrawal experience is occurring in defined benefit schemes generally. Consequently the proposed rates represent our best estimate of future experience.

[8] From 2015, only members who leave the Scheme and return within five years will have their accrued service in the existing schemes linked to their final salary at retirement.

Chart 7.1



Use of the assumption

7.6 Withdrawal rates specify the rate at which members are assumed to leave voluntarily before retirement, becoming entitled to either deferred benefits or, for those with less than two years' service, a refund of contributions. The withdrawal rates are 'net' rates, ie they are intended to reflect the probability of leaving service and not re-joining within five years, and therefore the member's benefits not being linked to their final salary at retirement in relation to pre-2015 benefits.

Results of analysis

7.7 The calculation of the net withdrawal rates is split into two elements:

- what is the likelihood that a member leaves service; and
- if a member does leave service, what is the likelihood they do not return within five years.

7.8 For the first element, we have analysed the pattern of withdrawals from active membership over the three-year period to 31 March 2014.

7.9 For the second element, we have analysed service data and the date of joining the Scheme for active members. This shows that around 10% of active members have a previous period of service. From this we have estimated, after allowing for members with transfers in, that 10% of all leavers, regardless of their gender or age, will re-join the scheme within 5 years.

7.10 Recent experience may not be representative of the long term expectation due to prevailing conditions in the wider labour market. However we do not have sufficient information to analyse this effect and it may be partially offset by a lower than typical rate of voluntary exits in a difficult employment environment.

7.11 Analysis was carried out separately for members with less and more than two years' service. Although there is quite clear evidence that members with shorter service are more likely to withdraw (but with less variation by age), the impact of allowing for this on the valuation results is small: members with less than two years' service have relatively little past service liability and so there will be little impact on the results of the valuation.

7.12 The tables below set out a comparison of the numbers of actual withdrawals (among members with more than 2 years' service) compared to the numbers of expected withdrawals in 5-year age bands based on the withdrawal assumptions adopted in 2013.

Table 7.1A – Actual versus expected numbers of withdrawals among active men with over 2 years' service

Age group	Expected number of ultimate withdrawals 2011-2014	Actual number of ultimate withdrawals 2011-2014	Ratio of actual to expected withdrawals (%)
Up to 25	1,226	611	50%
25 to 29	1,314	547	42%
30 to 34	1,515	654	43%
35 to 39	1,486	599	40%
40 to 44	1,942	758	39%
45 to 49	2,060	811	39%
50 to 54	1,720	594	35%
55 to 59	1,227	421	34%
60 to 64	449	176	39%
65 +	36	13	36%
Overall	**12,976**	**5,184**	**40%**

Table 7.1B – Actual versus expected numbers of withdrawals among active women with over 2 years' service

Age group	Expected number of ultimate withdrawals 2011-2014	Actual number of ultimate withdrawals 2011-2014	Ratio of actual to expected withdrawals (%)
Up to 25	721	435	60%
25 to 29	1,735	1,032	59%
30 to 34	2,750	1,370	50%
35 to 39	2,992	1,442	48%
40 to 44	3,942	1,893	48%
45 to 49	4,099	2,107	51%
50 to 54	2,907	1,561	54%
55 to 59	1,760	1,106	63%
60 to 64	357	402	113%
65 +	67	26	39%

Age group	Expected number of ultimate withdrawals 2011-2014	Actual number of ultimate withdrawals 2011-2014	Ratio of actual to expected withdrawals (%)
Overall	**21,329**	**11,374**	**53%**

7.13 The charts below show the gross withdrawal rates derived from the analysis and the rates that are being recommended for the 2014 valuation. The proposed rates need to be extended to older ages, which will accommodate the anticipated longer working lives of members of the 2015 Scheme. We recommend that the rates are extended by continuing the broadly linear trends seen at the older ages in the analysis.

Chart 7.2A

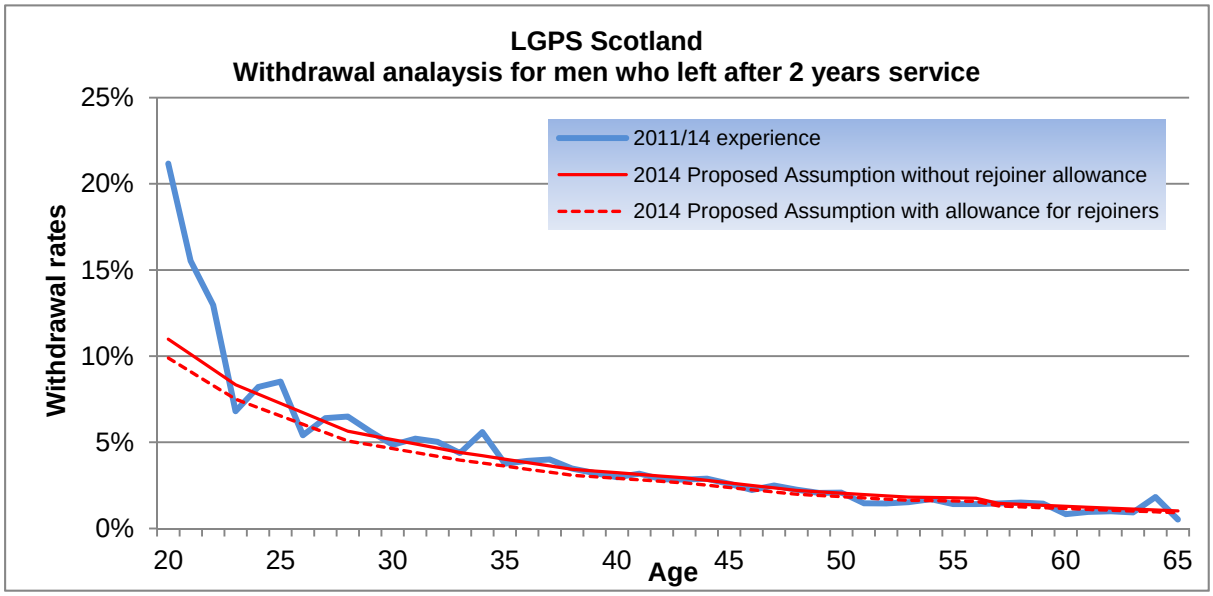
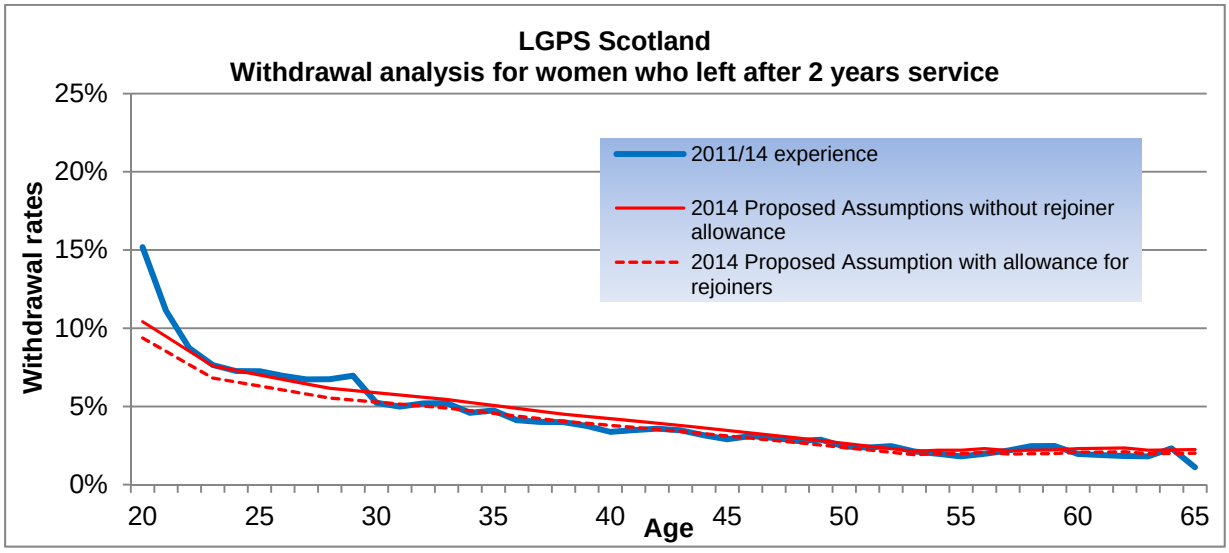


Chart 7.2B



7.14 The withdrawal experience among members with less than 2 years' service has also been analysed. These members generally show a higher incidence of withdrawal, with a pattern that is less age-dependent, than members with over 2 years' service. At older ages the withdrawals among members with less than 2 years' service tend to be slightly higher than the 2013 assumptions, and slightly lower at the younger ages. However, this variation in experience does not have a significant impact on the employer cost cap mechanism.

7.15 The proposed assumptions are significantly lower than the 2013 assumptions at all ages.

Financial impact

7.16 The approximate financial impact of the proposed change to the withdrawal rate assumptions compared to those used in 2013 is set out in Table 7.1

Table 7.3: Approximate financial impact of proposed change in withdrawal assumptions

	Employer cost cap
Change in withdrawal assumptions from 2013 to those recommended for 2014	not material

7.17 The withdrawal assumptions do not have a material impact on the employer cost cap because of the design of the 2015 Scheme, which provides for revaluation of benefits to be by reference to a change in consumer prices both during a member's service and in deferment after leaving service. The withdrawal assumptions are more significant for the calculation of the liabilities of active members in respect of service before 1 April 2015, and will have an impact on the initial value of the cost cap fund and hence on the future operation of the cost cap mechanism.

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 2014 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 both to existing members who have been members of the existing scheme and to those who join the 2015 Scheme without having any existing scheme membership. Assumed rates of death in service increase with age but, except for men at ages beyond 63, remain less than ½% a year. Sample rates are provided in Appendix B.

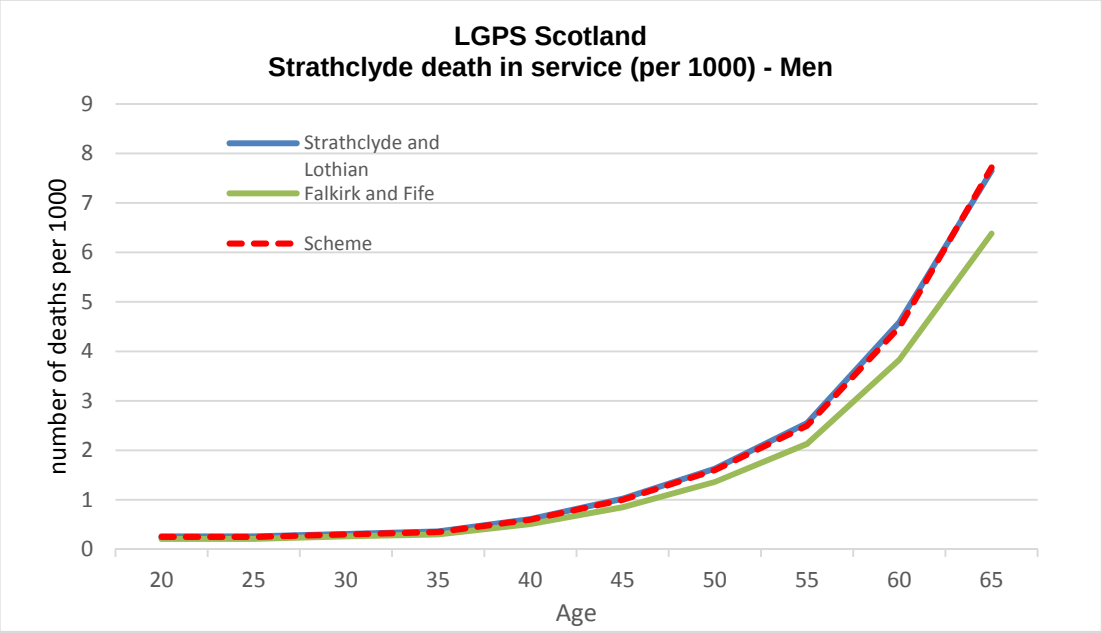
2013 assumptions

8.2 Single sets of rates (separate for men and women) were used in 2013 to allow for the possibility of death before retirement. The rates were based on earlier experience and are higher than those recommended now for the 2014 valuation. The proposed 2014 rates are approximately 83% for men and 76% for women of the 2013 assumptions respectively.

Local actuaries' assumptions

8.3 The assumptions proposed are broadly in line with the assumptions adopted by the local actuaries for Strathclyde, Lothian, Falkirk and Fife. This can be seen in the following chart.

Chart 8.1



Use of the assumption

8.4 Death before retirement rates are used to allow for the possibility of death whilst in active service or whilst entitled to a deferred pension. The number 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

8.5 We have analysed the deaths of active members over the three-year period to 31 March 2014. The recommended assumptions for both deaths in service and in deferment are based on this analysis. In total there were around 750 deaths of active members over the period. The analysis compares the number of actual deaths to the expected number of deaths under the 2013 assumptions and under ONS data on the rates applying to the whole population. Further information on the data analysed and the results of that analysis are shown in Annex G.

8.6 The analysis showed there were significantly fewer deaths than expected. To formulate a recommended assumption we considered what adjustment to the ONS rates would provide the closest comparison with actual experience. The 'best fit' was achieved by taking 39% and 36% of the ONS rates (National Life Tables, Scotland 2011-13) for men and women respectively.

8.7 The tables below set out a comparison of the numbers of actual deaths in service compared to the numbers of expected deaths in 5-year age bands based separately on the mortality assumptions adopted in 2013 and ONS rates specified in section 8.5 above.

Table 8.1A – Actual versus expected numbers of deaths among active men

Age group	Expected number of deaths 2011-2014 using 2013 assumptions	Expected number of deaths 2011-2014 using ONS assumptions	Actual number of deaths 2011-2014	Ratio of actual to expected deaths using 2013 assumptions (%)	Ratio of actual to expected deaths using ONS assumptions (%)
25 to 29	4	12	4	113%	32%
30 to 34	6	24	8	141%	34%
35 to 39	9	36	11	122%	30%
40 to 44	26	73	22	84%	30%
45 to 49	56	123	54	97%	44%
50 to 54	89	182	67	75%	37%
55 to 59	115	236	109	95%	46%
60 to 64	116	204	74	64%	36%
Overall	**420**	**890**	**349**	**83%**	**39%**

Table 8.1B – Actual versus expected numbers of deaths among active women

Age group	Expected number of deaths 2011-2014 using 2013 assumptions	Expected number of deaths 2011-2014 using ONS assumptions	Actual number of deaths 2011-2014	Ratio of actual to expected deaths using 2013 assumptions (%)	Ratio of actual to expected deaths using ONS assumptions (%)
25 to 29	3	10	2	58%	20%
30 to 34	9	21	14	154%	67%
35 to 39	21	41	13	62%	32%
40 to 44	52	87	28	54%	32%
45 to 49	96	166	56	58%	34%
50 to 54	125	253	84	67%	33%
55 to 59	120	273	98	82%	36%
60 to 64	61	162	75	124%	46%
Overall	**487**	**1,014**	**370**	**76%**	**36%**

8.8 The charts below show the rates of the actual and expected deaths by age for men and women respectively.

Chart 8.2A

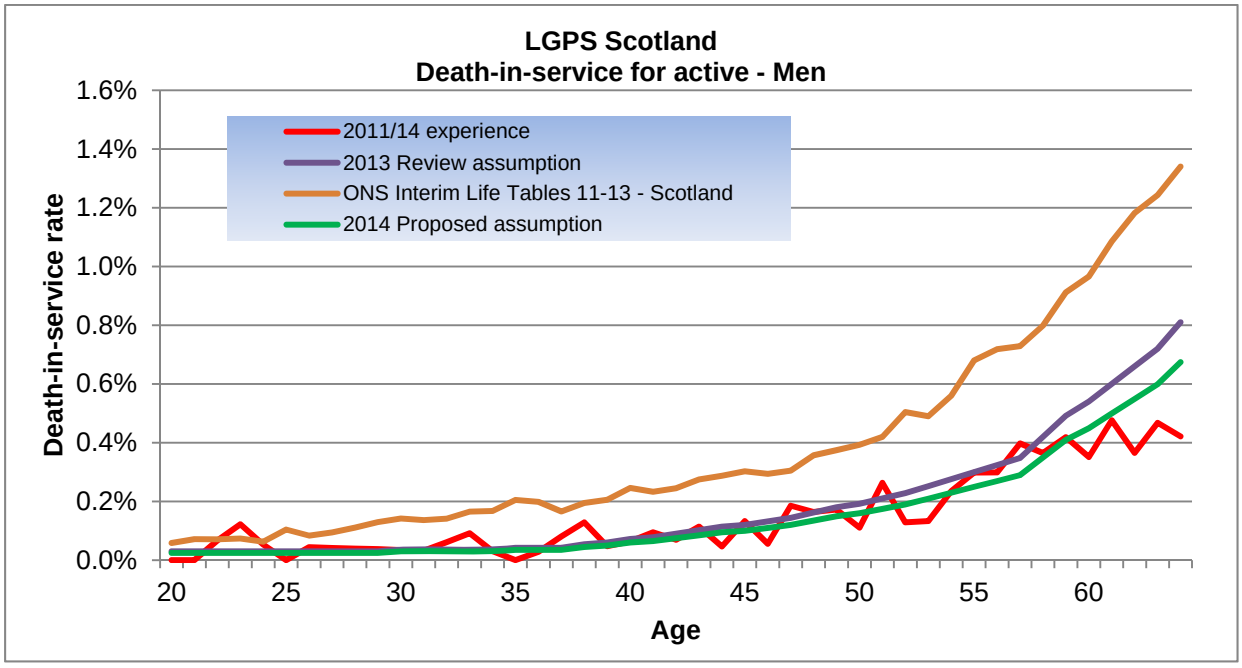
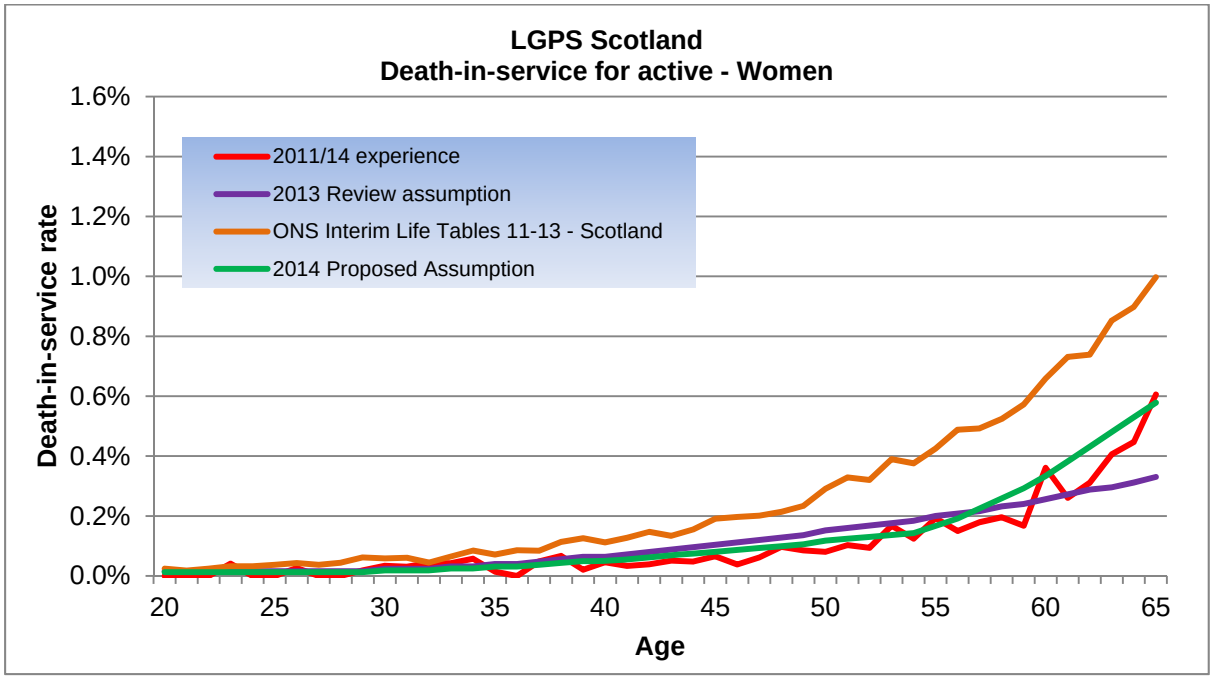


Chart 8.2B



8.9 Our analysis shows that the death-in-service rates over 2011-2014 were higher than those assumed in 2013 for younger men but lower for older men. For women, lower death-in service rates were observed at almost all ages compared to those assumed in2013.

8.10 We recommend assuming rates of 39% and 36% of the ONS rates for men and women respectively for the purposes of the 2014 valuation.

Financial impact

8.11 The approximate financial impact of the proposed change to assumed rates of death before retirement compared to those used in 2013 is set out in Table 8.1.

Table 8.3: Approximate financial impact of proposed change in death before retirement assumptions

	Employer cost cap
Change in death before retirement assumptions from 2013 to those recommended for 2014	not material

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 assumption

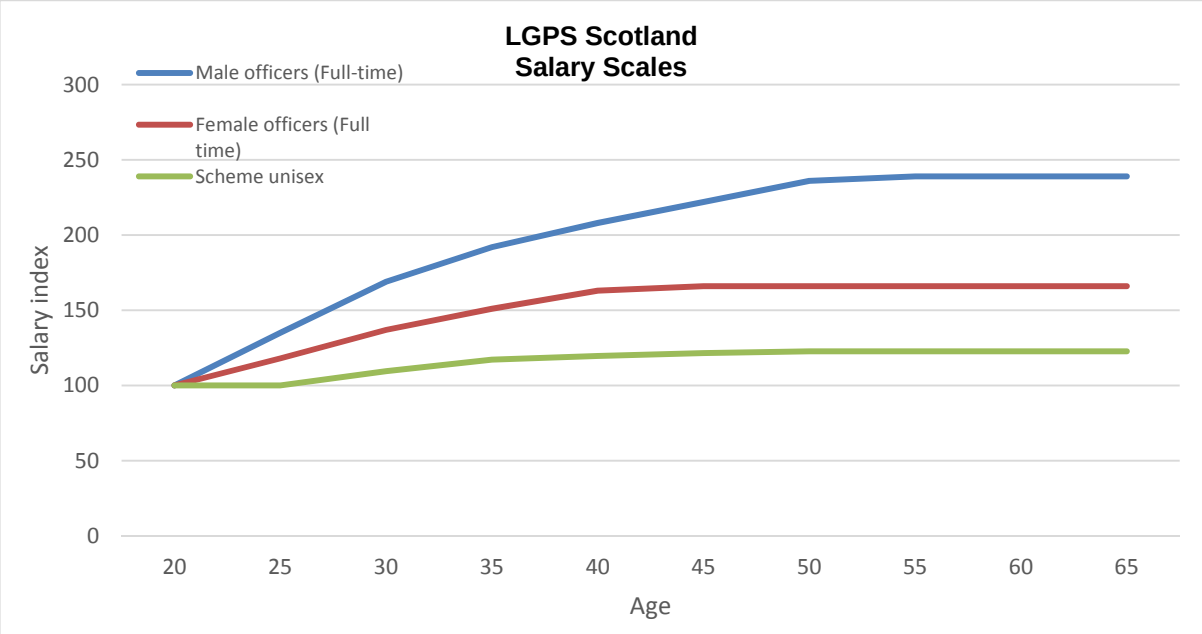
9.1 We recommend assuming unisex promotional increases. The increases are dependent on age and are steeper at younger ages. Sample values of the scales are provided in Annex B.

2013 assumptions

9.2 The assumptions recommended for the 2014 valuation are the lower than those used in 2013.

9.3 The assumption for salary scale is lower than the rates adopted for officers by the local actuaries, but their assumption is for no promotional scale for manual workers. Our analysis suggests that there is evidence of pay increases beyond general inflationary increases, particularly at younger ages, for the combined men, women, officer and manuals dataset (we do not have the data split to enable us to analyse officers and manual workers separately). Our proposed assumption is compared against the officer's promotional scales adopted by the local actuaries in respect of Strathclyde and other schemes.

Chart 9.1



Use of the assumption

9.4 For members with membership before 1 April 2015, those benefits are linked to salary at, or near, retirement. Members' salaries can increase through a combination of annual general pay awards and promotional 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 directed by HMT. The assumption for promotional pay increases is set by the responsible authority.

9.5 For members who join the 2015 Scheme with no membership of the existing scheme, their benefits are not linked to salary near retirement but are based on revalued career average earnings. However, their pay levels will affect their own contribution rates.

Results of analysis

9.6 We analysed the pay progression of the membership over the three-year period to 31 March 2014. Details of the analysis are shown below.

9.7 The analysis of the pay structure of the membership over the three years to 31 March 2014 does not provide a completely clear picture but does indicate that the 2013 assumption for promotional pay increases was too high at younger ages and that a higher scale for men than women is not justified.

2011-2014 experience

9.8 The experience over the three-year period to 31 March 2014 has been analysed in two different ways:

> Tracking the pensionable pay progression of individual members who were in pensionable service over the whole of the period (the "annual increase analysis");

> Looking at the profile of the active membership at 31 March 2014 in terms of average pensionable pay at each year of age and comparing that to the next year of age (the "profile analysis").

9.9 These analyses are shown together in the following graphs, separately for men and women. In each case, comparison is shown with the promotional salary increases assumed in 2013.

9.10 However, it should be noted that the annual increase analysis (broken line) in these charts includes inflationary as well as promotional pay increases. In setting the promotional scale, inflationary increases should be deducted. This is discussed further below, in the next sub-section.

9.11 Greater than expected salary growth will result in higher than expected liabilities particularly as existing scheme benefits are linked to final salary.

Chart 9.2

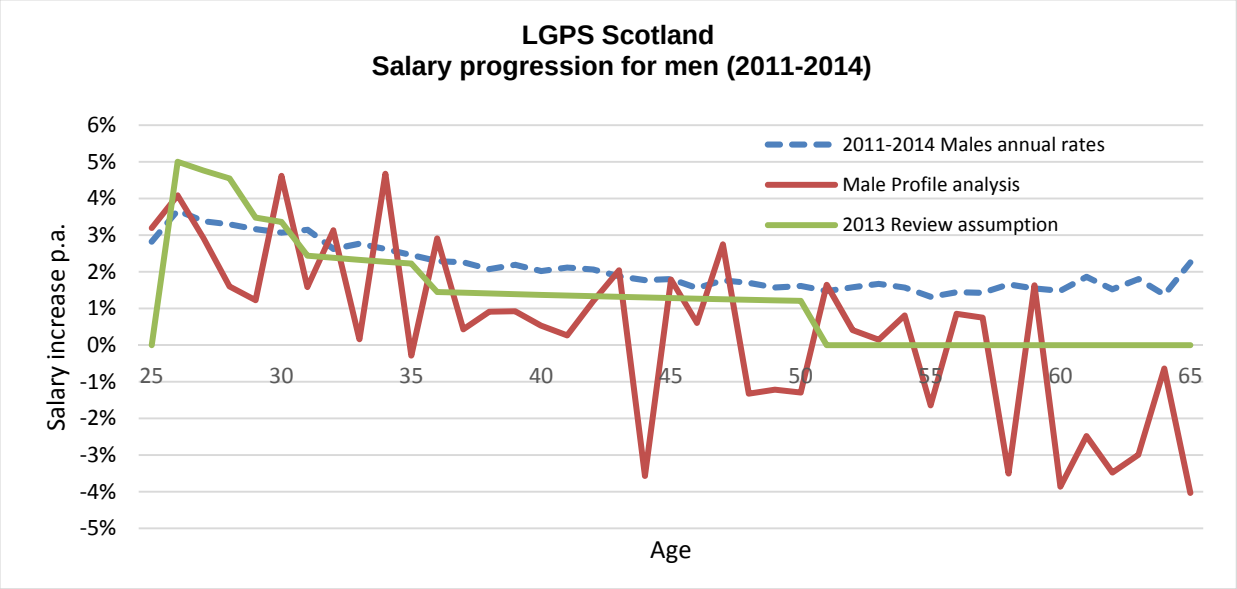
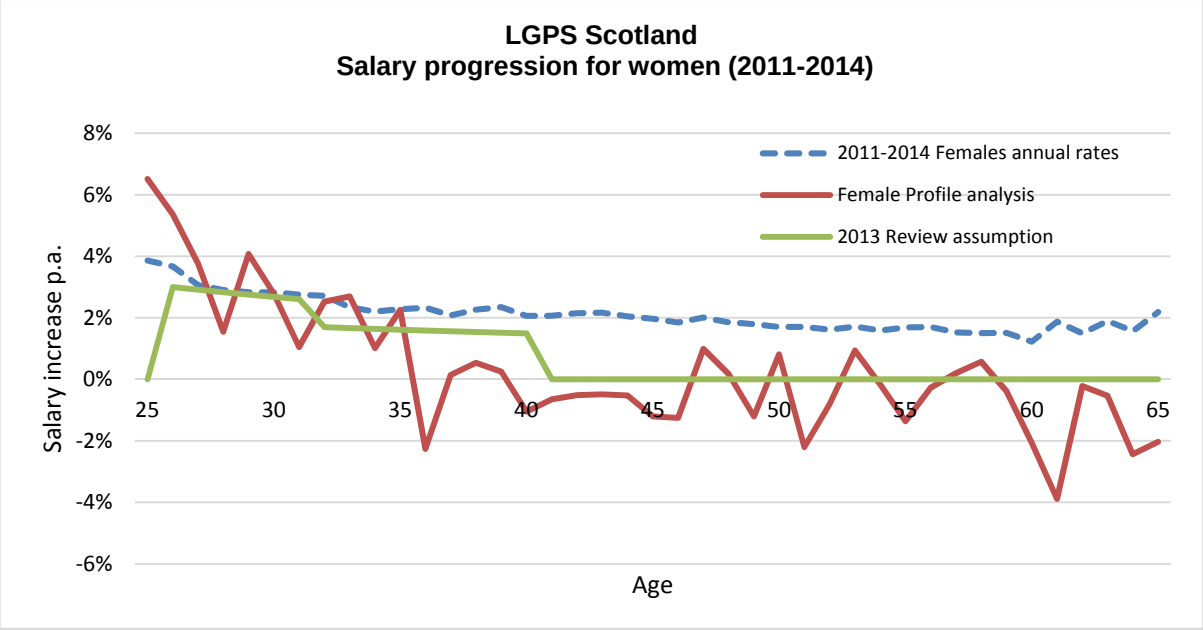


Chart 9.3



9.12 The profile analysis lines in each graph are difficult to interpret but may suggest a difference between men and women in the age range 35 to 45, where the average pensionable pay among women appears to decline from one year of age to the next (ie the solid red line is below the zero level in this age range), while among men there is either a zero or a small positive increase in the same age range. However, at most ages the experience is not consistently different between men and women.

9.13 The results of this part of the analysis should be treated with some caution since there may be a number of factors leading to the pattern shown, as discussed below.

Annual increase analysis

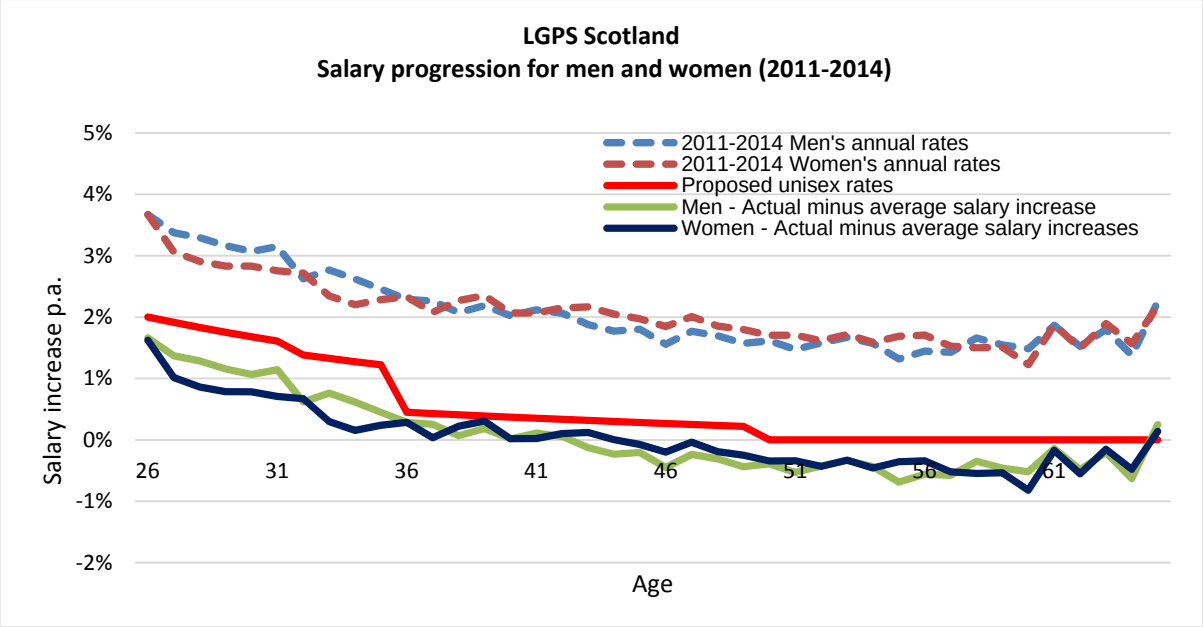
9.14 It is often the case that average pay increases by more than the headline general pay award (usually referred to as 'pay drift'). We understand HMT have included an allowance for pay drift in their directed general earnings increase assumption. Actual "pay drift" is difficult to identify. Our proposed promotional salary scale makes some adjustment for pay drift, and offsets average inflation increases.

9.15 Much of the increase may be driven by younger members with shorter service where pay scales are relatively steep. Applying the average increase to all members is likely to understate the pay increases for members with less service and overstate for those with more service.

Recommendation

9.16 The total annual increases for both men and women have been broadly similar based on experience of the Scheme over the 3 years to March 2014. Inflationary increases have generally been low in current years: zero due to pay freeze prior to 2013 and 1% per annum in 2013 and 2014 (Source: SCVO, Scottish joint Council pay scales). We propose a unisex promotional scale for this valuation as there is no discernible difference between men and women. We considered as evidence published pay increase announcements above and CPI increases, and exercised our judgement in relation to "pay drift" to determine the promotional component. The proposed scales and experience for men and women are illustrated in the chart below with sample rates in Appendix B.

Chart 9.4



Comparison with LGPS England and Wales

This assumption is similar to that used in the LGPS England and Wales Valuation as at 31 March 2012.

Financial impact

Table 9.1: Approximate financial impact of proposed change in promotional increases

	Employer cost cap
Change in death before retirement assumptions from 2013 to those recommended for 2014	not material

9.17 This assumption has very little financial impact on the costs of a CARE scheme, or on the employer cost cap. However it does affect the assessment of liabilities and will affect the prior value of the cost cap fund as at 31 March 2014.

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

Assumptions for 2014 valuation

10.1 HMT Directions specify the assumption regarding commutation where a member's retirement cash is provided only by commutation and the commutation rate is £12 cash for each £1 p.a. of pension: in this situation the assumption specified is that a member surrenders 15% of his or her pension for a cash sum at retirement.

10.2 For determining a future service contribution rate in relation to the Employer Cost Cap mechanism, the above assumption from the Directions will be relevant. However, where any valuation involving past service is undertaken, the specified assumption is no longer fully applicable because of the 3/80th retirement grant that applied for membership up to 2009. For that service it will be necessary to consider an assumption regarding commutation where a member already has an element of retirement cash provided automatically through the scheme benefit structure.

10.3 Table 10.1 below summarises the assumptions proposed for the 2014 valuation. The 10% rate for pre-2009 service broadly represents members electing to commute around half of the maximum commutable pension after allowing for the 3/80th retirement grant.

Table 10.1: Recommended commutation assumptions for the 2014 valuation

	Pre-2009 service	2009-2014 service[9]	2015 Scheme service[9]
Men	10%	15%	15%
Women	10%	15%	15%

Previous assumptions

10.4 In 2013 it was assumed that members took 75% of the maximum tax-free cash sum permitted by HMRC (75% x 36% = 27% of pension), including any retirement grant to which they were entitled. The pre 2009 component was not separately identified.

[9] Specified in HMT Directions

Use of the assumption

10.5 This assumption for amount commuted is specified by HMT in the Directions in respect of post 2009 service, so Scottish Ministers only set the assumption for a small component of the amount commuted (namely the pre 2009 component) in excess of the cash that members already receive as a right.

10.6 In practice, a member commutes part of their total pension, and does not specify whether the part commuted related to service before or after 2009. Consequently, it is not possible to do definitive analysis on the component of experience for which the Scottish Ministers need to make an assumption.

10.7 Differences between assumed and actual experience in the 2015 Scheme will feed through into the cost cap fund. Members may commute part of their pension for a lump sum at a rate of £12 for each £1 of annual pension given up. The assumption affects the value of liabilities 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 the overall commutation proportion has a significant impact on total liabilities, as well as contribution rates and the cost cap.

Financial impact

Table 10.2: Approximate financial impact of specified change in commutation assumption

	Employer cost cap
Change in commutation assumptions from 2013 to those specified for 2014	N/A

10.8 The financial impact is marked as "N/A" because the assumed commutation rate for pre-2009 service has no impact on the cost cap, which reflects benefits accruing over the period 2017-2020.

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 2014 valuation

11.1 We recommend the following assumptions.

- 80% of men and 70% of women at age 60 are assumed to be married or have a partner to whom a dependant's pension would be payable on their death. For men, the assumption increases slightly with age, whereas for women the assumption declines with age to below 40% at 80.
- Men are assumed to be three years older than their partners and women are assumed to be three years younger than their partners.
- No allowance is made for remarriage, on the grounds of materiality.

2013 assumptions

11.2 The assumed proportions married/partnered are similar to those adopted in 2013. For that review it was assumed that 85% of men and 70% of women were married or had a qualifying partner at retirement or on earlier death.

Use of the assumption

11.3 Dependants' pensions[10] are provided to qualifying dependants on the death of a member. 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.

11.4 Where the member has no service on or after 1 April 1998, the spouse's pension will cease if the spouse remarries. As this only applies to some current pensioners and deferred pensioners, this assumption does not impact the cost cap in any way.

Results of analysis

11.5 Our analysis of the pensioners who died during the three-year period to 31 March 2014 yielded lower proportions of members on whose death a dependant's pension was paid than implied by the 2013 assumptions except for men aged above 75. We have also compared against National Records of Scotland (NRS). This provided lower proportions at each age for both men and women, but this is expected, as the NRS only includes marriages as opposed to civil and other partnerships.

[10] Pensions are also payable to dependent children on a member's death but the costs are not material overall.

11.6 Across a wide range of ages, our analysis showed that dependants (ie spouse, civil partner or partner) of female members are, on average, 3 years older than the member, and dependants of male members are, on average, 3 years younger than the member.

11.7 We have analysed two items of family statistics over 2011-2014 based on deaths among pensioners during that period. This analysis provides information regarding the proportions of pensioners in respect of whom a dependant's pension became payable and, in those cases, the difference in age between the pensioner and the dependant.

Proportions married or partnered

Data

11.8 The results of this analysis should be treated with some caution, since there appears to have been inconsistent recording of death cases; whether a dependant's pension became payable; and what age the dependant was. There were some funds that recorded a dependant's pension to have been payable in 0% of deaths and a further one fund where the statistic was 100%. We have excluded those funds on the grounds that the data recorded seems implausible. However, there are a number of other funds where the data recorded may not reflect the actual position: it is difficult to be certain as to the level at which the recording is reliable. We have included all these funds with overall proportions lying between 1% and 95%, noting potential for some distortion in the results caused by inconsistent recording.

Experience

11.9 Charts 11.1 and 11.2 compare the actual proportion married or partnered to that assumed in 2013. The NRS assumptions are also given for comparison.

11.10 If a greater than assumed proportion of members are married or partnered, this will result in more dependants' pensions being payable than assumed and so result in a higher than assumed cost to the scheme.

Chart 11.1

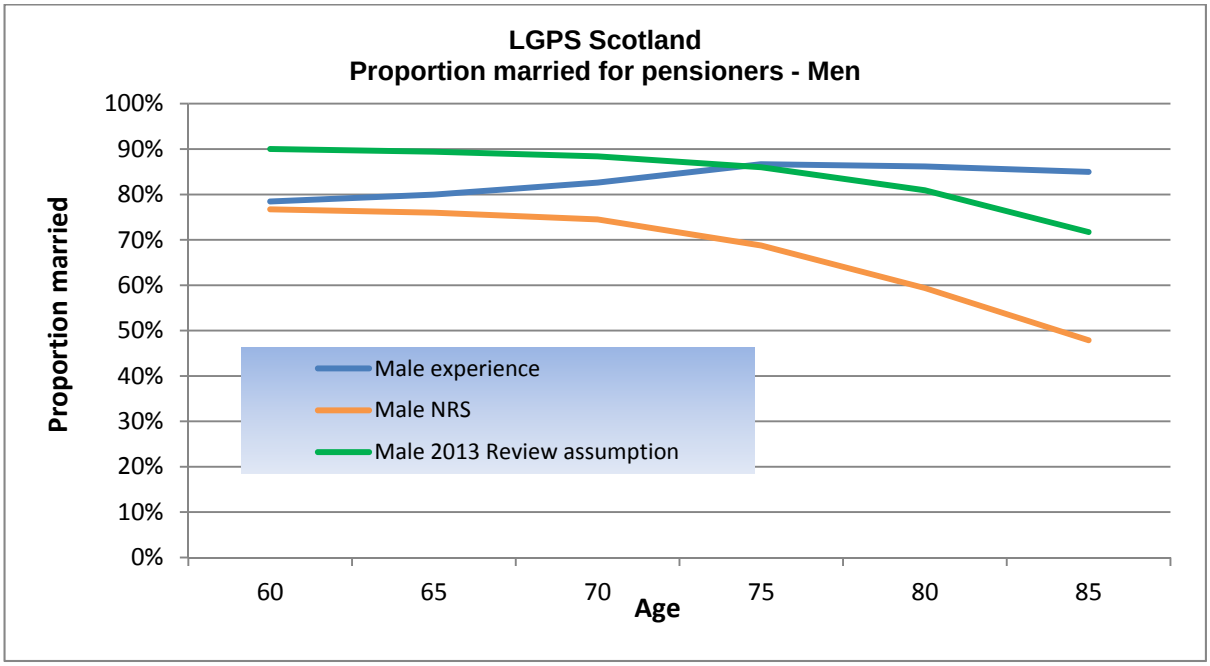
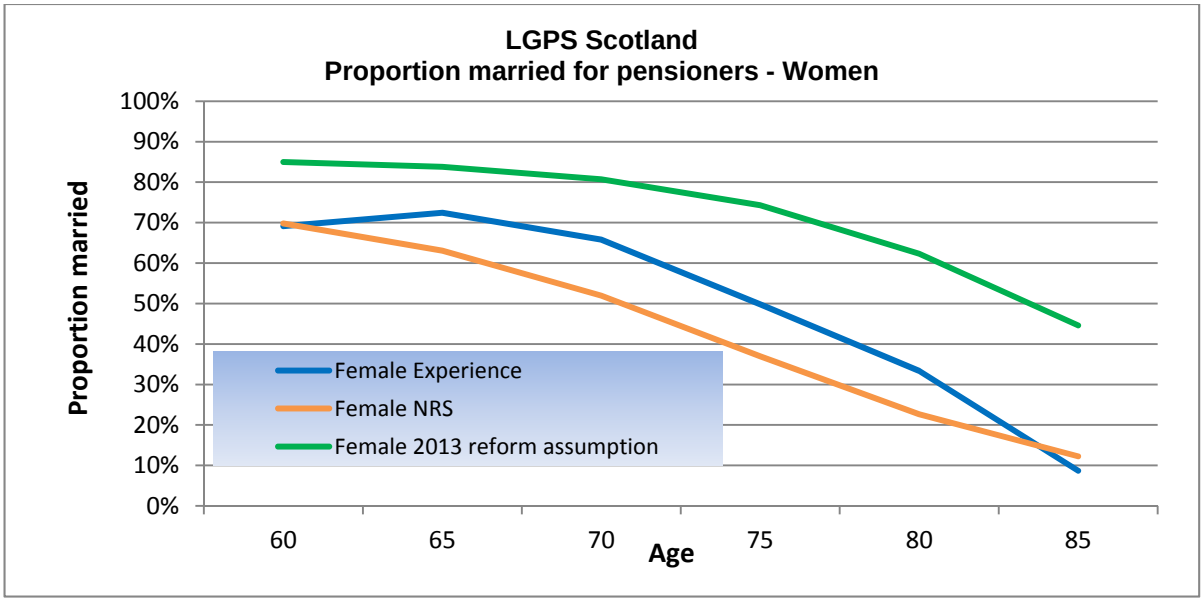


Chart 11.2



11.11 The charts above show the scheme's experience significantly above the 2008 NRS rates for men at all ages. For women, experience is in line with NRS at 60 and 85, but is higher in between. We have noted concerns about the quality of data and consistency between these data sources.

Age differences between members and dependant

Data

11.12 Although this analysis is based on the same data as that in paragraph 11.8 above, the inconsistency noted in that paragraph is unlikely to introduce any skewing of the results for this analysis. The average age difference is based on the cases where a record was shown, and these are likely to be a reasonable reflection of the Scheme's experience.

Experience

11.13 The data shows that dependent men (ie spouse, civil partner or partner) are, on average, 3 years older than the member, while dependent women are, on average, 3 years younger than the member. This conclusion holds across a wide range of ages: while there is some degree of variation this arises mainly at ages where relatively few deaths occur.

Financial impact

11.14 The approximate financial impact of the proposed change to the family statistics assumptions compared to those used in 2013 is set out in Table 11.1.

Table 11.1: Approximate financial impact of proposed changes in family statistics assumptions

	Employer cost cap
Change in dependants' proportions and in age difference assumptions, from 2013 to those proposed for 2014	No material impact

The financial impact shown in Table 11.1 arises from the change in the assumed proportions married: the change in assumed age differences between deceased member and their dependant does not have a material impact.

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
Pensioner baseline mortality[11]	Set as standard SAPS tables adjusted by the percentages shown below [12,13]	
Normal health	Men: 120% x S2NMA; Women: 114% x S2NFA	In line with 2011-2014 scheme experience
Dependants	Men: 130% x S2NMA; Women: 128% x S2DFA	In line with 2011-2014 scheme experience for dependent women, adjustment to normal health pensioner assumption for dependent men
Ill health (current)	Men: 132% x S2IMA; Women: 127% x S2IFA	In line with 2011-2014 scheme experience for ages 50+ (younger ages did not show compliance with a standard table)
Ill health (future)	Men: 132% x S2IMA; Women: 127% x S2IFA	The mortality of future ill-health retirees is proposed at the same level as that for current ill-health retirees.[14]

[11] As directed by HMT, future improvements in mortality assumed to be in line with those underlying the 2012 ONS principal population projections.

[12] SAPS tables are published by the Actuarial Profession and are based on the experience of self-administered pension schemes over the period 2000 to 2006. The 'S2' series has separate standard tables based on experience of members retiring in normal health (S2NXA) and in ill health (S2IXA) and for dependent women (S2DFA).

[13] Adjusted to take account of improvements in UK population mortality between 2002 (the base year for the tables) and 2012

[14] The tightening in criteria for approving ill-health retirements in recent years might be expected to lead to increasing mortality among ill-health retirements, on the grounds that future ill-health retirees will, on average, be more severely ill on retirement than current ill-health pensioners. However, the 2011-2014 mortality experience of ill-health pensioners is already higher than the standard tables which reflect the aggregate experience of a wide range of pension schemes, and there is no evidence to support an assumption of mortality even higher than recent experience.

Assumption	Summary of recommended assumptions	Rationale for recommendation
Age retirement All members joining on or after 1 December 2006, and all members not entitled to unreduced benefits before age 65 under the rule of 85.	7% (men and women) a year for each of the five years prior to NPA: 100% at NPA	Early retirement in line with 2011-2014 experience but excluding the effect of redundancies, expressed in terms of number of years early so as to accommodate the higher NPAs in the 2015 Scheme. This represents a change from the previous valuation at which members were assumed to retire at the earliest age their benefits could be taken unreduced.
Members entitled to unreduced benefits at age 60[15] under the rule of 85	Members with NPA 65 or 66 (born before 6 Apr 1960): typically 10% (men and women) retire at 60, with 0.3% (men and women) a year prior to CRA: 7% (men) or 9% (women) a year between CRA and NPA; 100% at NPA. Members with higher NPA (born after 6 Apr 1960): Rates intermediate between the above and those applying to members joining on or after 1 December 2006	In line with 2011-2014 experience (excluding redundancies). Retirement age for members with smaller amounts of 2015 Scheme service likely to be consistent with current experience. Retirement age likely to be influenced by both the 2015 Scheme and the Earlier Schemes
Members entitled to unreduced benefits at ages between 60 and 65 under the rule of 85.	Consistent with rates for those not entitled to retire unreduced before age 65	As above; assuming unreduced benefits are payable at 65 a reasonable simplification.

[15] Such a member may take service up to 31 Mar 2008 unreduced under the rule of 85; a member born on or before 31 Mar 1960 may have some protection for later service

Assumption	Summary of recommended assumptions	Rationale for recommendation
Ill-health retirement		
Incidence	Increasing with age: rates are around 0.02% at age 30, 0.1% at age 45, 1.2% at age 60;	In line with 2011-2014 experience: not adjusted for further improvements in health
Tier 1 / 2 split	70% / 30% (men and women)	In line with 2011-2014 experience
Withdrawal	Reducing with age: rates are around 5% at age 30, 3% at age 45, 1% at age 60, net of 10% re-entry within 5 years; no duration-based assumptions for men or women	In line with 2011-2014 experience and further adjusted for re-entry within 5 years on the evidence of a sample set of funds
Death before retirement	Increasing by age: rates for men are around 0.03% at age 30, 0.1% at age 45, 0.45% at age 60; rates for women are lower	In line with 2011-2014 experience; not adjusted for future improvements in mortality
Promotional salary scale	Unisex rates: 1.7% at age 30, 0.3% at age 45, 0% at age 60.	Lower rate than assumed in 2013, in line with 2011-14 experience
Commutation		
Pre-2009 service	10% of pension commuted	Estimate based on overall experience
2009-15 service	15% of pension commuted	Specified in HMT Directions
2015 Scheme service	15% of pension commuted	Specified in HMT Directions
Family statistics		
Proportion married/partnered	80% (M), 70% (F) at 60. The proportion married for men increase up to age 85 up to 80, then falls to 58%. For women, this falls sharply with age to below 40% at 80.	In line with 2011-2014 experience
Age difference	Men 3 years older than partner Women 3 years younger than partner	In line with 2011-2014 experience

Appendix B: Details of assumptions

B.1 This annex contains details of the recommended assumptions including sample rates and values.

Pensioner mortality

Table B1: Baseline mortality assumptions

Baseline mortality	Standard table[16]	Adjustment
Men		
Retirements in normal health	S2NMA	120%
Ill-health pensioners	S2IMA	132%
Dependants	S2NMA	130%
Women		
Retirements in normal health	S2NFA	114%
Ill-health pensioners	S2IFA	127%
Dependants	S2DFA	128%

B.2 As specified by HM Treasury, future improvements in mortality will be assumed to be in line with those underlying the 2012 ONS principal population projections for the UK.

Age retirement from service

B.3 The tables below show the probability of retirement in the relevant year. Table B2 summarises the rates in Table B3 for all members; it also summarises the rates in Tables B4 and B5 for members with NPA 65 and 66. Tables B4 and B5 set out in full the rates for members with NPA 67 and 68.

B.4 CRA is the age at which members are entitled to unreduced benefits in respect of service up to 31 March 2008 (and for some members, some service after this date).

B.5 The rates are set out fully in Tables B3 and B4.

[16] 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 and ill health and for dependants.

Table B3: Detailed age retirement rates for members joining on or after 1 Dec 2006, and all members entitled to unreduced benefits between ages 60 and 65 under the 'Rule of 85'

Age	NPA 65	NPA 66	NPA 67	NPA 68
55	0.000	0.000	0.000	0.000
56	0.000	0.000	0.000	0.000
57	0.000	0.000	0.000	0.000
58	0.000	0.000	0.000	0.000
59	0.000	0.000	0.000	0.000
60	0.070	0.000	0.000	0.000
61	0.070	0.070	0.000	0.000
62	0.070	0.070	0.070	0.000
63	0.070	0.070	0.070	0.070
64	0.070	0.070	0.070	0.070
65	1.000	0.070	0.070	0.070
66	1.000	1.000	0.070	0.070
67	1.000	1.000	1.000	0.070
68	1.000	1.000	1.000	1.000

Table B4: Detailed age retirement rates for members entitled to unreduced benefits at age 60 under the rule of 85

Age	NPA 65	NPA 66	NPA 67	NPA 68
55	0.002	0.002	0.001	0.001
56	0.002	0.002	0.001	0.001
57	0.002	0.002	0.001	0.001
58	0.002	0.002	0.001	0.001
59	0.002	0.002	0.001	0.001
60	0.100	0.100	0.059	0.031
61	0.083	0.083	0.050	0.026
62	0.083	0.083	0.078	0.026
63	0.083	0.083	0.078	0.074
64	0.083	0.083	0.078	0.074
65	1.000	0.083	0.078	0.074
66	1.000	1.000	0.078	0.074
67	1.000	1.000	1.000	0.074
68	1.000	1.000	1.000	1.000

Table B6.1: Ill-health retirement rates for all members

Age	Men %	Women %
20	0.00	0.00
25	0.00	0.02
30	0.02	0.03
35	0.03	0.05
40	0.05	0.07
45	0.11	0.11
50	0.29	0.22
55	0.60	0.57
60	1.20	1.09
65*	1.91	1.70

*rates are zero if above the NPA of the relevant section

Table B6.2: Percentage of ill-health retirement in Tiers 1 and 2 for all members

Tier 1	Tier 2
70%	30%

Voluntary withdrawal from service

Table B7: Withdrawal rates (net of re-entry within 5 years) for all members

Age	Men %	Women %
20	9.9	9.4
25	6.5	6.3
30	4.6	5.3
35	3.6	4.6
40	2.9	3.8
45	2.4	3.1
50	1.8	2.4
55	1.6	2.0
60	1.2	2.0
65*	0.9	2.0

*rates are zero if above the NPA of the relevant section

Death in service

Table B8: Death in service rates for all members

Age	Men %	Women %
20	0.02	0.01
25	0.02	0.01
30	0.03	0.02
35	0.03	0.03
40	0.06	0.05
45	0.10	0.08
50	0.16	0.12
55	0.25	0.17
60	0.45	0.33
65	0.77	0.58

Promotional pay increases

Table B9: Promotional salary scales* for all members

Age	Men and Women
20	93
25	93
30	100
35	107
40	109
45	111
50	112
55	112
60	112
65	112

* Relative to an index value of 100 at age 30.

Commutation of pension for cash at retirement

Table B10: Commutation of pension for cash at retirement

	Pre-2009 service	2009-2014 service	2015 Scheme service
Men	10%	15%	15%
Women	10%	15%	15%

Family statistics

Table B11: Recommended proportion married or partnered at retirement for future pensioners

	Proportion married or partnered at retirement
Men	80%
Women	70%

Consistent proportions are assumed at higher ages, allowing for the impact of mortality.

Table B12: Recommended proportion married or partnered for current pensioners (at the valuation date)

Age	Men	Women
60	80%	70%
70	83%	66%
80	86%	33%
90	58%	0%

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