Government
Actuary's
Department

Local Government Pension Scheme (Northern Ireland)

Actuarial valuation as at 31 March 2016
Advice on assumptions

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Contents

1 Executive summary

This report contains our recommendations for the best estimate assumptions to be set by the Department for Communities for the 2016 valuation of the Local Government Pension Scheme (Northern Ireland).

1.1 An actuarial valuation of the Local Government Pension Scheme (Northern Ireland) ('LGPS (NI)' or 'the Scheme') is being carried out as at 31 March 2016 under the Public Service Pensions (Valuations and Employer Cost Cap) Directions 2014 as amended ('the Directions'). The main purpose of the valuation is to compare the cost cap cost of the scheme with the employer cost cap. Note that this valuation does not report on the rate of employer contributions.

1.2 The Directions require that, unless specified otherwise[1], the assumptions to be adopted for this valuation will be set by the Department for Communities, having taken advice from the scheme actuary. Direction 19(c) requires the assumptions to be the Department for Communities' best estimates.

1.3 GAD is the appointed scheme actuary to the Scheme for the purpose of carrying out valuations under the Directions. This report is addressed to the Department for Communities and sets out our formal advice on the appropriate assumptions to be adopted for the 2016 valuation, as required by the Directions. The purpose of this advice is to enable the Department for Communities to determine the required best estimate assumptions.

1.4 This report was provided to the Department for Communities in draft form, and was also shared and discussed with the LGPS (NI) Scheme Advisory Board ('LGPS NI SAB') at their meeting on 28 September 2017. It has been signed alongside the formal valuation report. No substantive changes have been made to the recommended assumptions. The Department for Communities has already confirmed to GAD, following consultation with relevant stakeholders, to adopt the best estimate assumptions recommended in our advice. For the mortality assumptions, the Department wishes GAD to employ the approach recommended by the LGPS NI SAB, namely, the 50:50 averaging approach.

Background

1.5 The Department wrote to us on 18 September 2017 to confirm that they were minded to set the demographic assumptions in line with those used for the for the valuation of the scheme as at 31 March 2016 prepared for the Northern Ireland Local Government Officers' Superannuation Committee ('NILGOSC') in accordance with Regulation 68 of the Local Government Pension Scheme Regulations (Northern Ireland) 2014 ('the NILGOSC valuation'). Our advice in this report is provided in this context.

[1] Certain assumptions are specified in the Directions.

1.6 We have carried out a limited review of the proposed assumptions, and compared them with the assumptions recommended for the valuation of the Local Government Pension Scheme (England and Wales) ('LGPS (E&W)') at the time of consultation with the LGPS NI SAB in September 2017. We believe that the assumptions proposed by the Department for the valuation under the Directions are reasonable for that purpose, but the Department should note the comments below.

1.7 This report also provides our recommended assumptions to be used to calculate the Prior Value of the Cost Cap Fund under Direction 30.

Proposed assumptions

1.8 The main advised assumptions are summarised in Table 1 with further detail in Appendix A. Table 1 include an estimate of the approximate financial impact of proposed changes to the 2013 valuation assumptions. These figures are intended to illustrate the magnitude of the financial impact. The results of full valuation calculations may be different to these approximations.

1.9 Demographic assumptions concern member behaviours. Experience, both recent and longer term, generally provides the most reliable evidence when considering best estimates of assumptions about future experience. Anticipated future events may also influence how assumptions are set.

1.10 The previous completed actuarial valuation of the Local Government Pension Scheme (Northern Ireland) under the Directions was carried out as at 31 March 2013. Some of the assumptions put forward in this report are the same as those adopted for that valuation. The most significant changes are:

> Two possible alternatives are set out for mortality rates. Both possible assumptions for baseline mortality for pensioners retiring in normal health are overall lighter than the previous assumption (ie such pensioners are assumed to live for longer in retirement than under the previous assumption). This has been offset by assuming future improvements in mortality will be in line with those underlying the most recent (2016-based) Office of National Statistics (ONS) population projections, such improvements being slower than those anticipated in the 2012 ONS projections which were assumed at the previous valuation. The overall change in mortality assumptions will reduce the Cost Cap Cost of the Scheme.

> The proposed assumption for the rates of ill-health retirement from the Scheme assumes that members will in future retire from the Scheme at a lower rate than that assumed at the previous valuation. This change will reduce the Cost Cap Cost of the Scheme

> The proposed assumption for the proportion of members who are married or partnered is lower than at the previous valuation. This change will reduce the Cost Cap Cost of the Scheme.

1.11 Assumed life expectancies used in the NILGOSC 2016 valuation were significantly higher compared with the 2013 valuation assumption. If the NILGOSC assumption for baseline mortality rates were used for this valuation, it would imply life expectancies that are now broadly in line with the LGPS (E&W) assumption. Our report for the 2013 valuation noted that the scale of the difference between the LGPS (NI) 2013 assumption and the corresponding LGPS (E&W) assumption was larger than the differential seen for other schemes in Northern Ireland. We have set out an alternative option, more in line with GAD's approach for other public service pension schemes of taking the average of the 2013-16 scheme experience and the 2013 assumption which would result in a smaller change.

Scope of GAD review of proposed assumptions

1.12 At the request of the Department, we have carried out a limited review of the proposed assumptions, in particular:

> We have considered whether the different purpose of this valuation might mean that it would be appropriate to adopt assumptions different from those used in the NILGOSC valuation

> We have compared the proposed assumptions with those adopted for the 2013 valuation

> We have compared the proposed assumption with those for LGPS(E&W)

1.13 We have not done any independent analysis but have used the factual information about the NILGOSC Actuary's analysis contained in the reports from the NILGOSC Actuary to their client. Our conclusions depend on the information supplied.

1.14 It may be reasonable for two separate actuaries to propose different assumptions despite both considering the same evidence. We have not sought to revisit the judgements that have been made in setting the assumptions from the NILGOSC valuation based on the experience of the Scheme.

1.15 The following chapters and appendices provide more detail on the advice, including the issues the Department should consider when setting the assumptions, the comparison with the assumptions proposed for LGPS (E&W) and an indication of the magnitude of the financial impact of each assumption on valuation results. They also contain important background information about the context of this advice and its limitations.

1.16 Where the Scheme membership data is not sufficient for the scheme actuary to carry out a robust analysis of that aspect, the Directions require the report to include a statement to that effect. There was insufficient data to undertake an analysis of the new entrant profile or marital statistics. There was also insufficient data to carry out a robust and full analysis of the rates of re-joining service, although some limited analysis was possible. Despite these shortcomings it is still possible to propose reasonable assumptions.

1.17 This work has been carried out in accordance with the applicable Technical Actuarial Standards: TAS 100 and TAS 300 issued by the Financial Reporting Council (FRC). The FRC sets technical standards for actuarial work in the UK. .

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

Assumption	Summary of recommended assumptions	Rationale for recommendation	Approximate magnitude of financial impact on Employer Cost Cap Cost of change from 2013 valuation assumption % Pensionable pay
Pensioner baseline mortality[2]	Aligned to standard SAPS table[3,4]	Standard tables as used in the NILGOSC funding valuation. Two options for adjustments to tables:	Alternative 1: NILGOSC assumptions Increase of 1.2%
Normal health	S2PXA	1 As used in NILGOSC funding valuation and based on 2013-16 scheme experience	Alternative 2: Averaging approach Increase of 0.7%
Ill-health	S2IXA	2 Average of 2013 assumptions and 2013-16 scheme experience	
Dependants	S2PXA		
Age retirement			
Rates apply for all service	Retirement ages depending on, NPA/CRA[5] and protection status.	As used in the NILGOSC funding valuation and based on 2013-16 scheme experience.	N/A

[2] The Directions require that future improvements in mortality are assumed to be in line with those underlying the 2016-based ONS population projections. The financial impact shown relates to the change in the baseline mortality only.

[3] SAPS tables are published by the Actuarial Profession and are based on the experience of self-administered pension schemes from 2004 to 2011. The S2 series has separate standard tables based on experience of all pensioners (S2PXA), and those retiring in ill health only (S2IXA).

[4] Adjusted to take account of improvements in population mortality between the base year for the tables and the date the future improvements are applied from.

[5] Under the rule of 85, some members are able to take unreduced benefits prior to normal pension age (NPA). The age at which this applies is known as Critical Retirement Age (CRA)

Ill-health retirement			
Incidence	Rates increasing by age: 0.04% at age 30, 0.15% at age 45, 1.85% at age 60	As used in the NILGOSC funding valuation and based on 2013-16 scheme experience.	Reduction of around 0.3%
Upper/lower tier split	70% assumed to retire on tier 1 benefits and 30% on tier 2.		
Withdrawal	Rates decreasing by age: 8.3% at age 25, 3.0% at age 45, 1.2% at age 60	As used in the NILGOSC funding valuation and based on 2013-16 scheme experience.	Reduction of around 0.1%
Death before retirement	50% x S2PXA (C=2016)	Simplified version of assumption used in the NILGOSC funding valuation and based on 2013-16 scheme experience.	Immaterial
Promotional salary scale	Age dependent scale. Steeper at younger ages: 3.2% at age 25, nil at age 45 nil at age 60.	No change. As used in the NILGOSC funding valuation and based on 2013-16 scheme experience.	Nil

Commutation			
Pension from pre-2009 Service	8.5% of pension commuted in addition to lump sum as of right (to provide total cash of 65% of HMRC maximum)	As used in the NILGOSC funding valuation and based on 2013-16 scheme experience.	Nil
Family statistics			
Proportion married/partnered	80% of non-pensioners assumed married or have a partner at retirement or earlier death 80% of pensioners assumed to be married or have a partner at age 65	As used in the NILGOSC funding valuation. 2013-2016 data not adequate to support an analysis. Set after consideration of ONS population projection statistics	Reduction of around 0.4%
Age difference	Males 3 years older than female spouse/ partners	No change to assumption. As used in the NILGOSC funding valuation.	Nil

2 Introduction

This report contains our advice to the Department for Communities but will be of interest to other parties who should note the limitations.

2.1 An actuarial valuation of the Local Government Pension Scheme (Northern Ireland) ('LGPS (NI)' or 'the Scheme') is being carried out as at 31 March 2016 under the Public Service Pensions (Valuations and Employer Cost Cap) Directions 2014 as amended. The main purpose of the valuation is set out in the Directions. This is to compare the cost cap cost of the scheme with the employer cost cap[6]. Note that this valuation does not report on the rate of employer contributions. Employer contributions are payable in accordance with the rates and adjustments certificate issued under Regulation 68 of the Regulations[7] as part of an actuarial valuation carried out by an actuary appointed by the Northern Ireland Local Government Officers' Superannuation Committee.

2.2 The Directions require that, unless specified otherwise[8], the assumptions to be adopted for this valuation will be set by the Department for Communities, having taken advice from the scheme actuary. Direction 19(c) requires the assumptions to be the Department for Communities' best estimates.

2.3 GAD is the appointed scheme actuary to the Scheme for the purpose of carrying out valuations under the Directions. This report is addressed to the Department for Communities and sets out our formal advice on the appropriate assumptions to be adopted for the 2016 valuation, as required by the Directions. The purpose of this advice is to enable the Department for Communities to determine the required best estimate assumptions.

2.4 The Department wrote to us on 18 September 2017 to confirm that they are minded to set the demographic assumptions in line with those used for the NILGOSC valuation. Our advice is provided in that context. If the Department changes their intentions we recommend they take further actuarial advice.

2.5 The advice covers the main assumptions to be set by the Department for Communities. In particular, we consider the following sets of demographic assumptions in this report:

- Pensioner mortality
- Age retirement from service
- Ill-health retirement from service
- Voluntary withdrawal from service
- Death before retirement

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[6] Specified in Regulation 124 of the Local Government Pension Scheme Regulations (Northern Ireland) 2014 (SR 2014 No 188) as 17.0% of pensionable earnings as determined at the 2013 valuation in accordance with Section 12 of the Public Service Pensions Act 2013

[7] SR 2014 No 188

[8] Certain assumptions are specified in the Directions.

- Promotional pay progression
- Commutation of pension for cash at retirement
- Family statistics

Appendix B includes other calculation assumptions as required to complete the valuation and Appendix C sets out assumptions made for data uncertainties.

2.6 This report was provided to the Department for Communities in draft form, and was also shared and discussed with the LGPS (NI) Scheme Advisory Board ('LGPS NI SAB') at their meeting on 28 September 2017. It has been signed alongside the formal valuation report. No substantive changes have been made to the recommended assumptions. The Department for Communities has already confirmed to GAD, following consultation with relevant stakeholders, to adopt the best estimate assumptions recommended in our advice. For the mortality assumptions, the Department wishes GAD to employ the approach recommended by the LGPS (NI) Scheme Advisory Board at its meeting on 28 September 2017, namely, the 50:50 approach which uses the average of the 2013 NILGOSC Valuation assumptions and the 2016 NILGOSC Valuation assumptions.

Assumptions for the Prior Value of the Cost Cap Fund

2.7 The report on the valuation of the scheme as at 31 March 2016 will contain an assessment of the Prior Value of the Cost Cap Fund as at 31 March 2015. Department of Finance (DoF) Directions have been amended to require the demographic assumptions for this calculation to be those used to calculate the proposed employer cost cap in the 'preliminary valuation' [*Direction 30*]. For the Local Government Pension Scheme ('LGPS') the preliminary valuation was the GAD valuation as at 31 March 2013.

2.8 The exception to this are the assumptions for age retirement, commutation of pension accrued prior to 1 April 2009 and rates of re-joining service.

2.9 The Directions require that assumptions for setting the Prior Value of the LGPS (NI) Cost Cap Fund should be set on the basis of information available at 31 March 2015. Data on membership up to 31 March 2015 can be used to set the assumption even if that data was not collected or collated until after that date.

2.10 NILGOSC supplied data on the experience of the scheme membership over the five-year period to 31 March 2015. We have used this data to consider the Scheme's experience of rejoining in order to develop our advice on this assumption.

2.11 In preparing this report GAD has relied on data and other information supplied by, or on behalf of, NILGOSC in its role as scheme administrator, as described in this report. Any checks that GAD has made on this data and information are limited to those described in this report, including any checks on the overall reasonableness and consistency of the data. These checks do not represent a full independent audit of the data supplied and do not by themselves confirm or guarantee the overall quality or correctness of the data. In particular, GAD has relied on the general completeness and accuracy of the information supplied without independent verification.

Approach to setting assumptions and consultation

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

2.13 The Department for Communities should consider whether there is any reason why the approach taken to setting the assumptions and/or the conclusions reached would be inappropriate. We are happy to revisit our advice to take account of any evidence relevant to expected future experience of the Scheme membership.

2.14 We are content for the Department for Communities to release this report to third parties, provided that:

- it is released in full
- the advice is not quoted selectively or partially
- GAD is identified as the source of the report, and
- GAD is notified of such release.

2.15 Third parties whose interests may differ from those of the Department for Communities should be encouraged to seek their own actuarial advice where appropriate. Other than to the Department for Communities, 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.

Directions

3.2 The advice in this report reflects the requirements of the Directions issued by the Department of Finance that assumptions should be set as the Department for Communities' 'best estimates' of future experience and should contain no margin for prudence or optimism. They should be set having regard to:

> assumptions set for previous valuations
> analysis of demographic experience in the period up to the valuation date
> historic long term trends and emerging evidence which may illustrate long-term trends in the future
> relevant data from any other sources.

3.3 Our understanding is that Direction 20 does not require GAD to carry out an analysis of experience if the following conditions are met:

> The actuary appointed by NILGOSC has undertaken an analysis of experience
> The actuary appointed by NILGOSC has provided the scheme actuary with details of the assumptions that have been adopted for the most recent triennial funding valuation
> The actuary appointed by NILGOSC has provided a certificate confirming that these assumptions are their best estimates and do not include margins for prudence or optimism and that they were determined with regard to
  - Previous valuation assumptions
  - The analysis of demographic experience
  - Relevant data from any other source (including relevant data that becomes available after the effective date)
  - Any emerging evidence about historic long-term trends
  - Any emerging evidence that may illustrate long term trends expected in the future
> The analysis supporting the certificate is available for inspection by the scheme actuary

3.4 Aon Hewitt were appointed to undertake the funding valuation as at 31 March 2016 and have provided us with:

> details of the assumptions adopted for the 31 March 2016 funding valuation of the scheme,
> a copy of their report to NILGOSC dated 31 August 2016 entitled "Actuarial valuation at 31 March 2016 – Experience analysis" and

> a note dated 20 June 2017 that states that the demographic assumptions adopted for the funding valuation at 31 March 2016 were set to be "best estimate" so that there is an equal chance that the assumptions will over or under-estimate future experience over the medium to long term.

3.5 On that basis the Department have instructed us not to carry out an analysis of experience except for rejoiners.

Setting assumptions in line with the NILGOSC valuation

3.6 Our report dated 6 March 2015 on the assumptions to be adopted for the actuarial valuation as at 31 March 2013 discussed issues to be taken account if setting assumptions in line with the NILGOSC valuation. These considerations still apply for the 2016 so the material is reproduced in appendix E.

3.7 The 2016 valuation will for the first time calculate the cost cap cost of the scheme, and compare it to the employer cost cap. Where the experience of the scheme shows significant volatility year on year, the experience over the 3 year period 2013-16 may not be representative of the long term. As assumption are to reflect the long term expectations it is reasonable to seek to smooth out the impact of short term effects. The can be achieve by setting assumptions reflecting both the experience over the 3 year period 2013-16 and the 2013 valuation assumption (which generally reflected experience in the period up to 2013).

Different populations

3.8 The Directions require this actuarial valuation to cover both the scheme established under the Public Service Pensions Act (Northern Ireland) 2014[9] ('2015 Scheme') and the previous pension schemes for Local Government workers ('Earlier Schemes'). Assumptions appropriate to both the 2015 Scheme and the Earlier Schemes are required for the valuation. The Directions also require assessment of benefit accrual costs over the implementation period[10] (as defined in the Directions). This requires assumptions about anticipated member behaviour and characteristics during 2019 - 2023 as well as assumptions about member behaviour and characteristics in the longer term.

3.9 There are currently 3 distinct groups of members.

> Existing members with membership accrued in the Earlier Schemes for whom the 'Rule of 85' continues to apply for service up to retirement: 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' retirement behaviours are expected to be heavily influenced by the provisions of the 2015 Scheme.

[9] Public Service Pensions Act (Northern Ireland) 2014
[10] 1 April 2019 to 31 March 2023

> Members who have both service before 1 April 2015 and service after 1 April 2015 without 'rule of 85' protection. Their behaviour is likely to be influenced by the provisions of the Earlier Schemes. Over time, as the proportion of 2015 Scheme service increases, their behaviour is expected to become increasingly influenced by the provisions of that scheme.

3.10 Where relevant we indicate in each of the following chapters the relative importance of each set of assumptions to each of the three groups of members identified above.

Options for mortality tables

3.11 We have set out two options for the mortality of pensioners. The first is to set the assumption in line with the NILGOSC valuation which is set in line with the experience from 2013 to 2016. The second is to set this in line with the approach that GAD have used for the valuations of other public service pension schemes. This sets the assumption as the average of the 2013 valuation and the experience from 2013 to 2016. The NILGOSC assumption is significantly different from the 2013 valuation assumption so the second approach smooths out some of this change.

Comparison with the assumptions adopted for the 2013 valuation

3.12 The assumed pensioner life expectancies are different from those assumed at the 2013 valuation on both options presented. The change due to two effects:

> setting current mortality in line with 2013-16 experience, which results in a significant increase in life expectancies, offset by:
> the change in mortality improvement assumption directed by DoF, which reduces life expectancies

3.13 The assumed rate of retirement on ill health has been reduced but a higher proportion are assumed to be on the top tier. The net impact is a similar rate of top tier ill health retirements but about half the rate of ill health retirements at the lower tier. This change will reduce the cost cap cost of the scheme.

3.14 The expected proportion of deaths of members that leads to a pension being payable to a dependant has been reduced in line with ONS statistics. This change will reduce the cost cap cost of the scheme.

Comparison with the assumptions for LGPS (E&W)

3.15 Assumed life expectancies for pensioners are broadly the same for LGPS (NI) compared with LGPS (E&W) using the NILGOSC base tables eg the life expectancy of a male/ female pensioner aged 65 in 2016 is 0.3 years higher/ 0.1 years lower for LGPS (NI). If the second mortality assumption option is taken, the life expectancies for LGPS (NI) are a little lower than for LGPS (E&W). The average life expectancy of the population in Northern Ireland is less than in England and Wales, and some other pension schemes in Northern Ireland have also observed lower life expectancies than the corresponding pension schemes in England and Wales. The differentials on both options presented for the 2016 valuation are within a typical range. The scale of the difference between LGPS (NI) and LGPS (E&W) based on assumptions adopted at the 2013 valuation was larger than would be typical.

3.16 The expected number of ill health retirements for LGPS(NI) is between two and four times the expected number for LGPS(E&W): this is in line with our experience of other schemes in Northern Ireland, but increases the LGPS(NI) employer cost cap cost of the scheme, relative to that for LGPS(E&W).

3.17 The 2013 valuation only calculated the Cost Cap. An additional age retirement assumption is required to calculate the Prior Value of the Cost Cap Fund. This takes a simpler form to the age retirement assumption used for LGPS (E&W). Different judgments are made about the behaviour of members with a mixture of service payable unreduced at different ages. The net impact of this is to increase the Prior Value of the Cost Cap Fund compared to using the LGPS (E&W) assumption.

Relative importance of assumptions

3.18 The Directions require the employer cost cap to be estimated to the nearest 0.1% of pensionable payroll. This is a required level of accuracy for a particular calculation and based on a particular set of assumptions. Appendix D provides an indication of the sensitivity of the valuation results to the particular assumptions under consideration.

Limitations

3.19 At the request of the Department, we have carried out a limited review of the proposed assumptions, in particular:

> We have considered whether the different purpose of this valuation might mean that it would be appropriate to adopt assumptions different from those used in the NILGOSC valuation

> We have compared the proposed assumptions with those used for the 2013 valuation

> We have compared the proposed assumption with those for LGPS(E&W)

3.20 We have not done any independent analysis but have used the factual information about the NILGOSC Actuary's analysis contained in the reports from the NILGOSC Actuary to their client. Our conclusions depend on the information supplied.

3.21 It may be reasonable for two separate actuaries to propose different assumptions despite both considering the same evidence. We have not sought to revisit the judgements that have been made in setting the assumptions from the NILGOSC valuation based on the experience of the scheme.

4 Pensioner Mortality

This chapter sets out two options for the baseline pensioner mortality assumptions and our commentary.

Proposed assumptions for 2016 valuation

4.1 We set out two options for the mortality assumptions. One is based on the approach of using the NILGOSC valuation assumptions. The other is to follow the approach the GAD uses for other public service pension schemes when there is significant volatility in the valuation experience.

4.2 The NILGOSC approach was to set the mortality assumptions using recently issued standard mortality tables and then adjust in line with the scheme's experience from 2013 to 2016.

4.3 The approach GAD is generally taking to set the assumption (such as mortality) where there is significant volatility in experience year on year is to recommend that the short term effects should be smoothed out by taking only 50% of the difference in experience since the previous valuation. This approach smooths out volatility in valuation results if the scheme experience is volatile from valuation to valuation. We would do this by making a different adjustment to the same standard mortality tables as used in the NILGOSC valuation.

4.4 Allowing for 50% of the difference in experience since the previous valuation places equal importance on the experience in 2013-16 and the 2013 valuation assumption (which itself was based on experience up to 2013). It may be appropriate to place more (or less) weight on the 2013-16 experience if that underlying data was regarded as being more (or less) reliable than earlier period. GAD did not perform either the analysis of the 2013-16 data or the analysis that informed the 2013 valuation assumption so cannot comment on whether the 2013-16 data was more (or less) reliable than earlier period. However we note that the outcome of the analysis of the 2013-16 data is more in line with our expectations, based on experience of LGPS (E&W) and mortality difference between England and Wales and Northern Ireland.

4.5 The assumptions we set out for baseline pensioner mortality for the 2016 valuation may be summarised as follows. The corresponding assumptions for the 2013 valuation are shown.

Table 4.1: Recommended mortality assumptions

	2016 valuation			2013 valuation	
Baseline mortality	**Standard table[11]**	**NILGOSC Adjustment**	**GAD approach Adjustment**	**Standard table**	**Adjustment**
Males					
Retirements in normal health	S2PMA	95%	103%	S1NMA	110%
Ill-health pensioners	S2IMA	105%	103%	S1IMA	100%
Dependants	S2PMA	95%	103%	S1NMA	110%
Females					
Retirements in normal health	S2PFA	90%	97%	S1NFA	110%
Ill-health pensioners	S2IFA	105%	102%	S1IFA	100%
Dependants	S2PFA	90%	97%	S1NFA	110%

4.6 As specified by the Department of Finance, future improvements in mortality will be assumed to be in line with those underlying the most recent ONS population projections, ONS-2016.

Comparison of expected pensioner longevity

4.7 Table 4.2, below, gives a comparison of the resulting life expectancies[12] (allowing for future improvements) assumed and set out as options for the 2013 and 2016 valuations respectively. The middle column shows life expectancies on the proposed 2016 base tables but with future improvements based on the ONS 2012 projections. This column is provided to illustrate the impact of the change in allowance for future improvements on expected life expectancy. The Directions specify that the future improvement basis for the 2016 valuation should be the ONS 2016 projections.

[11] SAPS (S2) 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 all pensioners (S2PXA) and of those retiring in ill health only (S2IXA). The S3 series of tables were released by CMI on 5 December 2018, these updated mortality tables cover experience between 2009 and 2016. The final tables are unchanged from the working paper issued during 2018, from which GAD concluded that moving to the S3 tables would likely have no material impact on the valuation results as a whole. It therefore remains appropriate to use the S2 tables for the current valuation.

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

Table 4.2: Comparison of life expectancies (years) at the valuation date

	2013 valuation ONS 2012	2016 NILGOSC base tables ONS 2012	2016 NILGOSC base tables ONS 2016	2016 GAD approach base tables ONS 2016
Current pensioners				
Male aged 60	27.6	29.1	27.7	27.1
Male aged 65	22.8	24.2	22.9	22.2
Female aged 60	30.2	31.7	29.8	29.2
Female aged 65	25.3	26.7	24.9	24.3
Future pensioners – current age 45				
Male life expectancy from age 60	29.4	30.8	29.3	28.6
Male life expectancy from age 65	24.9	26.4	24.9	24.2
Female life expectancy from age 60	31.9	33.4	31.3	30.7
Female life expectancy from age 65	27.4	28.9	26.8	26.2

4.8 Table 4.3, below, gives a comparison of the resulting life expectancies on the two alternative 2016 valuation assumptions with the NILGOSC valuation.

Table 4.3: Comparison of life expectancies (years) at the valuation date

Assumption	**Employer cost cap valuation**		**NILGOSC valuation**
Base table	**2016 NILGOSC**	**2016 GAD approach**	**2016 NILGOSC**
Mortality improvements	**ONS 2016**	**ONS 2016**	**CMI 2014**
Current pensioners			
Male aged 65	22.9	22.2	23.1
Female aged 65	24.9	24.3	25.7

4.9 Even where the baseline morality assumption is set in line with the NILGOSC, the resulting life expectancies are different because the mortality improvement assumption directed by the Department of Finance is different to that adopted in the NILGOSC committee.

Use of the assumption

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

Commentary

Analysis carried out

4.11 The NILGOSC assumptions are based on an analysis of 2013-16 mortality experience for the Scheme. The analysis was done on an 'amounts' basis. An amounts basis weights the experience by the size of each member's pension.

4.12 Members retiring in normal health and those who retired in ill health were analysed separately. Men and women were analysed separately but one adjustment was set for both.

4.13 Dependants were not analysed separately, but are assumed to have the same mortality as normal health members. In our experience dependant mortality tends to be slightly heavier. However the effect is not generally highly material.

General reasonableness

4.14 The assumptions set are based on the latest standard tables for UK pension scheme experience (at the time of valuation), in line with general practice (including at GAD), although other approaches could be adopted.

4.15 The adjustments to the tables are within the range typical in pension schemes.

Comparison with 2013 valuation assumption

4.16 The assumed pensioner life expectancies are different from those assumed at the 2013 valuation on both options presented. The change due to two effects:

> setting current mortality in line with 2013-16 experience, which results in a significant increase in life expectancies, offset by:
> the change in mortality improvement assumption directed by DoF, which reduces life expectancies

Comparison with England & Wales

4.17 The NILGOSC life expectancies for male pensioners are higher than LGPS (E&W) while for female pensioners, the NILGOSC life expectancies are slightly lower than for LGPS (E&W). The GAD approach life expectancies are lower than LGPS (E&W) for males and females. The tables below give a comparison of the resulting life expectancies based on the NILGOSC and GAD approach assumptions for LGPS (NI), compared with those proposed for LGPS (E&W).

Table 4.4: Comparison of life expectancies (years) at the valuation date (ONS 2014)

	NILGOSC base tables	England & Wales	Difference
Current pensioners			
Male aged 60	28.8	28.6	+0.2
Male aged 65	23.9	23.6	+0.3
Female aged 60	30.9	31.1	-0.2
Female aged 65	26.0	26.1	-0.1
Future pensioners – current age 45			
Male life expectancy from age 60	30.5	30.2	+0.3
Male life expectancy from age 65	26.0	25.7	+0.3
Female life expectancy from age 60	32.6	32.7	-0.1
Female life expectancy from age 65	28.1	28.1	0.0

Table 4.5: Comparison of life expectancies (years) at the valuation date (ONS 2014)

	GAD approach base tables	England & Wales	Difference
Current pensioners			
Male aged 60	28.1	28.6	-0.5
Male aged 65	23.3	23.6	-0.3
Female aged 60	30.3	31.1	-0.8
Female aged 65	25.4	26.1	-0.7
Future pensioners – current age 45			
Male life expectancy from age 60	29.8	30.2	-0.4
Male life expectancy from age 65	25.3	25.7	-0.4
Female life expectancy from age 60	31.9	32.7	-0.8
Female life expectancy from age 65	27.4	28.1	-0.7

4.18 The average life expectancy of the population in Northern Ireland is less than in England and Wales. The following table shows the life expectancies of the population of Northern Ireland and England and Wales.

Table 4.4: Comparison of population life expectancies (years) (ONS 2014)

	Northern Ireland	England & Wales	Difference
Current pensioners (ages in 2016)			
Male aged 60	25.6	26.2	-0.6
Male aged 65	21.1	21.6	-0.5
Female aged 60	28.1	28.7	-0.6
Female aged 65	23.3	23.9	-0.6
Future pensioners – current age 45			
Male life expectancy from age 60	27.4	28.0	-0.6
Male life expectancy from age 65	23.3	23.8	-0.5
Female life expectancy from age 60	29.8	30.3	-0.5
Female life expectancy from age 65	25.4	25.9	-0.5

4.19 Typically we would expect longevity of LGPS (NI) members is unlikely to be higher than LGPS (E&W) members, given that population life expectancies are lower in Northern Ireland. However, we would usually expect that the difference between LGPS(E&W) and LGPS(NI) life expectancies to be no greater than that difference in the population because ONS statistics show a link between occupation and mortality rates and members of LGPS(NI) have similar occupations to the members of LGPS(E&W).

4.20 At the 2013 valuation, the assumed LGPS (NI) life expectancies were lower than LGPS (E&W) by a larger margin than was typical but the life expectancies under either of the approaches now proposed are in line with a typical range.

4.21 Some public service pension schemes in Northern Ireland have also observed lower life expectancies than the corresponding pension schemes in England and Wales but others have adopted identical assumptions to England and Wales.

4.22 Mortality for members who retired in ill health is slightly lower in both options for the mortality assumptions than in LGPS (E&W). This may be related to the higher incidence of ill health retirements in Northern Ireland. If the GAD approach were used to set the assumptions, ill health mortality is closer to the LGPS (E&W) assumption than if the NILGOSC assumption is used.

5 Age retirement from service

This chapter sets out our recommendation for the assumed patterns of retirement on grounds other than ill-health, and our commentary.

Proposed assumptions for 2016 valuation

5.1 The assumptions we recommend for age retirement from service for the 2016 valuation are summarised as follows and is as published in the NILGOSC Actuary's report.

Table 5.1: Recommended age retirement assumptions for active members

Date joined/left LGPS	Assumed Retirement Age
Joined before 1 October 2006	Rule of 85 age(or age 60 if higher)(1)
Joined after 30 September 2006 but before 1 April 2015	Age 65(2)
Joined 1 April 2015 or after	State Pension Age (or age 65 if higher)

Notes:
(1) If member attained age 60 before 01/04/2020, the Rule of 85 age applies to all service. In other cases, any part of their pension with NPA later than CRA will be reduced.
(2) Post 2015 pensions will be reduced if the member's State Pension Age is over age 65 at that point.

Previous valuation assumptions

5.2 The 2013 cost cap valuation assumed that members would retire at the earliest age they can draw unreduced benefits. However, the results of that valuation were required to be calculated as if members have no pre-2015 accruals. That assumption is therefore the same as the assumption of retirement at State Pension Age (or age 65 if higher) now proposed for members joining 1 April 2015 or after.

5.3 The assumption used by the NILGOSC actuary at the 2013 funding valuation was the same as the table above, except that no assumption was needed for members joining 1 April 2015 or after.

Rule of 85 and critical retirement age

5.4 Members who joined before 1 October 2006 are entitled to unreduced benefits under the 'rule of 85' when the sum of their age and completed service equals 85, subject to a minimum of age 60 and a maximum of age 65. The age at which the rule of 85 is achieved is referred to as the member's critical retirement age ('CRA').

5.5 For the purpose of our calculations, members who joined after 1 October 2006, or who do not satisfy the rule of 85 prior to age 65, are assigned CRA 65. Members who can retire on unreduced benefits at age 60 under the rule of 85 are assigned CRA 60. Members who can retire at an age between 60 and 65 are assigned CRA 62 for simplicity.

5.6 Under the 2015 Scheme, a member's NPA follows the state pension age ('SPA'). For members who joined prior to 31 March 2015, NPA may vary for different tranches of service. LGPS (NI) members who joined prior to 31 March 2015 may have some benefits payable unreduced from NPA, or if earlier CRA, which means they might be expected to retire earlier than new entrants to the 2015 Scheme.

Financial effect of early and late retirement

5.7 The actuarial reductions/uplifts applied to the pensions of those who retire earlier/later than the earliest age at which they can take unreduced benefits are intended to mean that the timing of a 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 a spread of retirements will provide a more accurate reflection of the cost of the Scheme so long as future experience is in line with the assumptions.

5.8 The main 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) are:

> Members who retire after their CRA but before age 65 do not receive a late retirement uplift. If members defer retirement beyond their CRA in this way this will, other things being equal, reduce the cost of providing benefits

> The actuarial reduction on early retirement is set at a level to give an early retirement pension, broadly the same value as the deferred benefit for someone leaving at the same age. If more members than expected take early retirement, other things being equal, this will reduce the cost of providing benefits because they are foregoing future (assumed) salary increases to their benefit.

> Since commutation terms do not vary by age, then if a member retiring early commutes part of their pension for cash, the cost of providing the benefit is reduced, due to the widening differential between the cost of providing pension and cash.

5.9 The financial impact of late retirement beyond NPA is much less material.

Other retirements in normal health

5.10 The retirements in normal health that require the consent of the employer are excluded from this assumption. In these circumstances, NILGOSC require the employer to make a contribution to the fund to cover any additional costs to the fund arising from the employer's decision to consent to the retirement. These retirements are:

- Retirement on the grounds of redundancy or efficiency – the pension is awarded without any actuarial reduction
- Retirement before normal retirement when the actuarial reduction is waived
- Retirement before age 60 when the member satisfies the “rule of 85”.

5.11 The additional contributions payable by employers in these circumstances are to be credited to the Cost Cap Fund as discussed in Appendix B.

Commentary

5.12 The NILGOSC actuary has used the same assumption for age retirement at the 2013 and 2016 funding valuations. No analysis of experience was carried out at the time of the 2013 funding valuations but an analysis was carried out as part of the 2016 funding valuation. The 2016 valuation assumption is therefore based on analysis of the fund’s experience over the period 2013-16.

5.13 The Directions require that the assumption for the calculation of the Prior Value of the Cost Cap Fund should not take account of the experience of the fund after 31 March 2015. The NILGOSC actuary’s analysis of experience considered the average age of retirements. The average age of retirements over the two years 2013-2015 was not significantly different to the average age over the whole period considered by the NILGOSC actuary so it is reasonable to assume that the recommended assumption would be made if the 2015/16 experience had not been included in the analysis.

5.14 The assumptions adopted for England and Wales take a different and more complicated form to those recommended for Northern Ireland.

5.15 There are different assumptions about the extent to which members change their retirement behaviour if they have service over a mixture of periods with different ages at which the pension is paid unreduced. The NILGOSC actuary assumes that members with some pension payable unreduced at a CRA below age 60 and some service payable unreduced at age 65 will retire at age 65 while the LGPS(E&W) assumption is that these member’s retirement behaviour will be in line with fully protected members. The NILGOSC actuary has not made any allowance for retirement behaviour being different for members with different State Pension Ages while the LGPS (E&W) assumption allows for later retirement by those with higher State Pension Ages (who, being born later, are also likely to have a higher proportion of CARE accrual).

5.16 The members for whom the approach is different have not yet retired so there is not yet any experience of their actual retirement behaviour. Neither approach is unreasonable.

5.17 The LGPS (E&W) assumption would lead to a lower Prior Value of the Cost Cap Fund.

5.18 We propose to assume that deferred members retire at the earliest point that they can retire with unreduced benefits. However, the assumption for retirement pattern of deferred members has an immaterial impact on the level of the Cost Cap Cost of the Scheme due to the way in which the calculation is specified.

6 Ill-health retirement from service

This chapter sets out our recommendation for the assumed rates of retirement on the grounds of ill-health and our commentary

Proposed assumptions for 2016 valuation

6.1 The proposed assumption for incidence of ill health retirement is summarised in the chart on the next page and is as published in the NILGOSC Actuary's report. Further details are in Appendix A.

6.2 The proposed assumption is that 70% of ill health retirements are on Tier 1 and 30% on Tier 2.

6.3 Ill-health retirement rates specify the rate at which members are assumed to retire on grounds of ill-health. The rates of mortality experienced after ill-health retirement are also relevant to the valuation calculations and are discussed in Section 4 of this report.

Previous valuation assumptions

6.4 The proposed 2016 assumptions are approximately 80% of the rates adopted for the 2013 actuarial valuation.

6.5 The assumed proportion of members eligible for tier 1 benefits[13] is increased from that adopted for the previous valuation at 55%.

6.6 The net impact is that the rates of tier 1 ill health retirement is broadly the same as before but the rate of tier 2 ill health retirement is about half of the previous rate.

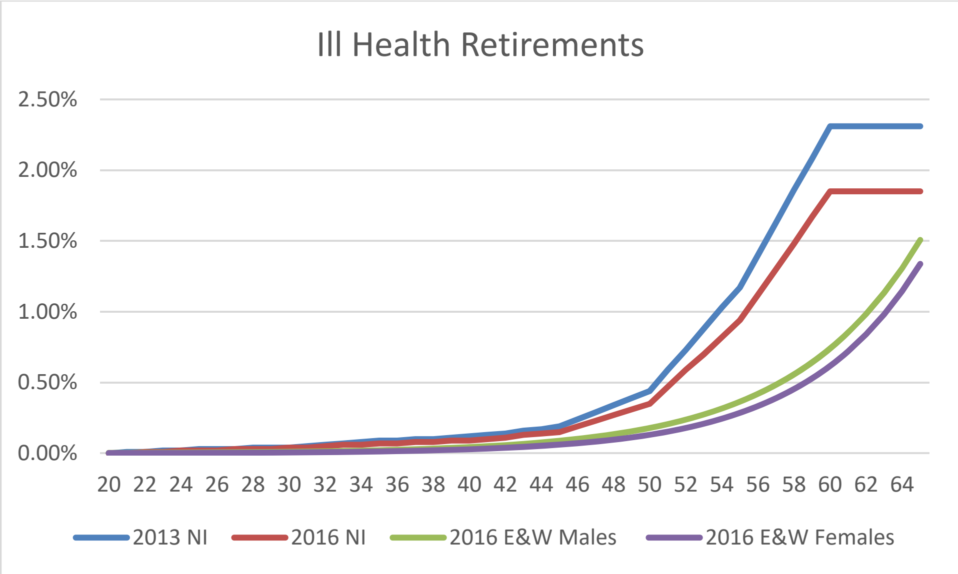
Commentary

6.7 The ill health rates and split of tiers are both based on analysis of the scheme experience over the period 2013-16.

6.8 The ill health retirement rates are not atypical of rates adopted for pension scheme valuations. The rates are significantly higher than those used in the LGPS (E&W) valuation and this is in line with our knowledge of the difference between public service scheme experience in Northern Ireland the rest of the United Kingdom.

[13] Tier 1 provides a higher level of benefit than tier 2

Chart 6.1: Comparison of ill health retirement rates in E&W and Northern Ireland



6.9 We note that the progression of ill health rates at older ages is different to LGPS (E&W), with no change in LGPS (NI) rates from age 60 onwards.

6.10 The proposed assumption for the proportion of ill health retirements on Tier 1 is lower for the LGPS(NI) than LGPS(E&W), which may reflect the higher incidence of ill health retirements overall.

7 Voluntary withdrawal from service

This chapter sets out our recommendation for the assumed rates of voluntary withdrawal from active service and our commentary

Proposed assumptions for 2016 valuation

7.1 The proposed assumption for incidence of early withdrawal from the scheme is summarised in the chart on the next page and is as published in the NILGOSC Actuary's report. Further details are in Appendix A.

Previous valuation assumptions

7.2 The proposed 2016 assumptions are approximately 20% higher than the rates adopted for the previous valuation.

Proposed assumptions for the Prior Value of the Cost Cap Fund

7.3 The assumption used for the 2013 Cost Cap valuation is recommended to be used for the calculation of the Prior Value of the Cost Cap Fund without any further adjustment to allow for re-joiners.

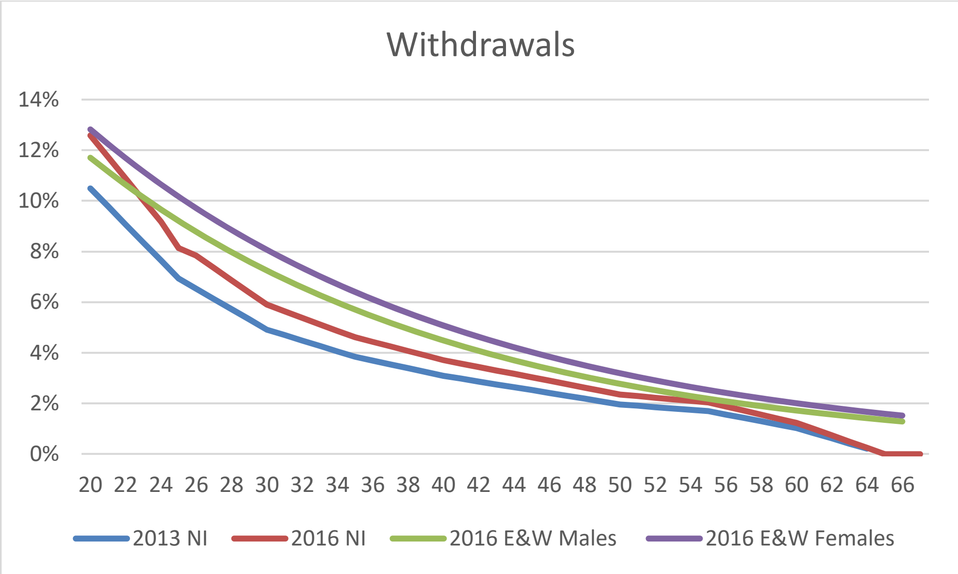
Commentary

7.4 The withdrawal rates are based on analysis of the scheme experience over the period 2013-16.

7.5 There is currently a large scale voluntary exit programme taking place across the public service in Northern Ireland. This started to have an impact on LGPS (NI) during 2015/16. The Aon Hewitt analysis covered the whole of the period from 2013 to 2016. The NILGOSC assumption adopted was not based solely on the 2013-16 experience and instead also took the previous assumption into account. This is a similar approach to the one that GAD has taken when experience has varied significantly since the previous valuation.

7.6 The withdrawal retirement rates are not atypical of rates adopted for pension scheme valuations. The rates are a little lower than those used in the LGPS (E&W) valuation and this is in line with our knowledge of the difference between public service scheme experience in Northern Ireland the rest of the United Kingdom.

Chart 7.1: Comparison of withdrawal rates in E&W and Northern Ireland



7.7 From the data provided we estimate that roughly 5-10% of withdrawals re-enter and aggregate[14]. We do not expect that to have a material impact on the calculation of the cost cap cost of the scheme and propose you do not make any allowance for it in the assumptions adopted.

7.8 You should note that the data used does not record rejoiners explicitly, so any analysis is necessarily limited and relies on information about movement and status codes provided by NILGOSC. Please also note the comments on the data in section 2.

7.9 An assumption for withdrawals was used at the 2013 valuation with the proviso that an allowance for re-joiners should be made for the Prior Value of the Cost Cap Fund calculations. The assumption for the calculation of the Prior Value of the Cost Cap Fund should not take into account experience after 31 March 2015. The data used to consider re-joiners covered the period 2010-2015. We do not expect including data covering 2015/16 would change our conclusion.

[14] By considering those members with the relevant combination of reason for leaving code and current status code, and also considering the status code history available for members.

8 Death before retirement

This chapter sets out our recommendation for the assumed rates of death before retirement, and our commentary.

8.1 The proposed assumption death before retirement is 50% of the standard tables S2PMA (for men) and S2PFA (for women) respectively. This is summarised in the chart on the next page and is as published in the NILGOSC Actuary's report. Further details are in Appendix A.

8.2 The NILGOSC actuary includes an allowance for future mortality improvements in line with their assumption for post-retirement mortality. We propose to ignore this allowance for simplicity and use the rates applying in the year 2016. The rates of death before retirement are very low, and this simplification will not have a material impact on the results of the valuation.

Previous valuation assumptions

8.3 The proposed 2016 assumptions are, on average about 80% of the rates adopted in the previous valuation for men and about 85% of the previous rates adopted for women.

Use of the assumption

8.4 Death before retirement rates are used to allow for the possibility of deaths whilst in active service or whilst entitled to a deferred pension. The numbers of deaths observed annually, and the recommended rates to be assumed are low, and thus this assumption has relatively little financial significance.

Commentary

8.5 The death before retirement rates are based on analysis of the scheme experience over the period 2013-16 and set by making an adjustment to an appropriate standard table.

8.6 The death rates are not atypical of rates adopted for pension scheme valuations. The rates are broadly in line with those used in the LGPS (E&W) valuation.

8.7 The charts below compare the rates proposed with those used at the previous valuation and in the LGPS (E&W) valuation.

Chart 8.1: Comparison of male death in service rates in E&W and Northern Ireland

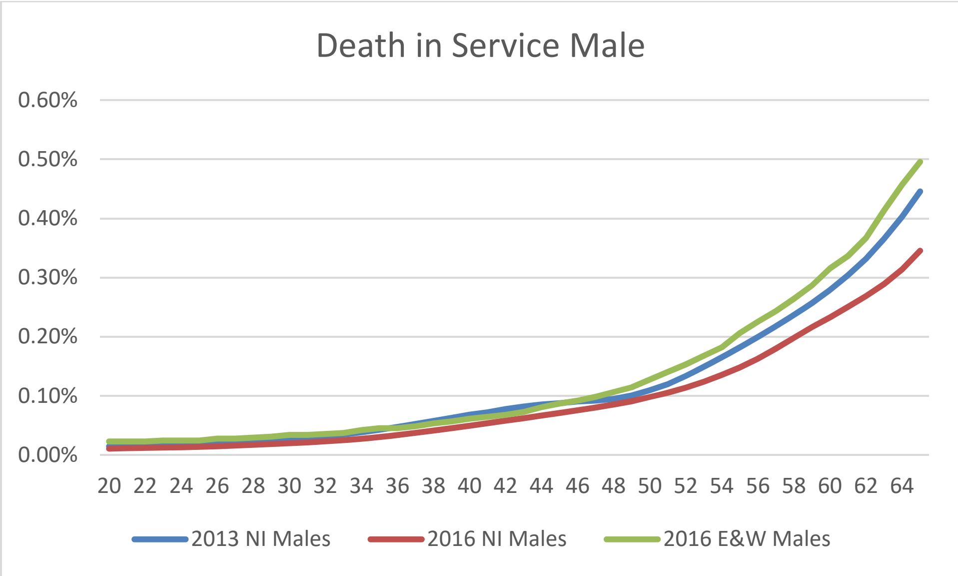
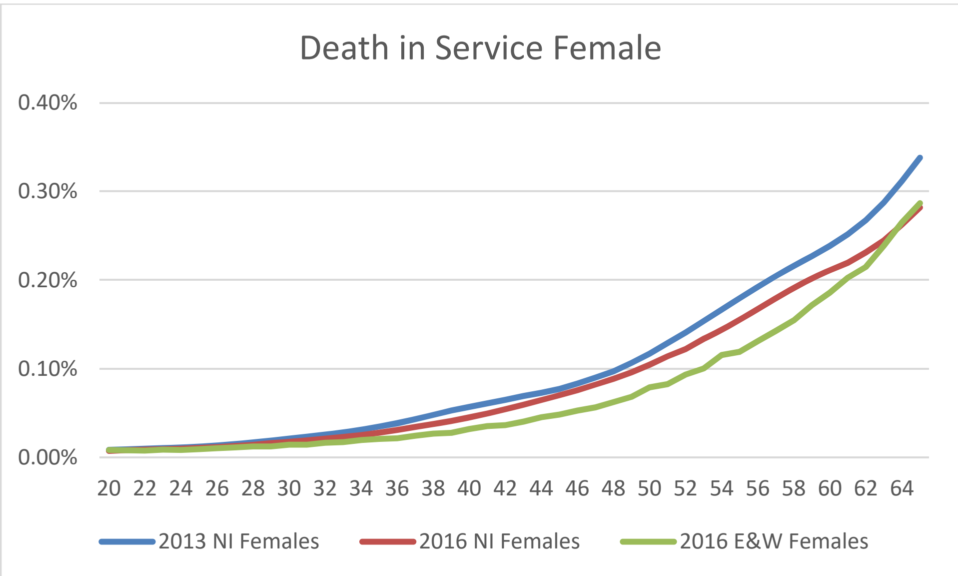


Chart 8.2: Comparison of female death in service rates in E&W and Northern Ireland



9 Promotional pay increases

This chapter sets out our recommendation for the assumed promotional pay increases of active members, and our commentary.

Proposed assumptions for 2016 valuation

9.1 The proposed assumption for promotional pay increases in the scheme is summarised in the chart on the next page and is as published in the NILGOSC Actuary's report. Further details are in appendix A.

Previous assumption

9.2 The assumption adopted for the 2013 valuation is the same as that now recommended for the 2016 valuation.

9.3 The NILGOSC actuary adopted the same assumptions for the 2013 and 2016 funding valuations.

Use of the assumption

9.4 For members who joined the Scheme prior to 31 March 2015, benefits earned prior to that date are linked to pay at or near retirement. Members' pay can increase through a combination of general annual pay awards and promotional 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 the Department of Finance. The assumption for promotional pay increases is set by the Department for Communities.

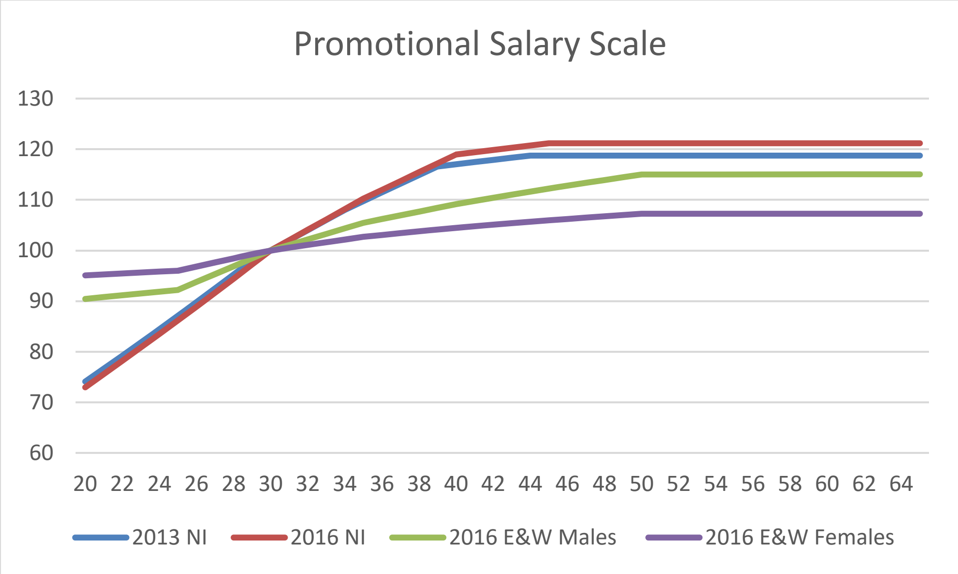
9.5 Future pay progression will be more significant (in terms of expected pension) for those members with longer service.

Commentary

9.6 The promotional salary scale is based on analysis of the scheme experience over the period 2013-16, but reasonably taking account of the short term effect of public sector pay restraint.

9.7 The salary scale is not atypical of scales adopted for pension scheme valuations. The scale is significantly steeper than those used in the LGPS (E&W) valuation.

Chart 9.1: Comparison of promotional salary scales in E&W and Northern Ireland



9.8 This assumption does not have a material effect on the level of the cost cap future service cost. However it may have a material effect on the calculation of the Prior Value of the Cost Cap Fund.

10 Commutation of pension for cash at retirement

This chapter sets out our recommendation for the assumed level of pension commutation at retirement (where this is not specified in the Department of Finance valuation directions), and our commentary.

Proposed assumptions for 2016 valuation and Prior Value of the Cost Cap Fund

10.1 An assumption is required about the amount of pension commuted by members in respect of their service prior to 31 March 2009. Prior to this date members received an automatic entitlement to retirement lump sum in addition to pension they might choose to commute for further cash. The assumption for the service after 2009, including post 2015 service, is specified in the Department of Finance directions, as set out in Table 10.1.

10.2 The calculation of the Employer Cost Cap did not require an assumption for commutation of pre-2009 service so an assumption needs to be specified.

Table 10.1: Recommended commutation assumption for the 2016 valuation

Pre-2009 Service	2009-2015 service (directed)	Post 2015 service (directed)
8.5%	17.5%	17.5%

10.3 The recommended assumption for pre-2009 service is defined by the NILGOSC actuary as assuming members take a total lump sum of 75% of the HMRC maximum permitted lump sum. This is equivalent to approximately 8.5% of pre-2009 pension being commuted.

Previous valuation assumptions

10.4 The directed assumptions were adopted for the previous valuation.

10.5 The NILGOSC actuary used the same assumption for the 2013 and 2016 funding valuations.

Proposed assumptions for the Prior Value of the Cost Cap Fund

10.6 This assumption is also recommended to be used for the calculation of the Prior Value of the Cost Cap Fund. The previous valuation did not require an assumption for Pre-2009 service as it only considered CARE benefits. Nonetheless, the assumptions report for the 2013 valuation recommended an assumption which was the same as is recommended now.

Use of the assumption

10.7 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 is important because the value of the pension given up, as assessed using the actuarial assumptions underlying the valuation is, on average, more than £12 and so commutation has a significant impact on total liabilities and the cost cap. Differences between assumed and actual experience will therefore feed through into the cost cap process.

Commentary

10.8 The NILGOSC actuary has used the same assumption for commutation of pre-2009 service at the 2013 and 2016 funding valuations based on analyses of the fund's experience over the period 2010-13 and 2013-16 respectively.

10.9 The assumption for the calculation of the Prior Value of the Cost Cap Fund should not take into account experience after 31 March 2015. Given that the same assumption was recommended at the time of the 2013 valuation, it is reasonable to assume that an analysis of experience up to 31 March 2015 would also support the use of this assumption.

10.10 The NILGOSC actuary's overall commutation assumption was that members receive a lump sum of 75% of the HMRC maximum. The directed assumption that 17.5% of post-2009 pension is commuted implies that in aggregate, lump sums received are significantly less than 75% of the HMRC maximum.

10.11 The assumption adopted for LGPS (E&W) is that 10% of the pre-2009 pension will be commuted. This is broadly in line with the assumption recommended for LGPS (NI).

11 Family statistics

This chapter sets out our recommendation for the assumptions around dependants' pensions, and our commentary.

Proposed assumptions for 2016 valuation

11.1 The proposed assumptions are:

> At ages up to 65, 80% of males and females are assumed to be married or have a partner to whom a dependant's pension would be payable on their death, with consistent assumptions for current pensioners.

> Male members are assumed to be three years older than their partners and female members are assumed to be three years younger than their partners.

Previous valuation assumptions

11.2 The assumed proportions partnered proposed are lower than those adopted for the 2013 valuation, which were that 90% of members would be married or have a partner to whom a dependant's pension would be payable on their death at all ages to age 65.

Use of the assumptions

11.3 Dependants' pensions[15] are provided on the death of a member. The scheme's benefit provisions for dependants differ according to when the service ended. For members who left service before 1 April 2009 only legal spouses and civil partners are eligible for a survivor's pension. For members in service on or after 1 April 2009, survivors pensions are payable to a qualifying partner[16].

Commentary

11.4 The family statistics have not been set based on the experience of the scheme over the period 2013-16 as data of sufficient quality was not available. We understand the NILGOSC Actuary has set their assumptions based on recent ONS data.

11.5 This assumption is not atypical of assumption adopted for pension scheme valuations. The assumption adopted for LGPS (E&W) is that 80% of men and 75% of women would be married or partnered at age 60.

[15] Pensions are also payable to dependent children on a member's death but the costs are not material overall.
[16] Qualifying partners includes legal spouse, civil partner and 'surviving nominated partner'. To satisfy the latter definition requires a 2-year exclusive relationship between parties able to legally marry or enter a civil partnership, and financial interdependency.

Appendix A: Details of assumptions

This appendix summaries details of the recommended assumptions including sample rates and values.

Mortality

Table A1: Baseline mortality assumptions

Baseline mortality	Standard table[17]	Adjustment	
		NILGOSC	GAD approach
Males			
Retirements in normal health	S2PMA	95%	103%
Ill-health pensioners	S2IMA	105%	103%
Dependants	S2PMA	95%	103%
Females			
Retirements in normal health	S2PFA	90%	97%
Ill-health pensioners	S2IFA	105%	102%
Dependants	S2PFA	90%	97%

Future improvements in mortality will be directed by the Department of Finance for pensioners and are assumed to be in line with those underlying the ONS 2016-based population projections.

[17] SAPS (S2) 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 all pensioners (S2PXA) and of those retiring in ill health only (S2IXA).

Age retirement from service

Table A2: Age retirement assumptions

Date joined/left LGPS	Assumed Retirement Age
Joined before 1 October 2006	Rule of 85 age(or age 60 if higher)[(1)]
Joined after 30 September 2006 but before 1 April 2015	Age 65[(2)]
Joined 1 April 2015 or after	State Pension Age (or age 65 if higher)

Notes:
(1) If member attained age 60 before 01/04/2020, the Rule of 85 age applies to all service. In other cases, any part of their pension with NPA later than CRA will be reduced.
(2) Post 2015 pensions will be reduced if the member's State Pension Age is over age 65 at that point.

Ill-health retirement from service

Table A3: Ill-health retirement rates for all members

Age	Rate
20	0.0000
25	0.0002
30	0.0004
35	0.0007
40	0.0009
45	0.0015
50	0.0035
55	0.0094
60	0.0185
65	0.0185

It is assumed that 70% of ill-health retirements qualify for tier 1 benefits and 30% for tier 2 benefits.

Voluntary withdrawal from service

Table A4: Voluntary withdrawal rates for all members

Age	Prior Cost Cap Fund calculation	Other 2016 valuation calculations
20	0.105	0.126
25	0.069	0.083
30	0.049	0.059
35	0.038	0.046
40	0.031	0.037
45	0.025	0.030
50	0.020	0.023
55	0.017	0.020
60	0.010	0.012
65	0.000	0.000

Death before retirement

Table A5: Death before retirement rates

Age	Male	Female
20	0.0001	0.0001
25	0.0001	0.0001
30	0.0002	0.0002
35	0.0003	0.0003
40	0.0005	0.0005
45	0.0007	0.0007
50	0.0010	0.0010
55	0.0015	0.0016
60	0.0023	0.0021
65	0.0035	0.0028

Promotional pay increases

Table A6: Promotional salary scales for all members

Age	Percentage Promotional pay increase over next year	Index (100 at age 30)
20	3.60%	74.1
25	3.22%	87.1
30	2.04%	100.0
35	1.59%	109.7
40	0.37%	117.0
45	0.00%	118.7
50	0.00%	118.7
55	0.00%	118.7
60	0.00%	118.7
65	0.00%	118.7

Commutation of pension for cash at retirement

Table A7: Recommended commutation assumptions for the 2016 valuation

Pre-2009 Service	2009-2015 service (directed)	Post 2015 service (directed)
8.5%*	17.5%	17.5%

* The actual NILGOSC actuary assumption is based on a proportion of HMRC limits, which we have converted to a % of pension

Family statistics

Table A8: Proportion married or entitled to a partners'/dependent's pension at retirement for future pensioners

Age	Proportion married or partnered at retirement
Males	80%
Females	80%

Male members are assumed to be three years older than their partners and female members are assumed to be three years younger than their partners.

Appendix B: Modelling approach and minor assumptions

Active membership projections

B.1 Direction 11 requires the actuary to use the 'projected unit methodology' to calculate the valuation results. The valuation results require the calculation of the cost of benefit accrual over periods after the effective date (31 March 2016). This implicitly requires the actuary to estimate the membership to future dates in order to determine the valuation results. Following discussion with the SAB in September 2017, the Department for Communities has agreed that for the purpose of this valuation it should be assumed that over the period from the ***effective date*** to the end of the ***implementation period*** the overall profile of the membership in terms of distribution of headcount and pay by age and gender will remain stable.

B.2 The expected cost of accruing benefits over periods after the effective date for cost cap purposes has been determined by assuming:

> The aggregate membership has the same age/pay profile over all projection periods (i.e. to 2023) (and assuming all in the 2015 scheme).

> Allow for the actual membership (assumed) accruing benefits in the 2015 scheme to change over the projection period (i.e. to 2023). SPA in the projected populations is determined by implied dates of birth and so the SPA mix changes over time despite the assumed stable population.

> Mortality is projected forward to the relevant year of use in all cases.

Grouping of individual active member records

B.3 Individual active members have been grouped together for the purposes of calculating past service liabilities and future service contribution rates. Grouping data in this way is appropriate where there is a high volume of data and where grouping should not in itself lead to a distortion in the results. The volume of data in this situation is more than sufficient to permit grouping without compromising the accuracy of the valuation results.

B.4 Active members have been grouped by gender, age (to nearest whole year), Normal Pension Age (to nearest whole year) and Critical Retirement Age (CRA). CRA has been taken as either 60 (where that is the nearest whole year of CRA), 62 (where CRA is between 61 and 64 to the nearest whole year) or 65 (where that is the nearest whole year of CRA, or where the member does not have a CRA). The CRA groups of 60 and 65 jointly cover around 91% of the total active membership at 31 March 2016; with CRA 62 being the balance of around 9%. The CRA group of 62 is therefore relatively minor, and hence grouping a wide range of actual CRAs does not introduce a significant element of approximation to the overall results.

B.5 Deferred pensions and pensions in payment have similarly been grouped for the purposes of calculating past service liabilities.

Accrual cost methodology

B.6 When determining the cost of accrual as required by Direction 40 the cost for members in each group at each relevant date (as identified from the membership projections) has been determined for each age and that rate has been applied to the total pensionable pay at each age to determine the average for the membership as a whole at each date. The cost over each relevant period has been taken as the average of the cost at the start and end of each period.

B.7 Non-accruing benefits such as lump sums payable on death in service have been recognised only when a benefit payment is expected.

Guaranteed Minimum Pensions (GMPs)

B.8 Guaranteed Minimum Pensions were earned between 1978 and 1997. If a member has a Guaranteed Minimum Pension, the indexation they receive is reduced on the GMP element of the pension. We will ignore the impact of GMPs when calculating Cost Cap Fund liabilities and the Net Leaver Liability that represents the value of accrued liabilities for members who leave service. This simplification will have a negligible impact on the Cost Cap Cost of the Fund.

Earnings cap

B.9 For members who were subject to the Inland Revenue earnings cap, which affected members whose pensionable service commenced on or after 1 June 1989 and which ceased to apply at 6 April 2006, their period of pensionable service was adjusted in 2006 to reflect the limitation on pensionable pay over the relevant period. Following that adjustment, the earnings cap therefore no longer has any impact on members' benefits or contributions, and therefore does not materially impact in the cost cap arena.

Public Sector Transfer Club (PSTC)

B.10 Allowance has been made for the potential additional liabilities arising from inward transfers on PSTC terms by assuming that the level of transfers continues at recent levels and the cost of providing the service credit is about twice the transfer value received. Overall, the additional costs are equivalent to about 0.1% of pensionable pay. In the longer term, PSTC transfers will increasingly be transfers of career average benefits and costs are expected to fall over time.

Final pensionable pay

B.11 All liabilities have been based on pensionable pay at the effective date as provided by NILGOSC. No explicit allowance has been made for the impact of prior years' earnings resulting in higher final pensionable pay for particular members since this effect is not expected to impact a material number of members.

Children's pensions

B.12 No allowance has been made for children's pensions (other than those already in payment), on grounds of immateriality.

Expenses

B.13 No allowance has been made for expenses. Expenses are outside the valuation framework.

Early retirement factors

B.14 When modelling retirement before Normal Pension Age where an actuarial reduction would be applied early retirement factors have been set equal to current factors (applied for the appropriate period before the normal pension age).

Re-entry of members

B.15 No explicit allowance has been made in the valuation for the possibility that members leaving active service subsequently re-join, on the grounds of immateriality.

B.16 No explicit allowance has been made in the valuation for a proportion of those deferred at the effective date to subsequently rejoin. This simplification has no material impact in the cost cap arena.

Additional voluntary contributions

B.17 Additional voluntary contributions paid on a money purchase basis have not been considered for the valuation. Additional voluntary contributions paid in accordance with the pension scheme regulations to secure added service or pension are taken into account as liabilities of the scheme.

Taper protection

B.18 As a result of the phasing out of the 'Rule of 85', some members are entitled to tapered early retirement factors in respect of service during the implementation period. In calculating the cost cap cost of the scheme, no allowance has been made for the impact of tapered early retirement factors on the grounds of immateriality. This simplification has no material impact in the cost cap arena.

The Scheme's 50/50 section

B.19 When calculating the valuation results we are required by the Direction 18 to assume that no members ever have, or ever will, make an election under regulation 12 of the Local Government Pension Scheme Regulations(Northern Ireland) 2014 (Temporary reduction in contributions), which we refer to as 'the 50/50 section'.

Cost Cap income

B.20 When calculating the Cost Cap income under Direction 33, we have included:

> Actual employee contributions payable

> Actual employer contributions made to fund early retirements which required employer consent, redundancy and efficiency retirements

> Employer normal contributions that would have been paid if employers had been required to pay contributions at the rate of the Cost Cap Fund Contribution Rate.

> Actual transfers-in

Member contribution yield over implementation period

B.21 The Member contribution yield over implementation period is calculated as the contribution yield expected from members between 1 April 2019 and 31 March 2023 based on the current regulations.

Other Direction interpretations

Directions 31, 32(1), 33(2)(a) (and related) – member contribution yields

B.22 See paragraph B.21.

Directions 32(1) and 40(1) – expected cost of benefits for future periods (for cost cap purposes)

B.23 See paragraph B.2

Direction 33 – cost cap income

B.24 The cost cap net leavers liabilities element of cost cap income has been based on the liability discount rate used for the cost cap liabilities at 2016 rather than the investment roll up. The impact is immaterial to the results.

Appendix C: Assumptions made for data uncertainties

Summary

C.1 Data was received from NILGOSC for the 2016 valuation. This was generally reasonable for the purposes of the valuation calculations, however, some aspects of the data were incomplete and/or unreliable for certain elements of our calculations.

C.2 It has not been possible to fully resolve these data issues in the timescale required for the valuation. Therefore, to calculate results for the 2016 valuation of the Scheme requires assumptions in respect of incomplete and/or unreliable individual member records and movements data. The latter is used in the calculation of the cost cap net leavers liabilities ('CCNLL') which has an impact on the cost cap cost of the scheme.

C.3 Scheme specific assumptions are determined by the "responsible authority", which is the Department for Communities in the case of the Scheme, and must be set as best estimate assumptions and not include margins for prudence or optimism.

Individual member records

C.4 Membership data is provided by NILGOSC for the purpose of the 2016 valuation and we apply checks to these membership records to ensure all key data items are provided and reliable for valuation purposes. Following these checks, it was identified that individual member records at the relevant dates as required for valuation purposes were not fully complete and reliable. We worked with NILGOSC to address a number of these issues, however where critical data items were missing from member records the general approach taken was to exclude that record for calculation purposes with calculations based on the remaining dataset being rated up incorporate an allowance for the excluded records.

C.5 Uprating factors were determined for each membership category equal to the ratio of known valid records and the number of records with adequate data. Implicitly this uprating approach assumes that the records with omissions or errors have the same average profile (age, sex, pay, service) as fully complete records. Some 1.7% of records were excluded from the 2016 valuation data and around 9.3% of the data provided for the purposes of setting the initial cost cap fund as at 31 March 2015.

C.6 As noted, the approach taken to data omissions is to assume each record with missing data has the same average profile as the complete records and therefore there is a risk that this assumption is not appropriate. The table below indicates the extent to which the valuation results might be incorrect if the approach in fact under/overstates the liability for the omitted members by 10%, which we believe to be a reasonable level to consider.

Table C1: Impact on results if liabilities under/overstated by 10%

31 March 2016	Cost cap cost of the fund
Active members (uprating applied: 5%)	±0.1%
Deferred members (uprating applied: 2%)	Nil
Pensioners (uprating applied: 3%)	Nil

31 March 2015	Cost cap cost of the fund
Active members (uprating applied: 9%)	±0.2%

C.7 The table above illustrates the potential impact if known data omissions are subsequently found to have been handled incorrectly. Since it is not possible to undertake independent checks for all categories of members and a full reconciliation has not been achieved against all prior datasets there is the potential for currently unidentified problems with the data to emerge in future. For example a group of deferred members could be identified where no liability has previously been determined. The impact of such unknowns emerging at subsequent valuations could be considerably more than the sensitivity indicated above.

Movements data

Cost cap net leavers liabilities (CCNLL).

C.8 The initial cost cap fund is set equal to the liability for actives members at 31 March 2015. The cost cap mechanism is intended to manage the costs of the reformed scheme and recognise any unexpected experience relating to pre-reformed entitlements of members in service at 1 April 2015, but only to the point at which they leave active service. CCNLL is a quantification of the amount of pre-reformed liabilities which fall out of the cost cap fund at a valuation owing to members which have left service since the previous valuation (or since the initial cost cap fund was set in the case of the 2016 valuation), net of the additional liabilities in respect of members with pre-reformed service who rejoined active membership during 2015-16.

C.9 To accurately calculate the CCNLL in accordance with the Directions requires full movement data for all members who were active in 2015 and are no longer active at the 2016 valuation. The data available was not suitable for calculating the CCNLL and it was not possible to make assumptions to adjust the data available to provide for a reasonable estimate of the CCNLL to be calculated. There have been some difficulties for all schemes in using the valuation data to determine the CCNLL, and these difficulties are particularly acute for LGPS where members may have multiple employments and re-joining and aggregation of benefits occur.

C.10 For the purposes of determining the 2016 valuation results, we recommend an approach which implicitly makes an assumption that there is no unidentified experience gain or loss arising over the period 2015 to 2016. A risk of this approach is that any upward or downward cost pressure that has occurred over the period but has not been explicitly identified will not be reflected in the 2016 valuation results.

C.11 We expect that the uncertainty introduced by the approach above is not more than 0.5% of pay. We would not expect significant unidentified experience gains or losses to arise over the one year period 2015 to 2016; although some uncertainty remains we would not expect any item as large as 0.5% of pay. However we do not calculate the employer contribution rate or deferred and pensioner liabilities as part this valuation, and we have not completed an analysis of the changes in the liability since the previous valuation. This increases the level of uncertainty and is reflected in our assessment that the uncertainty is not more than 0.5% of pay.

C.12 The level of uncertainty in the CCNLL calculation could potentially impact the rectification approach required for a breach of the cost cap in the 2016 valuation. For illustration using the default rectification approach of adjusting the accrual rate, the above uncertainty level of 0.5% of pay corresponds to uncertainty in the accrual rate required to correct a cost cap breach such that the improvements in the accrual rate might be from the current 1/49 to between 1/42.3 and 1/44.1 rather than 1/43.2.

C.13 For the 2016 valuation, the CCNLL calculation period is only one year, rather than a full four-year inter-valuation period. Given the short period over which any gain or loss may have arisen it might reasonably be concluded that the lack of data for the CCNLL calculation is not critical for this valuation although it would become so in future valuations when a longer inter-valuation period is considered.

Appendix D: Sensitivity of valuation results to Department set assumptions

D.1 The table below provides an indication of the sensitivity of the valuation results to the particular assumptions under consideration. The figures shown here are also provided in section 4 of the formal valuation report.

Sensitivity of valuation results to assumptions set by the Department

	Addition to cost cap cost of the Scheme
Membership profile: 2 years older on average over implementation period	1.1%
Mortality rates: 5%* heavier rates of pensioner mortality	-0.5%
Age retirement rates: Members assumed to retire one year later	0.0%
Commutation (other than as directed) Members commute 2% of pension more than assumed in respect of pre 2019 service, keep 17.5% assumption for post 2009 service	-0.3%
Ill-health retirement: 5%* increase to assumed rates	0.1%
Ill-health retirement: 5%* increase in proportion assumed to receive higher tier benefits	0.0%
Proportions partnered: 5%* more members assumed to have qualifying partners at death	0.1%
Resignations and opt outs: 5%* higher numbers assumed to leave voluntarily before retirement (net of rejoiners)	0.0%
Promotional pay increases: 0.5% higher promotional pay increases than assumed	0.5%

* All these represent multiplicative increases to rates, i.e. 5% means rates 1.05 times higher.

Note: Opposite changes in the assumptions will produce approximately equal and opposite changes in the valuation results.

D.2 In each variant of the above table the sensitivity shown is in relation only to the change in assumption described. The impact of a combination of assumption changes will not necessarily equate to the sum of the relevant rows above.

Appendix E: Extract from 2013 assumptions report: setting assumptions in line with NILGOSC valuation

Setting assumptions in line with the NILGOSC valuation

E.1 The Department have informed us that they propose to set the demographic assumptions in line with those used in the NILGOSC valuation(as the membership is identical, because there is only one fund) and that they have reliable assurances that these assumptions are 'best estimate' in the sense that they do not include any margins for prudence or optimism. Our advice in this report is provided in this context. Should the Department decide not to set the assumptions in this way then they should take further actuarial advice.

E.2 Different actuarial exercises for different purposes may require different sets of assumptions even if they are for the same group of members. Even where both sets of assumptions are set as 'best estimates' there may need to be differences as different assumptions may be or more less material to the results for different exercises. Therefore deciding to adopt the NILGOSC demographic assumptions cannot be automatic.

E.3 It may be reasonable for two separate actuaries to propose different assumptions despite both considering the same evidence. For example:

> In recommending assumptions different actuaries may decide to put different weights on historic experience, experience in the corresponding scheme operating in England and Wales or any other relevant experience.

> Actuarial consultancies may have a different "house view" on certain areas, such as the granularity of assumptions or whether select periods should be used.

> The underlying experience analysis carried out may not be consistent should, for example, members may be grouped differently or different time periods may be considered.

E.4 In deciding whether or not to adopt the NILGOSC assumptions the Department should consider:

> How closely the purpose and outcomes of the NILGOSC valuation aligns with those of the valuation under the DFP [now DoF] Directions

> The relative importance of assumptions in each valuation

> Whether the population valued in both exercises is the same, or similar enough for the assumptions to be appropriate

> Whether there are any differences in the benefits valued or methods adopted which could mean that the assumptions may not be appropriate.

E.5 As part of our advice we have compared the proposed LGPS NI assumptions with those proposed for the equivalent valuation in the Local Government Pension Scheme England & Wales and used our experience of typical differences in demographic experience between public service schemes in Northern Ireland and the rest of the United Kingdom.

Purpose and outcomes of the valuations

E.6 Setting the cost cap (and calculating the starting level of the cost cap fund) are "one-off" exercises which may be difficult to change in the future if they prove to be inaccurate. It may be appropriate to take a more detailed approach to setting some assumptions than has been taken for the NILGOSC valuation.

E.7 The NILGOSC valuation is an "ongoing funding exercise" with calculations every three years. This means that small under or over payments will be automatically corrected at the next valuation. Therefore it is quite reasonable to take a proportionate approach in modelling for such exercises.

E.8 Therefore, theoretically speaking, the modelling (and the assumptions set) should be, if anything, more detailed for the cost cap calculations in order to reduce the risk that the cost cap (or cost cap starting fund) is set at an inappropriate level, which is not the intention of the policy and might make a future breach more likely. However, in practice, given the uncertainties involved in these calculations increasing the complexity of the cost cap modelling may not significantly reduce the risk of future cost cap breaches.

E.9 Overall we do not consider that the difference in accuracy required is such that the assumptions adopted for the NILGOSC valuation are inappropriate. However the assumptions for age retirement and rejoining the scheme (with a final salary link) taken individually are less detailed than GAD have recommended for other valuations under DoF Directions.

Relative importance of assumptions

E.10 DoF 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. Changes are not considered material if their expected impact on the contribution rate is less than 0.05%.

E.11 Although we do not have any specific statement of the level of accuracy adopted in the NILGOSC valuation given that results are reported to the nearest 0.1% of pensionable payroll there is no reason to believe that it is sufficiently different so as to make the assumptions inappropriate.

Benefits and valuation methods

E.12 Both valuations measure the same benefits for post 2015 service. For that reason we would expect that, as far as benefits are concerned, the proposed assumptions would be appropriate for the cost cap valuation.

E.13 Both valuations use the same overall actuarial methodology (known as the Projected Unit Method) and we would not expect that the differences in some of the details of the methodology would affect the appropriateness of the assumptions.