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Actuarial assumptions for New Zealand superannuation scheme valuations

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1 Executive summary

There is no current forum for an analysis of the assumptions actuaries across New Zealand are using for superannuation schemes. In this paper we have tried to summarise some current practice, and provoke discussion on how this can be improved in the future.

The actuary as a contributor to the financial statements

Each year, we review the assumptions for over 20 superannuation schemes. The purpose of these reviews is to confirm to the scheme's or the company's external auditors that the actuary's assumptions (and hence the results and conclusions) are relevant and reasonable.

We sometimes find that practices that have been routine for actuaries for many years can be hard to justify to non-actuaries. Particularly with the advent of International Financial Reporting Standards, actuarial numbers are increasingly required as entries into the company's balance sheet. The approaches traditionally used for funding valuations may need adaptation for financial reporting. Additionally, conservatism (an actuarial fallback) is as inappropriate as underestimation.

Actuarial assumptions

One of our key propositions in this paper is that actuaries should be making explicit and measured allowance for improving mortality over the lifetimes of beneficiaries. The evidence relating to mortality improvements is overwhelming, yet we have had our heads in the sand in relation to this. Possibly this is because existing valuation systems do not handle it, and there is little interest in investing in new software for a dwindling industry. A single deduction of a number of years of age from an existing table makes an allowance, but the timing and incidence of the improvement is inaccurate, and the effect is reduced through changes since the date of the table and selection effects. After schemes close to new members, pensioner liabilities become an increasing proportion of their liabilities. Getting the mortality assumption (including future improvements) right becomes more critical, both to the sponsoring company, and to the reputation of the actuarial profession.

Closed or dwindling schemes also call for a considered approach to allowances for future administration expenses, to ensure these are sustainable in the longer term, without a large increase in the employer contribution rate in future.

Retirement age and commutation assumptions are also relevant. As the assumptions for the financial reporting are often different from those for funding, the commutation factors may no longer be actuarially neutral, so some attention should be paid to ensuring assumptions reflect actual commutation practice.

Summary

Technology continually advances, and accounting standards have an increasing effect on the work we do. The need to provide the best possible advice and assistance to our clients does not change, but what this involves does. This paper calls upon actuaries to think about how they can do the best job for their clients in this new environment, including taking a proactive approach to ensuring the end of the year is on a "no surprises" basis. As a profession, we need to ensure we are proactive in respect of the change in value of our client's accounting entries, and assist them in managing their risks by providing the most accurate and thoughtful advice we can. This will ensure the reputation and continued relevance of the profession.

"You can't do today's job with yesterday's methods and expect to be in business tomorrow"

2 Introduction

Why this paper?

In 2000, a new role developed for New Zealand actuaries, that of assisting financial auditors of companies developing an opinion in relation to actuarial reports and calculations, when we were amongst the first actuaries to join a New Zealand accounting firm.

In the ten years since then, in New Zealand, actuaries as auditors have become common across life insurance, general insurance and superannuation, as well as other fair value balance sheet items. This reflects the greater role actuaries play in calculating figures for companies' balance sheets, and the greater scrutiny these figures are under.

As part of this role, we are asked to review the actuarial reports for about twenty superannuation schemes each year. It has been interesting to see the different approaches adopted by various firms and actuaries, and we are grateful to those actuaries who have understood our task and cooperated so graciously with us.

Auditing another actuary's work to confirm to non-actuaries that the approach taken is reasonable (in particular, in relation to the setting of assumptions) brings another perspective to our lives as actuaries. At times, it brings about the conclusion that there are things actuaries often do, things that could even be described as "market practice", which can be challenging to justify to non-actuaries and where consideration indicates we, as a profession, could perhaps do better.

With the implementation of *New Zealand Equivalent to International Accounting Standard 19 - Employee Benefits*, there has developed a need for actuaries to realise and understand the short term effect of their valuations and assumptions on a company's annual accounts, rather than just the effect on the timing of the scheme's long term funding.

It is these kinds of considerations that have been the genesis for this paper. Our aim is to spark debate amongst our colleagues and for us all to reconsider how to do the best we can for our clients.

Role of the actuary assisting in audit

The review of actuarial work as part of an audit is covered under the *New Zealand Institute of Chartered Accountants International Standard on Auditing (New Zealand) 500 - Audit evidence*. Paragraph 8 of this standard states:

"If information to be used as audit evidence has been prepared using the work of a management's expert [e.g. an actuary], the auditor shall, to the extent necessary, having regard to the significance of that expert's work for the auditor's purposes,:

- (a) Evaluate the competence, capabilities and objectivity of that expert;*
- (b) Obtain an understanding of the work of that expert; and*
- (c) Evaluate the appropriateness of that expert's work as audit evidence for the relevant assertion."*

Understanding the work of the management's expert is further covered under paragraph A44:

"An understanding of the work of the management's expert includes ... determination of whether the auditor has the expertise to evaluate the work of the management's expert, or whether the auditor needs an auditor's expert for this purpose":

And under paragraph A45:

“Aspects of the management’s expert’s field relevant to the auditor’s understanding may include:

- *Whether that expert’s field has areas of specialty within it that are relevant to the audit.*
- *Whether any professional or other standards and regulatory or legal requirements apply.*
- *What assumptions and methods are used by the management’s expert, and whether they are generally accepted within that expert’s field and appropriate for financial reporting purposes*
- *The nature of internal and external data or information the auditor’s expert uses.”*

Evaluation the appropriateness of the management’s expert’s work is covered under paragraph A48:

“Considerations when evaluating the appropriateness of the management’s expert’s work as audit evidence for the relevant assertion may include:

- *The relevance and reasonableness of that expert’s findings or conclusions, their consistency with other audit evidence, and whether they have been appropriately reflected in the financial statements;*
- *If that expert’s work involves use of significant assumptions and methods, the relevance and reasonableness of those assumptions and methods; and*
- *If that expert’s work involves significant use of source data the relevance, completeness, and accuracy of that source data.”*

The *New Zealand Institute of Chartered Accountants’ International Standard on Auditing (New Zealand) 620 – Using the work of an auditor’s expert*, covers the situation where expertise in a field other than accounting or auditing is necessary to obtain sufficient appropriate audit evidence and the auditor engages an auditor’s expert (such as ourselves). The auditor must also assess the competence, capabilities and objectivity of the auditor’s expert, so it is not just those preparing the work who are being assessed! However, the auditor retains sole responsibility for the audit opinion expressed.

We sometimes find that actuaries whose work we are auditing are not clear on our role or what we are trying to achieve through the questions we ask. Aside from details such as confirmation of Fellowship of the Society and area of specialisation, our role usually relates to:

- giving the auditor confidence that the:
 - assumptions,
 - methodology, and
 - dataused are appropriate and reasonable,
- and thus that the scheme’s or company’s liabilities are fairly represented.

Both overstatement and understatement are considered, whereas traditionally some actuaries, accustomed only to funding valuations, may have tended towards a slightly conservative approach. In addition, fair value accounting has a focus on market consistency that does not always sit easily with long term funding approaches.

3 Superannuation scheme valuations in New Zealand

Valuations we review fall under two main categories, those required under the Superannuation Schemes Act 1989 and those falling under *New Zealand equivalent to International Accounting Standard 19 – Employee benefits*.

Superannuation Schemes Act 1989

The primary piece of legislation in New Zealand in respect of the funding of defined benefit superannuation schemes is the *Superannuation Schemes Act 1989*, which came into force on 1 April 1990.

This defines an actuary as a Fellow of the New Zealand Society of Actuaries, and requires in Section 15(1) that:

“If a registered scheme –

- (a) Operates on the principle of unallocated funding; or*
- (b) Provides benefits that are dependent upon the contingencies of human life, and the risks associated with those benefits are not fully insured with a company engaged in the business of life insurance,--*

the trustees shall ensure that an actuary examines the financial position of the scheme as at dates that are no more than 3 years apart.”

The report is due no later than seven months after the date at which the scheme was examined and the trustees must send a copy to the Government Actuary within 28 days after the date of its receipt by the Trustees.

There is no guidance to the actuary in regard to the examination in the Act.

NZSA Professional Standard No. 2

Professional Standard No.2 - Actuarial reporting for superannuation schemes applies to actuarial reports prepared for the purposes of the Superannuation Schemes Act 1989 where the as at date of the examination is 31 March 2003 or later.

The standards says at paragraph 2.6

“When preparing any report of the financial condition of a superannuation scheme an actuary must exercise professional judgement in determining the extent of the investigation, the funding method and the underlying assumptions.”

Section 6 covers the actuarial valuation method. This states:

The report must include at least the following information in respect of the actuarial funding objectives and valuation method used by the actuary:

- 6.1. An explanation of the funding objectives and the valuation method used to achieve those objectives.*

- 6.1.2 *An explanation of the implications of the funding objectives and the valuation method in terms of the stability of future contribution rates and future funding levels.*
- 6.1.3 *A statement as to whether or not there has been any change in the funding objectives, or the valuation method, or both, since the date of the report on the immediately preceding investigation, and , if so, an explanation of the effect of such changes.”*

Section 7 covers the requirements for actuarial assumptions, but in the most part this relates to the disclosure and explanation of the assumptions the actuary has made rather than a prescriptive approach to what the assumptions must be. In this regard, actuaries have a considerable amount of discretion in the approach they take. The accompanying commentary has some suggestions for how certain items may be treated.

NZ IAS19 valuations

New Zealand Equivalent to International Accounting Standard 19 - Employee Benefits (NZ IAS 19) was issued in November 2004 and became mandatory for an entity's financial statements covering annual accounting periods beginning on or after 1 January 2007.

Because it covers a range of employee benefits other than defined benefit superannuation schemes, some of the concepts were initially alien to actuaries. However, as the results of an NZ IAS 19 valuation go directly into the company's balance sheet, it is important for the actuary to work closely with the CFO, to ensure the scheme's position, and the impact on the company, are fairly recognised each year.

In an NZ IAS 19 valuation, the actuary is required to use the Projected Unit Credit Method. The discount rate is set with reference to long term bonds (Government Stock in New Zealand). Other actuarial assumptions are set with reference to the **entity's best estimates** of the variables that will determine the ultimate cost of providing post employment benefits. In practice the entity will be guided by the actuary in most areas, future salary escalation being an occasional exception.

NZ IAS 19 valuations are carried out at least annually. Some organisations request NZ IAS 19 valuations during the year so that they can budget for the effect of changes in the scheme's position at the end of the year.

[There is an opportunity for actuaries practicing in this area to take a proactive approach in this regard, as CFOs are not fond of end of year surprises.](#)

4 Pensioner mortality assumptions

As auditors, one of the areas of most concern to us is the appropriateness of the pensioner mortality assumption.

What we are seeing

Most actuaries are using New Zealand population life tables, with an age deduction of 1 to 3 years. This is varying described as “reflecting the better mortality of members of superannuation schemes than the general public”, “reflecting the time since the table was developed” and “to allow for mortality improvements”, or some combination thereof. Interestingly, while some say the deduction provides an allowance for improving future mortality, others expressly state that no allowance has been made for improving mortality.

We have noticed some firms appearing to standardise all their schemes to a single mortality assumption for most schemes. The most common assumption currently appears to be NZLT2005-07 less two years. We have also seen NZLT2005-07 less one year, NZLT2000-02 less two years and PA(90) less three and four year age deductions used for schemes we have reviewed over the last year or so.

Is the mortality assumption reasonable?

For many schemes, the size of the membership and the low number of deaths makes it difficult, if not impossible, for the actuary to ascertain the true rate of mortality. However, we are all aware that mortality is a significant assumption in respect of a pension scheme, and is becoming increasingly important for a number of large pension schemes which are closed to new members, with the pension liabilities increasing significantly in relation to the value of future contributions.

The common lack of an allowance for improving future mortality is a real point of concern for us.

Requirements of PS2

PS2 requires:

“If the pensioner mortality assumption is one of the most financially significant assumptions, a statement of the provision made for future improvement in mortality.”

As mentioned above, many actuaries are including selection as well as mortality improvement in their age deduction, or are simply making non-specific comments that they have deducted two years “in line with market practice”, and thus the actual provision made for future improvement in mortality is unclear.

Empirical evidence

We conduct a full pensioner mortality investigation for the National Provident Fund (NPF) every three years with a relatively meaningful dataset.¹ Five triennial investigations have now been completed and data for the last four are available in a comparable format.

Appendix A - NPF pensioner mortality experience shows the mortality experienced in each of the last four triennial investigations, compared to NZLT2005-2007. It should be noted that even with the number of pensioners that NPF has, statistical reliability is an issue and the results in the 65-69 and 95-99 age groups for males and 65-69, 70-74 and 95-99 age groups for females are not reliable for individual investigations. We have included them in the information presented, as the overall trends are still interesting when the various investigations are considered together.

We have broken the analysis into two groups of pensioners, the DBP Annuitants Scheme (DBPA), and the non-DBPA pensioners. DBPA pensioners come from the Fire Services, Heath Authorities, Local Authorities, schools, national airline and similar employees. On the other hand, non-DBPA pensioners come from the meat industry, farm workers, and other schemes which were open to the general public.

A number of observations can be noted from these triennial investigations.

NPF mortality differentials

The DBPA pensioners and the non-DBPA pensioners show statistically significant different mortality. This has always been the case for the males. Whether the difference is statistically significant has varies for females over the years (the smaller number of deaths making statistical analysis more difficult).

As a broad generalisation, the male NPF pensioners tend to be former contributory members and the female NPF pensioners are their wives.

The mortality differential illustrated between these two groups indicates that a one-size fits all approach may not be appropriate.

Shape of the NPF mortality curve

There has been an almost surprising consistency the “shape” of the mortality rates compared to population tables from one investigation to the next, with the DBPA pensioners showing a mortality curve of a similar “shape” to the population mortality, but the non-DBPA pensioners showing comparatively lower mortality at the younger ages compared to population mortality than at the older ages. (This has been allowed for by adopting an insured lives table as the base mortality, which has showed a better match.)

NPF Pensioner selection

There is no observable mortality selection against the Schemes. Members of the DBP Contributors Scheme have been able to take a lump sum proportionate share of the assets of the Scheme, in lieu of a retirement pension from DBPA, since 1994. However, over the various investigations, the mortality at the younger ages has shown no discernable reduction compared to that experienced at the older ages,

¹ We would like to acknowledge and thank the Board of the National Provident Fund for permission to include details from our investigation in this presentation.

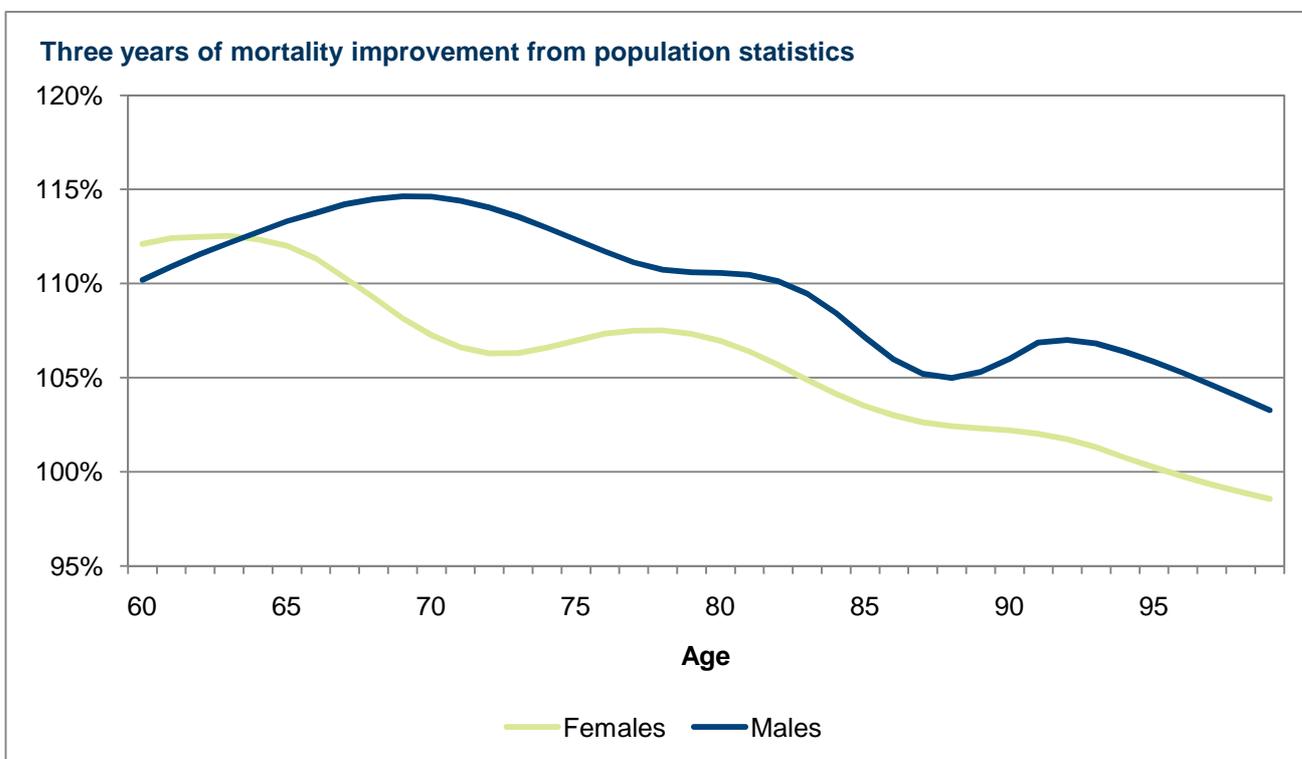
as would be expected if new retirees were selecting against the Scheme on the basis of their mortality expectations. The same option is available to non-DBPA pensioners. In addition, a few years ago each of the existing non-DBPA pensioners was offered the opportunity to exchange their pension for a cash lump sum equivalent. There was no discernable effect on the mortality experienced by the pensioners.

NPF mortality improvement

There has been consistent evidence of mortality improvement over time. This is discernable from the charts in Appendix A, but is more obvious when the results are considered in more detail and with regard to statistical significance. The general trend is for improvements to be larger (as a percentage) at the younger ages than at the older ages.

Population mortality improvement

For comparison, three years' worth of mortality improvements in population mortality can be determined by taking "60%" of the change in population mortality rates between NZLT2000-2002 and NZLT2005-2007. This indicates the following:



This chart shows a similar pattern of larger percentage increases at the younger ages than at the older ages.

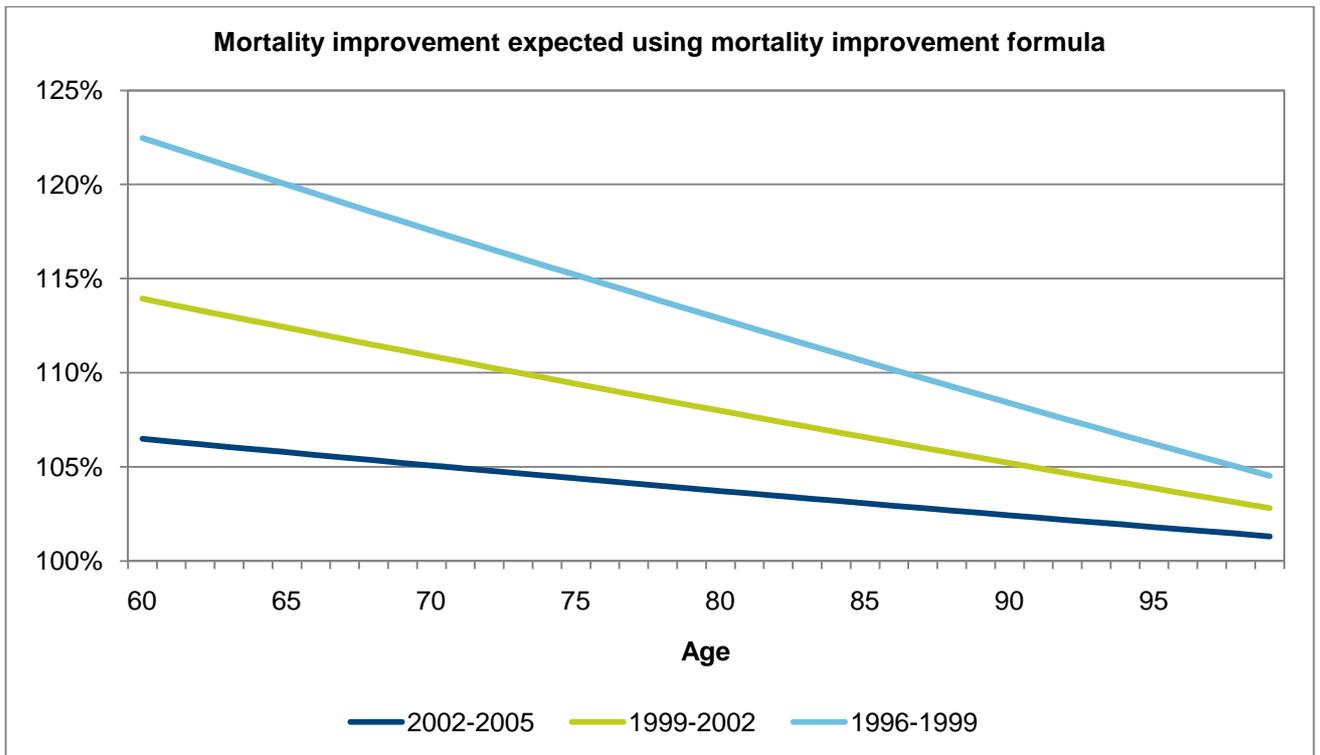
Thus both the NPF data and the population data indicate that there has been mortality improvement and that the mortality improvement has been a larger percentage at the younger ages than at the older ages.

NPF mortality improvement formula

We adopt a mortality improvement formula taken from Continuous Mortality Investigation Report 10 of the (then) Institute of Actuaries. While this formula has been refined by the Continuous Mortality Investigations since then, the original formula has worked well in practice in predicting the level of mortality improvement and so we have not changed it.

The mortality improvement is taken from the mid-point of the investigation period.

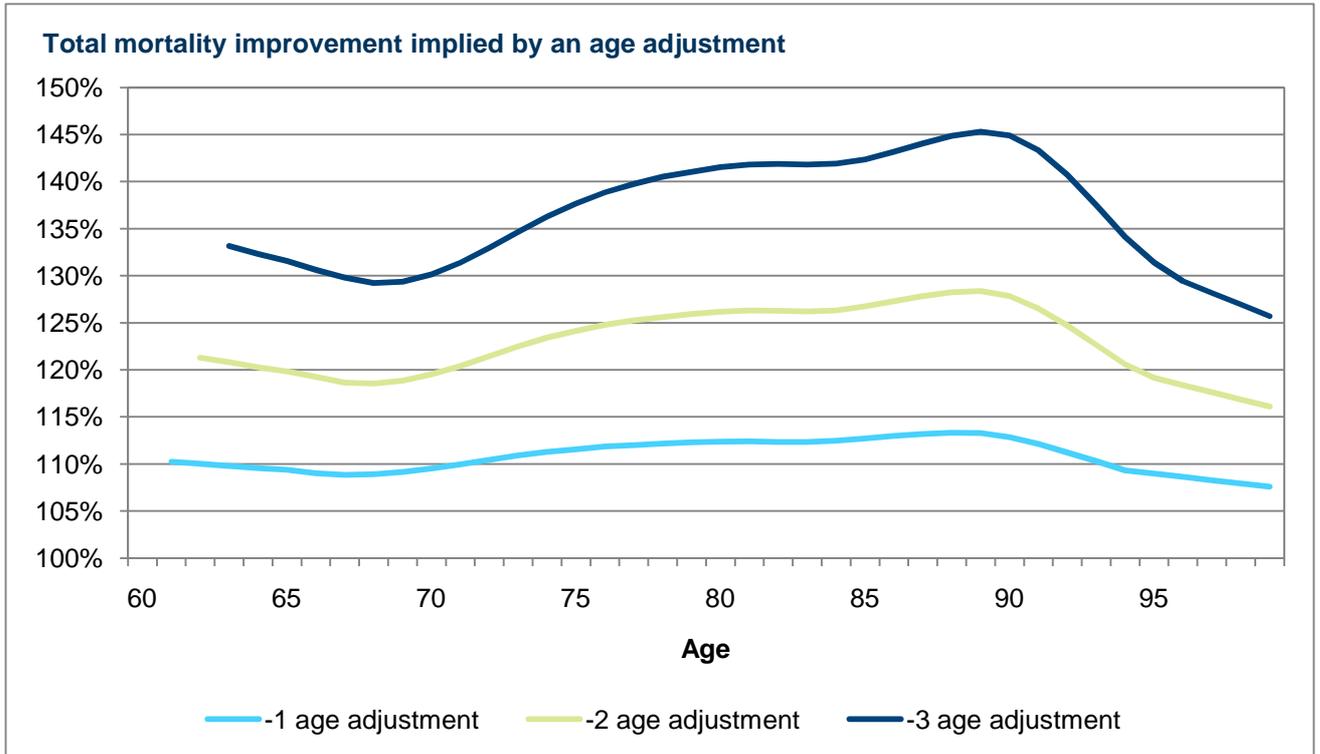
The following chart shows pattern of mortality improvement predicted by the mortality improvement formula, by comparing the mortality that would have applied for earlier periods, as a percentage of the latest population mortality experience. This graph can be compared directly with the chart above and those in Appendix A,



Overall, the mortality improvement in this chart is similar to that experienced and shown in Appendix A. However, the amount of improvement is approximately half of that shown by the population mortality improvement. This may indicate a difference between the rate of mortality improvement for population compared with select lives, i.e. that there are higher rates of improvement at the lower ends of the socio-economic spectrum. Alternatively it could be the effect of random selection or administrative process changes. It will be interesting to see what the next triennial investigation shows.

Effect of an age deduction

The next chart shows the mortality improvement implied by using an age deduction, based on NZLT2005-07. This gives far larger improvements at the older ages compared to younger ages. It is also a “single” improvement rather than a continuous improvement and so cannot be compared directly to the other charts.



NPF fitted tables

While it is not apparent from the graphs in the Appendix, at each NPF pensioner mortality investigation we have fitted a range of “standard” mortality tables to the actual data, allowing for an age deduction and a percentage adjustment. In every case the percentage adjustment has given a better fit than an age adjustment, hence we have never adopted an age adjustment for the NPF.

Insured lives experience

The New Zealand Society of Actuaries’ Report into the Mortality of New Zealand Insured Lives 2005-2007 also showed significant improvements in mortality rates; albeit the data at the older ages that are relevant for pensioners was scant.

...and back to our question as to what mortality assumption is reasonable?

Given

- we find quite different mortality rates between different schemes
- the irrefutable evidence of mortality improvement
- that pensioner mortality is generally one of the more significant assumptions
- that pensioner liabilities are often increasing as a proportion of a scheme's total liabilities, and
- that there is a relatively straightforward actuarial formula for mortality improvement

should we be telling our auditing colleagues that New Zealand life tables with a two year deduction is reasonable for both current pensioner mortality and future improvements in pensioner mortality?

Practical difficulties in implementing an improving mortality assumption

We suspect many actuaries do not use a mortality improvement formula because it is not available in their superannuation valuation software. It is also more complex to apply, as mortality rates then depend on time as well as age and sex. However, it is simple to build improving mortality into a spreadsheet, and output from a valuation program could be transferred to that spreadsheet to calculate the required values.

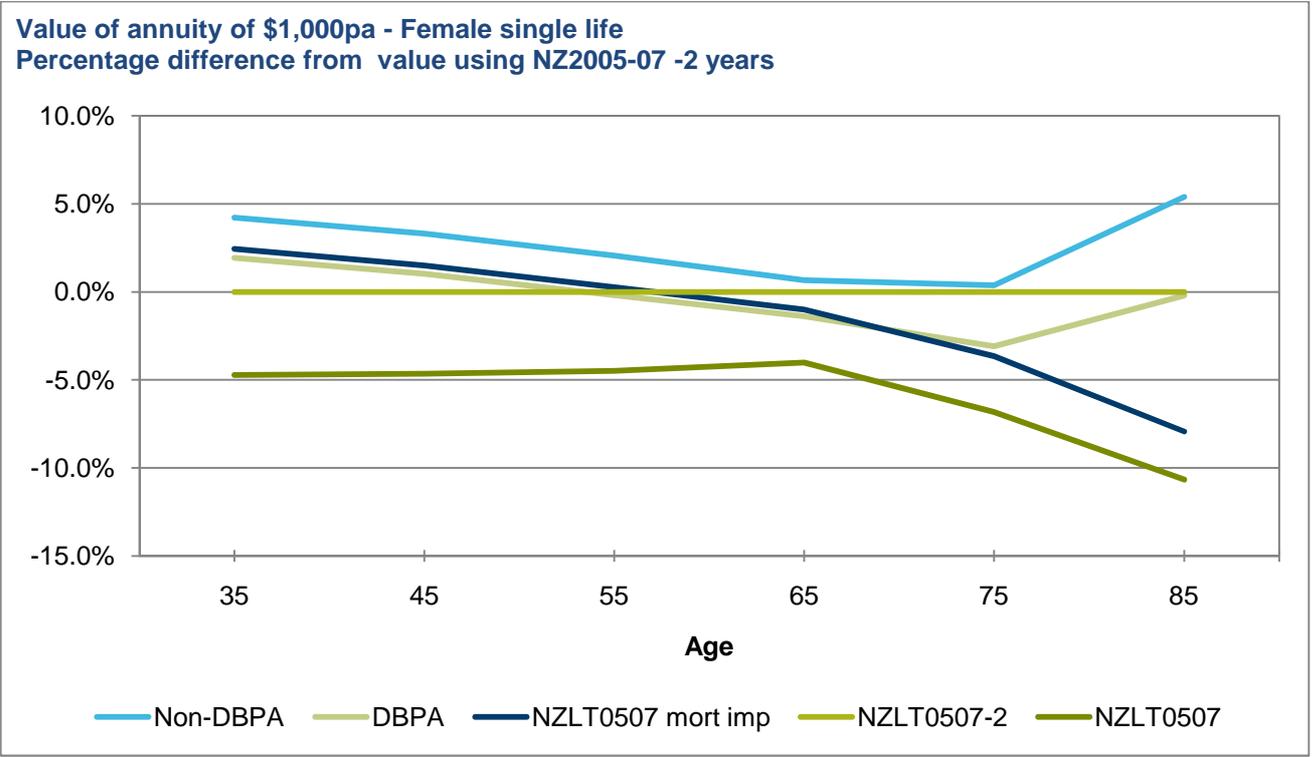
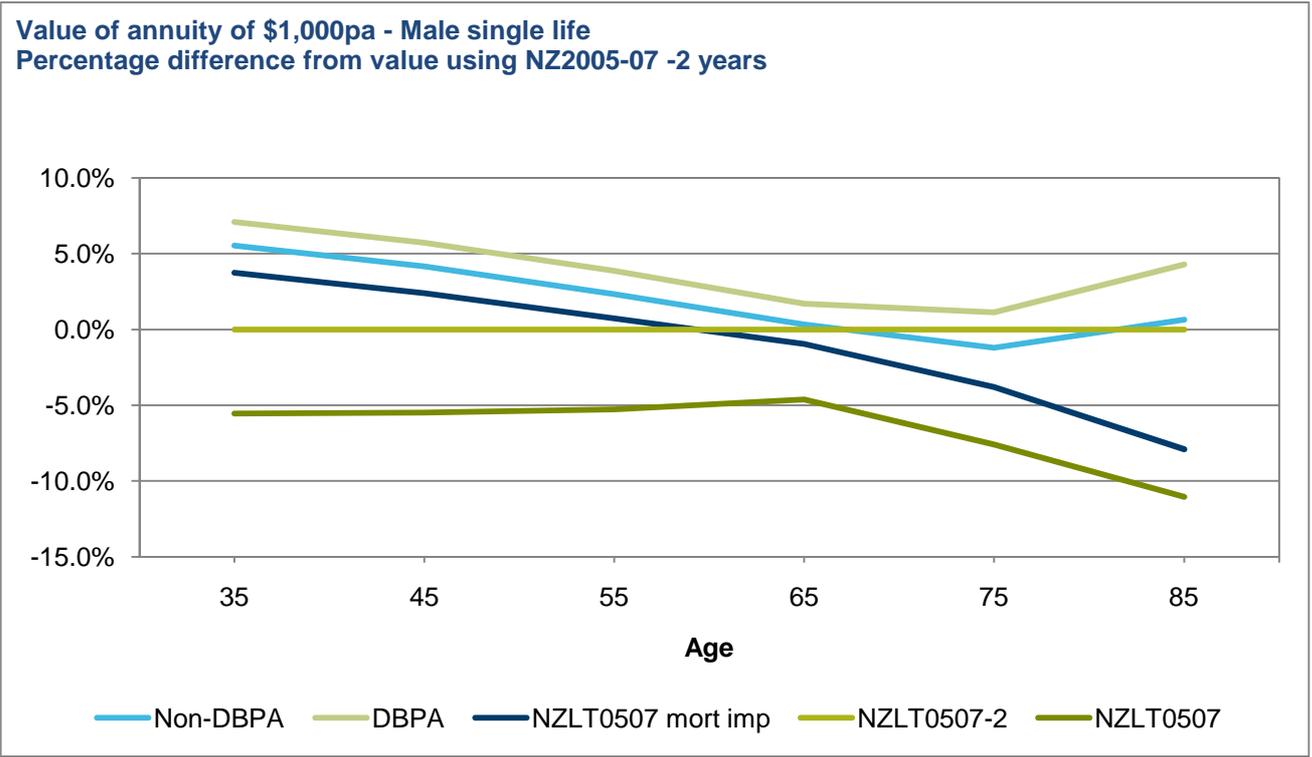
How much difference does it make?

We have illustrated the difference for a range of pensioners (or deferred pensioners) as set out in the following charts. We have used NZLT05-07, either as is, or with deductions of a number of years, or with an improving mortality allowance, and compared this against our assumptions for DBPA and non-DBPA pensioners. The graph shows the value of an annuity of \$1,000 pa commencing at age 65 (or in payment for those older than 65), and a discount rate of 5.5% pa.

These charts indicate that while NZLT2005-07-2 may be a reasonable estimate of mortality for current pensioners (assuming their underlying mortality is somewhere between that of the two groups of NPF Schemes, i.e. the same or only slightly better than population mortality), it clearly underestimates the mortality that can reasonably be expected for those in service.

In actuarial reports there are sometimes comments that the mortality experience is in line with the assumptions. This indicates that the experience of the particular pensioner pool is in fact below that for the general population, in which case we would have to conclude that there is insufficient allowance for future mortality improvements.

The reason for the increase in the NPF results at the older ages is that we extend the standard mortality tables, which stop at age 100, through to age 120. This has a significant effect on the value placed on the pensions of older pensioners.



Other potential approaches to mortality assumptions

A sliding scale against population mortality

More recent work we have done for other clients indicates, not unexpectedly when you think about it, that in fact mortality rates will approach population rates at the older ages, so a sliding scale against a mortality table could be better than a fixed percentage at the oldest ages. This reflects the fact that the lifestyle and health benefits arising from employment will be shared in some way by all those reaching the older ages, and the group will then experience population mortality, as they are the only ones left.

Removal of heavily impaired lives

For example, for an extremely favourable occupation class we recently investigated, experienced mortality was fitted to 50% NZLT2005-07 up to age 89, increasing by 2% each year thereafter (subject to a maximum of 100%). Part of the reason this appears to be such a low factor (50%) is that if a life became disabled, a separate heavily weighted mortality table was applied. However, shouldn't the in-service mortality table for workplace savings schemes also exclude the mortality due to heavily impaired lives?

Next step?

The postcode mortality lottery

Watson Wyatt has released its Postcode Mortality Tool, and an accompanying colour-coded map of occupational pension scheme mortality differentials, to help pension funds and life insurers better understand the mortality of their pensioners. This comes on the back of several years of far more acute analysis of geographical mortality experience by a number of specialist consultants.

The findings show that the probability of death during any one-year period for male pensioners living in parts of Glasgow, Middlesbrough and Liverpool is over two-and-a-half times more likely than for those living in areas such as Christchurch in Dorset or Lymington in Hampshire.

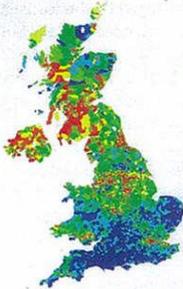
Matthew Edwards, senior consultant at Watson Wyatt, said: "These findings show vividly that postcodes can explain substantial variations in mortality, with the longevity of 65-year old males varying from 17 to 25 years according to their postcode band; a difference in expected future life time of eight years. These variations in life expectancy are due to substantial differences in general health and lifestyle patterns between different parts of the UK. The North-South divide in particular is very striking. We find 'healthy postcode' men expecting to live longer than 'unhealthy postcode' women.

"Understanding the mortality of

pensioners has become increasingly important, especially in the current market where there are a welter of opportunities for pension funds to pass on some of their longevity risk with transactions such as bulk buy-outs, buy-ins and standardised or bespoke longevity hedging instruments."

One wonders where is the cause and where the effect or are the conclusions all useful empirical analysis? Will we one day see estate agents selling properties marked up 'Spacious flat for sale with extensive views and attractively low mortality rating'?

Relative mortality by postcode for male pensioners in the UK
The map aggregates postcode-level results up to the postcode sector level, with red denoting high mortality, blue low mortality. The mortality differential between red and blue is of the order of a factor of two (the probability of death in a red area is twice the probability of death in a blue area), while many individual postcodes within those areas exhibit even more extreme mortality variations.



It was interesting to see the adjacent article in "The Actuary" magazine from the Institute and Faculty of Actuaries (December 2009). It shows that in the UK, Watson Wyatt has managed to use postcode as a predictor of pensioner mortality, showing a difference of up to eight years in life expectation based on the pensioner's post code.

Perhaps something to think about for the future?

5 Discount rates

Generally the discount rates we see are fairly reasonable. In this section we discuss some of the considerations in regards to discount rates for valuations.

Funding valuations

The discount rate, or the relationship between the discount rate and the salary increase assumption, is generally one of the most financially significant assumptions, as such PS2 requires:

“an explanation of how the values for these assumptions were derived. This explanation shall include at least:

- *If the investment earnings assumption is one of the most financially significant assumptions, an explanation of the relationship between the investment earnings assumption and the current investment strategy the scheme, any changes assumed in the future to the investments strategy and the allowances made for each of future investment expenses, administration expenses and taxation”*

While, after investigation, the discount rates almost invariably appear reasonable, we do find that this is an assessment that we make using our professional knowledge and experience and is not always apparent from the information provided. It is an area where we frequently need to ask for additional information to demonstrate that the assumption is reasonable.

IAS19 valuations

In the past, the practice adopted in almost all cases has been to use the 10 year Government Stock rate to discount liabilities. There have been number of problems with this approach:

- As it is the spot rate on a single bond with limited liquidity, it can cause the discount rate to fluctuate more than would be expected if a range of more liquid bonds were available from which to determine the discount rate.
- The weighted term of the liabilities is not necessarily the same as for this one bond.

In July this year, The Treasury issued its paper Methodology for Risk-free Discount Rates and CPI Assumptions for Accounting Valuation Purposes. These rates are required to be used for accounting valuations that are reported to the Government for consolidation purposes and rates are issued as at 30 June, 31 October, 31 December and 28 February. Although rates are not issued at all the dates an organisation may want, the methodology is clearly laid out and easy to reproduce.

Because these rates explicitly consider the longer term risk free rates and consistency with inflation assumptions, they are attractive for other NZ IAS 19 valuations. They have the added advantage as they model risk-free rates over a long term horizon, they are more stable than the single 10 year Government Stock rate and they allow better matching to the term of the liability.

In addition, the Treasury paper discusses a number of contentious issues, including:

- use of a term structure for discount rate, to automatically match the duration of liabilities
- risk premium

Discount rates

- scarcity discount
- adjustments to reflect the liquidity of liabilities
- the differences between Government Stock and bank swap rates
- the approach for durations longer than the longest traded government stock
- common errors such as not annualising half yearly rates.

6 Other valuation assumptions

In this section we discuss some of the other areas where frequently we have to more closely consider the reasonableness of the approach the actuary has taken.

Pension increases

During the tough economic times New Zealand superannuation schemes have experienced over the last five years or so, with investment markets falling significantly and sponsoring employers fighting the effects of the GFC, there has understandably been a reduction in the frequency of discretionary pension increases.

However, we have seen assumptions of no further future pension increases ever in some interesting places, for example, a valuation assuming no future pension increases even though there had been quite generous increases in each of the three inter-valuation years. How is this reasonable?

NZ IAS 19 is very clear that it is not just the benefits that are set out in the terms of the plan which must be valued, but also benefits resulting from any constructive obligation that goes beyond those terms, with a past history of increasing benefits to mitigate the effects of inflation being used as an example of this.

We have not yet seen it, but perhaps a reasonable approach where there has been a history of discretionary pension increases may be to model pension increases returning in some time frame, or some small continuing allowance even though there are no immediate plans to give a more reasonable indication of the likely future costs. No allowance at all can be hard to justify, and can give the appearance of managing liabilities down in the short term.

We have also seen one scheme using a lower discount rate than the investment earning rate, as an explicit allowance for pension increases, i.e. adopting the approach that pension increases would be granted when investment earnings exceeded the valuation discount rate (rather than being linked to inflationary increases).

Administration expenses (past service or future service cost)

The treatment of administration expenses has been another interesting area.

As there is no requirement to allow for administration expenses in NZ IAS 19 valuations, these comments apply only to valuations required under the Superannuation Schemes Act 1998.

Many schemes allow for future administration costs through a reduction in future investment returns. This allocates the cost between past and future service in proportion to the present value of past service benefits and future service benefits.

Occasionally, particularly for schemes in wind-down, an allowance is made another way.

There seems to have been a trend to adopting administration expenses which are a percentage of members' future salaries, even those many of these schemes are closed, with a rapidly falling contributory membership, and pension payments to be made many years into the future. In some cases the percentage adopted has escalated rapidly, to counteract the falling membership and the total allowance for future administration expenses often seems optimistic when the length of time the scheme will need to exist to pay out its pensions is considered.

This approach can also result in the allocation of the cost solely to future service liabilities, and the funding level hence appearing more favourable.

Paragraph 7.6 of PS2 states

“The allowance for future administration expenses may be expressed, for example, a dollar amount per member or a percentage of some other amount, for example future salaries, contributions or assets.”

Because many defined benefit schemes are now winding down, this is an area where actuaries should be giving some thought to the most appropriate methodology.

Retirement ages and commutation options

Frequently early and late retirement factors and commutation option are actuarial neutral on the scheme's valuation basis. However, this neutrality is then often destroyed when moving to a valuation on a risk-free discount rate.

Therefore, for NZ IAS 19 valuations, retirement ages and commutation options are often significant assumptions.

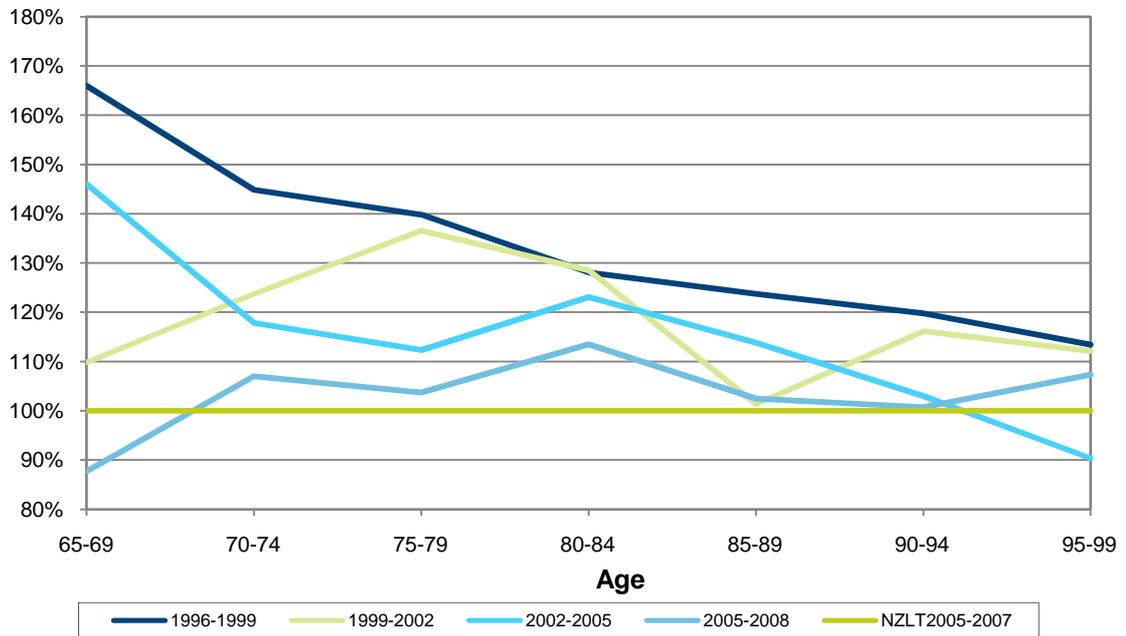
A question we frequently have to go back to scheme actuaries to ask is: how does the experience like compare with their assumptions? Although PS2 only requires the actuary to justify how values were derived for the most financially significant assumptions, we would like to think that the actuary would consider actual experience in setting retirement and commutation assumptions for the triennial valuation. Having considered it, a summary of the information should be easy to include in the report, even if it is simply a statement such as “this assumption is in line with actual experience over the inter-valuation period”.

Appendix A NPF pensioner mortality experience

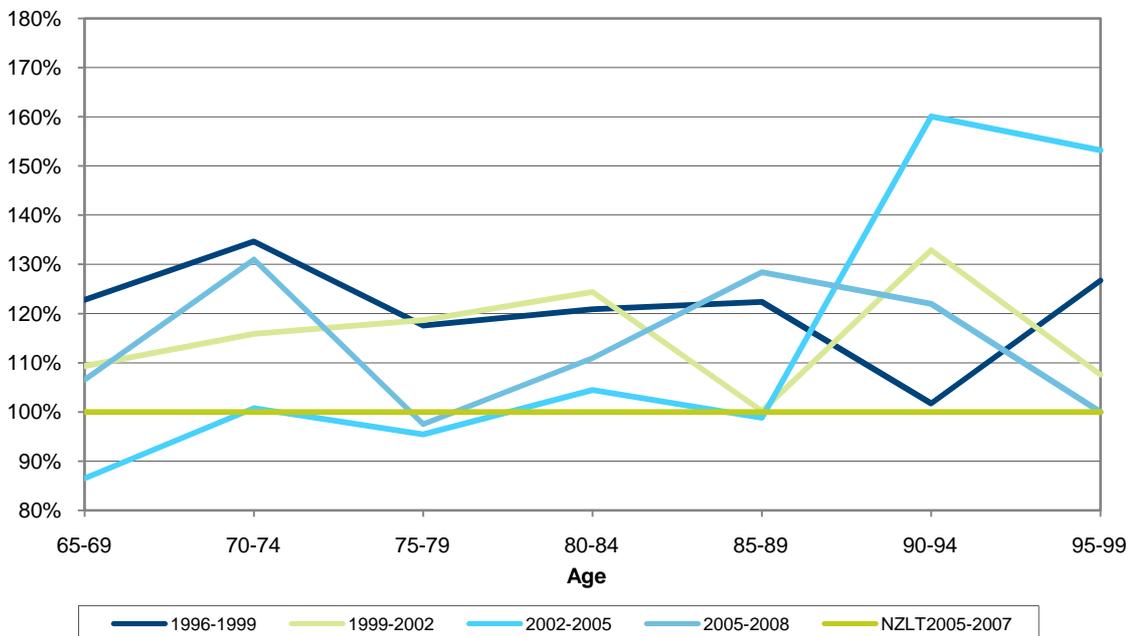
The following charts show the pensioner mortality observed in the NPF Schemes in the last four triennial investigations, in relation to the latest population mortality rates (NZLT2005-2007). The improvement in mortality is shown very clearly for non-DBPA males, by the lines representing the mortality rates reducing over time. Of the four groups, this group has the largest number of deaths (827 in 2005-2008). The other groups do not show the trend as clearly across all age ranges. They had between 466 and 531 deaths in the 2005-2008 period and so there is more uncertainty in the underlying rates. However, even with these, it is clear that there is an overall trend of reducing mortality.

We have shown both male charts on one page, and both female charts on one page, for ease of comparison.

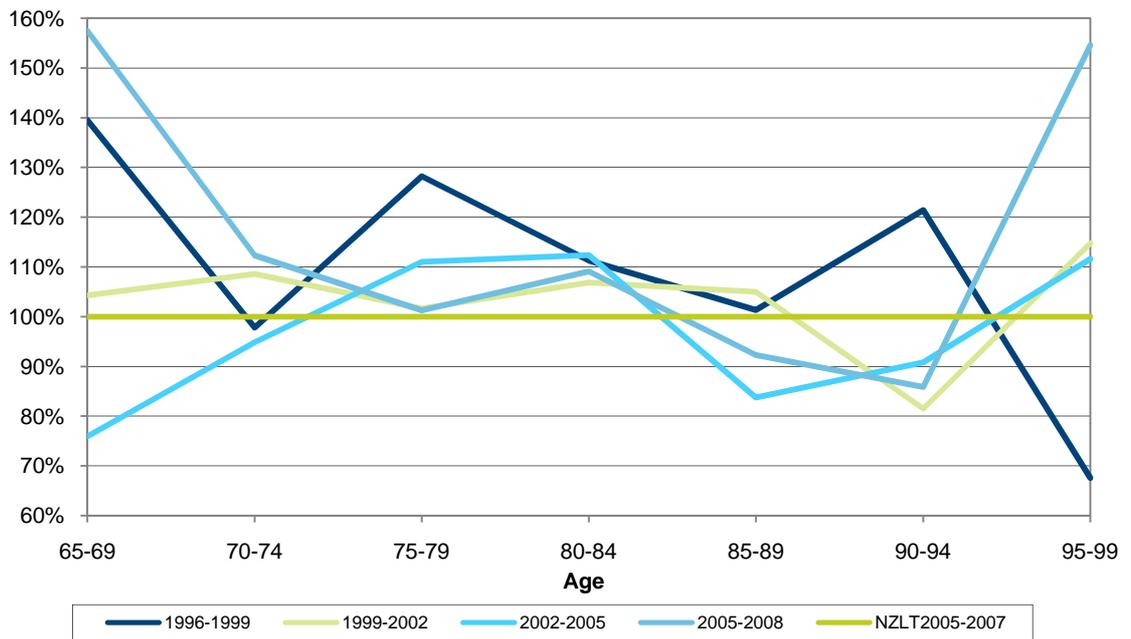
Actual mortality as a percentage of NZLT2005-07 - Non-DBPA males



Actual mortality as a percentage of NZLT2005-07 - DBPA males



Actual mortality as a percentage of NZLT2005-07 - Non-DBPA females



Actual mortality as a percentage of NZLT2005-07 - DBPA Females

