Cambridgeshire County Council Pension Fund

VITAINDEX

Longevity Analytics for Cambridgeshire County Council Pension Fund

July 2012

CLUB VITA

Club Vita LLP

VitaIndex

This VitaIndex report guides you through the diverse longevity history of the first 150 participants who, together, comprise the index in this report. Just like your fund all their data has passed through the VitaCleansing processes on its way into VitaBank.

The VitaIndex has been designed to reveal where your fund sits relative to all members of the index, plus a peer group of similar funds to yours. You are able to look back at the longevity journey you have been on and benchmark your position relative to your peers.

This analysis identifies the unique characteristics of the members of your fund, your demographic "DNA". This, in turn, can be used to calibrate your own set of survival curves, known as VitaCurves, which are tailored to your own demographic patterns.

Your VitaIndex report is updated annually.

	A signpost to help you navigate around VitaIndex
	A rule of thumb, to help you understand, approximately, the importance of particular longevity statistics for the management of your pension fund's liabilities

Foreword

On behalf of the whole Club Vita® team, we have pleasure in presenting the results of our latest research into the longevity patterns of occupational pension funds. We are very grateful for the support of all the funds that are participating in this research.

This VitaIndex report analyses the longevity experience of the combined data of the first 150 funds currently participating in Club Vita. When combined these funds have provided records on some 505,000 deceased pensioners, stretching back to the early 1990s, and in some funds much earlier. The pensioners have contributed some 15.0m years of life to VitaBank.

VitaIndex is a comprehensive study of the subject, but is also personalised to your fund. It compares your own experience with the rest of VitaBank and a peer group of similar funds.

VitaIndex, like most of Club Vita's tools, is primarily intended for trustees and pension managers. It assumes no prior knowledge of the statistical analysis of longevity. We appreciate that it is a long document, but that is a reflection of the many colourful charts that we have included to help tell the story, rather than the number of words. The sections have been presented in what we believe is a logical order for someone new to the subject.

We open with a summary of the key findings. And, to help you dip into sections of VitaIndex, we have included signposts to lead you to related material. Our Rules of Thumb help you understand materiality.

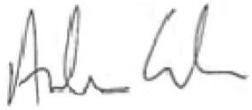
The specialist world of statistical analysis of longevity is full of technical terms. We have sought to avoid using these wherever possible, and where technical terms are used, we have explained them in the jargon buster boxes.

Jargon buster

Longevity describes how long people will live; whilst **mortality** describes how likely it is that someone will die.

VitaIndex highlights the rich diversity of longevity patterns occurring within occupational pension funds, which can be factored into your own valuations of liabilities by adopting your own tailored survival assumptions which we call VitaCurves.

We do hope that you enjoy reading VitaIndex. We are very grateful for any feedback on the content of this report that you may have.


Steven Baxter Andrew Gaches Steven Hood

For and on behalf of Club Vita LLP

25 July 2012

Summary of Key Observations

Your fund

There is a wide variation in life expectancies between funds – the life expectancy of a 65 year old currently varies between 79.4 years and 85.2 years for men and between 83.7 years and 88.8 years for women amongst the funds analysed. Within the Cambridgeshire County Council Pension Fund the life expectancy is currently 83.4 for men, and 86.2 for women[1].

Individual characteristics - we are all different

Every fund has its own 'demographic DNA' which explains why its members have a lower or higher life expectancy than others. The DNA refers to the fund's mix of the following:

- **Normal and ill-health** retirees – a pensioner retiring in normal health can typically expect to survive between 2 and 3½ years longer than a pensioner that retires in ill-health. The effect of retirement health on life expectancy is at the upper end of this range for pensioners that have the best lifestyles and highest levels of affluence.
- **Lifestyle**, or how individuals spend their money outside of work, can lead to considerably different life expectancies – all else being equal, there is a difference of up to 5 years in life expectancy between the least healthy and healthiest lifestyles.
- The effect of wealth, or **affluence** of members on life expectancy, is best measured differently for men and women:
  - For men, the last known salary (revalued to current terms) is generally a better indicator of the effect of affluence on longevity, men with the highest levels of affluence having a life expectancy of up to 2½ years longer than those with the lowest.
  - For women, the effect of affluence on longevity is best predicted by the amount of pension in payment, the effect being smaller than that seen in men.
- **Occupation**, or whether an individual has carried out a 'manual' or 'non-manual' role, accounts for less than 1 year difference in life expectancy for men (and up to 1½ years for women), with 'ex-manual' workers tending to have lower longevity.

Published tables do not fit well...

- The actual mortality experience of the combined dataset was heavier, i.e. a greater proportion of the membership died, than would have been expected based upon (recently) published tables.
- The extra 'unexpected' deaths are not evenly spread across all ages – with more deaths at the youngest and oldest ages. Published tables are therefore a poor fit for the shape of mortality patterns we have observed.
- This is not surprising – we noted above that individuals with different characteristics have different life expectancies. Individuals in occupational pension funds are likely to have different longevity characteristics to individuals in the insurance company data underlying commonly used mortality tables.
- It is important to reflect these differences when assessing the liabilities of your fund. One way to do this is to use tailored 'survival curves' that allow for the specific combinations of longevity characteristics exhibited by your membership. These curves (**VitaCurves™**) are available to subscribers to Club Vita and are introduced in section 10. More detail on the application of the curves to your fund can also be found in your 'Tailoring VitaCurves' report.

[1] Based on your experience within the period 2006-2010

Longevity trends

- Life expectancy has recently been increasing at around two years per decade.
- The rate at which these improvements will continue is unknown – however most published projections relate to analysis of trends in insurance company data or the population as a whole, and represent an average for people with very different longevity characteristics.
- Our analysis of the experience data received during the Club Vita pilot has shown that the historic rates of improvement have been of a different 'strength' and 'shape' to the published projections.
- We believe that it is important to understand the historic trends in life expectancy increases in terms of the longevity characteristics identified earlier. By understanding these trends, along with the prospects for medical advances and lifestyle changes, we believe it is possible to tailor allowances for future improvements to specific funds.
- Inevitably, actual experience will differ from whatever is anticipated. We believe that it is important that all funds **monitor** emerging experience and remain **informed** of the latest developments.

Club Vita LLP

Contents

1 The pool of life

Club Vita aims to provide greater insight into the longevity characteristics in occupational pension schemes by bringing like-minded funds together in a community where longevity experience data is pooled. By combining the data from individual funds a clearer picture of the underlying patterns emerges as we shall see in subsequent sections.

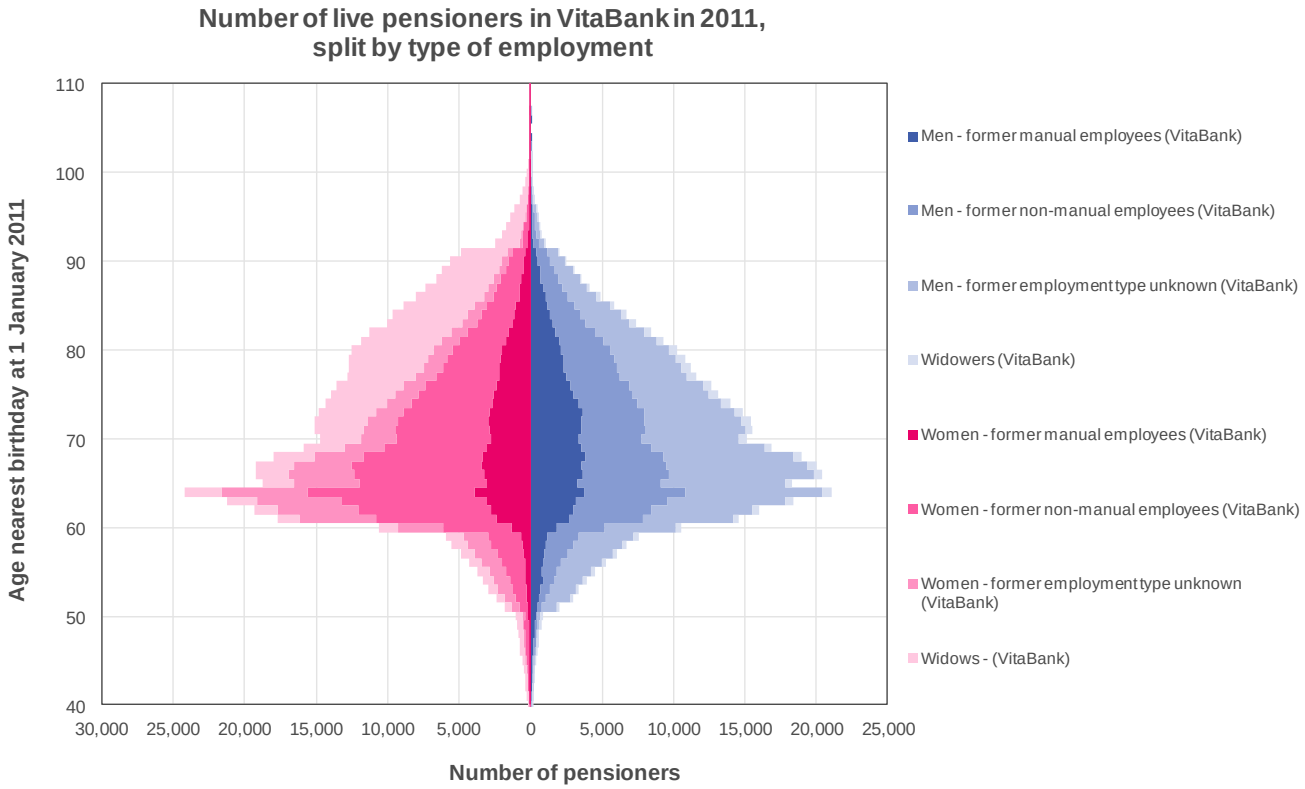
The combined data, known as **VitaBank™**, presented in this report comes from 150 funds, who in total had around 1.4m pensions in payment[2], spread across the UK. The charts in this section illustrate the rich and diverse profile of VitaBank and contrast the data of the Cambridgeshire County Council Pension Fund with it.

More details are provided in Appendices C, D and E for the Cambridgeshire County Council Pension Fund and in Appendices F, G and H for VitaBank as a whole.

1.1 Profile of pensioner membership

Chart 1A – VitaBank, split by type of former occupation

The 'population pyramid' below shows the numbers of pensions in payment at each age in 2011.



The data is grouped according to age and gender and also according to the main types of employee role we are able to identify in the database, namely former manual employees, former non-manual employees and 'unclassifieds'. The 'unclassifieds' are members of pension funds where a manual / non-manual split is not available or members of local authority pension schemes who joined after 1998 after which a manual/officer (i.e. manual/non-manual) classification ceased to apply.

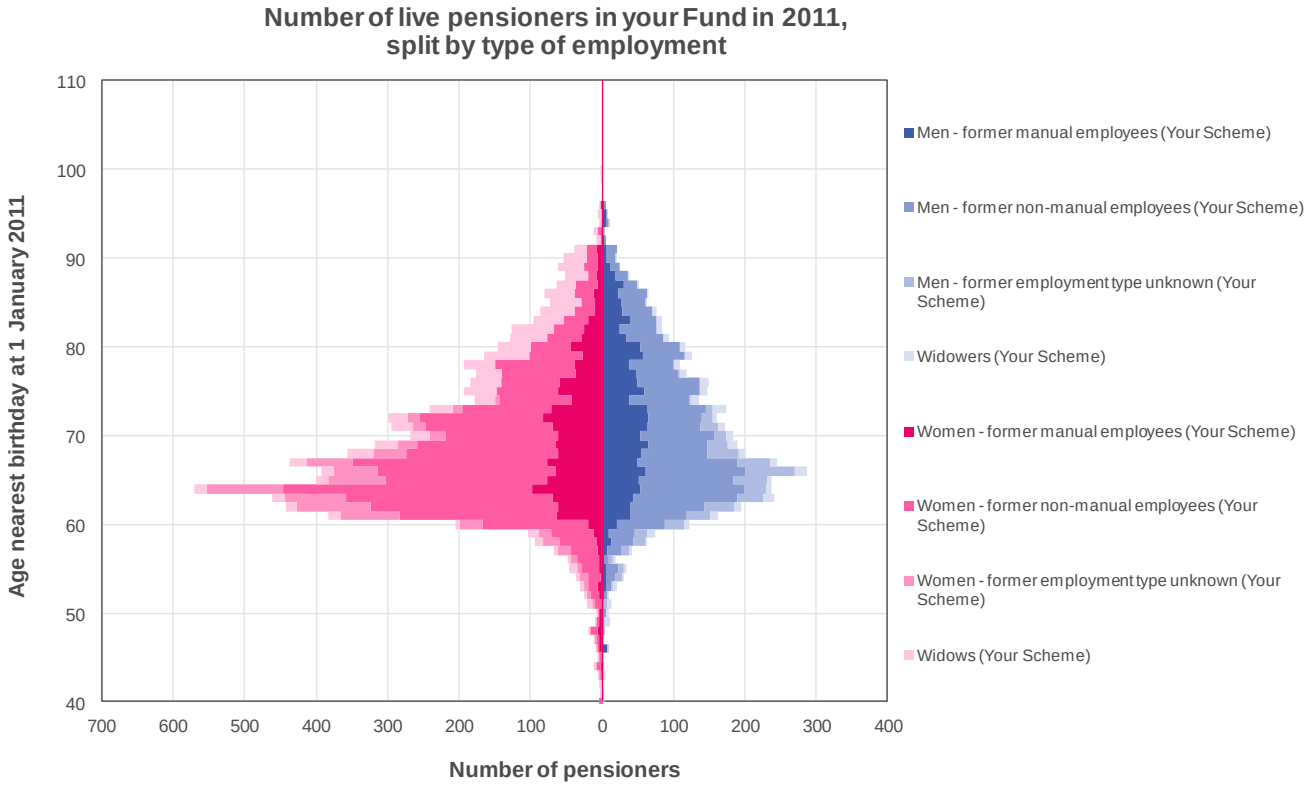
[2] As at the last date each scheme in VitaBank submitted data to Club Vita. As schemes are supplying updated information at different points in time the actual numbers of pensions in payment shown in later charts are slightly lower than this.

It is worth noting the diversity exhibited within the data:

- 47% of the total pensioner population are men and 53% are women.
- 29% of the total female pensioner population are the surviving spouses (widows) of former fund members, compared with just 4% of the male pensioner population.
- 18% of the total pensioner population are former manual employees, 34% former non-manuals and 30% unclassified entrants. The balance is widows and a few widowers.
- There are sharply higher numbers of pensions in payment at younger ages, with a marked reduction at around age 91. We believe that this pattern is explained by the post 1st world war 'baby boomers' and, to a lesser extent, by the liberalising of qualifying conditions in the 1970s.
- The bulge at age 64 may in part be explained by the first post 2nd world war baby boomers.

Chart 1B – Pensioner Profile for Cambridgeshire County Council Pension Fund

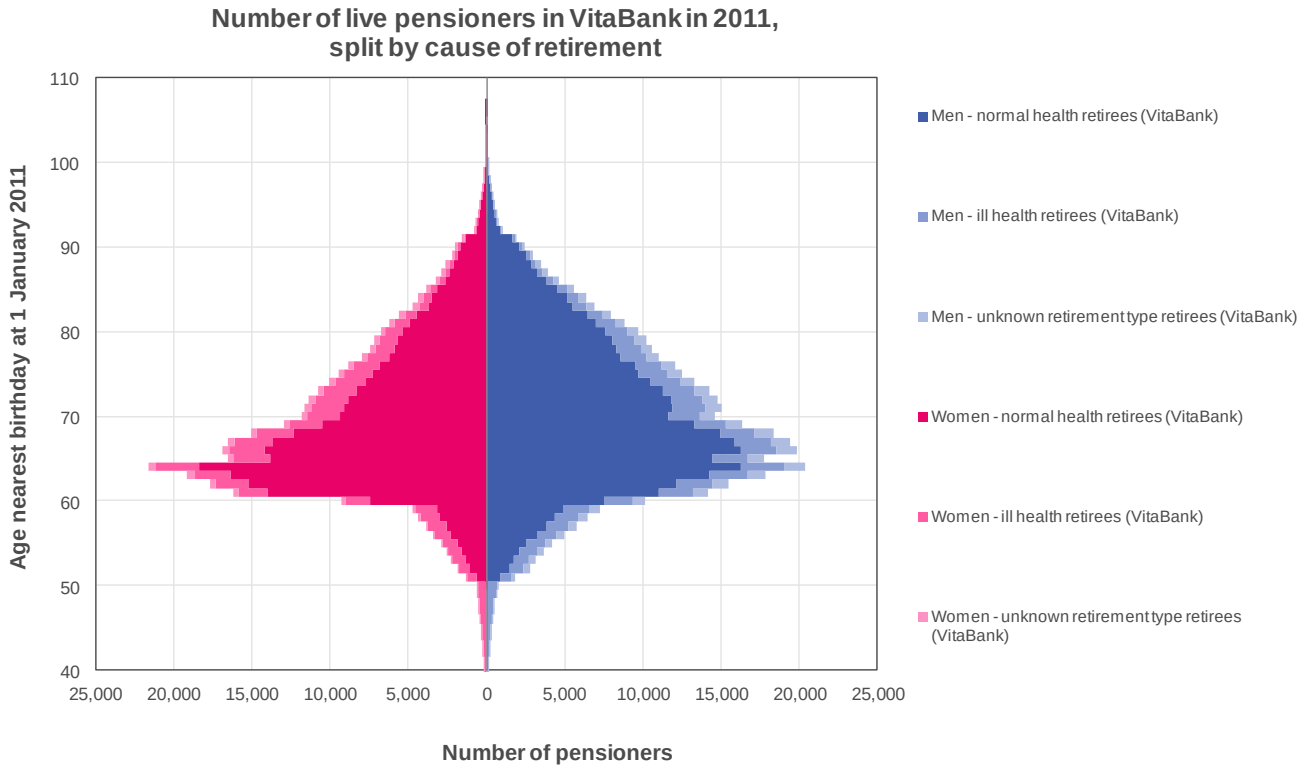
The Cambridgeshire County Council Pension Fund represents 1.0% of the records of live pensioners in VitaBank. The chart below shows the structure of the pensioners of your fund.



Appendix I contains key metrics to compare the structure of your fund to VitaBank and your peer group.

Chart 1C – Retirement type

The population pyramid below also looks at the numbers of pensions in payment in VitaBank, but this time grouped according to whether or not the pensioner took early retirement due to ill-health. Please note that since this chart excludes widow(er)s the number of pensioners included is lower than in Chart 1A.



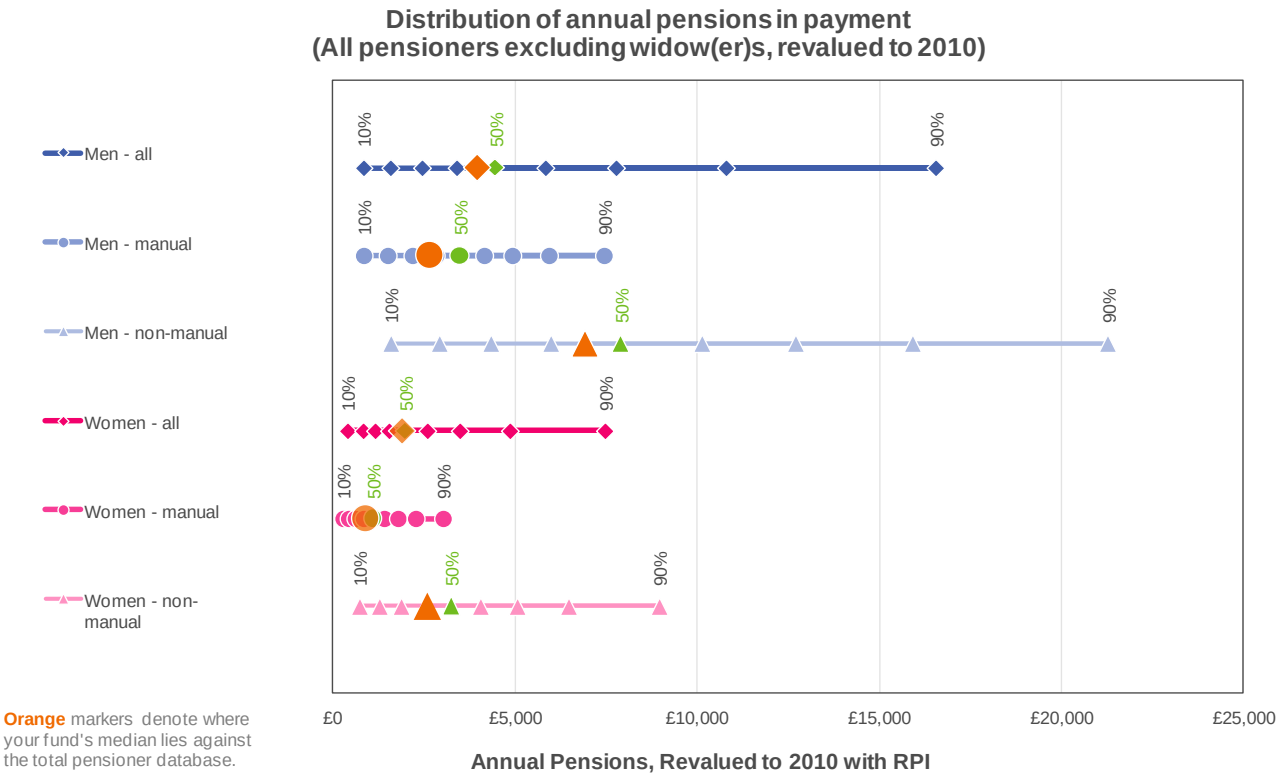
- Within the pooled dataset, 15% of men and 17% of women originally retired early on grounds of ill-health.
- For your fund, 16% of men and 14% of women retired early on grounds of ill-health.
- There is a noticeable decline in the proportion of ill health pensioners at older ages. This may be because ill-health pensioners die (on average) sooner than those in 'normal' health or that the records of pensioners who retired some time ago did not identify ill-health retirements separately. We analyse the mortality of ill health retirees' in more depth in **section 6** of this report.

1.2 Income spread

One of the key things we investigate in this study is how affluence influences mortality rates – in order to do this it is important that we have a mix of members with different income levels. We explore the profile of the data pool in terms of pensions in payment and last known salaries in charts 1D and 1E.

Chart 1D – Spread of pensions in payment

The chart below shows the distribution of annual amounts of pensions in payment by former employee status within the combined dataset.



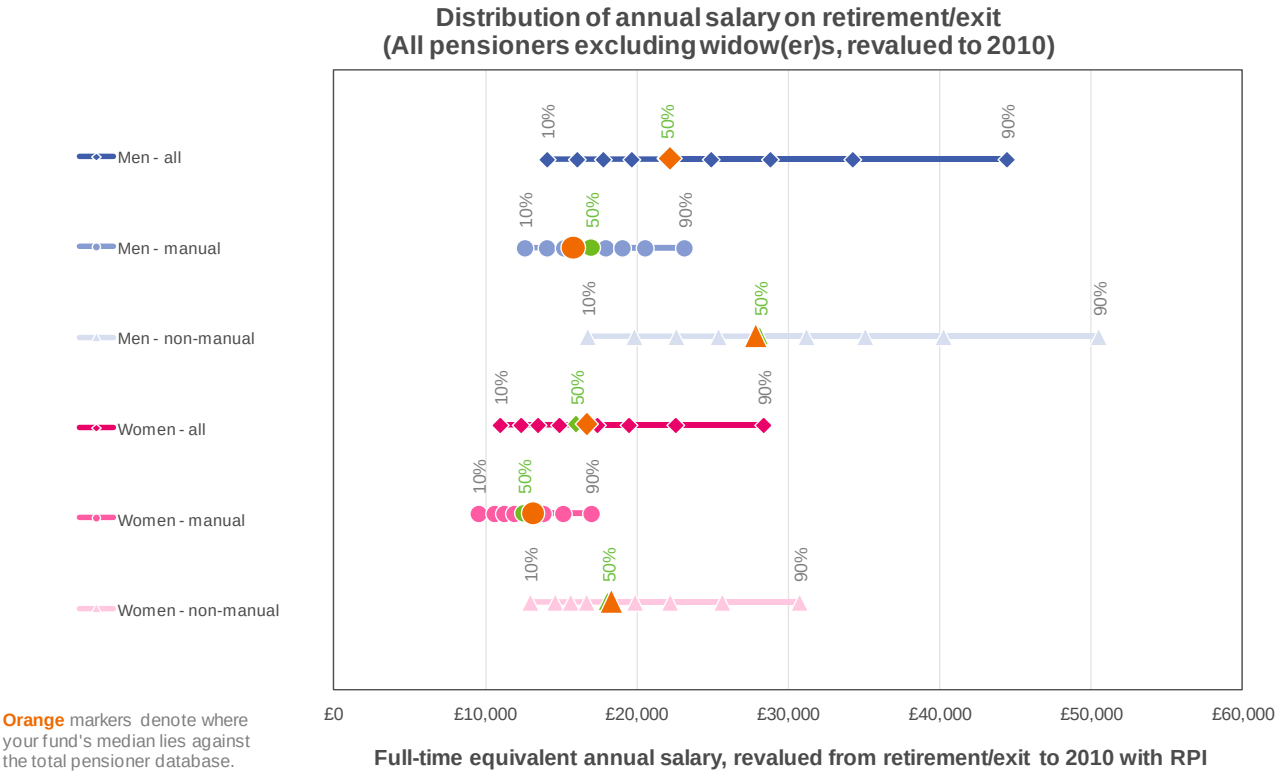
This chart shows:

- the large numbers of small pensions, with larger pensions quite spread out;
- that former non-manual employees typically have larger pensions than former manual employees; and
- the larger pensions of men compared to women.

Chart 1E – Spread of salaries at retirement / exit

Virtually all the pensions in payment amongst those funds participating in the pilot of Club Vita are final salary pensions. This means that the pensions are a function of an individual's salary at retirement (or earlier exit) and length of service. Most of the participants in the study (including your fund) have been able to supply us with details of these last known salaries.

The chart below shows the distribution of annual salary at retirement/exit from active service for people whose pensions are currently in payment. Since these pensioners will have left active service / retired at different times we have revalued the figures to current terms in line with the Retail Prices Index (RPI). For part-timers, the figures shown are the full-time equivalent rates of pay.



- Compared to the amounts of pension (Chart 1D), there is less difference between men and women. This suggests that the dominant reason for women having smaller pensions than men is their shorter lengths of service.

The variation between former non-manual employees is greater than among former manual employees. Also former non-manual employees typically have higher salaries than manual employees which is consistent with the higher pensions seen in Chart 1D.

- The orange markers indicate that your male pensioners' median salary was higher than VitaBank for men and was higher for women.
- We return to pensions in payment and salaries at retirement/exit in **section 7** where we consider whether more affluent individuals have lower death rates and so typically live longer.

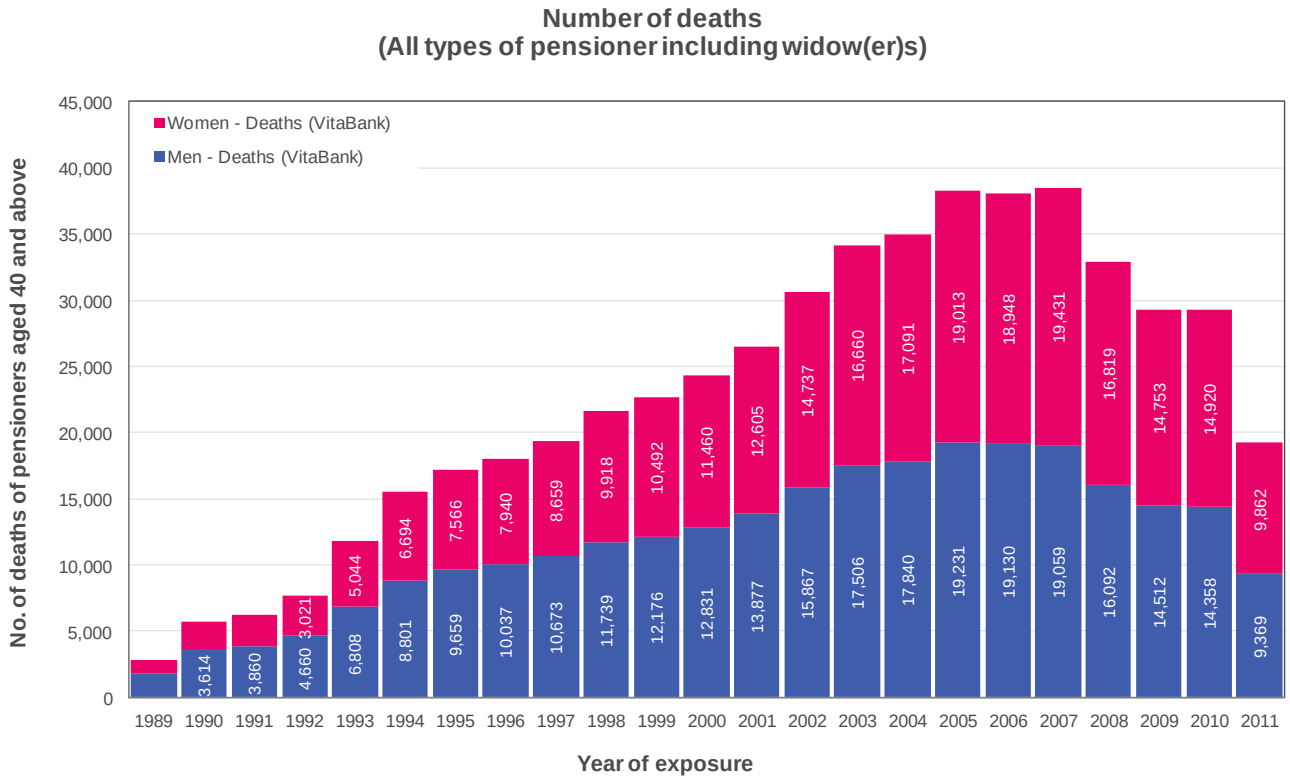
2 The rich history of VitaBank

2.1 Completeness of death records

Each fund's data is captured in VitaBank from the first date that we believe complete records of all deaths have been retained, with reliable dates of death. In your case this date is 1 January 1993 - more information on which can be found in the **VitaCleansing™** report.

Chart 2A – Deaths over time

The total number of useable records on deceased members is 505,000. The number of pensioner deaths in VitaBank increased rapidly over the 1990s, as shown in the chart below.



The chart shows that historically, certainly prior to 1993, very few funds retained member details following their death. The chart also illustrates that as it became less expensive to retain this data, and there was a realisation that information on member deaths was useful, the retention of member details following death became much higher.

The last few years of the chart capture both the maturing of pension funds (for funds that have been closed for some time there is no longer a steady flow of new pensioners coming through) and the fact that the funds participating in Club Vita submit their data throughout the calendar year, so it is likely that the data we hold relates to part years only.

2.2 Comparing like with like

You can tell little from looking solely at the numbers of deaths over time, since a rise may be the result of more pensioners retiring, the existing pensioners getting older, or a combination of the two.

But, by calculating death rates, you can allow for shifts in the population. To work out death rates, you also need to count the number of live pensioners, who, in the brutal language of demographics, are known as the 'exposed to risk'.

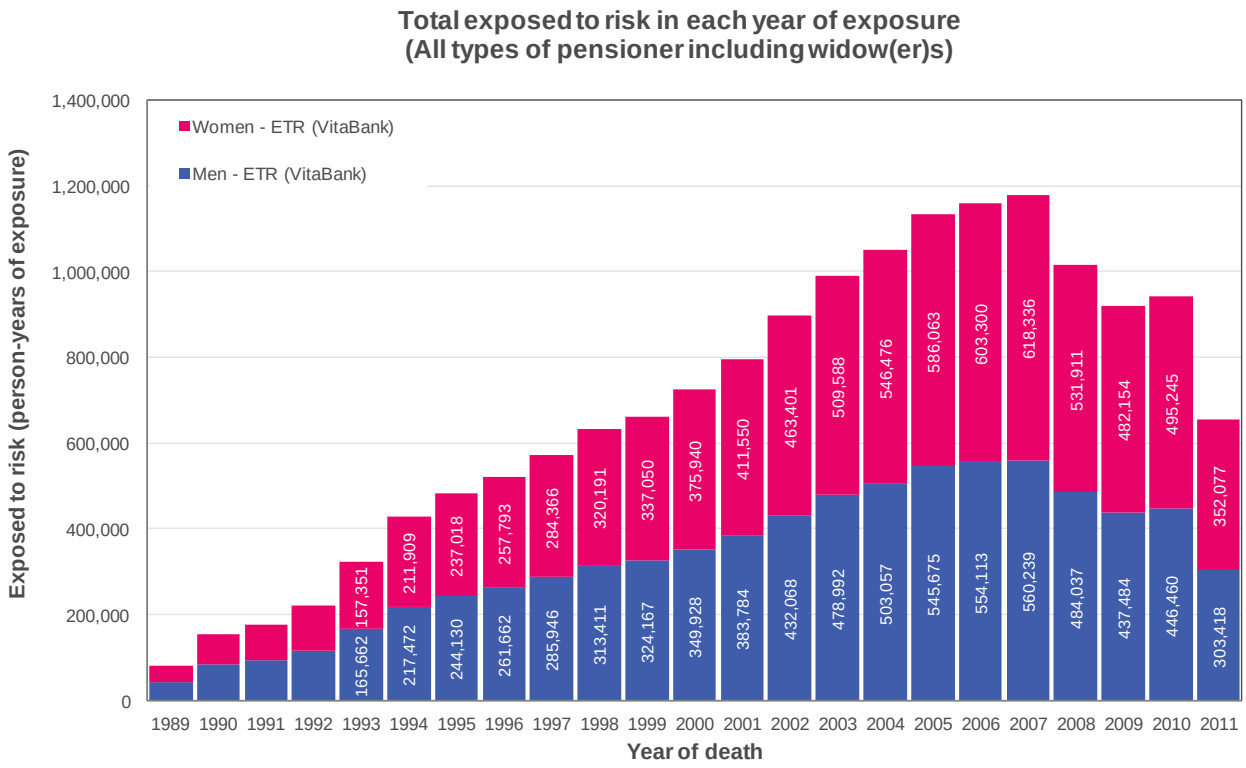
Jargon buster

The **exposed to risk (ETR)** is a count of the number of individuals who were alive at some point during the calendar year, and so were 'exposed' to the 'risk' that they might not survive to see the new year. Individuals who join the pensioner population part way through the year are counted for the part of the year they were present – for example an individual who retires on 1 July 2007 contributes six months to the count for 2007.

Throughout this report we use **initial exposed to risk** whereby someone who is alive at the start of the year contributes a full year to the exposed to risk, even if they die during the year[3].

The chart below shows the number of pensioner-years of 'exposed to risk' falling in each calendar year split between men and women.

Chart 2B – Exposed to risk



The chart shows:

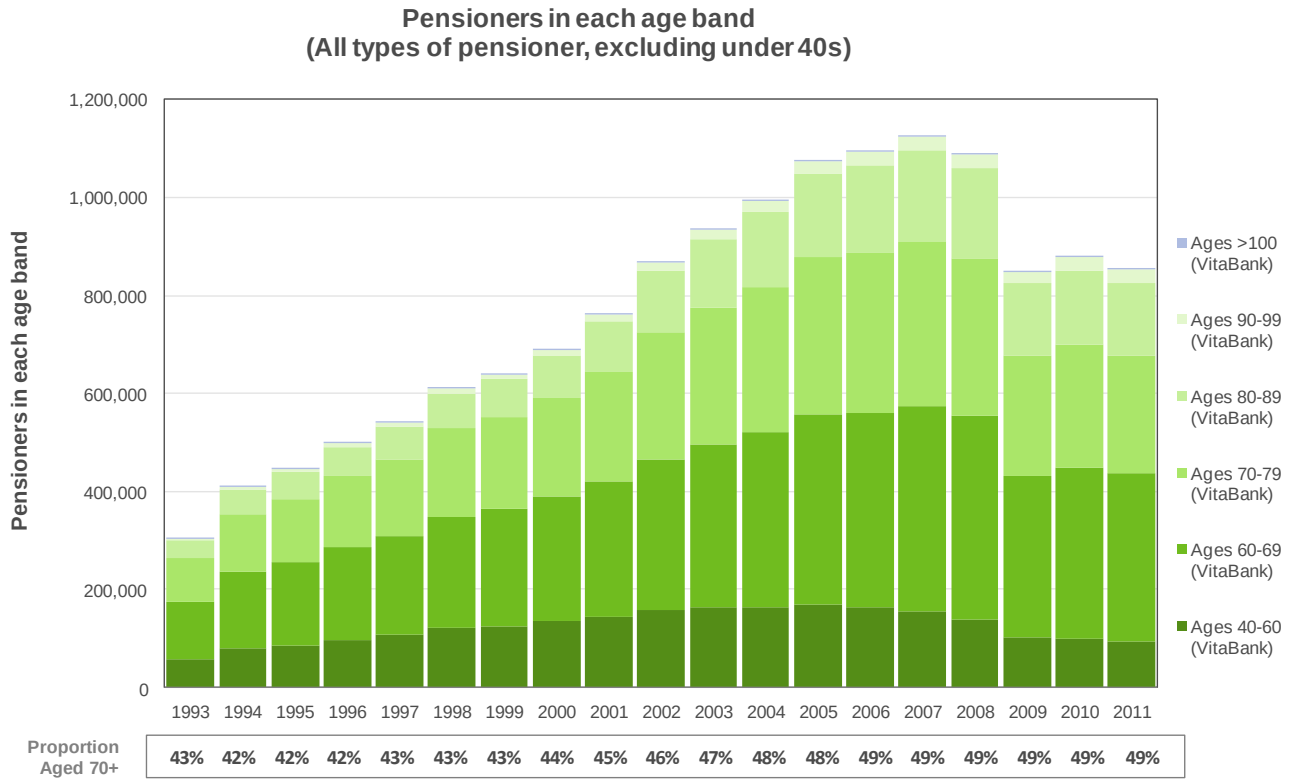
[3] Technically, some individuals leave during some years. These members only contribute the part of the year up until the benefit ceases.

- The male pensioner population has grown steadily, at an average rate of 9% a year since 1993. This is partly due to the number of new retirees exceeding the number of deaths, and partly because of new funds entering VitaBank during that period.
- The female pensioner population has grown more rapidly, at an average rate of 10% a year over the same period. We believe that this is largely due to the reduction in the qualifying service requirements and the acceptance of part-time employees into many pension funds in the early 1990s which are now filtering through into the pensioner population.
- The number of 'live' pensioners who have been observed in each of the years since 1993 is considerable and enables us to see the trends in longevity amongst members of occupational pension funds. This is a key benefit of having pooled your data with that of other funds and is explored further in **sections 11 and 12**.

2.3 A history of ages

In order to be able to carry out meaningful analysis of mortality rates, and how these have changed over time, it is important that the data spans the full range of older ages. We consider this in Chart 2C which shows the number of pensioners in each year from 1993 to 2011 grouped into 10 year age bands.

Chart 2C – The Golden Oldies



It is pleasing to see that we have a healthy number of 'old' pensioners (those aged 70+) to make our analyses statistically meaningful. When we look at pensioner longevity risk, the mortality rates in which we are most interested are those of pensioners who have reached their 'three score year and ten' – this is because the likelihood of death at ages prior to 70 is relatively modest.

The proportion of pensioners aged 70 or over has risen from 43% in 1993 to some 49% today.

Rule of Thumb

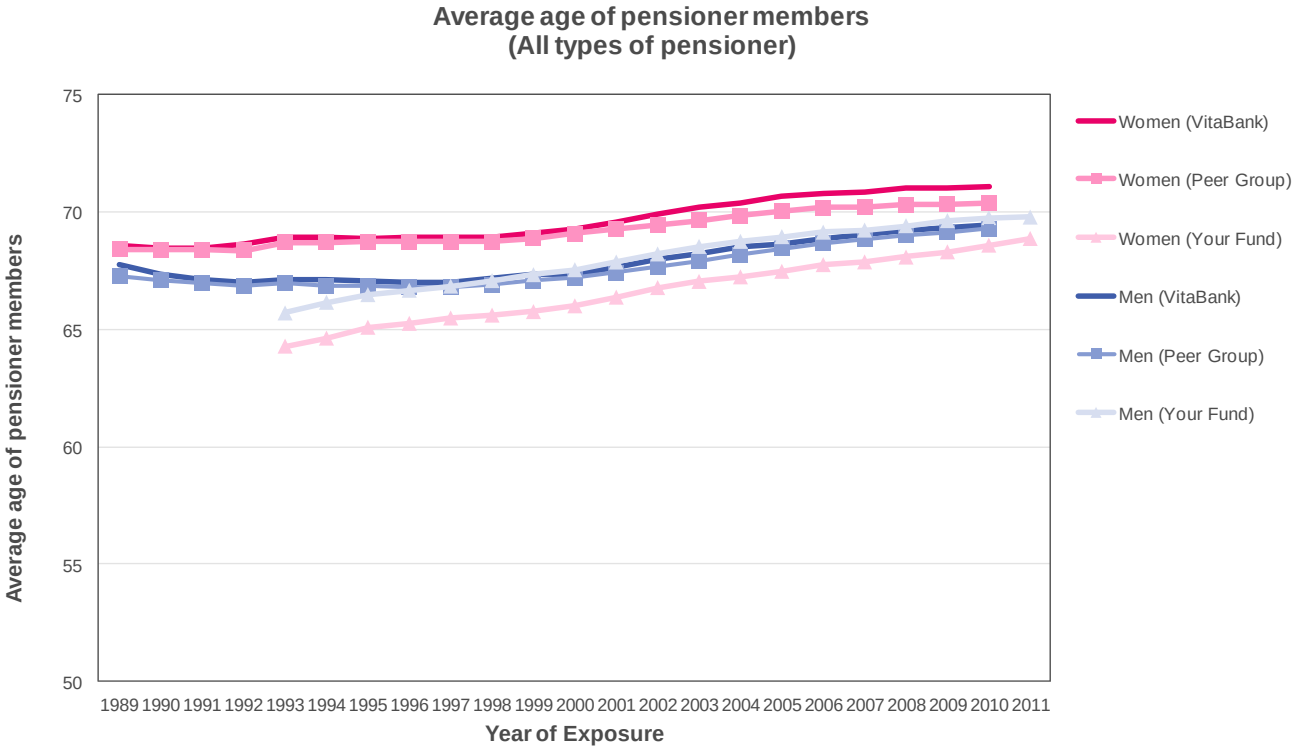
Mortality rates at ages below 70 are typically less than 2% p.a. - in other words someone aged below 70 has a less than 1 in 50 chance of dying within the next year.

Further, 9 out of every 10 normal health retirees at age 60 can typically expect to reach their 70th birthday.

There is also a good number of particularly long-lived pensioners aged over 100 – a total of 825 members, of whom 2 are in the Cambridgeshire County Council Pension Fund. (Please see your **VitaCleansing™** report for more information on the 'oldest old' in your fund, and the process by which we verify these records.)

Chart 2D – Ageing pensioners

This chart looks at the average age of pensioners in each year from 1989 to 2011. Please note that since pensioners aged below 40 have been excluded from the analysis, the average ages shown in this chart are higher than the average ages within your entire pensioner population (with which you may be familiar from other analyses).



Within the pooled data the average pensioner ages have risen over the 21 years to 2010, from age 67.8 for men and 68.6 for women in 1989 to ages 69.5 and 71.1 respectively.

The equivalent numbers for the Cambridgeshire County Council Pension Fund, other LGPS Schemes and within VitaBank as a whole are shown in the following table.

	Average age of pensioners			
	Men		Women	
	1993	2010	1993	2010
Cambridgeshire County Council Pension Fund	65.7	69.8	64.3	68.6
LGPS Schemes	67.0	69.3	68.7	70.4
VitaBank (all funds)	67.1	69.5	68.9	71.1

- The increase is only partially a result of improving longevity: much of the increase is simply due to a maturation of the pension fund i.e. as pension funds 'grow up' (or mature) so the pensioners are distributed across both the young ages of new retirees and the older ages of 'established' pensioners.
- The relatively youthful nature of the pensioners both within VitaBank and within your fund means that we would expect the average age of pensioners to gradually rise as the pensioner populations matures
- Appendix E provides a breakdown of the average ages of in-force pensioners by retirement type for the Cambridgeshire County Council Pension Fund, whilst Appendix H provides the breakdown for VitaBank as a whole.

3 Why pooling is valuable

3.1 Known knowns and known unknowns

When making longevity assumptions for the members of your fund there are two key elements:

Recent mortality rates

In principle these are measurable from the numbers dying in recent years – although as we shall see in this section a large volume of data is needed before we can really be certain about these rates. These also vary considerably from one group of individuals to another – as we shall explore in sections 6 through to 9.

In the memorable language of Donald Rumsfeld, these are the *'known knowns'* – the element of the longevity assumption which in principle is known and so the most objective part of the longevity assumption; or in the less catchy language of the Pensions Regulator this is **baseline mortality**.

We hope that sections 6 through to 9 will be helpful to you when discussing an appropriate baseline mortality assumption.

To see how recent tables published by the CMI compare to the experience of **VitaBank™** please consult **section 4**.

For more information on which factors influence how long people live for, and so which factors you may wish to consider allowing for in setting baseline mortality, please see **sections 6-9**.

In **section 10** we describe how **VitaCurves™** offer one way in which members of Club Vita can allow for these factors in setting the baseline mortality.

Future changes in mortality rates

We know that mortality rates, and so life expectancies, will change in the future – but in which direction? And by how much? In the context of UK pension funds this is a multi-billion pound question – no one knows the right answer, and so this represents (in Rumsfeld speak) the *'known unknowns'*.

In the language of the Pensions Regulator these are **mortality improvements**. In order to project future changes in longevity it is important to have a good understanding of recent changes. We provide analysis of the improvements seen within the occupational pension funds participating in this study in sections 11 and 12. We believe that this is the first time that longevity improvements within occupational pension schemes have been analysed in such depth.

To see analysis of the rates of improvement observed within **VitaBank™** please see **section 11.**

For a comparison of these improvements with the projections which the Pensions Regulator previously proposed could be used as a trigger for those funds submitting Recovery Plans under The Occupational Pension Schemes (Scheme Funding) Regulations 2005 please see **section 12.**

3.2 Death is 'fuzzy'

For individual funds it can be very difficult to draw conclusions from recent experience – even for large funds such as yours.

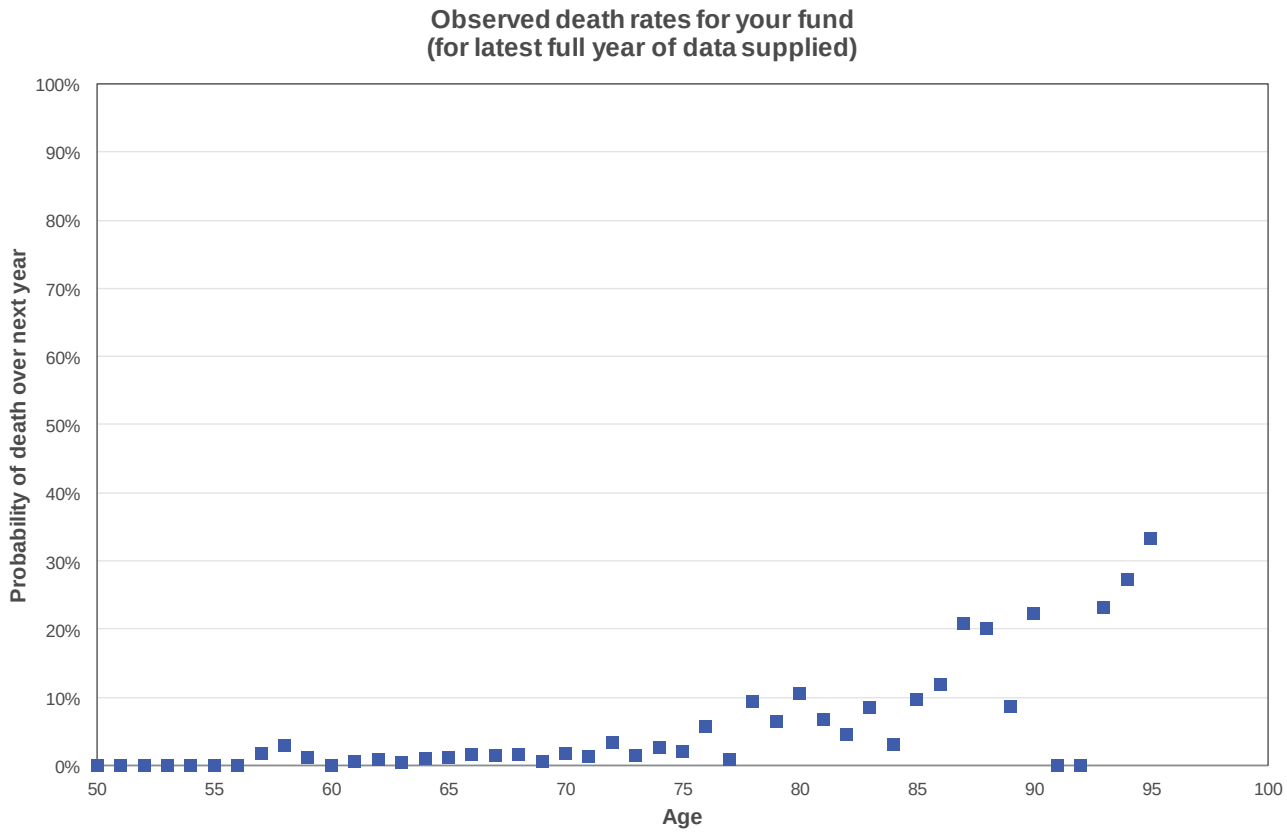
Chart 3A – Crude death rates (men)

For example it is possible to analyse the 'crude' death rates experienced at different ages, in an effort to work out what proportion of people might reasonably be expected to survive to their next birthday, or more morbidly what proportion died at each age (the death rate). It would be usual (as a minimum) to look at the pattern separately for men and women.

Jargon buster

The **crude death rate** is the number of deaths in each year divided by the number of individuals alive (known as the **exposed to risk** – see earlier) in that year. The calculations in this report have been done separately for men and women and at each individual age, for each calendar year.

In the chart below we see the pattern of death rates by age for your fund in 2010.

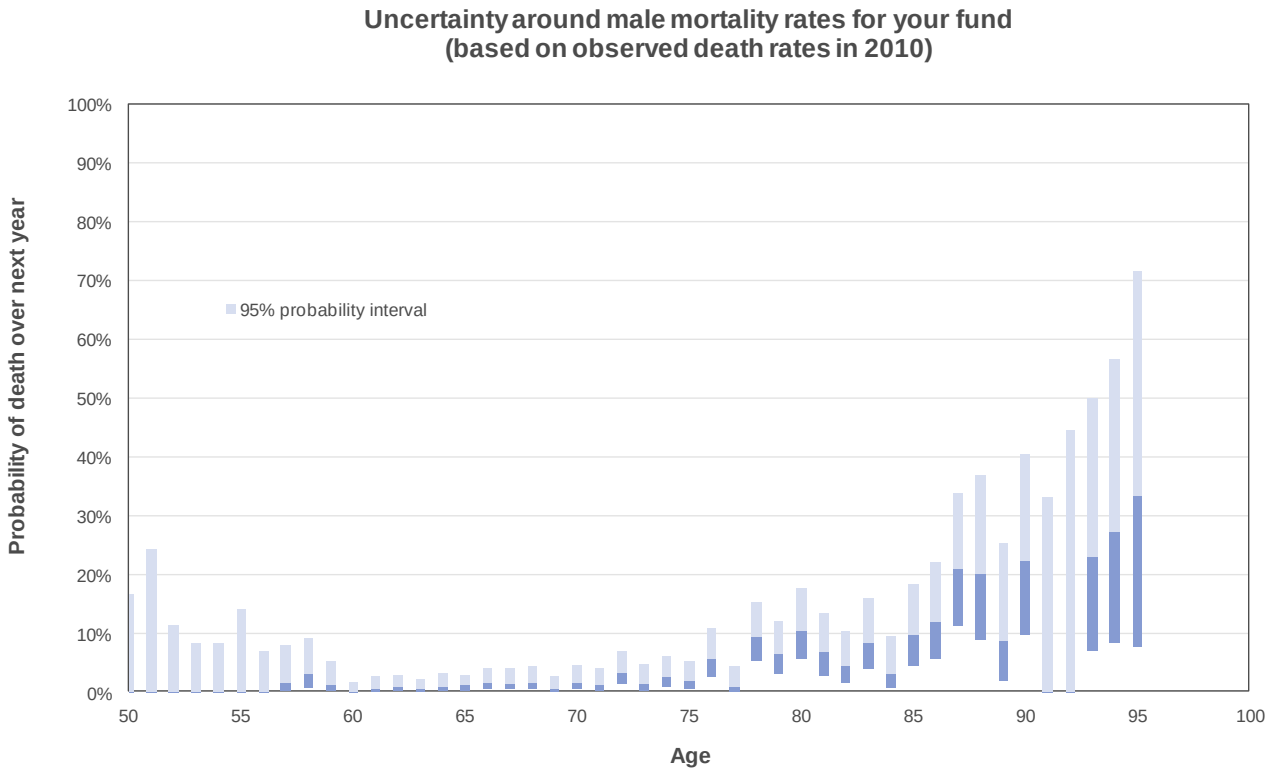


- The actual death rates are 'spiky' – there is a general pattern that the death rates are lower at younger ages, and not unsurprisingly, tend to increase with age.
- The challenge is to work out what the underlying 'pattern' is – i.e. how to draw a gradually increasing curve through, or between, the points.

- For example we might typically **expect** 5 in every 100 individuals aged 75 to die before their 76th birthdays – but if we have 100 people aged 75 there is a very good chance we will see fewer than 5, or more than 5 die.

Chart 3B – A 'best guess' at mortality rates

The 'spikiness' identified above makes it difficult to say with certainty what proportion of individuals might, at each age, reasonably be expected to survive, or die during, the next year. For example for your fund, all we can actually say is that the 'true' death rates are likely[4] to be somewhere in the blue bars (i.e. all except one in twenty ages the 'true' mortality rates pass through the bar) and that the deeper the colour blue the more likely it is that the true rate lies in that part of the bar. Note that at some ages the bars may be missing – this occurs where your fund has no members of those ages alive in 2010 and so we are unable to draw any conclusions about the death rates at those ages in 2010.



- Whilst we have some certainty at those ages where there are lots of pensioners and widow(er)s (i.e. the younger ages) the uncertainty as to the true mortality rates generally increases with age.
- Since it is at the older ages (75+) where pension liability values are typically most sensitive to the mortality rates assumed, the uncertainty we see above is particularly unhelpful.

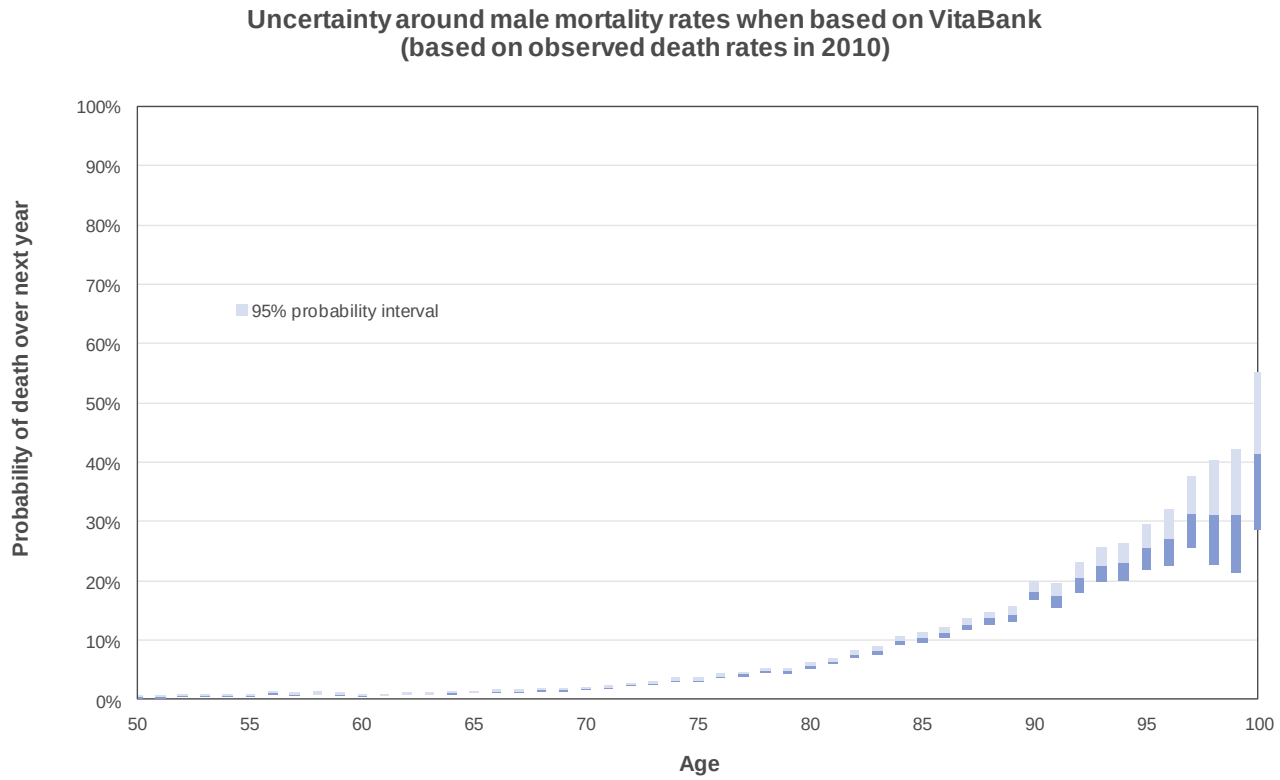
[4] For the technical reader: the shaded blue bars are 95% beta-binomial Bayesian probability intervals for the 'true' average mortality rate at each age in light of the observed crude death rates.

3.3 Lifting the fog on longevity

One way to remove some of the uncertainty seen above is to pool data over a number of calendar years – however for small funds in particular this often requires a large number of years before the noise is reduced. An alternative to this is pooling the data across a large number of funds – as done in Club Vita.

Chart 3C – Clarity in numbers

The chart below shows the comparable chart to 3B – but for VitaBank as a whole in 2010.



- The blue bars are now considerably shorter – this shows how much more certain we can be about the 'true' mortality rates when working with data spanning 442,000 male pensioners in 2010, as opposed to the 4,700 male pensioners alive in the Cambridgeshire County Council Pension Fund in 2010. These figures exclude pensioners aged under 50.
- It remains a little difficult to draw a nice smooth curve through the bars above – this reflects the fact that the mix of people differs at each age i.e. each bar is based on lots of people with different longevity characteristics and so chances of dying.
- Because of the large amount of data obtained by pooling we can start to look at smaller groups of individuals, and identify with confidence the mortality rates experienced by such groups. (We explore this in sections 6-9, and the more complex statistical methods we have used to identify the underlying patterns are outlined in Appendix B.)

Benefits of pooling

There are several benefits of pooling:

- Greater clarity of current mortality rates (see section 5 for further information)
- Ability to delve beneath the surface and find out:
  - Which individuals tend to live longer than others (see sections 6-9 for further information)
  - How the patterns in mortality have been changing over time for different groups of individuals

The Cambridgeshire County Council Pension Fund represents just 1.0% of the pensioner membership in VitaBank. By pooling the fund's membership data with that of other occupational pension schemes a clearer picture of the factors influencing longevity becomes apparent. Consequently the bulk of this report focuses on analysis of VitaBank rather than the fund itself.

4 VitaBank experience and 'off the shelf' tables

In this section we contrast the actual number of deaths observed in VitaBank with the number we would have expected had deaths occurred in line with the 'off the shelf' tables widely used in placing a value on pension fund liabilities. The ratio of these two numbers is known as the A/E ratio is shown as a dark orange line in each chart in this section.

Jargon buster

The **A/E ratio** is the *actual* number of individuals who died divided by the number of deaths which would have been *expected*, had experience been in line with a particular mortality table. An A/E ratio of 1.0 suggests that the *overall* number of deaths have been in line with expectations.

The first three charts (4A, 4B and 4C) in this section show data from VitaBank from 1993 to 2010. In Charts 4A and 4C the A/E ratio for your fund is also shown as a lighter orange line.

In calculating the expected deaths we have chosen to focus on the CMI's "92" series and "00" series of mortality tables – introductions to which are included in sections 4.1 and 4.2. We have chosen these tables as they are some of the most recently published series of "off the shelf" tables (i.e. widely available tables). New tables have been published as part of the CMI's SAPS study and have been approved for use by the Actuarial Profession.

Since funds contribute data at different dates across the year, not all the funds will have provided data for 2011. This means that the ratio of actual to expected deaths in 2011 may change when we receive this extra data. Consequently Charts 4A, 4B and 4C may not show A/E line for VitaBank for the most recent calendar year(s) until sufficient data has been submitted, and some of the A/E values may be indicated as being provisional by using the dotted line.

Rule of Thumb

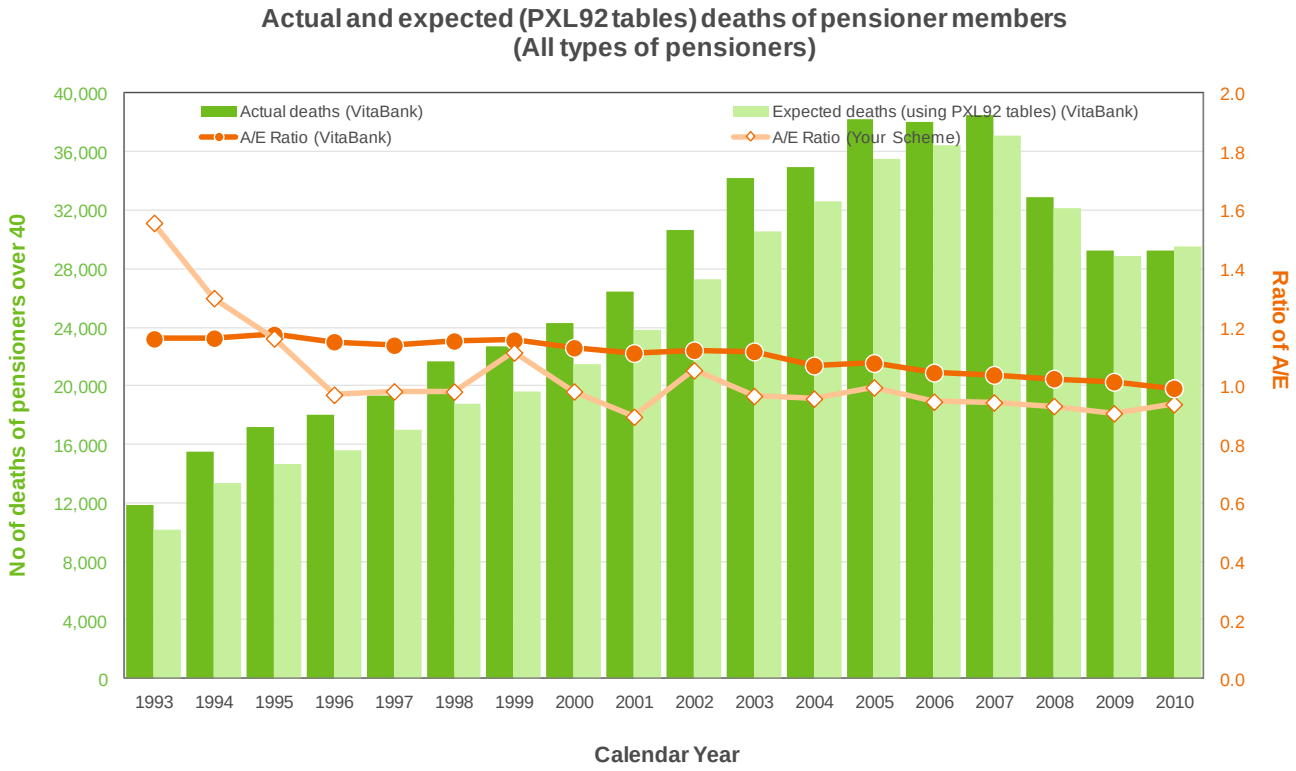
When looking at the charts in this section you might find it useful to know that a fall of 0.1 in the A/E ratio is equivalent to an increase in life expectancy of approximately 1 year.

4.1 Comparison with the '92' series tables – with improvements since 1992

One particular set of 'off the shelf' tables currently used by many pension funds is the '92' series of tables. These tables were published in 1998 and reflected the experience of insured pension arrangements between 1991 and 1994. The publication of these tables was accompanied by a set of 'improvements' as a means of allowing for falling mortality rates since 1992.

Chart 4A – Numbers dying over time

The chart below considers the actual numbers of deaths (dark green bars) in each year from 1993 to 2010 compared with the number of deaths expected based on the CMI's '92' series tables PML92 and PFL92 (the light green bars). These tables have been projected to the relevant calendar year using the CMI's original '92' series projections – with no supplementary adjustment for the short, medium or long 'cohort effect'. (We return to describe the cohort effect in Section 12 where we consider whether VitaBank's experience shows a 'cohort effect'.)



- The graph shows that the actual numbers of deaths and the expected numbers on the '92' series tables over the whole period from 1993 to 2010 have risen. As noted in section 2 this is partly due to the amount of useable data in VitaBank growing, and partly due to the maturation of pension funds.
- However, what we are really interested in is the relative heights of the green bars. This is measured by the A/E ratio which is shown by the dark orange line and is plotted against the right-hand axis. Notably, the actual numbers of deaths have reduced relative to the expected numbers of deaths, from an A/E ratio of almost 1.16 in 1993 down to 0.99 in 2010.
- The A/E ratio has been more volatile for your fund (light orange line).
- This suggests that the rate of longevity improvement of the combined pensioner population has been faster than was predicted by the '92' series projections. This conclusion is not surprising - the same feature has been widely experienced across other pensioner populations, which is why the CMI issued its interim cohort projections in 2002 and has since carried out extensive research into more sophisticated methods of projecting longevity improvement.

Chart 4B – Amounts of pension ceasing

The chart below shows the actual amounts of pension ceasing on pensioner death in each year from 1993 to 2010 compared with the expected amounts of pension ceasing using the same tables as used in Chart 4A. As in Chart 4A, these tables have been projected to the relevant calendar year using the CMI's original '92' series projections – with no allowance for the 'cohort effect'.

The analysis here uses the CMI's 'lives' tables rather than the 'amounts' tables (PMA92 and PFA92) so that the A/E ratios are directly comparable to those in Chart 4A.

The orange A/E line follows a similar path to that in Chart 4A, albeit at a slightly lower level. This suggests lower death rates amongst those with bigger pensions.

Lives or Amounts?

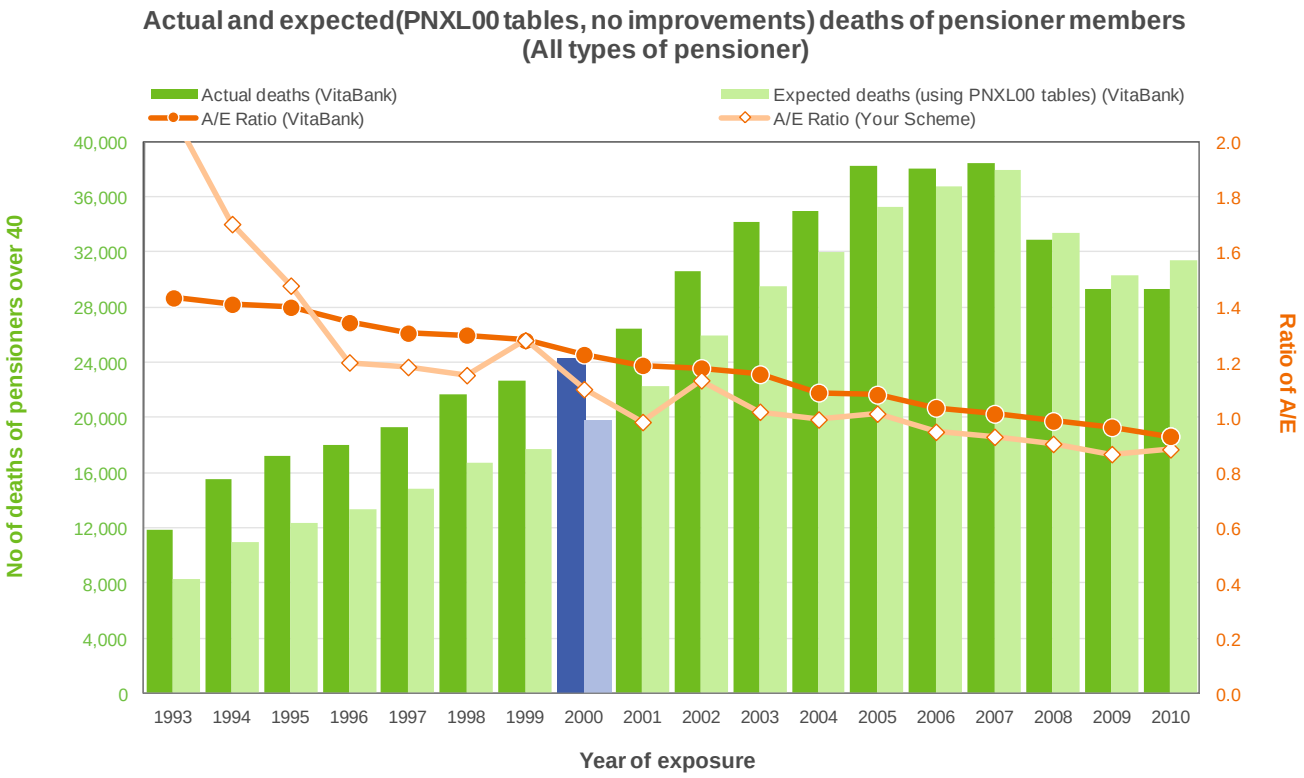
Throughout the rest of this report we will consider actual numbers of deaths over time compared to the expected number, rather than considering the amounts of pensions ceasing. This is because we will separately analyse the impact of affluence in **section 7** where we identify more powerful longevity differentiators than amount of pension.

4.2 Comparisons with the '00' series tables - no improvements

In 2006 the CMI published a new series of 'off the shelf' tables, known as the '00' series – these were also based upon the experience of insured pension arrangements – but between 1999 and 2002. Owing to ongoing research into methods for projecting mortality – and the belief that no single answer is 'right' – these tables were published without any recommended method for allowing for the passage of time since 2000.

Chart 4C – Numbers dying over time

In the chart below the expected numbers of deaths are based on the CMI's '00' series of tables, but this time with no improvement. The focus ought to be on the data around year 2000, which is the central year the tables relate to.



- For virtually all of this period the actual deaths in VitaBank exceeded the expected deaths. In the 'pivotal' year of 2000, the A/E ratio for the pool as a whole was 1.23 (meaning 23% more deaths than expected).
- The difference between 1993 and 2010 is stark, with the A/E ratio falling by roughly 35%.

4.3 Fit by Age Group

In practice it would be usual to adjust published tables to reflect the differences seen in the charts above, for example 'scaling' the 'off the shelf' tables. This can be done by applying an age rating (eg treating your members as being one year older than the off-the-shelf tables) or by multiplying by a scaling factor, of say 110%. For funds that are large enough, these adjustments can be applied so that the A/E ratio is approximately 1.0 i.e. so that the overall number of deaths equals the number expected under the adjusted table.

But, the approach of adjusting an 'off the shelf' table only works if:

1 There is sufficient data to calculate the adjustments reliably – whilst this maybe the case for very large funds or studies such as Vita, it is more difficult for individual funds owing to the uncertainty in mortality rates identified in section 3.

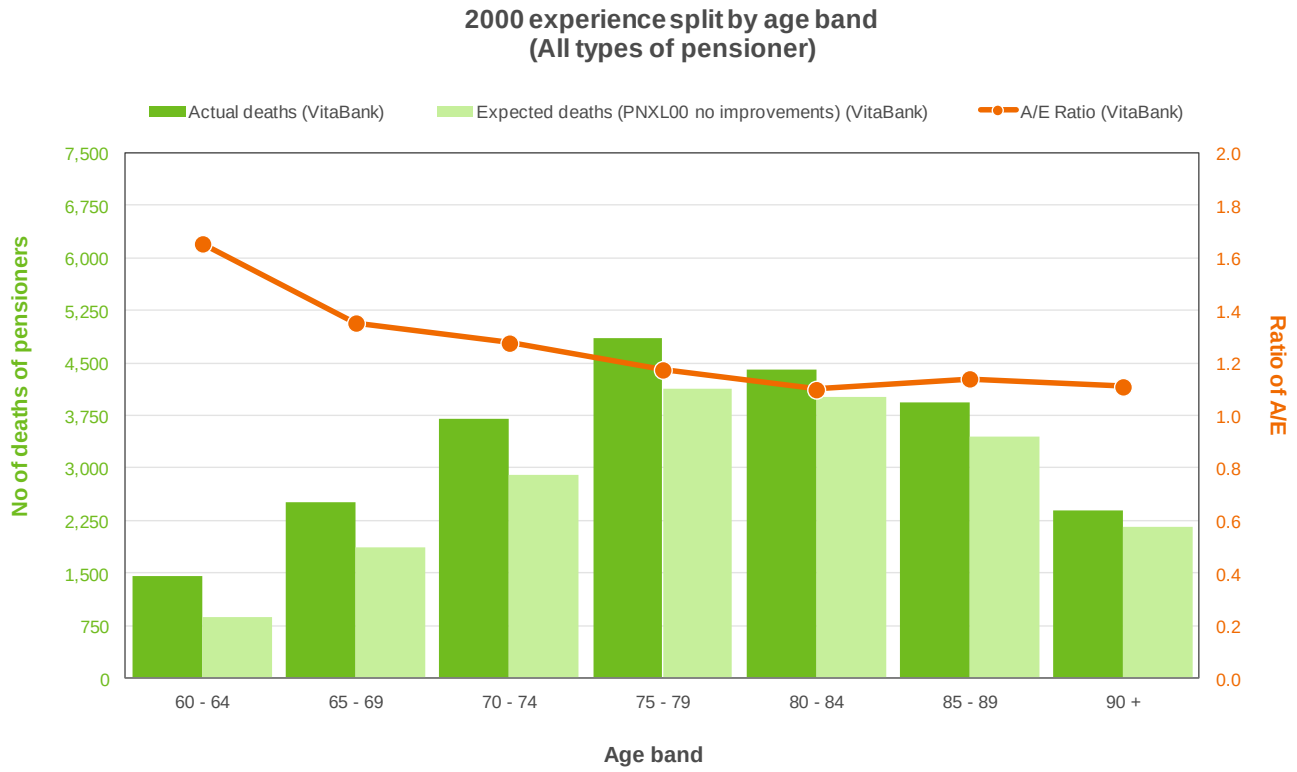
2 The 'off the shelf' table appropriately captures how mortality varies with age and other individual characteristics such as affluence.

Mortality rates tend to increase with age – i.e. all else being equal an 80 year old is more likely to die within the next year than a 60 year old. Mortality tables try to capture the 'shape' of how the chance of dying changes with

age. However just as an 'off the peg' suit will be a poor fit for many people's body shapes, so the shape of an 'off the shelf' table can be a poor fit for the shape of deaths with age for many funds.

The chart below illustrates this - to help show the patterns, we have aggregated the data into 5 year age bands for this analysis and compared the actual deaths for 2000 against the expected deaths arising from the CMI "00" series of mortality tables (with no improvement).

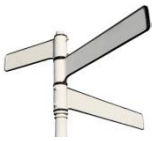
Chart 4D – Poor fit, especially at youngest ages



The downward sloping dark orange line suggests that the '00' series rates were too light at the younger ages, but better from age 75 onwards, probably because of ill-health retirements which are much more common in some funds than others. This tells us that using a simple average of how many more deaths occurred than were anticipated to adjust 'off the shelf' tables will provide a poor fit.

4.4 Tailor made tables

We have seen above that the 'off the shelf' tables available from the CMI do not provide a good fit to the profile of deaths within VitaBank as a whole. Further, as we shall see in sections 6-9, mortality rates differ markedly depending on a number of characteristics such as income and lifestyle factors for which there are currently no 'off the shelf' tables. One solution is to adopt tables that are tailored to the characteristics of your membership profile. As a subscriber to Club Vita you have access to such tailored tables – which we refer to as **VitaCurves™** - included in your membership. We return to this in **section 10**.



The tables published by the CMI represent a poor fit by age to the overall level of experience we have observed within occupational pension schemes.

We explore how the experience varies between funds in **section 5.**

We identify the underlying characteristics of individuals which lead to the differences in experience in **sections 6-9.**

We illustrate how you can use tables which allow for these differences in **section 10.**

5 Every fund is different

5.1 Who lives longest – you, your peers or everyone else?

This section looks at the extent to which life expectancies are different in the individual funds participating in Club Vita.

Jargon buster

Life expectancy is the average length of time an individual can expect to live. Life expectancy can either be expressed as **future life expectancy** (for example 20 years for someone currently aged 65) or as **total life expectancy** (for example 85 for someone currently aged 65). In this report we use total life expectancies.

The chart overleaf plots the life expectancy for men against women, with each fund[5] identified by a single marker. These 'period' life expectancies represent the lifespans that would be expected if mortality rates observed over the last five years were repeated in future[6] - this makes no allowance for future improvements.

Jargon buster

When looking at life expectancies it is important to know whether they include any allowance for future changes in longevity. **Period life expectancies** are based on mortality rates experienced for one particular period, whilst **cohort life expectancies** are determined using projected death rates for one particular generation and so assume some future change (usually reduction) in the chances of dying at each age. Throughout this report we use period life expectancies.

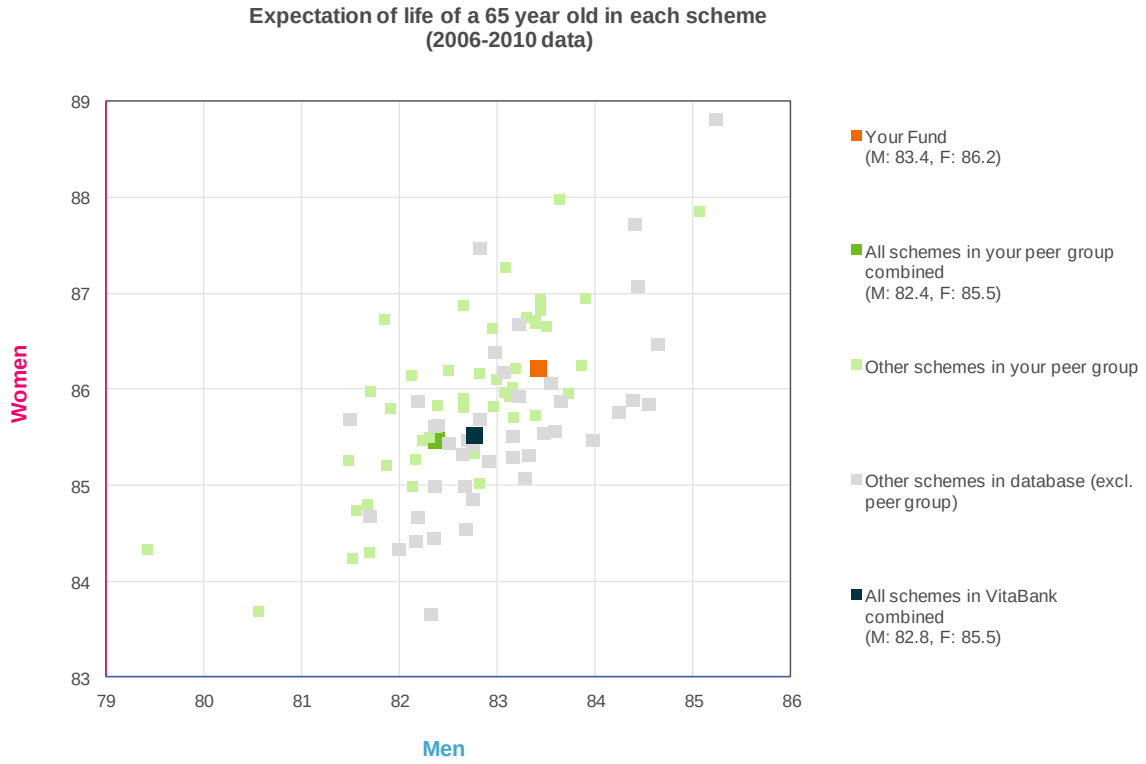
In calculating the life expectancies we have included the information relating to widow(er)s as this provides insight into mortality rates at the oldest ages, where, as seen in Chart 1A there is considerable volumes of data in relation to widows in particular.

We have highlighted your fund so that you are able to compare your experience against that of other funds in the database and in particular your peer group of other LGPS Schemes - which are highlighted in green.

[5] Please be aware that markers are not shown for all schemes in the dataset as those with less than 1000 years of exposed to risk over the period 2006-2010 are likely to be subject to too much random variation for the marker to be meaningful. Immature schemes (i.e. those with no or very few individuals at the older ages (85+) have also been excluded.

[6] To avoid problems with the sparseness of data at extreme old ages for some schemes the mortality rates have been calculated in five year age bands and at the oldest age bands VitaBank's average data is used where schemes have insufficient data to use their own crude death rates.

Chart 5A – Variations in life expectancy



If men and women demonstrate the same mortality patterns in each fund then within this chart we would observe a diagonal line. It is therefore encouraging to see that the funds appear to follow a diagonal suggesting that men and women exhibit similar mortality patterns in each fund. Some of the funds which appear off of the diagonal may be due to distortions caused by relatively small bodies of data, or differences between the male and female populations in those funds in terms of the other key longevity differentiators we identify in sections 6, 7 and 8.

You, your peers and everyone else

The gap between highest and lowest appears considerable: from 79.4 to 85.2 for men and from 83.7 to 88.8 for women within the database as a whole. In particular:

- Within LGPS Schemes there is a range of life expectancies of between 79.4 and 85.1 for men and between 83.7 and 88.0 for women.
- Within your peer group the average life expectancy is 82.4 for men and 85.5 for women. For both men and women this is similar to the average life expectancies for VitaBank.
- The life expectancies within your fund are 83.4 for men and 86.2 for women. For both men and women this is greater than the life expectancies seen for other LGPS Schemes and for the combined data in VitaBank.

Every year costs 3%

Rule of Thumb

To put these differences into context a broad 'rule of thumb' is that **every one year increase** in life expectancy from age 65 equates, in current economic conditions, to approximately **3% extra** on the value of a fund's liabilities.

The exact impact depends on the nature of the pension promise (e.g. level of pension increases and survivor benefits), along with the financial assumptions used in assessing the liabilities and the profile of the membership.

If every pension fund within the database (or simply within your peer group) had an identical benefit structure then Chart 5A suggests that the difference in the value placed on the liabilities due to differences in **current life expectancy alone** would be approximately:

- 15% between the funds with the highest and lowest life expectancies in VitaBank.
- 14% between the Funds with the highest and lowest life expectancies in your peer group (LGPS Schemes)

Please note that the above figures represent a 'rule of thumb' only and should not be relied upon for any other purposes. For an assessment of the impact of one year of increased life expectancy on the liabilities of your fund you should contact your actuarial advisor.

5.2 Why do different funds have different life expectancies

Every fund is made up of a variety of individuals each of whom will have different characteristics for example health, lifestyle etc... As such it is perhaps not surprising that individual funds' memberships have quite different average life expectancies. In **sections 6-9** we see that there is information available to pension fund trustees which can help them identify which members are likely to live longer (or shorter) lives than others, and so allow for this in their funding assumptions.

Before we proceed though it is useful to introduce the notion of a fund's demographic DNA.

Your demographic DNA

Your fund's **demographic DNA** can be considered to be the 'DNA' of your fund in terms of its longevity characteristics.

Just as every individual is unique in terms of his or her DNA, every fund is a unique collection of individuals, each of whom will have very different characteristics which will define their longevity prospects. Your fund's demographic DNA considers the fund's membership profile in terms of the concentrations (or sparcity) of particular characteristics, such as the number of (former) manual workers, earnings profile and lifestyle indicators, each of which, as we shall see in sections 6-9, are crucial to understanding why your members tend to live longer than average amongst your peers.

Club Vita LLP

We identify the underlying characteristics of individuals which lead to the differences in experience seen above in **sections 6-9.**

We illustrate how you can use tables which allow for these differences in **section 10.**

We verify that the variation in experience between funds is consistent with the differences in the membership profiles of the funds in **Appendix A**.

6 Which fund members live the longest?

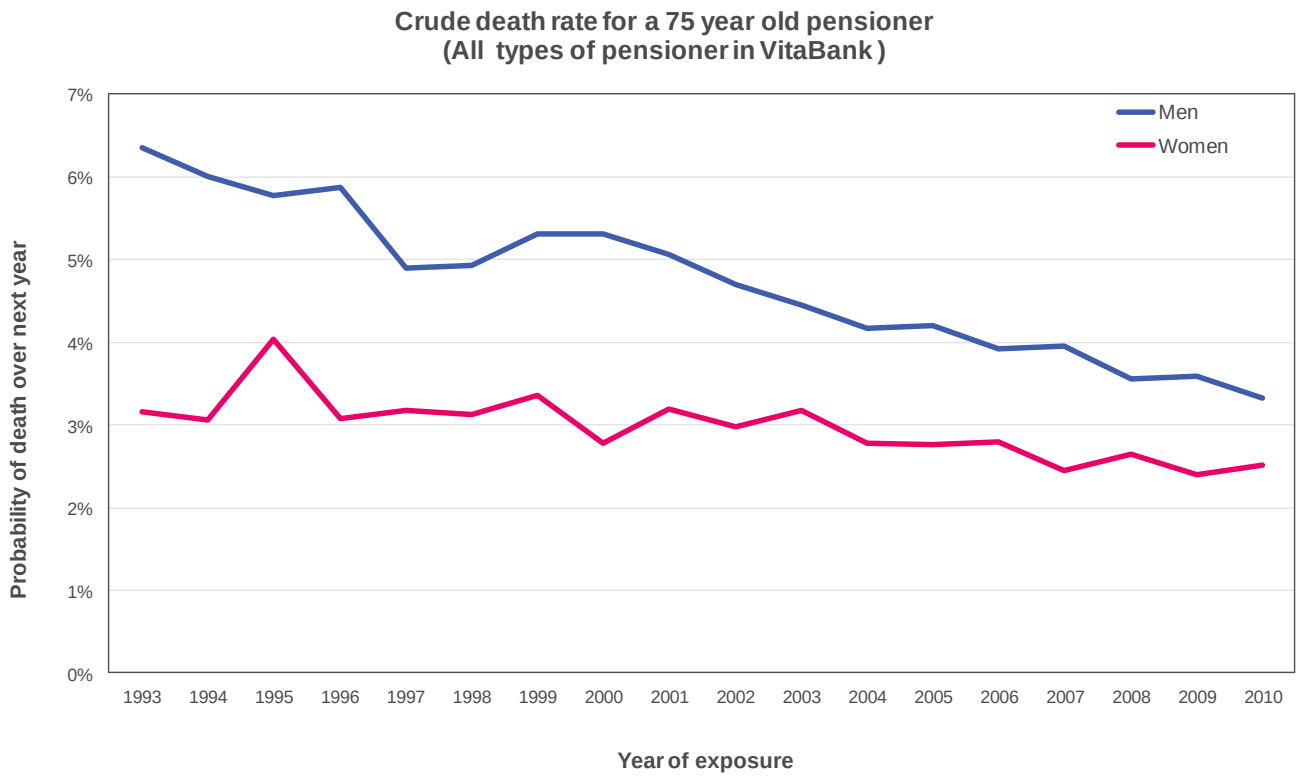
In order to understand why different funds exhibit different life expectancies we need to understand more about why the different members of those funds may have different life expectancies, and how your fund differs from others in terms of its **demographic DNA** (i.e. the makeup of your membership in terms of these different characteristics).

The charts in this section reveal patterns in crude death rates over time and between groups of members, at some sample ages. By limiting the figures to a single age we eliminate the variations due to age seen in earlier sections, but it does mean that the figures are more volatile as there is less data. This approach is intended to be used as a pointer to look at particular features in more detail.

6.1 The difference between men and women

Chart 6A – Crude death rates (men and women)

The crude death rates from 1993 to 2010 are plotted below for men and women at a sample age of 75.



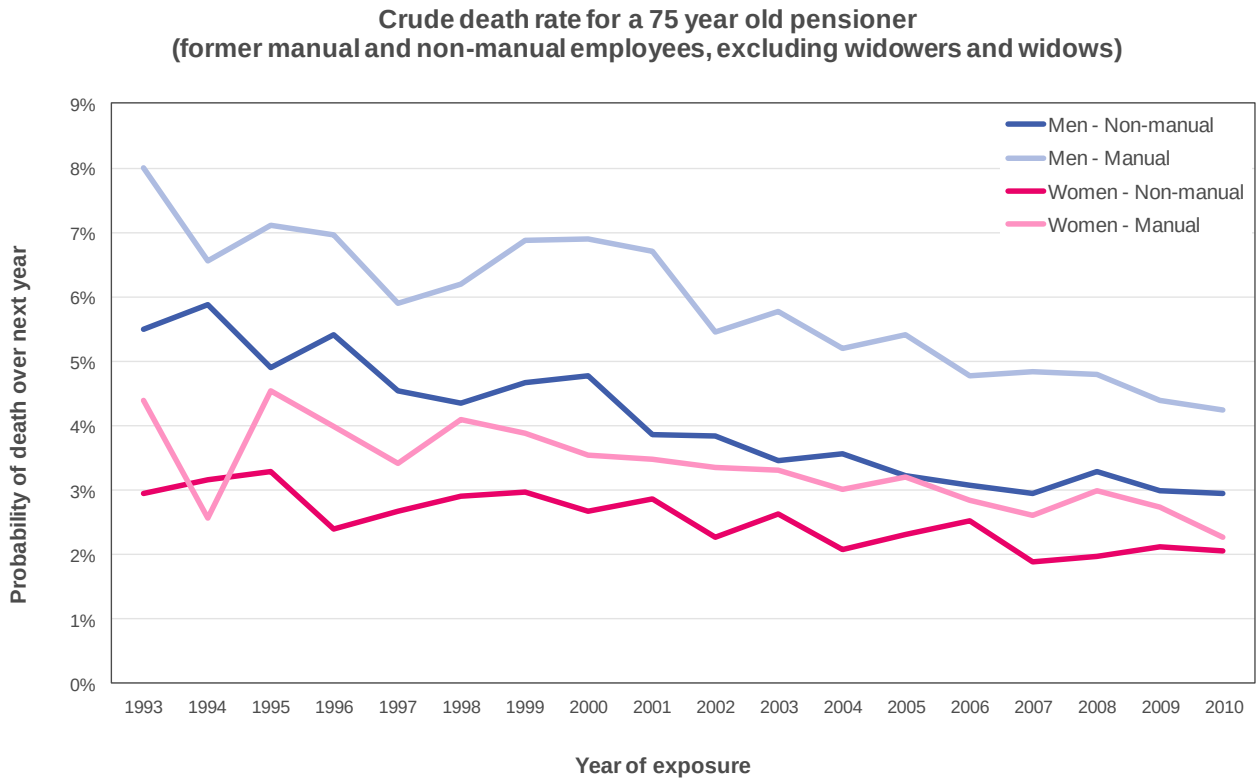
The chart shows that:

- The death rates tend to be higher for men than for women – this observation would be repeated if we were to look at other ages across the age spectrum.
- The crude death rate of 75 year old male pensioners has steadily fallen from 1993 to 2010. The death rates of female pensioners have fallen less dramatically.
- We quantify the rates of change in sections 11 and 12.

6.2 A job for life (and death)

Chart 6B – Crude death rates (Occupation)

The chart below also looks at the crude death rate at age 75, but split according to whether the pensioner was formerly a non-manual or manual employee (where this information is available). Please note that we have excluded widow(er)s from this chart as no meaningful information exists on the former occupation of these individuals.

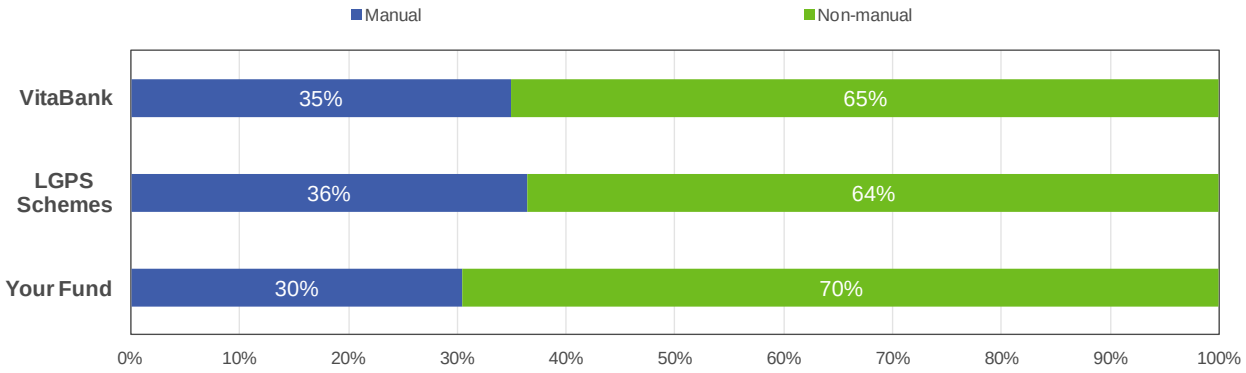


The chart shows that the mortality of former manual workers is higher, on average, than for former non-manual workers. This result is consistent with National Statistics studies[7] of life expectancy according to socio-economic group, which shows longer life expectancies for those in non-manual occupations than for manual workers – both before and after retirement.

[7] ONS longitudinal study (England and Wales) data from 1997-2001
http://www.statistics.gov.uk/StatBase/Product.asp?vlnk=8460&Pos=3&ColRank=1&Rank=272

Chart 6C – Your occupational 'DNA'

The chart below considers the split of your pensioner membership, including ill health retirees but excluding widow(er)s, between those formerly employed in manual roles and those formerly employed on non-manual roles, for those members where this information is known[8].



We can see that within your fund:

- there is (amongst those for whom former employment type is known) a lower proportion of former manual employees than within VitaBank; and
- there is a lower proportion of former manual employees than within your peer group.

All else being equal, we would expect members of funds with a higher proportion of former manual employees to have a lower average life expectancy than those in occupational pension schemes in general.

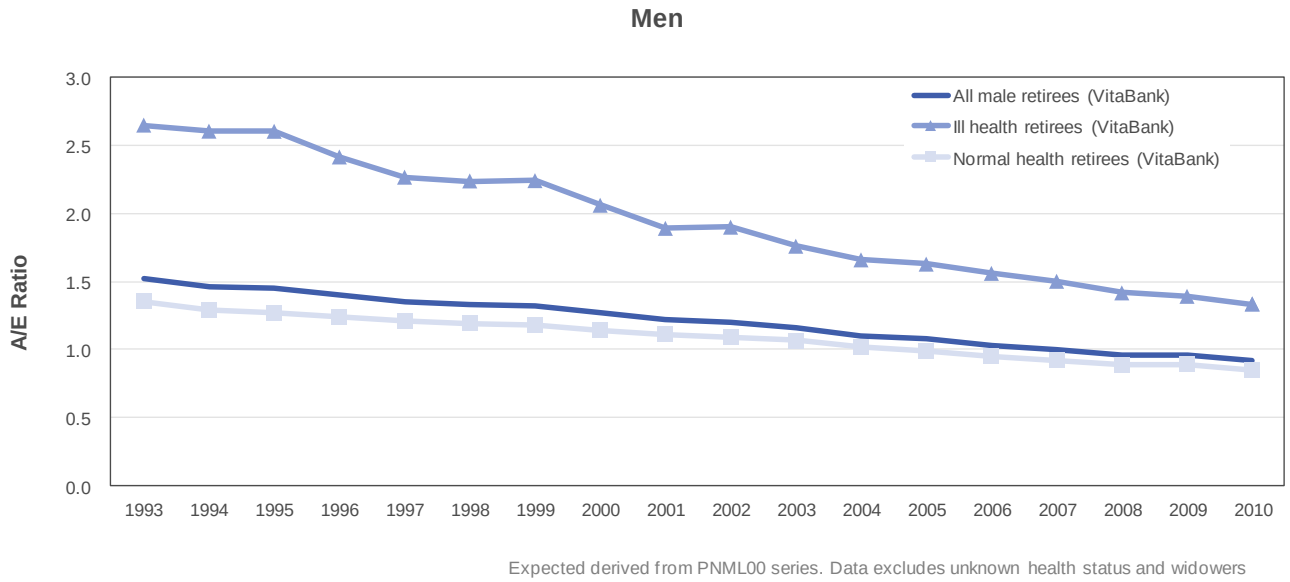
6.3 The sick die young

The charts in the previous sections have focussed on all pensioners (excluding widow(er)s), but this begs the question of how different the mortality rates of 'normal health' and ill-health retirees are? The charts overleaf plot A/E ratios for normal and ill-health retirees separately, and contrasts them with VitaBank's data[9]. The charts illustrate changes over time and between age bands, separately for men and women.

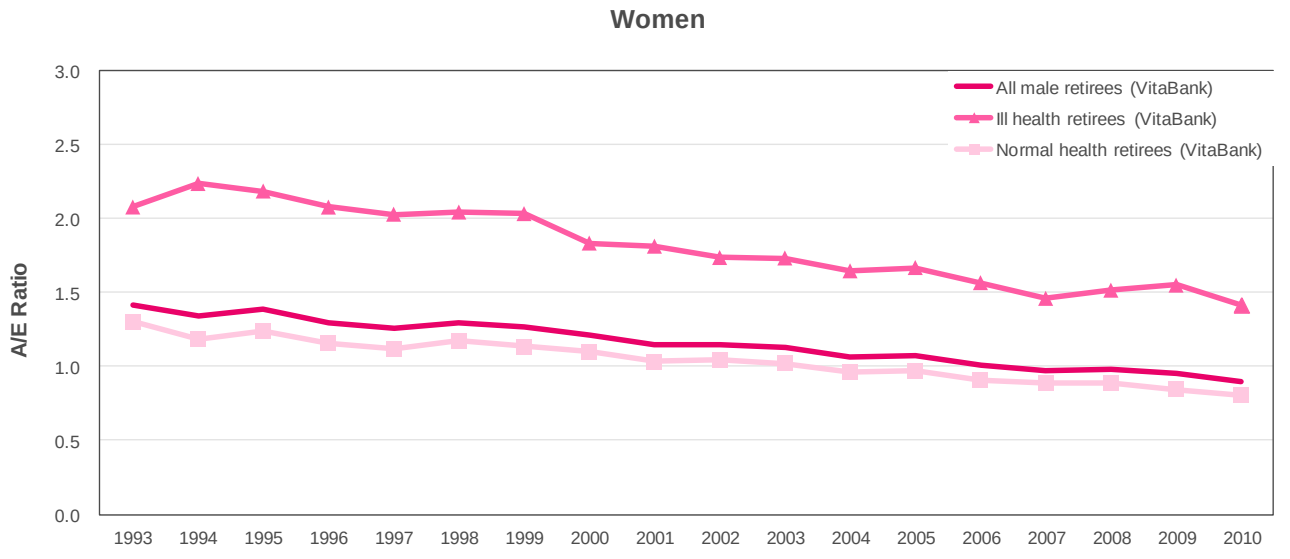
[8] This information is known for 88% of your members.

[9] Since not all funds have been able to provide data which identifies the ill health retirees separately this chart relates to the combined data for those funds where the information is available i.e. fewer schemes are included in these charts than the charts in previous sections.

Chart 6D & Chart 6E – Normal versus ill health retiree mortality over time



Expected derived from PNML00 series. Data excludes unknown health status and widowers



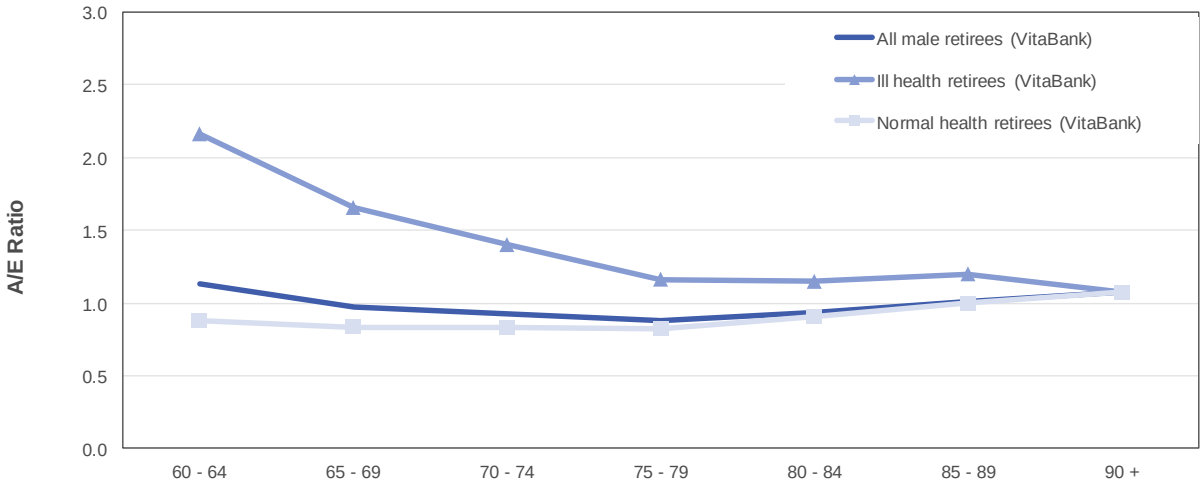
Expected derived from PNFL00 series. Data excludes unknown health status and widows

The A/E ratios for ill-health retirees are considerably higher than for normal retirees. Charts 6D and 6E show that the 'gap' between the 'sick' and the 'healthy' appears to be closing. However care is needed in drawing any conclusions from this chart owing to the interaction between:

- the tightening of the ill health eligibility rules that have happened in the late 1990s for many of the funds in the database (for example the local authorities)
- the maturing age profiles of the membership over the last 15 years meaning that the above ratios increasingly reflect the relative mortality rates over the entirety of later life for ill health retirees rather than the years most immediately post retirement.

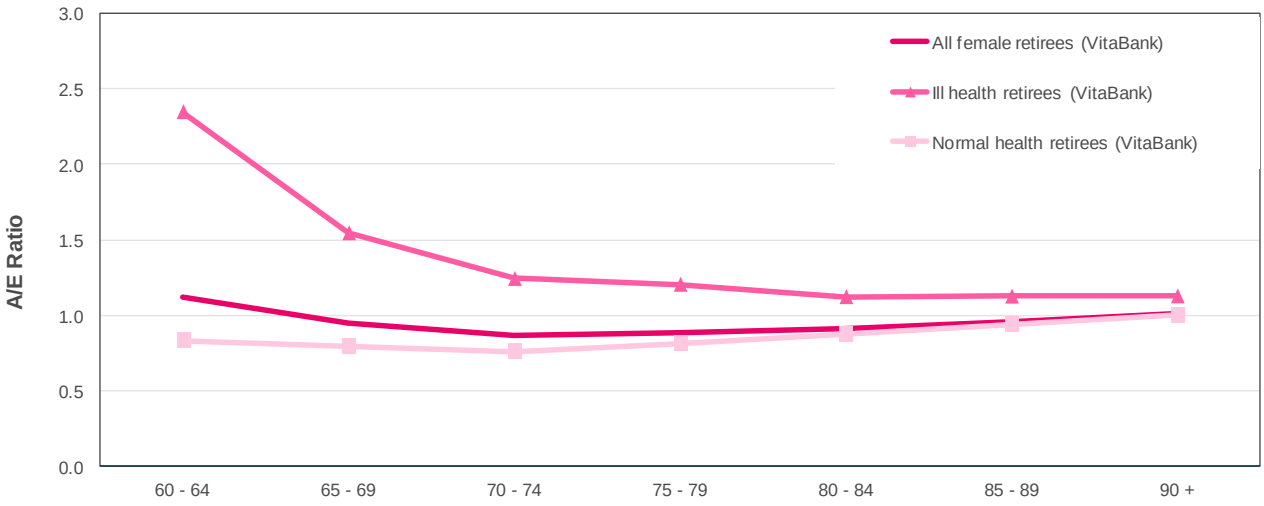
Chart 6F & Chart 6G – Normal versus ill health retiree mortality with age (2006-2010)

Men



Expected derived from PNML00 series. Data excludes unknown health status and widowers

Women



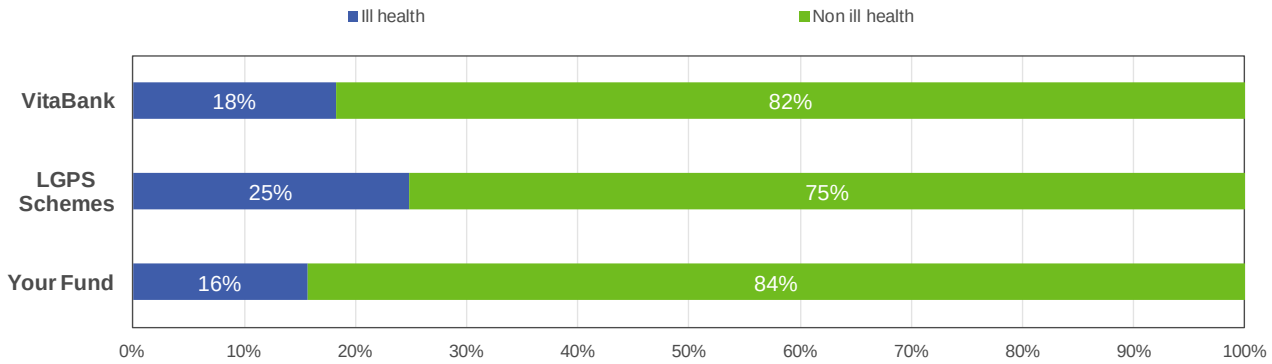
Expected derived from PNFL00 series. Data excludes unknown health status and widows

Charts 6F and 6G show that the ill health retirement effect wears off with age.

These patterns highlight the extra accuracy gained from setting specific assumptions for pensioners according to type of retirement (where possible), rather than setting a global assumption.

Chart 6H – Your ill health 'DNA'

The chart below considers the split of your pensioner membership, excluding widow(er)s, between those who retired on grounds of ill-health or in 'normal' health where this information has been provided[10].



We can see that within your fund:

- there is (amongst those for whom retirement type is known) a lower proportion of ill health retirees than within VitaBank; and
- there is a lower proportion of ill health retirees than within your peer group.

All else being equal, we would expect members of funds with a higher proportion of ill health retirees to have a lower average life expectancy than those in occupational pension schemes in general.

Care is needed though in comparing the ill health DNA of different funds owing to the considerable variation in ill health eligibility terms seen between different funds contributing to VitaBank.

[10] Retirement health was supplied for 99% of your pensioners.

7 Money matters

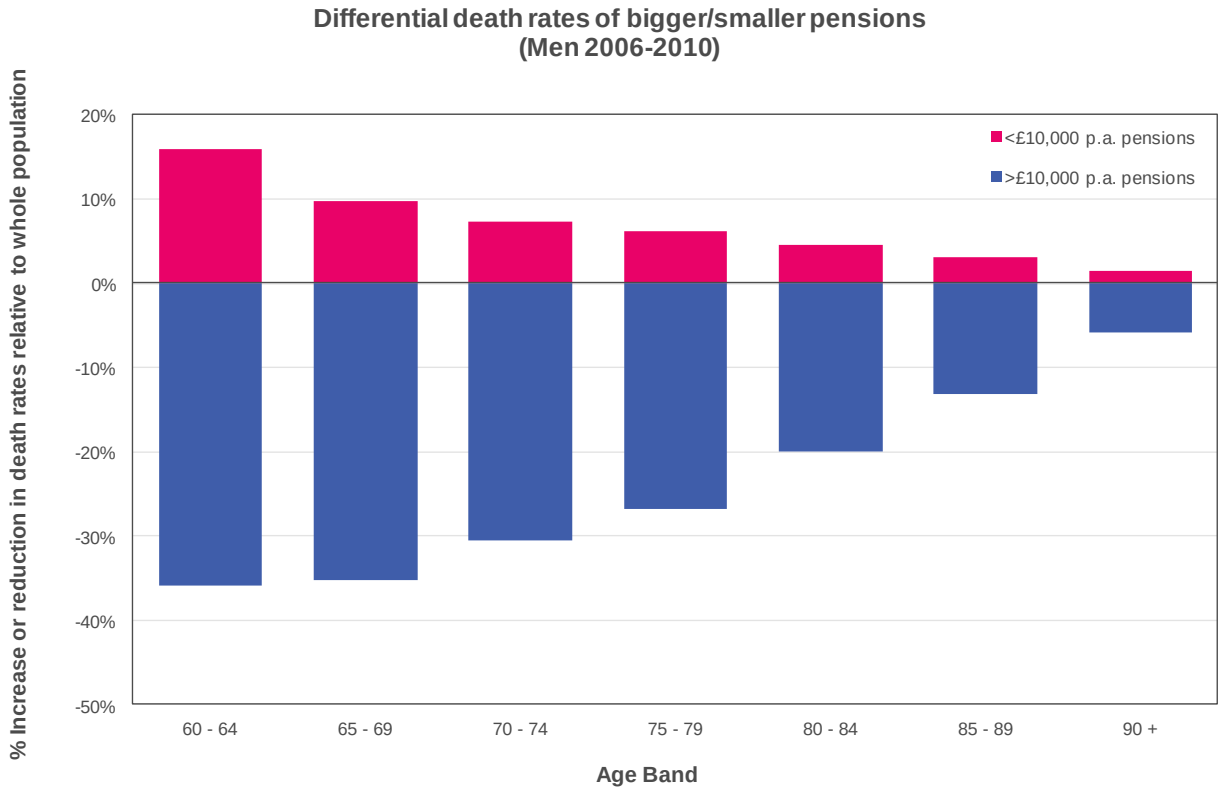
The charts in section 4 indicated that those with larger pensions tend to survive longer. We explore this further in this section, by looking at the survival patterns of pensioners with different amounts of pensions and exploring, for the first time, whether salary at retirement (or earlier exit) is a better predictor of longevity.

7.1 Pensions

We have separated out the data for those with the largest pensions to look at the mortality patterns of this group separately. The cut off point we have taken is £10,000 a year for men and £5,000 a year for women. Based on the 2010 membership of VitaBank, 24% of men and 21% of women have pensions (revalued to 2010) exceeding these values. This analysis essentially splits the earlier 'lives' analysis into two groups depending on the annual amount of pension.

Since widow(er)s have appreciably lower pensions than pensioners we have excluded widow(er)s' pensions to remove any distortion they may cause. This also makes the charts comparable with those in section 7.2 where we look at alternative affluence measures such as salary at retirement. The annual pensions of all the different generations of retirees have been revalued to the same year, to enable fair comparisons to be made. The pension amounts have all been revalued to 2010 in line with Retail Prices Index (RPI).

Chart 7A – Men with large pensions live longer



This shows the relative difference in mortality rates compared to all men of the same age. The zero line represents the average for the whole population in that age group. The blue bars indicate consistently lower rates of mortality for pensioners receiving at least £10,000 a year in all age groups. There is also evidence of this effect wearing off with increasing age.

So, for men with pensions over £10,000, the mortality rates over ages 65 to 79 appear to be around 30% lower than the average of all pensioners of the same age.

The chart is not symmetrical (in that the red bars are shorter than the blue bars) because there are a far larger number of pensioners receiving less than £10,000 a year.

Chart 7B – But women behave differently…

- Fewer women than men have annual pensions of more than £10,000, so we have dropped the threshold from £10,000 to £5,000.
- We see clear evidence in most age groups of an effect linked to pension amount for women, with those receiving pensions above £5,000 a year having consistently lower rates of mortality. The effect appears to wear off at higher ages.

Why are pension amounts of limited use?

Consider two individuals Peter and Paul – both of whom have just retired with a £5,000 annual pension from a fund with an accrual rate of 1/80th of pay for every year of service. Based on pension alone they appear of equal affluence, until we learn that:

- Paul earned his £5,000 pension over 20 years of service, and with a final pensionable pay of £20,000 a year.
- Peter earned his pension as a senior manager, having completed 5 years with a final pensionable pay of £80,000 a year.

In this situation we would reasonably consider Peter to have noticeably different affluence characteristics!

We believe that pension amount is a poor indicator of affluence. Small pensions often arise from short service rather than low pay. Single careers spent in one pension fund are rare, so there may well be pension income from more than one fund, or possibly from a partner or inherited money from a previous generation. For women, the picture is further complicated by a significant proportion of women working part-time, and those part-timers only recently acquiring the right to accumulate pensions.

For these reasons, it is natural to seek to use the member's last known salary figure rather than their pension amount.

7.2 Using final salary as a differentiator

We believe that we can improve on the level of longevity prediction offered by pension amount by looking at the last known pensionable pay of an individual – i.e. at retirement or earlier exit – rolled up to current terms using RPI[11]. For part-timers, the figures used are full-time equivalent pay. Since there is no salary at retirement/exit information for widow(er)s they have been excluded.

We have divided the members of VitaBank into four sub-populations according to revalued annual salary:

- Up to £15,000
- £15,000 - £25,000
- £25,000 - £35,000
- Over £35,000

To give you a reference point, the Minimum Wage today is around £12,000 a year, National Average Earnings is around £24,000 a year and the threshold for 40% income tax is around £42,500.

The majority of funds contributing data to VitaBank have been able to supply data on salary at retirement/exit. Amongst those pensioners where we have this information:

[11] We would note that even for a scheme with a history of long serving employees this approach is likely to have benefits, since studies which consider the impact of pension income on death rates typically pool data from schemes with very different service histories.

- For men, approximately 14% of the exposed to risk (2010) was in the bottom band, 45% in the second band, 21% in the third band and 21% in the top band.
- For women, the corresponding figures were: 43%, 43%, 10% and 4%. Because of the limited number of higher earners, we have combined the top three earnings bands for women to give two bands of under £15,000 and over £15,000.

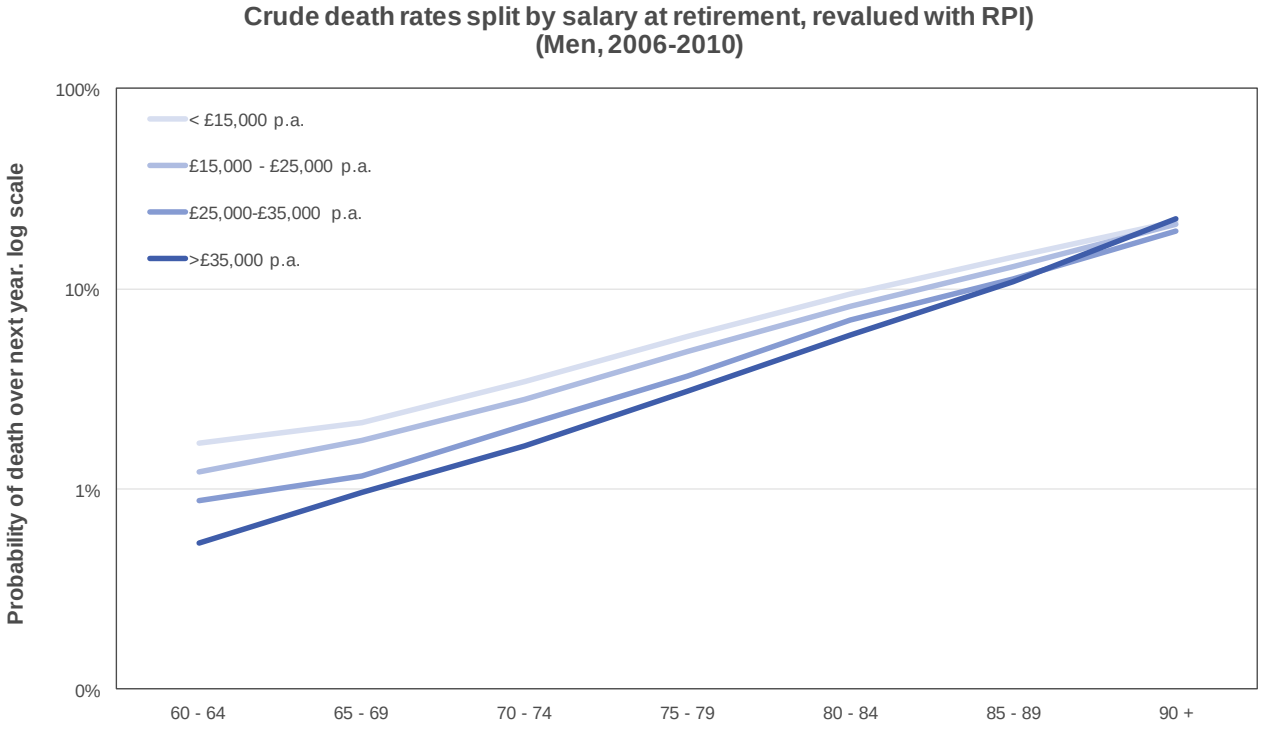
Chart 7C – High earners live longer (Men)

This chart shows the crude death rates of each of the four groups, against a log scale.

Jargon buster

Under a **log scale** each unit increase on the y-axis is equivalent to multiplying by a fixed number, e.g. doubling. In the charts in this section a unit increase is equivalent to multiplying by a factor of 10.

If the mortality of different groups of individuals is the same, except for multiplication by a fixed number, then, when plotted on a log scale the mortality rates would be parallel.



- There appears to be a clear tendency for lower death rates amongst those with larger salaries on retirement relative to all four groups combined. Taking the 21% of the male population in the over £35,000 annual salary bracket, for example, their mortality rates appears around 70% lower than those with an annual salary below £15,000 at ages 60 to 64.

- The differential closes with age suggesting (unsurprisingly) that wealth, whilst still a differentiator at older ages, is less of one[12], possibly as decay of body becomes less "curable" by wealth alone, and possibly because amongst the less wealthy it is the 'super-fit' who survive to the oldest ages.
- Since the lines are not parallel this suggests that the age-profile of mortality is different for the different salary bands. Consequently simply adjusting 'off the shelf' tables is unlikely to be a good reflection of the impact of different levels of affluence.
- In particular the differences in mortality between those earning in excess of £35,000 p.a. and those earning a salary of below £15,000 p.a. is equivalent to 3.8 years difference in life expectancy from age 65.

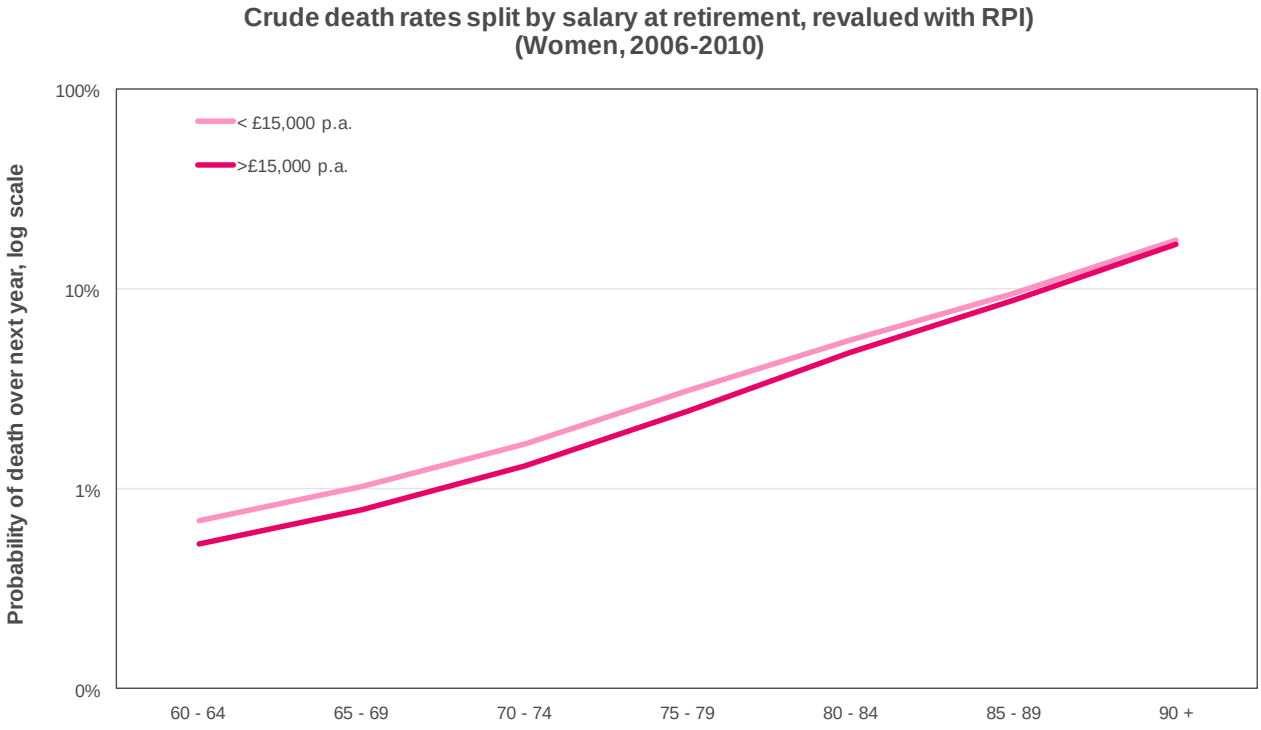
Our more detailed statistical tests, summarised in Appendix B, show that looking at salary at retirement as a measure of affluence explains more of the differences in life expectancy between men than the amount of their pensions. This means that it is a more powerful predictor of life expectancies for male members of occupational pension schemes than the pension amount which is used by, for example, the CMI.

Also, for some funds, it would be appropriate to consider more extreme salary bands as this is likely to show an even greater impact of salary.

[12] Technically this is less of a differentiator in terms of how many times more likely an individual is to die (e.g. twice) rather than in terms of the difference in mortality rates (e.g. 1%).

Chart 7D – Higher earners live longer (Women)

The corresponding graph for women is shown below. Chart 1E showed that the pay of women pensioners in VitaBank is more bunched than for men. There appears some evidence of differentiation between the two earnings bands, but it is less marked than for men.



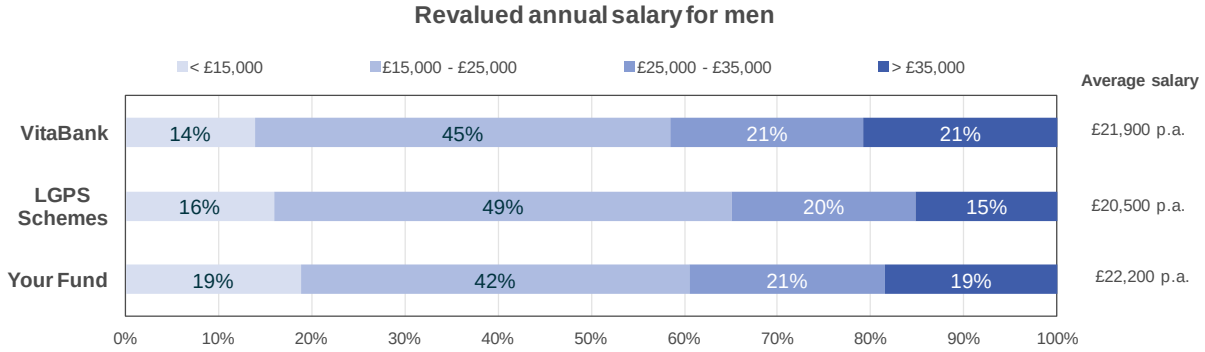
In the case of women our more detailed statistical testing has confirmed that affluence is indeed a much less important differentiator than for men. This is not surprising for current pensioners as they will be largely from a generation where it was usual for the household income to be dominated by the husband's income.

For current pensioners our modelling suggests that for women the pension income, rather than salary, is a better differentiator than salary. However, we anticipate this to change over time as the 'dual income' generations (i.e. current actives and deferred pensioners) increasingly enter the retired population.

7.3 Your affluence 'DNA'

The two charts below illustrate the affluence profile of the pensioners in your fund compared to VitaBank and your peer group. For men we compare the profile of salaries[13] and for women we compare the profile of pension[14] amounts where this information has been provided.

Chart 7E – Your male affluence 'DNA'

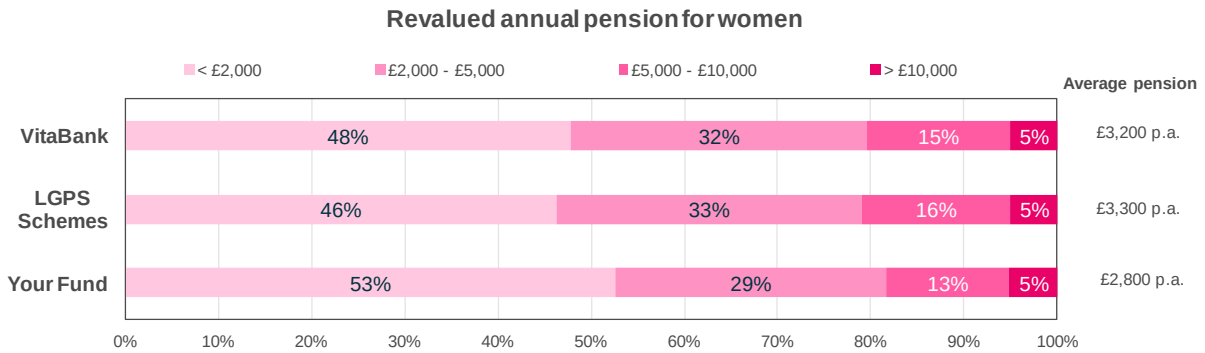


The male pensioners in your fund have:

- a higher average salary at exit/retirement (revalued to current terms) than the average for VitaBank as a whole; and
- a higher average salary at exit/retirement (revalued to current terms) than the average for your peer group.

All else being equal, we would expect members of funds with lower salaries to have a lower average life expectancy than those in occupational pension schemes in general.

Chart 7F – Your female affluence 'DNA'



The female pensioners in your fund have:

- a lower average pension than the average for VitaBank as a whole; and
- a lower average pension than the average for your peer group.

All else being equal, we would expect members of funds with lower pensions to have a lower average life expectancy than those in occupational pension schemes in general.

[13] A reliable salary value was supplied for 99% of your pensioners – please see your VitaCleansing report for more information.
[14] Pension was supplied for 87% of your pensioners – please see your VitaCleansing report for more information.

8 Life is more than just work...

We have seen in the previous sections how gender, nature of retirement (ill health or otherwise), occupation and income are all indicators as to whether an individual will (on average) live longer or shorter than someone else. In this section we will show that it is not just how much income an individual has, but how they spend it which is important.

For example within **VitaBank™** there are 49 funds which are local authority pension funds – within these local authority funds we see a spread of 4.6 years in life expectancy from age 65 amongst normal health retirees for both manual and non-manual employees. This is despite the fact that there is a consistency of pay structure within local government which would lead us to expect there to be relatively modest differences in the distribution of salaries at retirement/exit between the funds.

Although some of the difference in life expectancies observed between these local authorities will be down to random variation, the size of the difference means that there are other factors influencing life expectancy which have yet to be identified. In this section we consider how it is possible to learn more about individual pension fund member's lifestyle to explain some of this variation away.

8.1 Understanding individuals' lifestyles

Having information on the postcode of the individuals in VitaBank means that we are able to explore how lifestyle varies between different individuals. The members' postcodes enable us to enrich the database with geo-demographic information available in a variety of marketing databases purchased from third party providers.

The example we look at below focuses on one particular market research database which classifies each of the UK's 1.7m postcodes into 57 different geo-demographic categories based upon information such as:

- type of property, (e.g. Urban terraced house);
- lifestyle information on the residents including:
  - which newspaper an individual is most likely to read
  - most likely hobbies, holiday habits etc….
  - financial sophistication

It should be noted that these classifications work on the basis of propensity indices – which means that individual postcodes are classified by the type of person who is **most likely** to live there. As such they will not be a definitive reflection for every single individual within your fund, although they are designed so that they provide an accurate reflection for the majority of individuals.

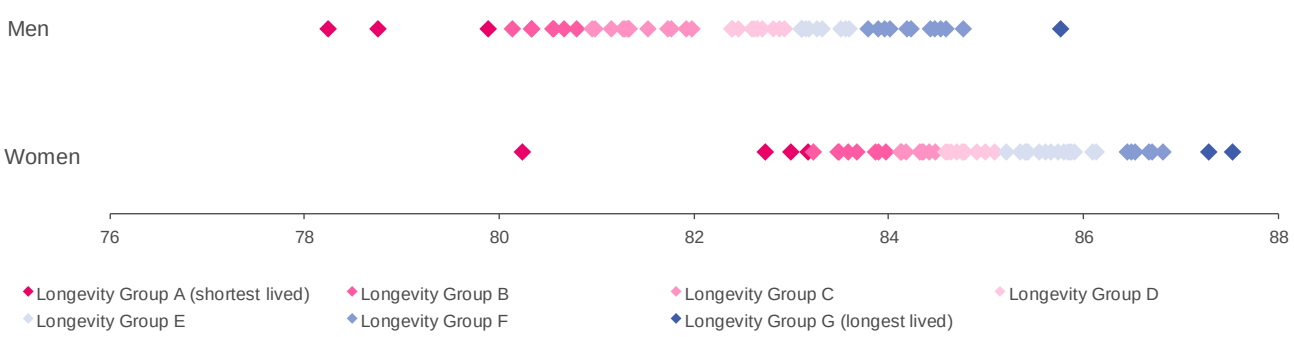
8.2 Finding 'like-lived' individuals

Owing to the considerable volumes of data within VitaBank we are then able to see how life expectancy varies between these different geo-demographic types.

Chart 8A – Social climbing

We have grouped the data in VitaBank into the 57 socio-economic types, and then calculated life expectancies for each of these types.

Although 57 varieties works for Heinz, it is usually too many to practically manage in an actuarial valuation. We have therefore combined the 57 types into a smaller number of groups. Our analysis suggests that combining these types into seven groups provides a good balance between having a manageable number of groups and capturing noticeable differences in longevity.



The seven groups are highlighted by the different colours into the chart above. It is worth noting that we find it best to group the types slightly differently for men and women, suggesting that some lifestyles are more beneficial for men than for women – and vice versa.

The two extremes of the longest lived group (Group G) and the shortest lived group (Group A) for men are described by 'Meet John' and 'Meet Tom' below.

Meet Tom

Tom enjoys relaxing watching his favourite TV programs, reading the tabloids or the occasional evening in his local pub. Although Tom's disposable income is fairly limited he does dream of winning the lottery and even places the occasional bet. He rarely holidays abroad. Tom's main passion is his local football club which he supports through thick or thin with his mates, a number of whom are unemployed.

Meet John

John is a keen golfer and a winter ski enthusiast. His interest in current affairs is fuelled by reading the broadsheets on his commute into work. John appreciates the theatre and the arts and will often enjoy good food and wine with his friends, many of whom are highly educated. He uses the internet to research the best saving products to invest in. He always seems to be planning his next holiday to far flung places.

What's in a postcode?

Think about where you live. Assuming you do not live in a remote cottage then it is likely you will have others living around you.

What are your neighbours like? Whilst you may not share exactly the same tastes (your neighbours prefer red wine and you prefer white; or you prefer 'proper beer' and they prefer lager) it is likely that you have a lot in common. After all we all like to live in areas which suit our lifestyle. Utilising information on 'likely lifestyle' for different postcodes means we can enrich the information you and other funds have supplied to Club Vita.

More than this though – unlike some analyses we use the **full postcodes** of members to capture differences down to the street level. For example if you live in an urban or semi-urban area how far do you have to go before the area changes? Is it the end of the street or just around the corner?

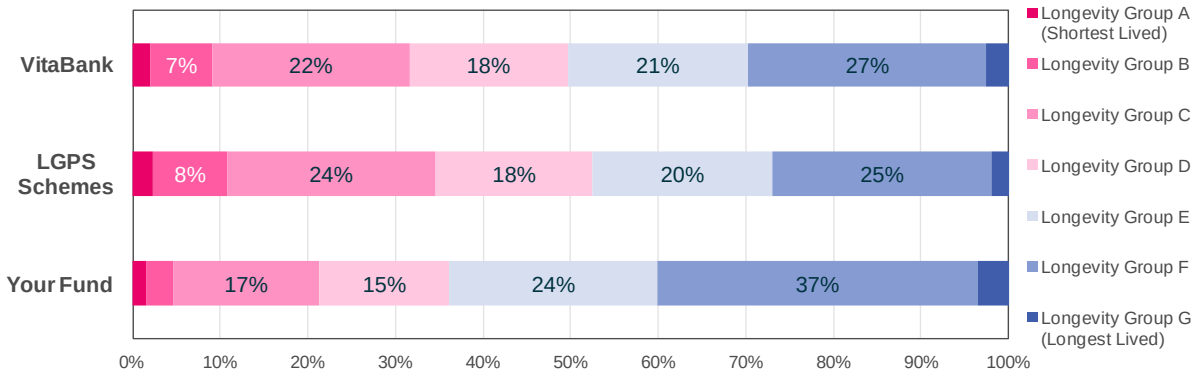
The map to the above right shows a part of residential Edinburgh. Two postcodes are highlighted which only differ in the last character. This puts the postcodes a couple of hundred yards apart in Lanark Road, yet the likelihood is that the residents are at opposite ends of longevity spectrum! We find local contrasts like this all over the UK.

Chart 8A shows a spread of around 6.8 years for men and 5.1 years for women between the typical live expectancies seen in the shortest lived groups (deep pink dots) and the longest lived groups (deep blue dots). On average there is a difference of around 6.0 years between the shortest and longest lived group. However, not all of this difference will be due purely to lifestyle differences as some of the characteristics used to identify the 57 varieties of geo-demographic types relate to affluence (for example, type of property). We are able to use powerful statistical techniques, known as multi-variate analysis, to isolate the individual effects of different characteristics such as geo-demographics and affluence – this is described in more detail in **Appendix B**.

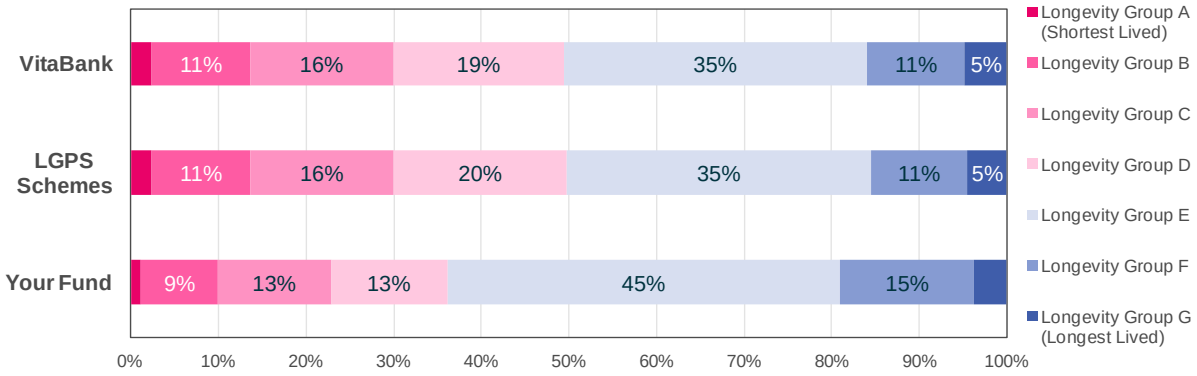
Chart 8B & 8C – Your geo-demographic 'DNA'

The charts below consider the split of your membership, between the seven longevity groups identified above for those pensioners and dependants for whom you have supplied postcodes[15].

Men



Women



We see that, amongst those members for whom postcodes are known, your:

- men and women live, on average, in postcodes associated with longer life expectancy than typically seen within VitaBank
- men and women live, on average, in postcodes associated with longer life expectancy than typically seen within LGPS Schemes

As a subscriber to Club Vita you automatically have access to **VitaMap™** - our proprietary system for mapping the postcodes of your fund's members to longevity groups.

[15] Which, after our data cleansing, have been recognised by our geo-demographic profiling software i.e. 84%of your pensioners and dependants – please see our VitaCleansing report for more information.

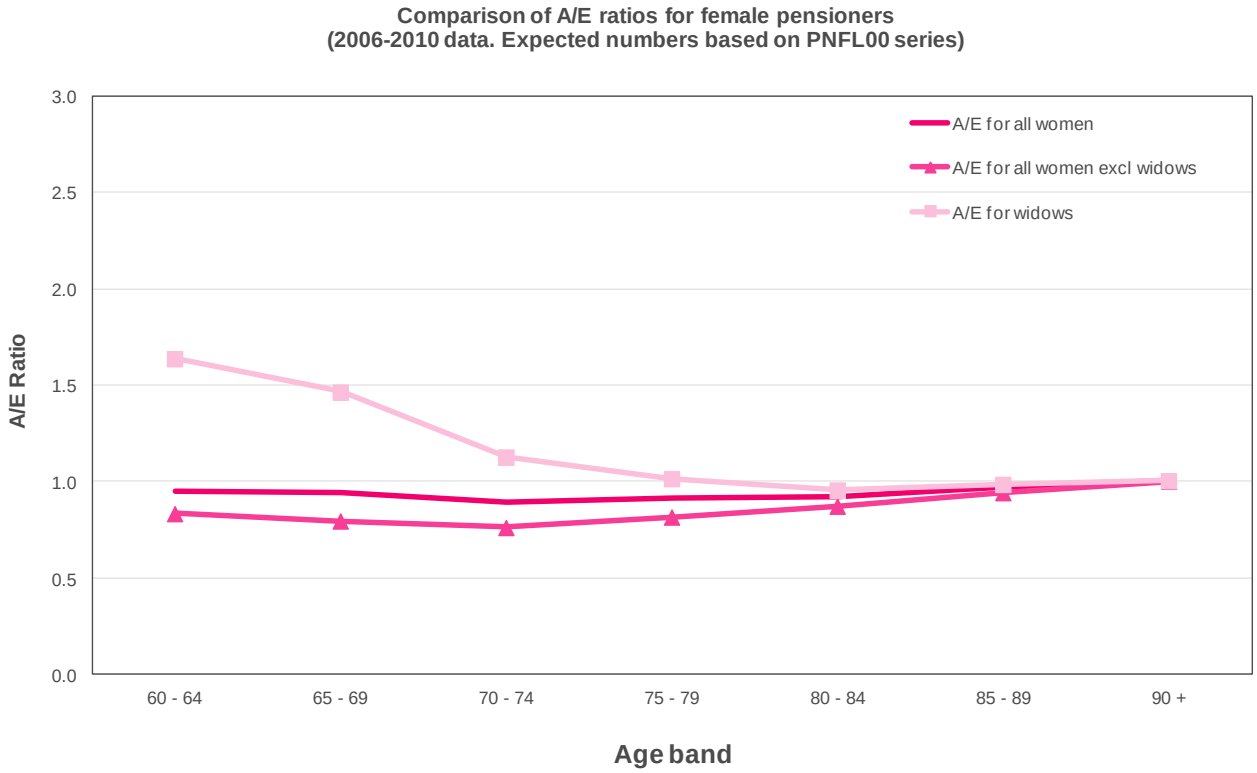
9 Marital relations

Within VitaBank there is considerable information on widows and as such it is worth asking whether the mortality rates differ for example between a widow and other female pensioners.

9.1 Grieving widows?

The following chart compares the A/E ratios of widows with other female pensioners.

Chart 9A – Grieving widows?



- This chart shows a sharply higher death rate amongst young widows, but with convergence from age 70 upwards.
- This suggests that the mortality of widows is similar to that of female pensioners at older ages, but that the loss of a partner can lead to an increased chance of death at younger ages. This is consistent with other studies[16].
- In particular, the similar mortality rates at the older ages validates the inclusion of widows when looking at life expectancies for women in Chart 5A[17].

[16] See for example 'Modelling the short-term dependence between two remaining lifetimes' by J Spreeuw and X Wang (http://www.actuaries.org.uk/__data/assets/pdf_file/0006/128832/Spreeuw_modelling.pdf)

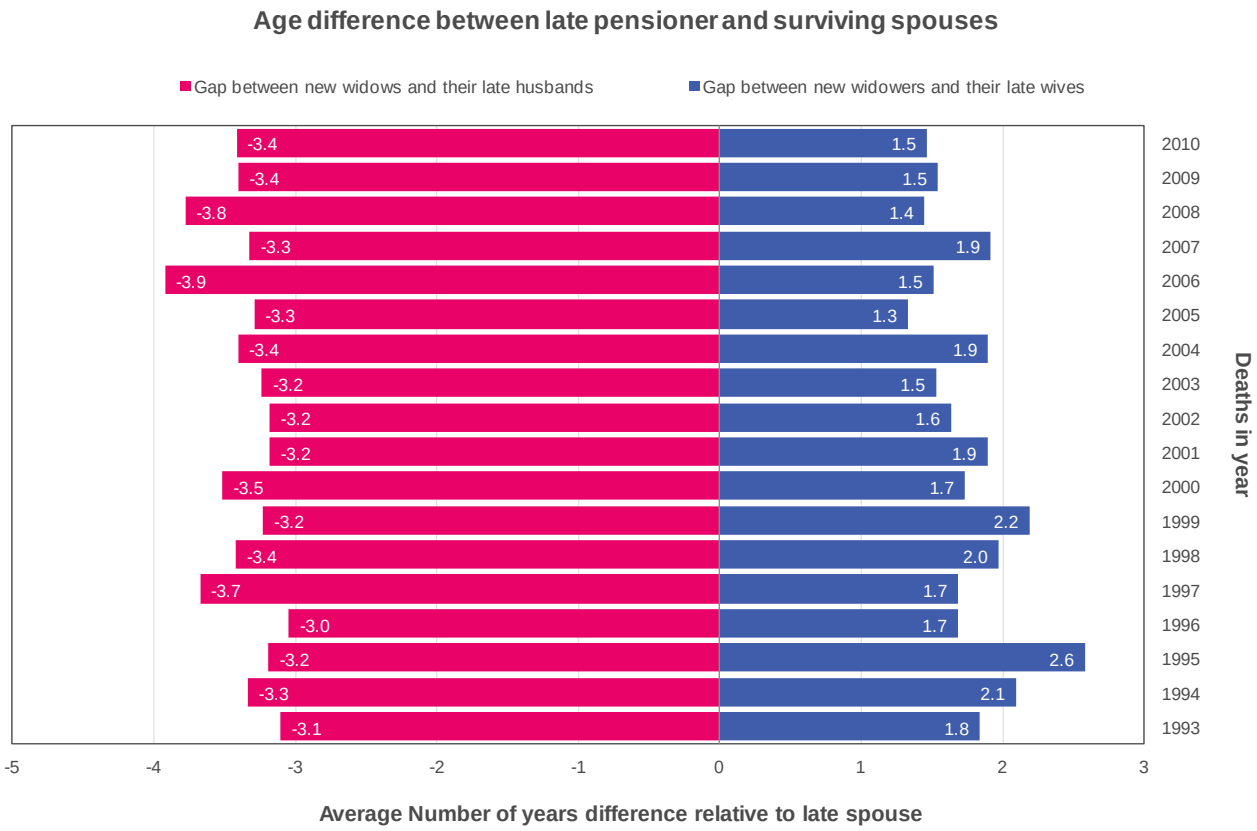
[17] The inclusion of widowers in Chart 5A is also reasonable on the grounds of consistency especially as relatively small amounts of data are available on widowers.

9.2 Toy-boys and trophy wives

When placing a value on the benefits payable to any spouse should he or she outlive the fund member, it is usual for your actuary to make an assumption as to the relative ages of a pensioner and his (or her) spouse.

We are able to link together a spouse's pension record with the record of their deceased husband or wife for many of the records in VitaBank. This enables us to calculate the average age difference between a member and their spouse at the time of the member's death, as illustrated in the chart below.

Chart 9B – Husband-Wife Age Gaps



- It is well known that men tend to marry younger women. The older member of the marriage – typically the man – is more likely to die first.
- The pink bars show that widows are typically 3 - 3½ years younger than their late husbands.
- As expected, the age gaps are in the opposite direction for new widowers' pensions, but the gaps are not symmetrical. The fact that the blue bars are smaller than the pink bars – at around 2 years – may also be a reflection of the relative mortality rates. Men who outlive their wives are more likely to be those with smaller age gaps.

10 Everyone is different

10.1 Individuals' life expectancies

In sections 6-9 we have identified that different individual members of your fund will exhibit different mortality and have a different life expectancy depending on their 'longevity characteristics'. To summarise:

- mortality rates for men are around 9% higher than for women;
- mortality for former manual workers is around 30% higher than for former non-manual workers;
- ill-health retirees experience mortality ranging from more than twice as heavy as normal retirees at ages below 65 to about 20% heavier at ages 85+;
- mortality varies depending on affluence:
  - For men this is better measured by the last known salary (revalued to current terms) than by the pension income...
  - ...men with a salary in excess of £35,000 p.a. have a life expectancy of 3.8 years longer than those with a salary below £15,000 p.a.
  - Whilst for women differences in personal affluence result in smaller differences in life expectancy and, for current pensioners, longevity is best predicted by pension in payment;
- life expectancy varies considerably depending on how individuals spend their money (i.e. lifestyle) with a difference of around 6.0 years between the best and worst groups.

We saw in Chart 5A how, taken together, this mix of factors leads to a variation in ***average*** life expectancy (from age 65) between funds of around 5 years.

10.2 Interactions between longevity predictors

Many of the characteristics identified above are inter-related. For example those with higher incomes can often afford healthier lifestyles. In other words, some of the 6.0 years of extra life expectancy between the best and worst lifestyle groups will be due to differences in income, or perhaps, occupation.

In order to make appropriate allowances for different longevity characteristics it is important to be able to identify the impact that individual characteristics have in isolation and how the impact of these characteristics decrease with age. Our research team has used sophisticated statistical techniques designed to separate out the impact of individual longevity predictors i.e. the effect of different parts of your fund's demographic DNA – a summary of these methods is included in Appendix B.

As part of this analysis our statistics team have also identified the groupings of salary and pension which provide most insight into differences in longevity.

Change in longevity characteristic	Impact on life expectancy from age 65 (if all other characteristics are unchanged)
Male to female	Increase of 2½ to 3 years
Normal to ill health retiree (men)	Typically a decrease of 2 to 3½ years (the impact is biggest for those combinations of lifestyle and affluence with the longest life expectancy in normal health)
Geo-demographic longevity group A to G for men	Increase of 4½ to 5 years
Increase in pay at retirement from below £20,000 p.a. to over £55,000 p.a. (men)	Increase of 2 to 2½ years
Manual to non-manual (men)	Increase of less than 1 year (the impact is larger for women at around 1½ years)

Technical note: Above values are based upon the adjusted impact of the change in a single characteristic as derived from logistic generalised linear models fitted to the 136 schemes loaded onto VitaBank as at February 2012 and stratified by sex and adjusted for age, occupation, retirement type, affluence (salary at exit/retirement and pension) and postcode based longevity group (including any significant interactions between these covariates). For additional details please see Appendix B.

We can see from the above table that lifestyle in isolation makes around 4½ to 5 years difference in life expectancy for men, confirming that some of the spread in life expectancies seen in chart 8A is due to the better lifestyles also being associated with, for example, higher average income.

It is of particular note that this research suggests that the differences in life expectancy between individuals in different geo-demographic longevity groups and/or different levels of pay are comparable to the differences between men and women. This begs the question of, if you allow for the difference in longevity of men and women in placing a value on the liabilities of the Cambridgeshire County Council Pension Fund should you not also allow for the differences in geo-demographics and pay?

10.3 Tailor made assumptions for your fund's demographic DNA

One way to allow for the differences in the longevity characteristics identified above is to use tailored survival curves that allow for the specific combinations of longevity characteristics exhibited by your membership – these curves (known as **VitaCurves™**) are available to all members of Club Vita.

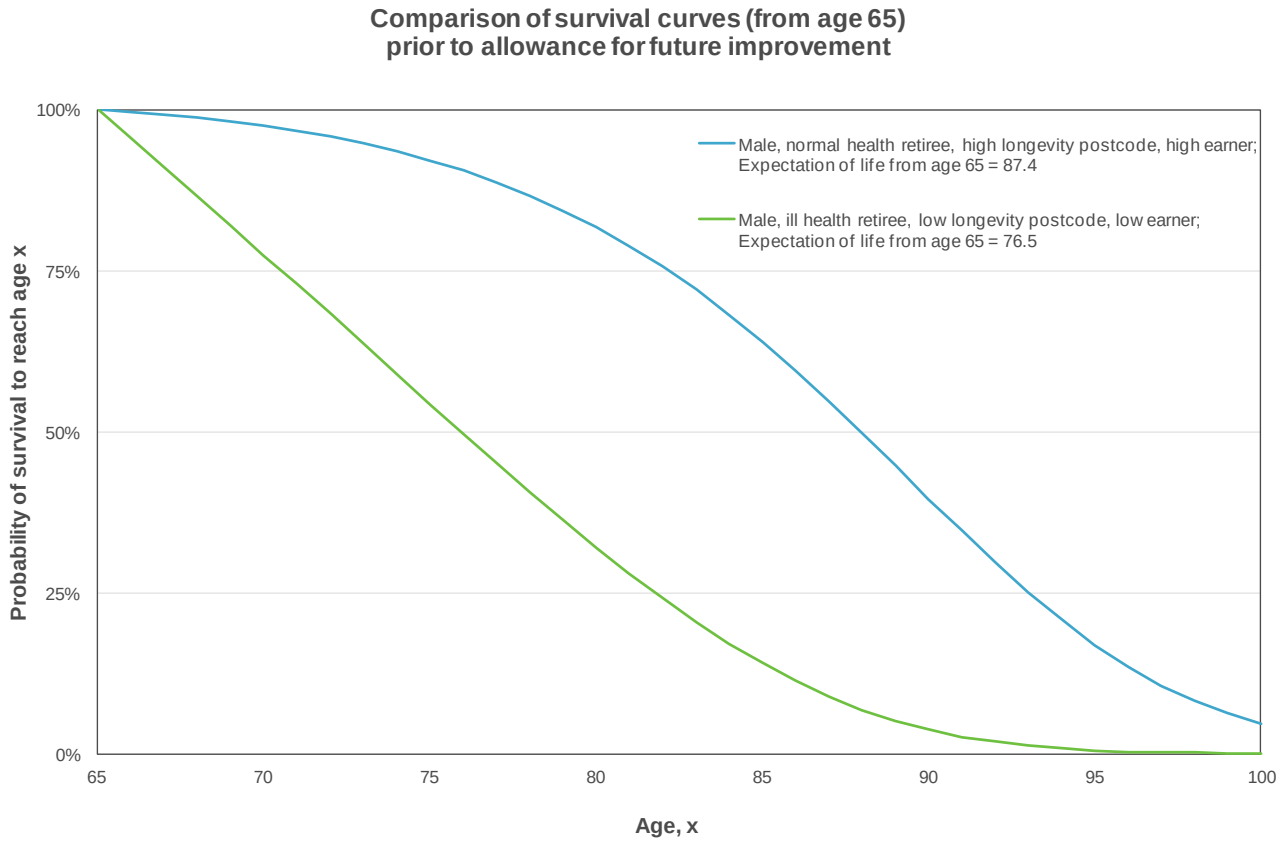
Jargon buster

Survival curves are an alternative way of portraying the potential lifespans of retirees. Rather than considering how many people die they focus on the more pleasant idea of the proportion of individuals of a certain age expected to reach each older age.

In the illustration overleaf the survival curve is shown from age 65, although we can look at the same picture for any age.

An example of this is shown in the following chart where we show the spread that exists for men between an individual with shortest life expectancy characteristics and longest life expectancy characteristics.

Chart 10A - Two extremes (Men)



- For those in the shortest lived example (ill health retiree who was on a low income and in the worst geo-demographic group) the life expectancy for a 65 year old man is just 76.5.
- In contrast the life expectancy is some 10.8 years longer amongst men whom we expect to be longest lived (normal health retiree who was on a high income and in the best geo-demographic group)
- Based on the 'rule of thumb' of 3% extra liabilities for every extra year of life expectancy this difference represents a range in liability values of 33% between the two extremes.

Your fund is a mix of these two extremes

The membership of your fund contains a diverse mix of individuals between the two extremes illustrated above – the mix represents your fund's unique **demographic DNA**. In sections 6-9 we saw how your Fund's demographic DNA helps explain the difference between the life expectancy in your plan and in other schemes. We extend this analysis in **Appendix A** where we see how the difference between funds in terms of these characteristics is consistent with the variation seen in life expectancies between funds (Chart 5A).

Current and future pensioners – different DNAs

The analysis in this report focuses on the mortality of current pensioners - both within your fund and within VitaBank. For many funds though the assumptions made about life expectancy after retirement for future pensioners are just as important. By understanding the characteristics which identify those individuals expected to live longer than others, it is possible to make an **objective** allowance for how the characteristics of your active and deferred population differ from those of your current pensioners.

Club Vita LLP

In other words if you understand how your demographic DNA differs between current and future pensioners, you can ensure consistency between the longevity assumptions used for current and future pensioners by using survival curves tailored to the characteristics of the different populations.

As a member of Club Vita you have access to survival curves tailor made to your fund's demographic DNA via **VitaCurves™**.

For more information please see your 'Tailoring VitaCurves to the Cambridgeshire County Council Pension Fund' report.

11 Living longer but how much longer?

So far the focus of our analysis has been on identifying which factors distinguish between those who are expected to live longer or shorter than others – i.e. factors which it may be important for you to take into account when setting the baseline assumption for funding purposes.

However, mortality rates are likely to change in the future and in order to put possible future projections into context it is important to understand how mortality rates and life expectancies have been changing in the past. In this section we start to analyse the changes that have been happening over the last 17 years. The charts in section 4 showed strong evidence of reductions in mortality rates over time, but have these reductions affected all age groups of pensioners in the same way?

11.1 Over two years a decade

The following charts build on the previous analyses to demonstrate a helpful way of summarising the information into a single figure – a life expectancy.

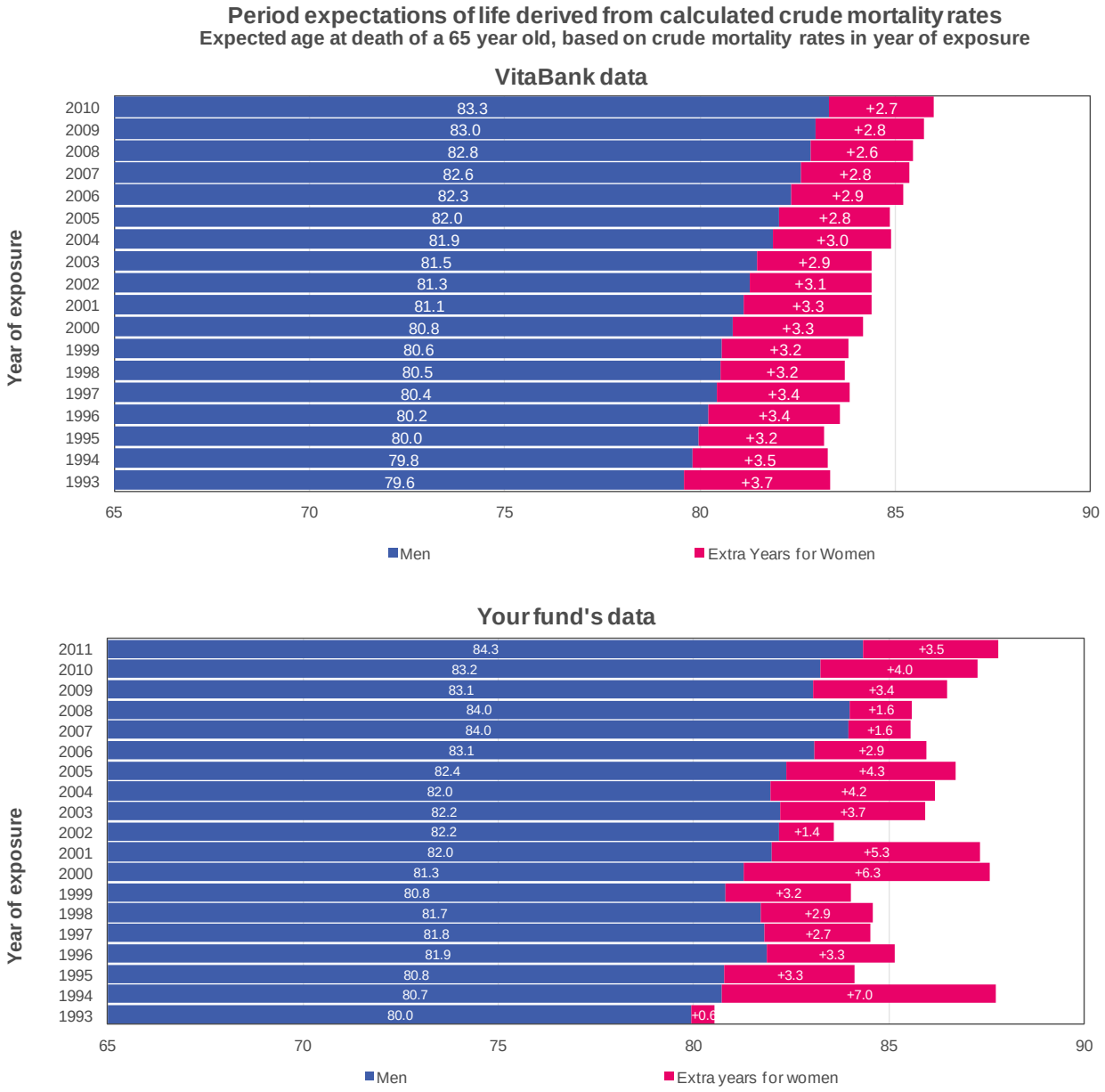
We have taken the crude death rates across all ages in each calendar year to calculate the implied expected age of death if the same death rates occurred in future. They are useful for comparing year-on-year trends in mortality, and variations between groups. In each case we have considered someone aged 65 in each complete calendar year of experience (i.e. from 1993 to 2011).

The figures are known as 'period' expectations of life – because they are calculated based upon the crude mortality rates experienced over a specific period of experience (here a calendar year). It is important that these life expectancies use the mortality rates applicable in one calendar year and so make no allowance for any future changes in mortality rates - as such they are unlikely to be a best estimate of the **future** life expectancy of someone aged 65 in the year in question.

However, precisely because no allowance has been made for future changes in mortality, these figures do not incorporate any judgemental views, and are simply functions of the observed data[18].

[18] However, this introduces a limitation because we do not have complete information at all ages – for instance at some ages where we are observing a small number of individuals there will be some years where no one is observed to die, suggesting a misleadingly low death rate of 0%. Similarly at other ages there may only be a small number of individuals all of whom die, or there may be no one alive at all. To avoid these problems some smoothing has been carried out at ages over 100.

Chart 11A and 11B – Increasing life expectancies



The charts reveal:

- The life expectancy for men (at age 65) has risen from 79.6 in 1993 to 83.3 in 2010 – an increase of around 2.6 months each year, or around 2.2 years per decade[19].
- The life expectancy for women has also risen, but less rapidly than for men. This shows that the life expectancy for men has been catching up with women. One of the drivers for this is that more men smoked historically and so the quitting of smoking which has happened in recent decades has been most beneficial to men.

[19] The results are similar to those observed in the UK population, as evidenced by National Statistics studies. http://www.statistics.gov.uk/STATBASE/ssdataset.asp?vlnk=9522

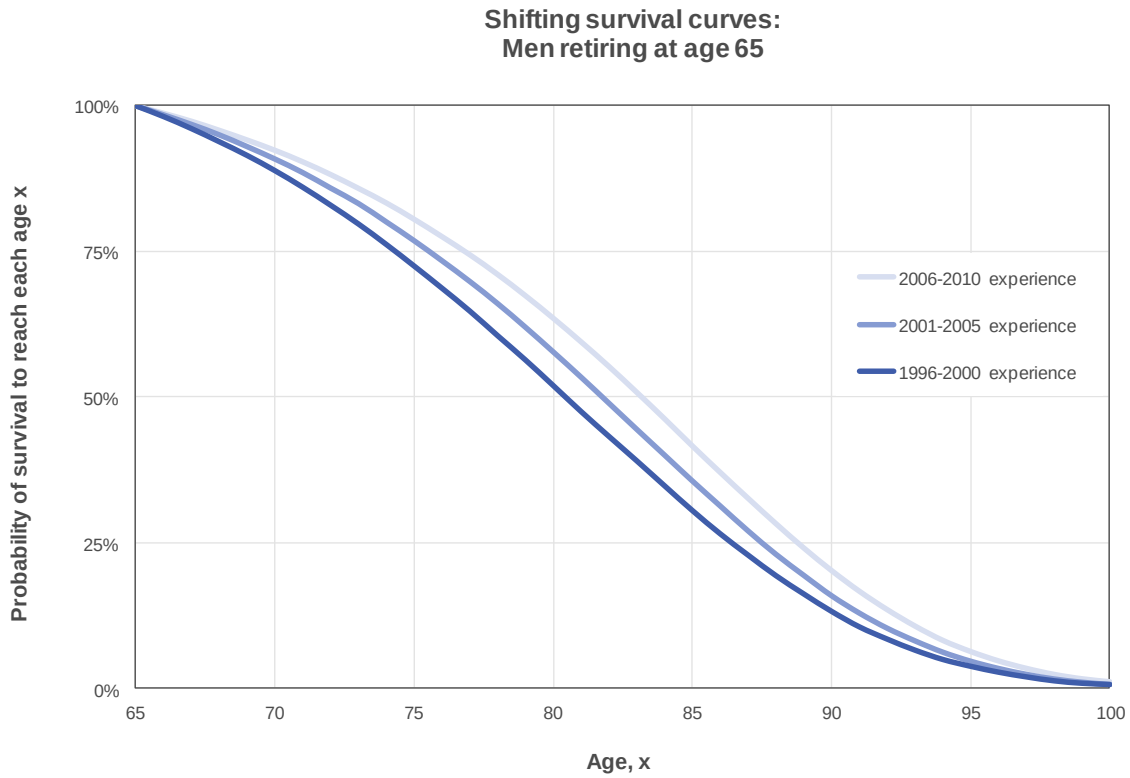
- The life expectancy of individuals within the fund has been far more variable over time, highlighting the clarity that comes from pooling data.

11.2 Shifting survival curves

In section 10 we introduced the survival curves as an alternative way of considering mortality rates, namely as the proportion of individuals surviving from age 65 to older ages. Another way of analysing improvements in life expectancy is to consider how the survival curves have changed for men and women over the last 17 years.

We have divided the period since 1993 (the first year where we have considerable volumes of data[20]) up until 2010 (the most recent year of complete data) into three distinct five year periods: 1996 to 2000, 2001 to 2005 and 2006 to 2010. For each five year period we have compared the survival curves for men and women in the following charts – in each case the curves include ill-health retirees and widow(er)s.

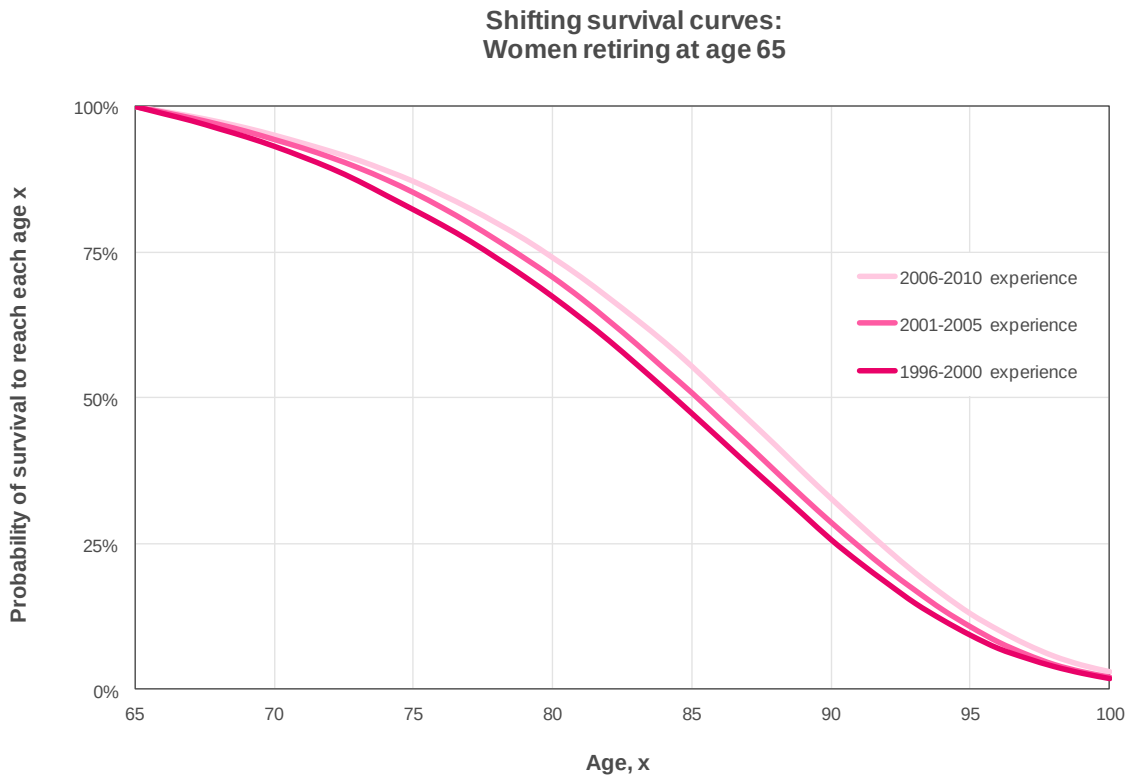
Chart 11C – Shifting survival curves (men)



- The proportion of men surviving beyond age 80 has increased from 52% to 64% over the last decade.
- Put another way, the '50% age' (i.e. the age to which half of 65 year olds are expected to survive to in the absence of any changes in longevity) has moved from 80.4 to 83.2, in ten years, broadly consistent with the **over two years per decade improvement rate** observed previously.

[20] Including a good mix of data from public and private sector schemes

Chart 11D – Shifting survival curves (women)



- A similar picture is seen for women, although we see how a higher proportion of women survive to each older age – this is consistent with the higher life expectancies seen in chart 11A.
- In particular, the '50% age' has moved from 84.4 to 86.2, in ten years.

11.3 Annualised rates of change (mortality improvements)

The following chart illustrates the annual rate of change for 2001-2005 compared with 1996-2000, and then 2006-2010 compared with 2001-2005.

Jargon buster

Mortality improvements typically refers to a fall in the mortality rate at a given age over a year. In this context, if the change value shown is **positive**, the death rate has reduced or improved. For example, a 4% 'improvement' would be equivalent to a reduction in the number of deaths from 100 to 96 over a 12 month period.

Chart 11E – Improvements in mortality rates

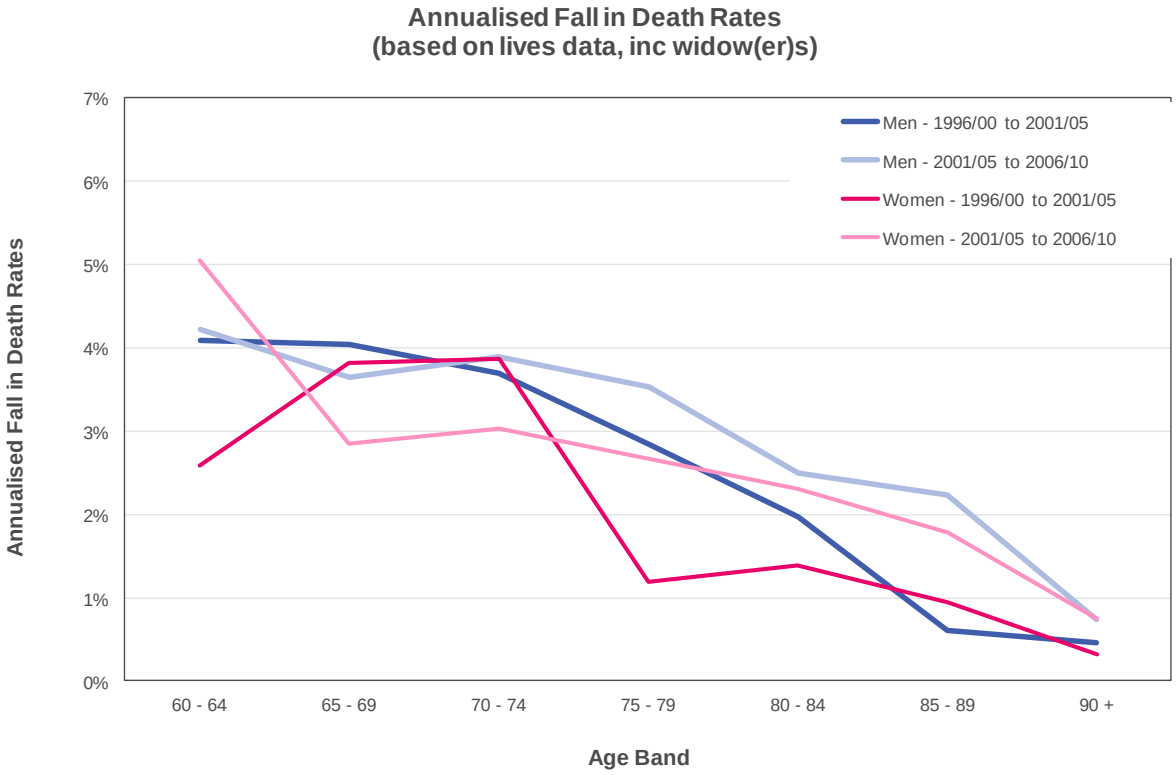


Chart 11E shows that:

- The rates for the 60-64 and 65-69 age groups have improved considerably – by around 4% p.a.
- However, the rates for the 85-89 age group improved by only 1.5% p.a. for men and 1% p.a. for women.
- This indicates a larger proportionate improvement in the death rates of younger pensioners than geriatrics. But, as the death rates are much higher for the over 85s, the smaller reduction is still potentially more significant.
- The progression across the three five year periods appears to indicate accelerating rates of change over time. That is you observe higher rates of improvements at most ages when comparing the third period (2006-2010) with the second period (2001-2005) than when comparing the second (2001-2005) to the first (1996-2000).
- We explore these patterns in more detail in the next section.

12 Back to the future

In this section we consider the pattern of emerging improvements in occupational pension schemes in more detail. We contrast these with the projections which the Pensions Regulator had suggested might be used as a trigger for further scrutiny where Recovery Plans are submitted as part of complying with the requirements of The Occupational Pension Schemes (Scheme Funding) Regulations 2005.

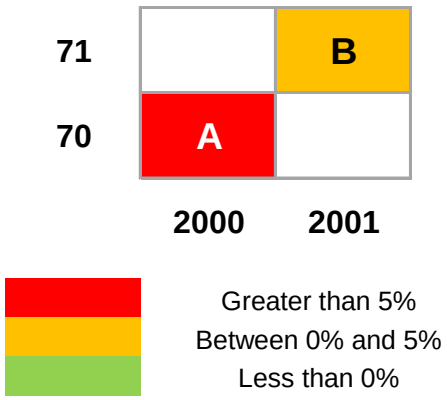
The analysis in this section is in no way an endorsement of any particular projection method – rather the analysis of this section is intended to help inform discussions with your actuarial advisors as to what might be an appropriate allowance for future improvements.

12.1 The hot and cold of death

An alternative way to consider the improvements described in section 11 is to look at the change in the mortality rates (i.e. proportion of people dying) at each age from one year to the next. By colouring those areas of strong improvements (reductions) in mortality rates in hot oranges and reds, and those areas of weak improvements or worsening in mortality rates in cooler yellows, greens and blues we get a picture known as a heat map.

Chart 12A – Explaining heat maps

The chart below provides a very simple example of a heat map, considering two ages, 70 and 71, and two calendar years, 2000 and 2001. We will use this chart to explain how to read heat maps.



In a heat map each square represents the change in the death rate at a certain age compared to the rate in the previous year. In the example to the left, the square marked A represents how much lower the death rate was amongst 70 year olds in 2000, compared to the previous year, 1999. Since the square is a bright red this tells us that there was more than a 5% reduction in deaths per thousand 70 year olds in 2000 compared to 1999.

Similarly, the square marked ‘B’ indicates that the death rate amongst 71 year olds in 2001 was lower, by up to 5%, than it was in 2000. So, if, for example, 100 in every one thousand 71 year olds died in 2000, then perhaps only 96 in every thousand 71 year olds died in 2001.

When reading these heat maps it is also important to know that individuals born at similar times – known as *birth cohorts* – move along diagonals in these charts – since someone aged 70 in 2000 will be aged 71 in 2001.

In practice the year-on-year changes, even in a large dataset like **VitaBank™** can give a very multicoloured pattern to these ‘maps’. In order to avoid this, some smoothing of the underlying rates is usually necessary – throughout the rest of this section the heat maps relate to smoothed data.

12.2 Cohort projections

A golden generation of pensioners

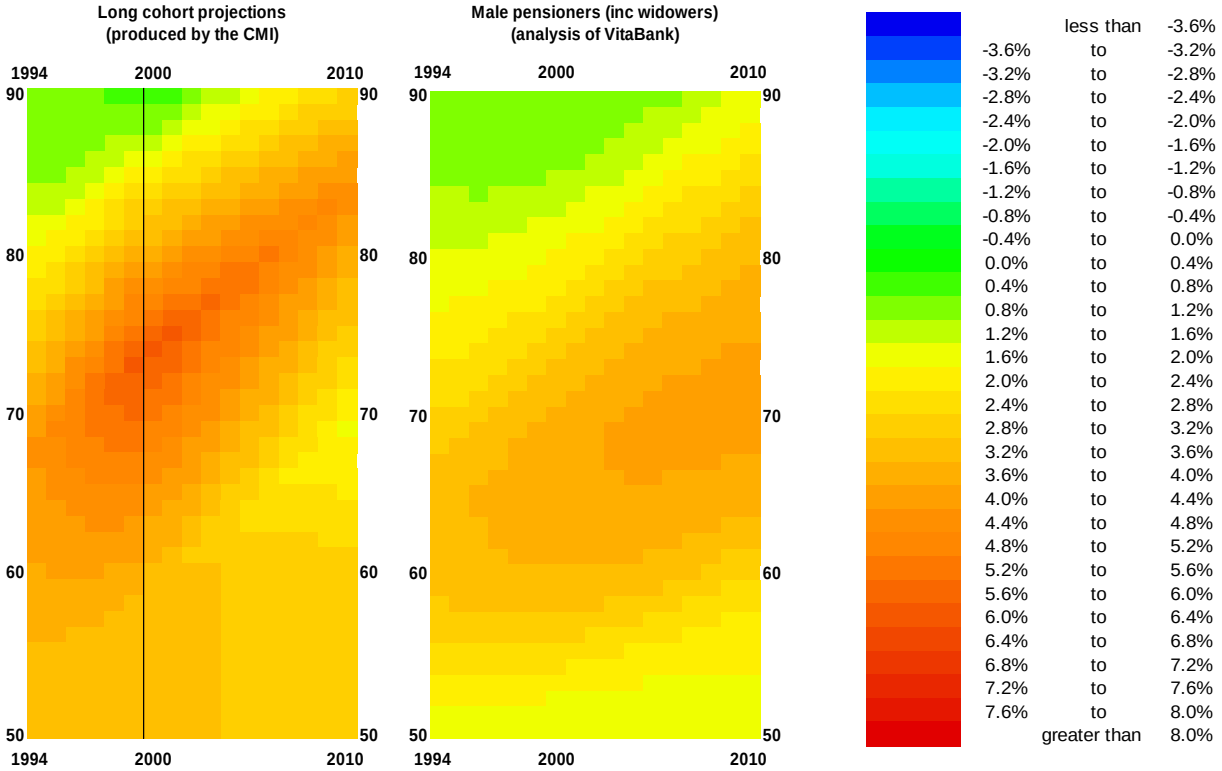
It has been widely commented that individuals born in the 1920s and 1930s have lived significantly longer than the previous generation. This phenomenon, termed the “cohort effect”, has been observed in both the UK population as a whole (particularly for those born around the mid 1930s) and for life office pensioners (especially for those born in the 1920s).

But does this effect exist in occupational pension schemes? And if so, how strong an effect is it, and for how long will these particularly rapid improvements continue? These are key questions which will impact on the cost of occupational pension provision.

A common method of making some allowance for these effects to continue into the future is to use one of the CMI's "cohort projections". In the remainder of this section we compare VitaBank to the CMIs "long cohort" projection.

Chart 12B – Long cohort vs. VitaBank (men)

The following chart shows how the long cohort projections compare with the actual emerging experience for men within our database. Since the first full year of data within VitaBank relates to 1993 - these charts start with the improvements observed between 1993 and 1994. Importantly the data from 1993 onwards contains a good mix of funds and so the profile between, for example public and private sector funds, has been relatively stable over the period illustrated[21].



Note: This chart is based upon the analysis of 132 funds which Club Vita had processed data for by 23 January 2011.

When looking at this chart it is important to realise that in the left-hand heat map (the *long cohort*) the information to the left of the black line, 1999, is (smoothed) historic experience – whilst to the right is a projection[22]. In contrast the right hand heat map is based entirely upon actual experience data.

We can see that:

- Within VitaBank the improvements, have, to date, generally been a lighter shade of orange i.e. gentler than anticipated under the CMI's 'cohort projections'.

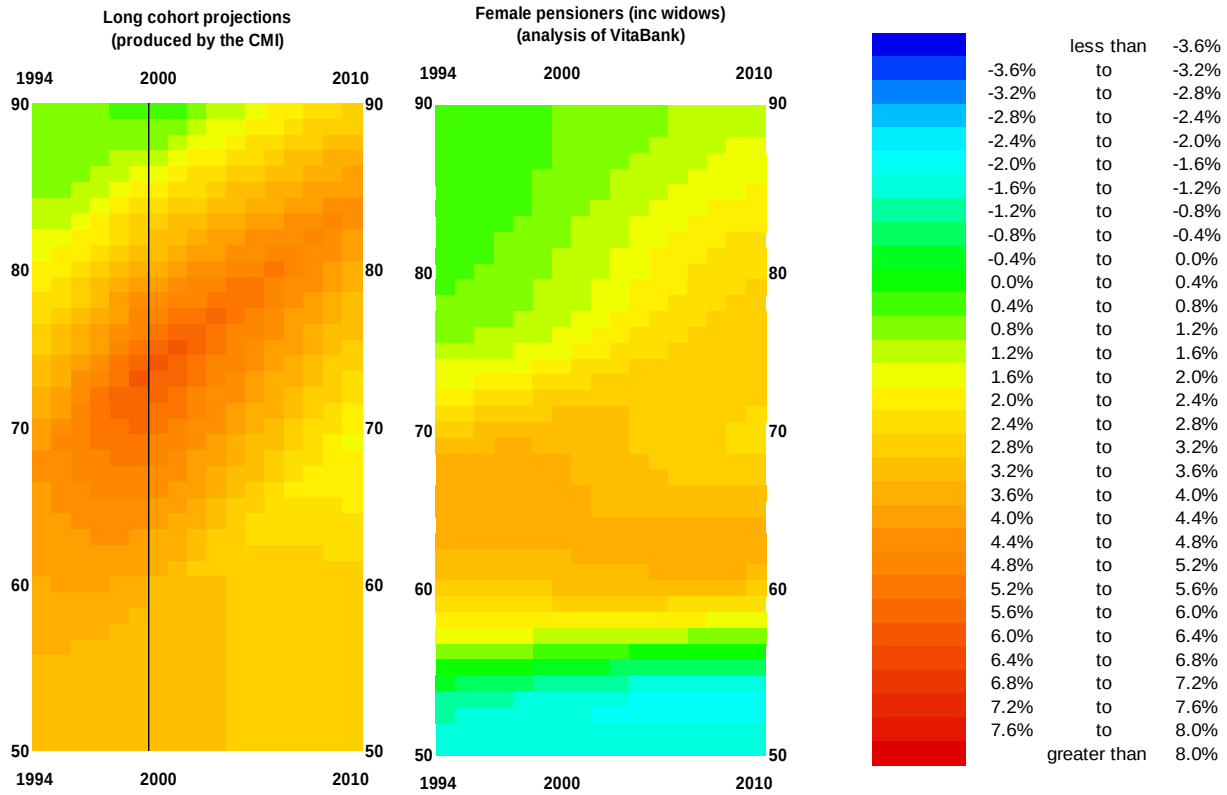
21 We have chosen to compare the VitaBank experience against 'long cohort' as this was the assumption (when combined with an underpin) that the Pensions Regulator originally proposed as a benchmark for funding purposes.

22 In generating the projection the CMI also considered historic data prior to 1994 however in order to make the two heat maps directly comparable we have only included information from 1994 onwards.

- There is evidence of a diagonal of strong oranges – this is consistent with a 'cohort effect' existing within occupational pension schemes.
- The 'golden generation' (i.e. the 'cohort generation') appears to be centred on a younger generation of individuals, namely those aged around 70 in 2007 (i.e. those born around the late 1930s) rather than those born in the mid 1920s (as was assumed in the long cohort projection).

Chart 12C – Long cohort vs. VitaBank (women)

The following chart shows the corresponding picture for women:



Note: This chart is based upon the analysis of 132 funds which Club Vita had processed data for by 23 January 2011.

As for men, there are significant differences between the long cohort projections (shown in the left hand block) and the improvements observed in VitaBank (in the right hand block). However the VitaBank improvements for women are not identical to those seen for men.

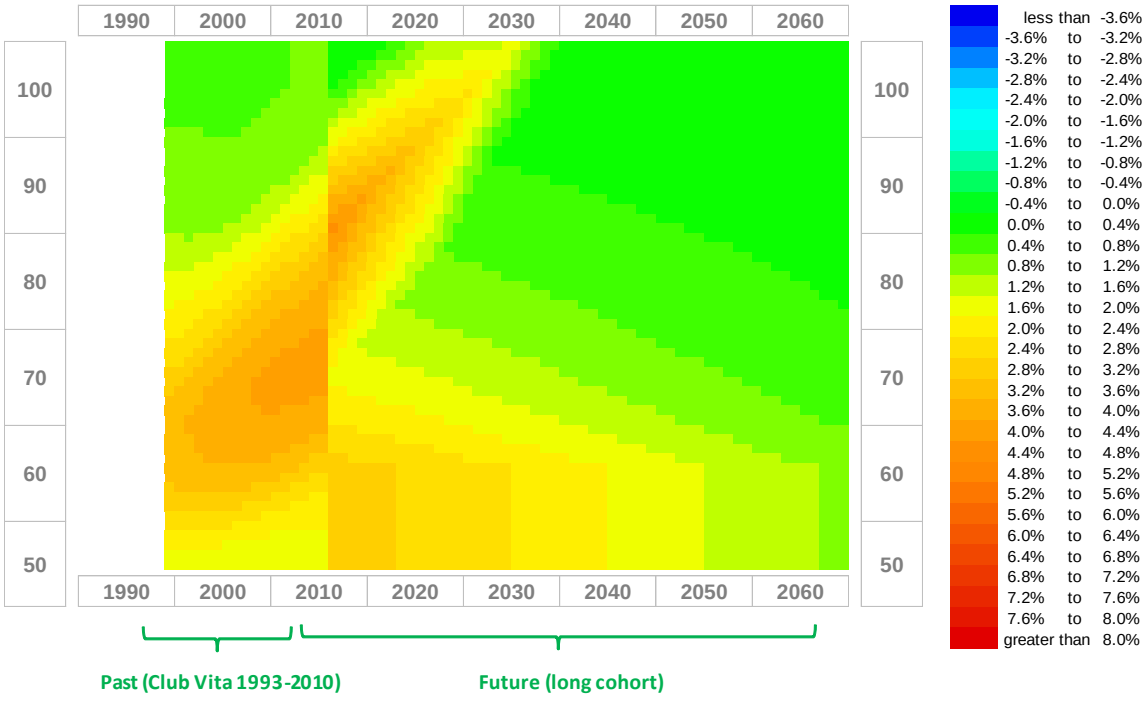
- As for men, the improvements for women in VitaBank have generally been less rapid (shown by lighter shades of orange, and more yellow and green) than assumed in the long cohort projections.
- There appears to be less evidence of a 'cohort effect'.

12.3 Regulatory trigger?

Following the Pensions Regulator's consultation on good practice in selecting mortality assumptions for the funding of defined benefit pension funds there has been considerable discussion as to the appropriateness or otherwise of the CMI's cohort projections, and the 'long cohort' in particular. However, how plausible is it that future mortality improvements will follow the long cohort assumption? One way to look at this is to consider how the heat maps seen in section 12.2 would 'evolve' if future improvements were to be in line with the long cohort.

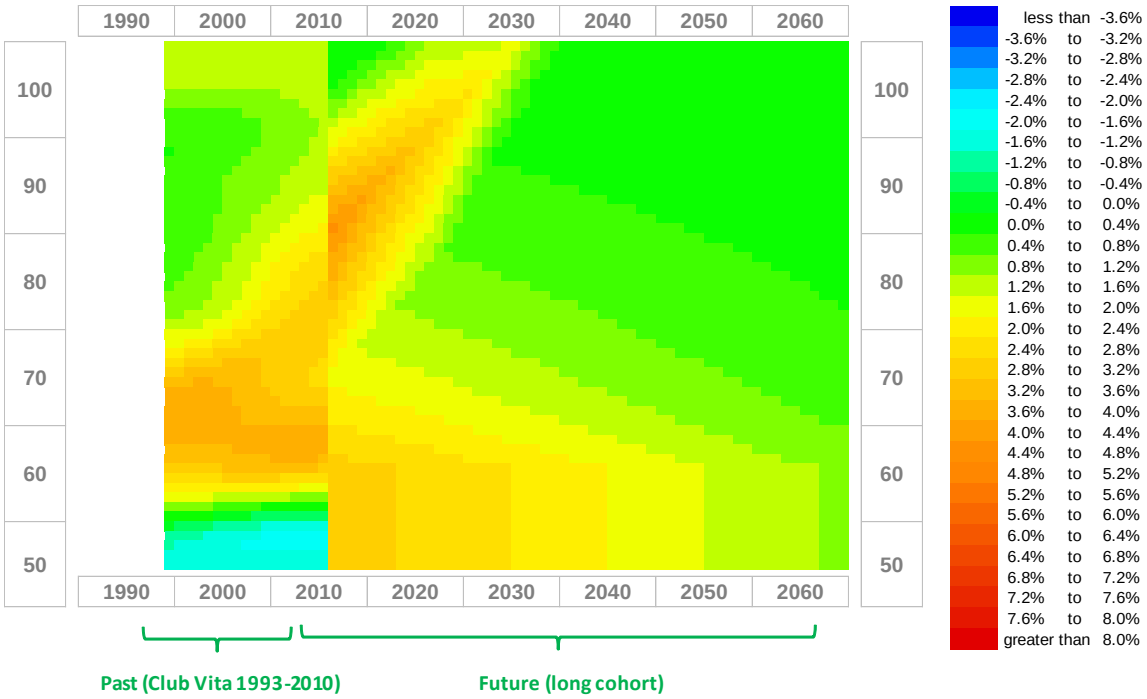
In charts 12D and 12E we illustrate what an assumption of long cohort would mean in terms of how the future would compare to recent past, if occupational pension schemes were to exhibit improvements in line with the long cohort projections from 2008 onwards.

Chart 12D – How the past might evolve? (men)



Note: When looking at the above chart please be aware that the years appear above and below the chart, and the ages to the left and the right. The year/age shown applies at the middle of the box. For example the dark vertical line represents 1990.

Chart 12E – How the past might evolve? (women)



A clear disconnect can be seen between observed improvements in VitaBank and long cohort projections. In particular:

- The most rapid improvements are currently occurring at around age 70, rather than around age 80 (which is assumed by the cohort projections).
- Pensioners in their early 50s appear to be seeing slower improvements in mortality than assumed under the cohort projections.

For those wondering how the other cohort projections (short or medium) compare – the strong diagonal of oranges and yellows seen above would be a much shorter burst of warm colours under medium cohort, and non-existent under the short cohort.

Demographic DNA revisited

When looking at the above charts it is important to realise that they contain a mixture of funds with different 'demographic DNA'. For this reason it is perhaps not surprising that the 'golden generation' observed in VitaBank differs from that observed within the population studied by the CMI – which is likely to have a different 'DNA'. Part of our ongoing research is to identify which elements of a fund's 'DNA' characterise how longevity has been improving. We look forward to sharing this research with Club Vita participants.

12.4 An apple a day...

In reality future changes in longevity observed in occupational pension schemes will be the result of a combination of factors including:

- Changes in medical and lifestyle practices over recent decades having an impact (positive or negative) on generations of future pensioners.

- Future medical advances
- Future lifestyle changes

Within Club Vita we are proactively engaging with the medical research community and with gerontologists (scientists who specialise in the ageing process). We anticipate that as a result of this research we will be able to provide alternative projection models to members of Club Vita to supplement those currently available.

12.5 The future is uncertain

We noted earlier that future changes in longevity are a *known unknown*. Consequently monitoring emerging mortality experience can provide early warnings as to whether more (or indeed fewer) people are surviving than expected. As a subscriber to Club Vita you will be receiving a report (**VitaMonitor™**) monitoring your experience against your funding assumptions. This will be provided from the second year of membership onwards so that it can reflect the results of our initial analyses and subsequent discussions we have with you.

Appendix A – Explaining the variation between funds

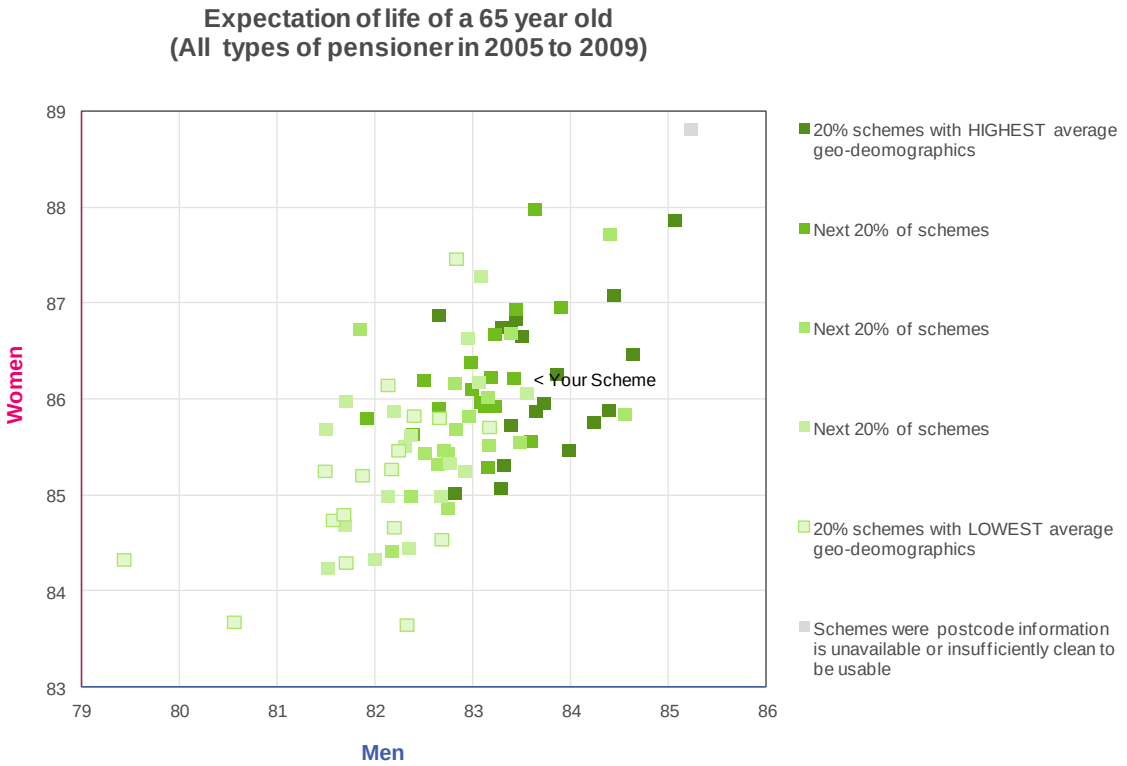
This Appendix verifies that the variation in life expectancies observed between individual funds is consistent with the funds having different demographic DNAs – for example the funds with a greater proportion of non-manual employees having the higher life expectancies.

The analysis is presented as a series of variations on the scatter-plot as seen in Chart 5A. Each variation looks at one of the key longevity characteristics identified in sections 6,7 and 8, and in each case markers for different funds have been plotted using a colour gradient representing how common a particular factor is within each fund[23] – the darker the colour the more common the characteristic is.

Chart A1: Variations in geo-demographics

In section 8 we saw how geo-demographics i.e. how people live life outside of work, is important in predicting longevity

In the following scatter-plot we identify the funds with the highest average geo-demographics. The darker the shade of green, the higher the average geo-demographics; whilst the grey points relate to the very few funds where we did not receive postcode information, or the information received appears insufficiently reliable to use.



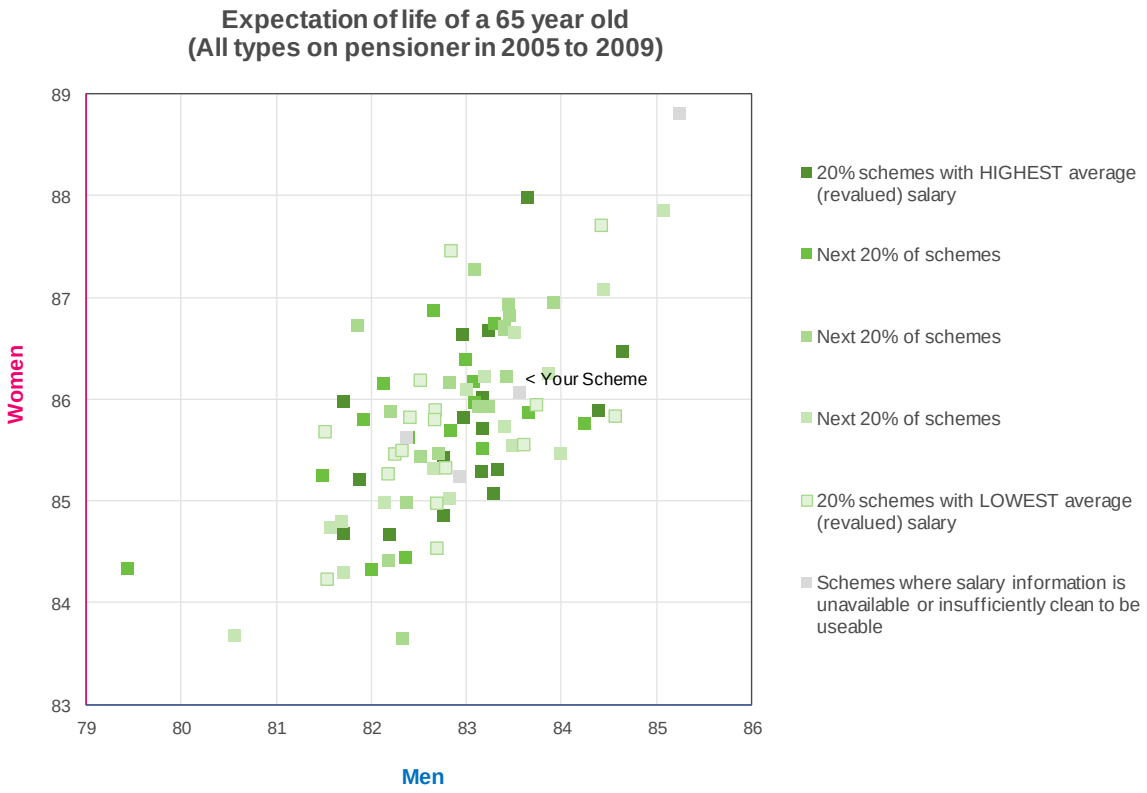
We can see from this chart that the funds which have the darker green markers (with more members in longer lived mortality groups) typically have the longest life expectancy. This shows that the geo-demographic 'DNA' of different funds is an important factor in explaining variations between funds - in other words understanding how

[23] We have considered the popularity of each characteristic as the average over the period to be consistent with the data used to calculate life expectancies. As such the values for your fund may be slightly different to those shown in the main body of this report.

your membership spends its time and money outside of work is crucial to understanding the likely longevity of your members.

Chart A2: Variation in affluence

In section 7 we saw how affluence is important in predicting longevity, and that for men this is best measured by salary at retirement/exit (revalued to current terms with RPI), which we shall refer to as 'salary' for ease. We can repeat the analysis of Chart A1 but colour coding employees by average salary. Also, as seen in section 1, men typically have higher salaries than women so we have based the colour coding on the average male salaries to avoid distortions due to funds having differing proportions of men and women.

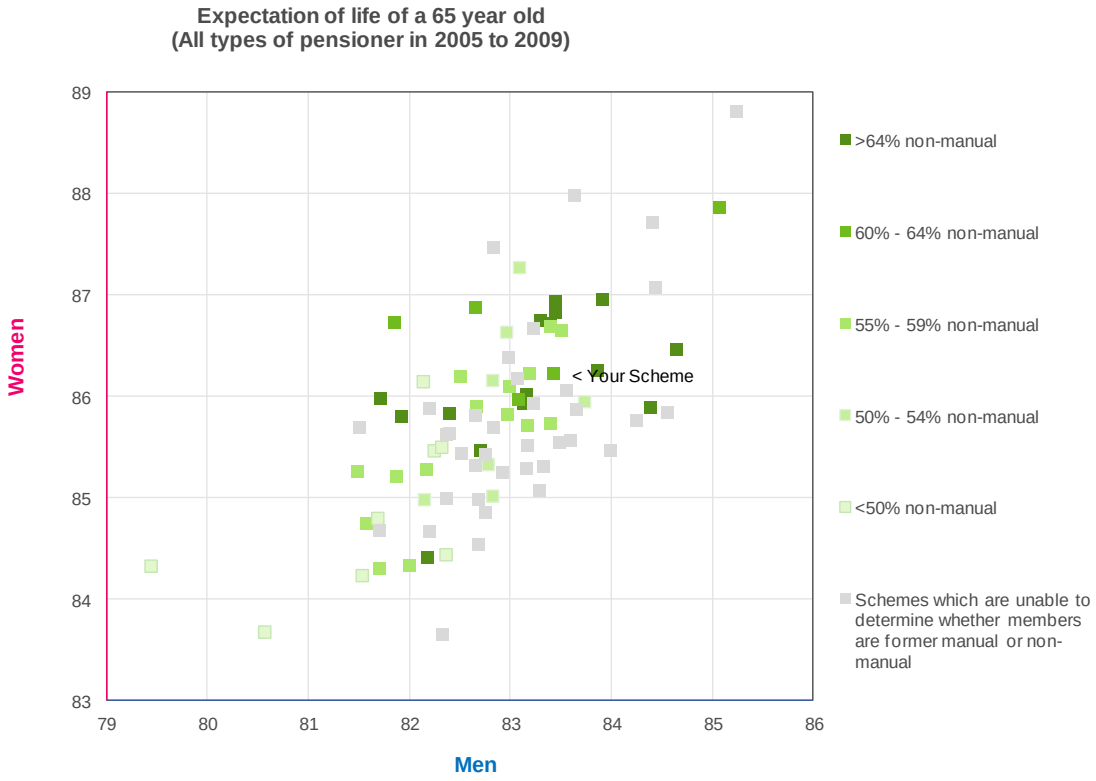


We would anticipate this chart showing darker greens at the top right of this chart (i.e. higher salaries having higher life expectancies) and lighter greens at the bottom left of the chart. This would broadly be the case, were it not for a number of darker greens towards the bottom left and some dark greens with broadly average life expectancies. On closer inspection the darker greens generally relate to local authorities which are London based and so have a 'London loading' in the salary. Since these loadings are designed to reflect the higher cost of living we would not expect the (unadjusted) higher salaries to be associated with longer life expectancies. If we looked at the above chart without the 'London loadings' we would expect to see a much clearer pattern of light to dark green from bottom left to top right.

Chart A3: Variation in employment type

For many of the funds in the database we are able to classify individuals based upon whether their former employment was manual or non-manual.

In the following scatter-plot we identify the percentage of the pensioner membership who are former non-manual employees, where this is known. The darker the shade of green, the greater the proportion of non-manual employees; whilst the grey points relate to funds where we are not able to identify whether employees are manual or non-manual.



We saw in section 6 how for non-manual employees, mortality rates were lower, and so life expectancies were higher compared to manual. It is reassuring therefore to see the darker green parts generally appearing to the top right of chart A1.

However there is considerable variation in this chart with some lighter green parts in the top right, (i.e. funds with considerable numbers of former manual employees which have high life expectancy), and some darker green parts in the bottom left. This suggests that the other factors explored in sections 6, 7 and 8 may be involved in explaining the variation between funds.

Appendix B – Isolating the effects of job, pay and location

Challenging the conventional approach

We have seen in sections 6 to 8 that factors such as occupation, retirement type, pension amount, salary and postcode based longevity group all have a significant impact on life expectancy. Traditionally, actuaries have made allowance for perhaps a few of these factors. This has been done using reference data which, in many cases, does not directly relate to occupational pension schemes.

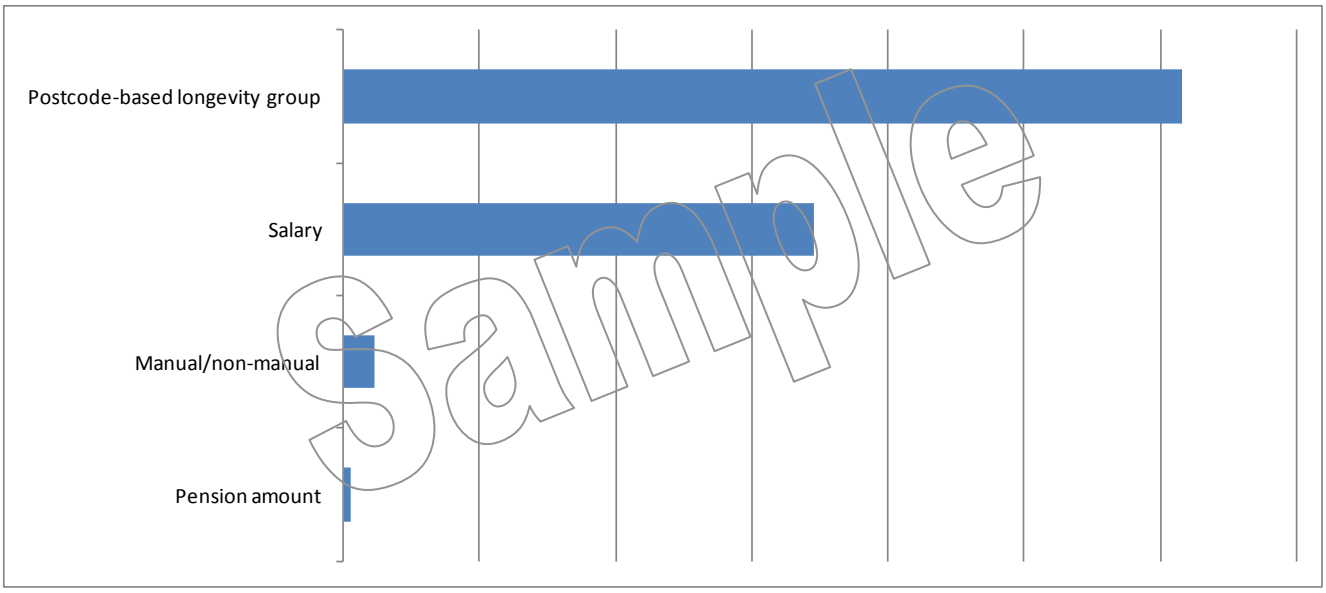
This raises important questions:

- Which of these factors are most significant? How does the relative significance vary for an individual fund, where only certain factors are known?
- How do these factors interact? How can actuaries allow for several of these factors if the interactions are unknown?
- How can actuaries make allowance for distortions where reference data does not relate to occupational pension schemes?

Or in other words, how can actuaries fully take into account a fund's unique demographic DNA?

Which factors are most significant?

The statistical methods adopted allow the relative impacts of the various factors to be assessed, for any combination of factors. An example is given below for the factors (in addition to age, gender and retirement type) available for a sample fund:



How do the factors interact?

Importantly, the statistical techniques we have adopted allow for interactions between factors.

For example, for the sample analysis above, pension amount has a very low impact on longevity. There is a good reason for this. We have already made allowance for affluence via salary (which comes third in the list of factors). As pension amount and salary have a strong correspondence, there is little benefit of allowing for pension amount in addition. This illustrates how the techniques we use avoid "double counting" related factors that influence longevity.

Crucially these techniques also enable us to consider the statistical importance of the 'interactions' between factors – for example whether the importance of salary 'wears off' with age.

How do we ensure VitaBank data is relevant?

We use data from occupation pension schemes for occupational pension schemes. This avoids the distortions of using less relevant data sets, such as the whole UK population, or individuals with life office pensions. But not all occupational schemes are the same. That's why we have sought to gather as much data as possible about the constituents of VitaBank, so that we can match VitaCurves to the specific demographic DNA of each member within each fund.

The technical bit

We have sought throughout to minimise the use of jargon and technical terms. But we know that knowing a bit more about which statistical techniques we have used, may be useful to some. The following is a very high level overview of some of the techniques adopted:

Multivariable statistical techniques have been used to allow the modelling of various covariates simultaneously. The main analyses estimate qx at the individual level using a Bernoulli model with binary responses, usually in the form of a Generalised Linear Model with logistic link function. Covariate selection uses a stepwise method and statistical criteria including log-likelihood ratio tests, Akaike Information Criterion and Bayesian Information Criterion. Cox proportional hazard models and survival analyses have been used to corroborate results. Postcode based longevity groups are defined using a variety of methods including recursive partitioning, regression trees and clustering based on Ward's method.

A fuller exposition of the statistical methods adopted is set out in the paper "What longevity predictors should be allowed for when valuing pension fund liabilities?", presented to the actuarial profession in September 2009. In addition the statistical methods have been independently reviewed by a leading academic body.

Appendix C – Summary statistics for your fund on a lives basis

The following tables summarise the numbers of pensions in payment (for those aged 40 or over) and the corresponding numbers of deaths in each calendar year. These tables may be compared with the corresponding tables for the whole of VitaBank shown in Appendix F.

Exposed to risk

			1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Men	Former employment	Manual	1,179	1,190	1,226	1,283	1,339	1,358	1,371	1,386	1,397	1,405	1,415	1,430	1,440	1,443	1,459	1,457	1,456	1,445	1,436
		Non manual	1,289	1,357	1,421	1,527	1,614	1,708	1,781	1,848	1,899	1,952	1,994	2,058	2,104	2,152	2,248	2,353	2,399	2,454	2,504
		Unknown	-	-	-	-	-	1	4	5	10	18	35	64	108	154	214	281	366	484	648
		Total	**2,467**	**2,547**	**2,647**	**2,810**	**2,953**	**3,067**	**3,156**	**3,240**	**3,305**	**3,374**	**3,444**	**3,551**	**3,651**	**3,749**	**3,921**	**4,091**	**4,221**	**4,383**	**4,588**
	Retirement type	Normal health	1,963	2,023	2,089	2,210	2,311	2,383	2,424	2,478	2,537	2,593	2,656	2,762	2,871	2,979	3,154	3,332	3,475	3,650	3,870
		Ill health	500	520	554	595	637	679	727	756	763	777	781	783	777	768	764	754	740	723	708
		Unknown	4	4	4	5	5	5	5	5	5	5	7	7	3	2	3	5	6	10	10
		Total	**2,467**	**2,547**	**2,647**	**2,810**	**2,953**	**3,067**	**3,156**	**3,240**	**3,305**	**3,374**	**3,444**	**3,551**	**3,651**	**3,749**	**3,921**	**4,091**	**4,221**	**4,383**	**4,588**
	Widowers		15	25	33	36	47	55	68	87	97	114	130	150	174	195	238	270	294	313	336
	Total		**2,482**	**2,572**	**2,679**	**2,846**	**3,000**	**3,122**	**3,224**	**3,327**	**3,402**	**3,488**	**3,574**	**3,701**	**3,825**	**3,944**	**4,159**	**4,361**	**4,515**	**4,696**	**4,924**
Women	Former employment	Manual	450	484	521	582	640	707	777	846	899	958	1,013	1,085	1,150	1,224	1,300	1,364	1,389	1,440	1,479
		Non manual	886	972	1,069	1,191	1,317	1,498	1,700	1,890	2,079	2,260	2,440	2,673	2,900	3,110	3,362	3,613	3,861	4,125	4,419
		Unknown	-	-	-	-	-	-		4	13	29	60	114	184	271	388	504	634	792	963
		Total	**1,336**	**1,456**	**1,590**	**1,773**	**1,956**	**2,205**	**2,477**	**2,740**	**2,991**	**3,246**	**3,514**	**3,872**	**4,234**	**4,605**	**5,050**	**5,482**	**5,884**	**6,357**	**6,861**
	Retirement type	Normal health	1,050	1,128	1,222	1,343	1,466	1,634	1,807	2,003	2,209	2,418	2,641	2,965	3,291	3,630	4,048	4,468	4,867	5,326	5,827
		Ill health	287	328	368	430	487	563	655	716	757	798	836	864	889	914	934	943	938	945	944
		Unknown	-	-	-	1	3	8	15	20	26	30	37	44	55	61	68	72	79	85	90
		Total	**1,336**	**1,456**	**1,590**	**1,773**	**1,956**	**2,205**	**2,477**	**2,740**	**2,991**	**3,246**	**3,514**	**3,872**	**4,234**	**4,605**	**5,050**	**5,482**	**5,884**	**6,357**	**6,861**
	Widows		411	458	519	571	613	651	702	746	788	840	874	927	983	1,021	1,054	1,091	1,128	1,172	1,203
	Total		**1,747**	**1,914**	**2,109**	**2,344**	**2,569**	**2,856**	**3,178**	**3,485**	**3,779**	**4,086**	**4,387**	**4,800**	**5,217**	**5,627**	**6,104**	**6,573**	**7,012**	**7,529**	**8,064**
TOTAL			**4,229**	**4,486**	**4,788**	**5,191**	**5,569**	**5,978**	**6,403**	**6,812**	**7,182**	**7,574**	**7,961**	**8,501**	**9,043**	**9,571**	**10,263**	**10,933**	**11,528**	**12,225**	**12,988**

Club Vita LLP

Number of deaths

			1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Men	Former employment	Manual	50	42	45	37	43	54	54	56	55	48	55	59	55	60	58	51	65	64	66
		Non manual	31	41	31	33	34	32	45	46	43	53	53	60	63	48	44	59	62	76	68
		Unknown	-	-	-	-	-	-	-	-	-	-	1	1	1	1	2	2	5	4	2
		Total	**81**	**83**	**76**	**70**	**77**	**86**	**99**	**102**	**98**	**101**	**109**	**120**	**119**	**109**	**104**	**112**	**132**	**144**	**136**
	Retirement type	Normal health	54	64	55	55	63	74	83	79	81	80	90	94	94	86	78	92	101	117	106
		Ill health	27	19	21	15	14	12	16	23	17	21	19	23	24	23	26	20	31	26	30
		Unknown	-	-	-	-	-	-	-	-	-	-	-	3	1	-	-	-	-	1	-
		Total	**81**	**83**	**76**	**70**	**77**	**86**	**99**	**102**	**98**	**101**	**109**	**120**	**119**	**109**	**104**	**112**	**132**	**144**	**136**
	Widowers		-	2	5	2	4	1	2	3	3	2	2	2	8	9	7	10	10	5	5
	Total		**81**	**85**	**81**	**72**	**81**	**87**	**101**	**105**	**101**	**103**	**111**	**122**	**127**	**118**	**111**	**122**	**142**	**149**	**141**
Women	Former employment	Manual	21	18	6	6	7	11	11	14	9	16	15	12	21	21	18	30	22	26	35
		Non manual	23	12	22	18	13	16	24	15	22	36	26	41	39	42	63	49	48	52	50
		Unknown	-	-	-	-	-	-	-	-	-	-	-	2	2	2	6	4	4	11	3
		Total	**44**	**30**	**28**	**24**	**20**	**27**	**35**	**29**	**31**	**52**	**41**	**55**	**62**	**65**	**87**	**83**	**74**	**89**	**88**
	Retirement type	Normal health	37	20	21	16	14	24	25	20	22	43	25	41	46	44	63	65	57	68	70
		Ill health	7	10	7	8	6	3	10	9	8	9	16	14	16	20	23	18	16	21	18
		Unknown	-	-	-	-	-	-	-	-	1	-	-	-	-	1	1	-	1	-	-
		Total	**44**	**30**	**28**	**24**	**20**	**27**	**35**	**29**	**31**	**52**	**41**	**55**	**62**	**65**	**87**	**83**	**74**	**89**	**88**
	Widows		9	7	10	13	19	16	24	17	16	33	32	19	29	38	38	44	41	45	48
	Total		**53**	**37**	**38**	**37**	**39**	**43**	**59**	**46**	**47**	**85**	**73**	**74**	**91**	**103**	**125**	**127**	**115**	**134**	**136**
TOTAL			**134**	**122**	**119**	**109**	**120**	**130**	**160**	**151**	**148**	**188**	**184**	**196**	**218**	**221**	**236**	**249**	**257**	**283**	**277**

Appendix D – Summary statistics for your fund on an amounts basis

The following tables summarise the amounts of pensions in payment (for those aged 40 or over) and the corresponding amounts of pension ceasing on deaths in each calendar year. These tables may be compared with the corresponding tables for the whole of VitaBank shown in Appendix G.

Exposed to risk (£'000s)

			1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Men	Former employment	Manual	1,875	1,956	2,105	2,289	2,465	2,622	2,678	2,806	2,871	2,946	3,118	3,270	3,414	3,551	3,822	4,019	4,038	4,296	4,595
		Non manual	6,626	7,174	7,815	8,600	9,494	10,752	11,443	12,389	13,120	13,724	14,570	15,628	16,594	17,670	19,414	21,160	21,400	23,345	25,344
		Unknown	-	-	-	-	-	0	0	4	18	23	63	120	270	420	616	832	1,139	1,639	2,269
		Total	**8,501**	**9,130**	**9,920**	**10,889**	**11,958**	**13,375**	**14,121**	**15,199**	**16,010**	**16,693**	**17,751**	**19,018**	**20,278**	**21,641**	**23,851**	**26,011**	**26,578**	**29,281**	**32,207**
	Retirement type	Normal health	7,081	7,600	8,253	8,995	9,808	10,940	11,491	12,337	13,018	13,563	14,447	15,583	16,818	18,086	20,123	22,154	22,820	25,363	28,162
		Ill health	1,402	1,512	1,647	1,872	2,128	2,411	2,606	2,837	2,967	3,105	3,272	3,403	3,454	3,548	3,719	3,845	3,744	3,894	4,021
		Unknown	18	18	19	22	23	24	24	25	25	26	31	32	7	6	9	12	14	24	25
		Total	**8,501**	**9,130**	**9,920**	**10,889**	**11,958**	**13,375**	**14,121**	**15,199**	**16,010**	**16,693**	**17,751**	**19,018**	**20,278**	**21,641**	**23,851**	**26,011**	**26,578**	**29,281**	**32,207**
	Widowers		7	12	16	19	24	30	40	51	60	85	104	127	165	193	259	300	320	364	425
	Total		**8,507**	**9,142**	**9,936**	**10,908**	**11,982**	**13,404**	**14,162**	**15,250**	**16,070**	**16,779**	**17,855**	**19,145**	**20,443**	**21,834**	**24,111**	**26,311**	**26,898**	**29,645**	**32,632**
Women	Former employment	Manual	363	414	464	526	586	660	712	770	816	860	914	974	1,056	1,156	1,258	1,349	1,356	1,494	1,624
		Non manual	1,980	2,295	2,619	3,055	3,481	4,067	4,632	5,313	5,966	6,546	7,251	8,173	9,099	10,086	11,273	12,577	13,289	14,807	16,747
		Unknown	-	-	-	-	-	-	0	9	51	57	104	218	293	415	569	783	985	1,398	1,931
		Total	**2,343**	**2,708**	**3,084**	**3,581**	**4,067**	**4,727**	**5,343**	**6,092**	**6,833**	**7,462**	**8,268**	**9,365**	**10,448**	**11,657**	**13,099**	**14,708**	**15,629**	**17,699**	**20,302**
	Retirement type	Normal health	1,732	1,969	2,230	2,521	2,808	3,233	3,607	4,127	4,684	5,135	5,728	6,630	7,554	8,586	9,895	11,356	12,324	14,182	16,544
		Ill health	611	739	854	1,060	1,258	1,492	1,731	1,952	2,128	2,297	2,491	2,676	2,818	2,985	3,103	3,244	3,187	3,377	3,591
		Unknown	-	-	-	0	0	2	5	13	21	30	50	59	75	87	102	108	118	140	167
		Total	**2,343**	**2,708**	**3,084**	**3,581**	**4,067**	**4,727**	**5,343**	**6,092**	**6,833**	**7,462**	**8,268**	**9,365**	**10,448**	**11,657**	**13,099**	**14,708**	**15,629**	**17,699**	**20,302**
	Widows		540	615	729	852	929	1,034	1,141	1,250	1,341	1,472	1,591	1,732	1,917	2,047	2,245	2,412	2,419	2,670	2,958
	Total		**2,883**	**3,324**	**3,813**	**4,433**	**4,996**	**5,761**	**6,484**	**7,342**	**8,174**	**8,934**	**9,859**	**11,097**	**12,364**	**13,704**	**15,344**	**17,120**	**18,048**	**20,369**	**23,261**
TOTAL			**11,391**	**12,466**	**13,749**	**15,342**	**16,978**	**19,165**	**20,646**	**22,592**	**24,245**	**25,713**	**27,714**	**30,243**	**32,808**	**35,538**	**39,455**	**43,431**	**44,946**	**50,014**	**55,893**

Note: Please note that all pension amounts have been revalued in line with RPI to the year of exposure.

Pensions ceasing (£'000s)

			1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Men	Former employment	Manual	77	62	73	66	75	104	77	108	103	79	98	142	118	129	151	107	141	166	184
		Non manual	105	159	164	182	149	139	178	223	256	320	260	384	335	314	301	348	353	602	579
		Unknown	-	-	-	-	-	-	-	-	-	-	0	1	5	1	4	4	1	6	4
		Total	**182**	**221**	**238**	**248**	**224**	**243**	**255**	**332**	**359**	**400**	**359**	**527**	**459**	**444**	**455**	**459**	**495**	**774**	**767**
	Retirement type	Normal health	108	153	198	222	186	193	220	282	308	338	313	405	379	359	369	384	396	644	599
		Ill health	74	69	40	26	38	49	34	50	51	62	46	100	80	85	85	75	99	129	169
		Unknown	-	-	-	-	-	-	-	-	-	-	-	23	0	-	-	-	-	1	-
		Total	**182**	**221**	**238**	**248**	**224**	**243**	**255**	**332**	**359**	**400**	**359**	**527**	**459**	**444**	**455**	**459**	**495**	**774**	**767**
	Widowers		-	1	1	-	-	1	1	1	1	1	0	2	12	10	5	10	9	3	3
	Total		**182**	**222**	**238**	**248**	**224**	**243**	**256**	**333**	**359**	**400**	**359**	**530**	**471**	**454**	**460**	**469**	**504**	**777**	**771**
Women	Former employment	Manual	7	14	6	8	7	8	10	13	11	20	15	12	17	20	26	28	24	35	36
		Non manual	33	18	47	65	58	44	56	38	52	116	99	132	100	146	203	151	168	174	169
		Unknown	-	-	-	-	-	-	-	-	-	-	-	3	21	23	8	7	3	8	1
		Total	**41**	**32**	**53**	**73**	**65**	**52**	**67**	**51**	**63**	**136**	**115**	**148**	**139**	**190**	**238**	**186**	**195**	**218**	**206**
	Retirement type	Normal health	32	18	33	55	42	43	45	39	47	116	73	90	106	85	151	120	146	172	165
		Ill health	9	15	19	18	23	9	22	12	16	20	42	57	34	103	85	66	47	45	41
		Unknown	-	-	-	-	-	-	-	-	0	-	-	-	-	1	1	-	2	-	-
		Total	**41**	**32**	**53**	**73**	**65**	**52**	**67**	**51**	**63**	**136**	**115**	**148**	**139**	**190**	**238**	**186**	**195**	**218**	**206**
	Widows		14	8	12	15	33	15	31	33	19	66	65	36	62	73	103	107	88	83	78
	Total		**54**	**40**	**64**	**88**	**98**	**67**	**98**	**84**	**82**	**201**	**180**	**184**	**201**	**263**	**340**	**293**	**283**	**301**	**284**
TOTAL			**236**	**262**	**303**	**336**	**322**	**310**	**354**	**417**	**441**	**602**	**538**	**714**	**672**	**717**	**800**	**762**	**787**	**1,078**	**1,055**

Note: Please note that all pension amounts have been revalued in line with RPI to the year of exposure.

Appendix E – Average ages & pensions for your fund

The following tables quote the mean ages and annual pensions of the in-force pensioners in each calendar year. The mean ages are not weighted by pension amount. These tables may be compared with the corresponding tables for the whole of VitaBank shown in Appendix H.

Average Annual Pension Amounts for in-force pensioners (£'s)

			1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Men	Former employment	Manual	1,591	1,643	1,717	1,784	1,840	1,931	1,953	2,024	2,056	2,097	2,204	2,287	2,372	2,461	2,619	2,759	2,774	2,973	3,201
		Non manual	5,142	5,287	5,499	5,631	5,882	6,295	6,425	6,703	6,910	7,032	7,307	7,594	7,888	8,211	8,636	8,992	8,921	9,514	10,120
		Unknown	-	-	-	-	-	23	48	836	1,891	1,306	1,804	1,879	2,508	2,734	2,874	2,961	3,110	3,387	3,501
		Average	**3,446**	**3,584**	**3,748**	**3,875**	**4,049**	**4,361**	**4,475**	**4,692**	**4,844**	**4,947**	**5,154**	**5,355**	**5,554**	**5,773**	**6,082**	**6,359**	**6,297**	**6,681**	**7,020**
	Retirement type	Normal health	3,607	3,757	3,951	4,070	4,244	4,591	4,741	4,978	5,130	5,231	5,440	5,641	5,857	6,072	6,381	6,649	6,567	6,949	7,277
		Ill health	2,805	2,906	2,975	3,145	3,341	3,550	3,583	3,752	3,889	3,998	4,188	4,349	4,446	4,620	4,865	5,100	5,062	5,388	5,676
		Unknown	4,419	4,532	4,683	4,502	4,564	4,748	4,824	4,967	5,055	5,131	4,735	4,799	2,207	3,202	2,857	2,442	2,184	2,382	2,485
		Average	**3,446**	**3,584**	**3,748**	**3,875**	**4,049**	**4,361**	**4,475**	**4,692**	**4,844**	**4,947**	**5,154**	**5,355**	**5,554**	**5,773**	**6,082**	**6,359**	**6,297**	**6,681**	**7,020**
	Widowers		439	472	506	536	512	539	591	584	623	750	802	848	947	989	1,092	1,113	1,089	1,162	1,264
	Overall male average		**3,428**	**3,554**	**3,708**	**3,832**	**3,994**	**4,294**	**4,392**	**4,584**	**4,724**	**4,810**	**4,996**	**5,173**	**5,344**	**5,536**	**5,797**	**6,034**	**5,957**	**6,313**	**6,627**
Women	Former employment	Manual	807	854	892	904	915	934	916	911	907	898	902	897	918	944	968	989	976	1,038	1,098
		Non manual	2,235	2,360	2,450	2,565	2,644	2,715	2,725	2,811	2,870	2,897	2,971	3,057	3,137	3,243	3,353	3,481	3,442	3,590	3,790
		Unknown	-	-	-	-	-	-	51	2,298	3,824	1,985	1,722	1,916	1,595	1,532	1,467	1,552	1,553	1,766	2,006
		Average	**1,754**	**1,860**	**1,940**	**2,019**	**2,079**	**2,144**	**2,158**	**2,224**	**2,284**	**2,299**	**2,353**	**2,418**	**2,467**	**2,531**	**2,594**	**2,683**	**2,656**	**2,784**	**2,959**
	Retirement type	Normal health	1,650	1,745	1,825	1,877	1,915	1,978	1,997	2,060	2,121	2,124	2,169	2,236	2,296	2,365	2,444	2,542	2,532	2,663	2,839
		Ill health	2,133	2,254	2,321	2,467	2,581	2,649	2,644	2,724	2,811	2,880	2,981	3,097	3,170	3,265	3,321	3,442	3,396	3,572	3,803
		Unknown	-	-	-	5	31	258	335	662	803	1,001	1,350	1,351	1,374	1,409	1,502	1,511	1,496	1,648	1,866
		Average	**1,754**	**1,860**	**1,940**	**2,019**	**2,079**	**2,144**	**2,158**	**2,224**	**2,284**	**2,299**	**2,353**	**2,418**	**2,467**	**2,531**	**2,594**	**2,683**	**2,656**	**2,784**	**2,959**
	Widows		1,314	1,345	1,404	1,493	1,516	1,587	1,626	1,675	1,702	1,752	1,821	1,868	1,950	2,005	2,129	2,211	2,145	2,278	2,459
	Overall female average		**1,650**	**1,736**	**1,808**	**1,891**	**1,945**	**2,017**	**2,040**	**2,106**	**2,163**	**2,187**	**2,247**	**2,312**	**2,370**	**2,436**	**2,514**	**2,605**	**2,574**	**2,706**	**2,885**
OVERALL AVERAGE			**2,693**	**2,779**	**2,871**	**2,956**	**3,049**	**3,206**	**3,225**	**3,316**	**3,376**	**3,395**	**3,481**	**3,558**	**3,628**	**3,713**	**3,844**	**3,972**	**3,899**	**4,091**	**4,303**

Note: Please note that all pension amounts have been revalued in line with RPI to the year of exposure.

Average Annual Pension Amounts for deceased pensioners (£'s)

			1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Men	Former employment	Manual	1,532	1,478	1,625	1,789	1,753	1,918	1,428	1,936	1,868	1,654	1,787	2,414	2,148	2,157	2,596	2,100	2,173	2,598	2,789
		Non manual	3,393	3,885	5,303	5,505	4,373	4,342	3,948	4,855	5,951	6,043	4,904	6,405	5,318	6,542	6,832	5,891	5,687	7,920	8,513
		Unknown	-	-	-	-	-	-	-	-	-	-	366	731	5,403	749	1,770	1,966	141	1,500	2,207
		Average	**2,244**	**2,667**	**3,125**	**3,541**	**2,910**	**2,820**	**2,573**	**3,252**	**3,660**	**3,957**	**3,290**	**4,395**	**3,854**	**4,075**	**4,372**	**4,094**	**3,747**	**5,377**	**5,642**
	Retirement type	Normal health	1,992	2,387	3,595	4,041	2,952	2,613	2,656	3,564	3,800	4,223	3,475	4,310	4,028	4,173	4,736	4,173	3,919	5,501	5,649
		Ill health	2,749	3,610	1,895	1,708	2,719	4,096	2,146	2,179	2,988	2,945	2,410	4,328	3,317	3,710	3,281	3,733	3,186	4,970	5,620
		Unknown	-	-	-	-	-	-	-	-	-	-	-	7,585	380	-	-	-	-	1,394	-
		Average	**2,244**	**2,667**	**3,125**	**3,541**	**2,910**	**2,820**	**2,573**	**3,252**	**3,660**	**3,957**	**3,290**	**4,395**	**3,854**	**4,075**	**4,372**	**4,094**	**3,747**	**5,377**	**5,642**
	Widowers		-	288	192	-	-	602	435	415	285	405	188	1,149	1,512	1,104	743	1,033	913	598	657
	Overall male average		**2,244**	**2,611**	**2,944**	**3,443**	**2,766**	**2,794**	**2,531**	**3,171**	**3,559**	**3,888**	**3,234**	**4,342**	**3,706**	**3,849**	**4,144**	**3,843**	**3,547**	**5,216**	**5,466**
Women	Former employment	Manual	347	804	960	1,393	1,049	725	939	936	1,236	1,246	1,027	979	821	975	1,441	935	1,093	1,340	1,022
		Non manual	1,451	1,495	2,131	3,599	4,465	2,757	2,346	2,501	2,343	3,214	3,821	3,229	2,572	3,487	3,228	3,075	3,492	3,355	3,383
		Unknown	-	-	-	-	-	-	-	-	-	-	-	1,732	10,744	11,441	1,391	1,834	867	754	399
		Average	**924**	**1,080**	**1,880**	**3,047**	**3,269**	**1,929**	**1,904**	**1,746**	**2,022**	**2,608**	**2,799**	**2,683**	**2,243**	**2,920**	**2,731**	**2,242**	**2,637**	**2,445**	**2,343**
	Retirement type	Normal health	868	886	1,579	3,425	3,026	1,782	1,792	1,947	2,124	2,697	2,919	2,206	2,294	1,942	2,403	1,841	2,564	2,535	2,357
		Ill health	1,218	1,469	2,785	2,291	3,836	3,104	2,185	1,298	1,994	2,182	2,610	4,083	2,096	5,168	3,715	3,689	2,961	2,152	2,285
		Unknown	-	-	-	-	-	-	-	-	4	-	-	-	-	1,016	831	-	1,582	-	-
		Average	**924**	**1,080**	**1,880**	**3,047**	**3,269**	**1,929**	**1,904**	**1,746**	**2,022**	**2,608**	**2,799**	**2,683**	**2,243**	**2,920**	**2,731**	**2,242**	**2,637**	**2,445**	**2,343**
	Widows		1,515	1,077	1,164	1,137	1,728	949	1,306	1,953	1,180	1,996	2,025	1,912	2,137	1,927	2,702	2,436	2,151	1,855	1,631
	Overall female average		**1,024**	**1,079**	**1,692**	**2,376**	**2,518**	**1,564**	**1,661**	**1,822**	**1,735**	**2,370**	**2,459**	**2,485**	**2,209**	**2,554**	**2,723**	**2,309**	**2,464**	**2,247**	**2,092**
OVERALL AVERAGE			**1,762**	**2,147**	**2,544**	**3,081**	**2,686**	**2,388**	**2,210**	**2,760**	**2,980**	**3,202**	**2,927**	**3,641**	**3,081**	**3,245**	**3,391**	**3,061**	**3,062**	**3,810**	**3,809**

Note: Please note that all pension amounts have been revalued in line with RPI to the year of exposure.

Average ages of in-force pensioners

			1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Men	Former employment	Manual	66.4	66.9	67.2	67.5	67.8	68.2	68.4	68.8	69.1	69.5	69.9	70.1	70.4	70.7	70.9	71.3	71.6	71.9	72.2
		Non manual	65.2	65.6	66.0	66.2	66.3	66.4	66.7	66.9	67.3	67.6	68.0	68.3	68.6	68.8	69.1	69.3	69.6	69.9	70.1
		Unknown	-	-	-	-	-	60.8	62.2	63.0	61.9	62.1	61.9	61.9	62.1	62.5	62.9	63.5	63.9	64.2	64.4
		Average	**65.8**	**66.2**	**66.6**	**66.8**	**67.0**	**67.2**	**67.4**	**67.7**	**68.0**	**68.4**	**68.7**	**68.9**	**69.1**	**69.3**	**69.4**	**69.6**	**69.8**	**69.9**	**69.9**
	Retirement type	Normal health	67.0	67.6	68.0	68.3	68.5	68.8	69.2	69.4	69.7	70.0	70.2	70.2	70.3	70.3	70.3	70.3	70.4	70.4	70.3
		Ill health	60.7	61.0	61.2	61.2	61.3	61.4	61.6	62.0	62.5	63.1	63.6	64.2	64.7	65.4	65.9	66.4	67.2	67.6	68.2
		Unknown	72.5	73.5	74.5	70.9	71.2	72.2	73.2	74.2	75.2	76.2	72.5	73.7	65.7	61.0	61.3	62.5	63.9	64.0	64.3
		Average	**65.8**	**66.2**	**66.6**	**66.8**	**67.0**	**67.2**	**67.4**	**67.7**	**68.0**	**68.4**	**68.7**	**68.9**	**69.1**	**69.3**	**69.4**	**69.6**	**69.8**	**69.9**	**69.9**
	Widowers		57.8	59.0	59.6	59.8	59.9	62.0	62.5	62.4	62.6	63.4	64.2	65.1	66.1	66.3	66.4	67.1	67.3	67.7	67.9
	Overall male average		**65.7**	**66.2**	**66.5**	**66.7**	**66.9**	**67.1**	**67.3**	**67.6**	**67.9**	**68.2**	**68.5**	**68.8**	**69.0**	**69.2**	**69.2**	**69.4**	**69.6**	**69.8**	**69.8**
Women	Former employment	Manual	63.1	63.4	64.0	64.3	64.7	64.9	65.1	65.3	65.7	66.2	66.5	66.9	67.3	67.6	67.9	68.3	68.8	69.3	69.9
		Non manual	63.9	64.1	64.4	64.3	64.4	64.4	64.4	64.6	64.9	65.3	65.6	65.8	66.1	66.4	66.7	66.9	67.1	67.5	67.8
		Unknown	-	-	-	-	-	-	60.0	58.0	57.7	59.9	60.3	60.0	60.5	60.9	61.3	61.9	62.5	62.9	63.4
		Average	**63.7**	**63.8**	**64.2**	**64.3**	**64.5**	**64.6**	**64.6**	**64.8**	**65.1**	**65.5**	**65.7**	**65.9**	**66.2**	**66.4**	**66.6**	**66.8**	**67.0**	**67.3**	**67.7**
	Retirement type	Normal health	65.4	65.7	66.2	66.5	66.7	66.9	67.0	67.2	67.3	67.5	67.6	67.6	67.6	67.7	67.6	67.7	67.7	67.9	68.1
		Ill health	57.2	57.3	57.7	57.7	57.8	57.9	58.0	58.2	58.8	59.4	59.8	60.3	60.9	61.5	62.0	62.7	63.4	64.1	64.9
		Unknown	-	-	-	60.0	61.3	62.3	62.5	62.9	63.1	63.4	64.1	64.5	64.3	64.8	65.4	66.0	66.5	67.2	67.9
		Average	**63.7**	**63.8**	**64.2**	**64.3**	**64.5**	**64.6**	**64.6**	**64.8**	**65.1**	**65.5**	**65.7**	**65.9**	**66.2**	**66.4**	**66.6**	**66.8**	**67.0**	**67.3**	**67.7**
	Widows		66.3	67.2	67.8	68.2	68.7	69.1	69.8	70.4	71.2	71.8	72.3	72.7	73.2	73.9	74.2	74.6	75.0	75.5	75.9
	Overall female average		**64.3**	**64.6**	**65.1**	**65.3**	**65.5**	**65.6**	**65.8**	**66.0**	**66.4**	**66.8**	**67.1**	**67.2**	**67.5**	**67.8**	**67.9**	**68.1**	**68.3**	**68.6**	**68.9**
OVERALL AVERAGE			**65.1**	**65.5**	**65.9**	**66.0**	**66.2**	**66.4**	**66.6**	**66.8**	**67.1**	**67.4**	**67.7**	**67.9**	**68.1**	**68.3**	**68.4**	**68.6**	**68.8**	**69.0**	**69.2**

Average ages of deceased pensioners

			1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Men	Former employment	Manual	68.0	71.8	70.6	70.7	72.1	74.5	75.4	74.0	76.3	75.8	76.5	76.3	76.5	77.6	76.7	78.9	77.1	78.9	80.5
		Non manual	66.8	69.9	70.8	72.5	73.3	70.8	75.8	73.0	72.7	73.8	75.5	75.2	78.0	76.4	79.0	76.9	80.2	79.9	77.7
		Unknown	-	-	-	-	-	-	-	-	-	-	64.0	60.0	64.0	60.0	64.0	63.5	65.8	65.0	61.0
		Average	**67.5**	**70.9**	**70.7**	**71.6**	**72.6**	**73.1**	**75.6**	**73.5**	**74.7**	**74.8**	**75.9**	**75.6**	**77.2**	**76.9**	**77.4**	**77.6**	**78.2**	**79.0**	**78.8**
	Retirement type	Normal health	70.9	72.1	72.0	72.7	73.9	74.2	76.9	75.3	76.0	76.5	76.9	77.1	78.8	77.7	79.0	79.3	79.2	80.6	80.1
		Ill health	60.9	66.6	67.2	67.4	67.1	66.3	69.1	67.6	68.7	68.3	71.3	68.5	71.2	74.0	72.8	69.9	74.6	72.5	73.9
		Unknown	-	-	-	-	-	-	-	-	-	-	-	86.0	77.0	-	-	-	-	66.0	-
		Average	**67.5**	**70.9**	**70.7**	**71.6**	**72.6**	**73.1**	**75.6**	**73.5**	**74.7**	**74.8**	**75.9**	**75.6**	**77.2**	**76.9**	**77.4**	**77.6**	**78.2**	**79.0**	**78.8**
	Widowers		-	62.5	61.0	53.5	47.3	78.0	63.0	74.3	67.0	72.0	67.5	70.0	74.1	72.2	73.3	78.9	78.8	75.2	77.2
	Overall male average		**67.5**	**70.7**	**70.1**	**71.1**	**71.4**	**73.2**	**75.4**	**73.6**	**74.5**	**74.7**	**75.8**	**75.5**	**77.0**	**76.6**	**77.2**	**77.7**	**78.2**	**78.9**	**78.7**
Women	Former employment	Manual	65.8	61.8	62.7	70.0	67.3	68.3	71.5	66.9	68.7	69.4	72.5	76.1	74.6	74.7	74.3	75.1	72.8	72.6	75.9
		Non manual	65.9	61.3	68.9	65.3	64.9	70.3	69.4	70.0	71.5	70.9	70.7	72.8	71.8	72.7	75.3	77.8	74.1	73.9	73.2
		Unknown	-	-	-	-	-	-	-	-	-	-	-	55.5	58.0	57.0	54.0	57.5	68.3	60.5	62.3
		Average	**65.8**	**61.6**	**67.6**	**66.5**	**65.8**	**69.5**	**70.1**	**68.5**	**70.7**	**70.4**	**71.4**	**72.9**	**72.3**	**72.9**	**73.6**	**75.9**	**73.4**	**71.9**	**73.9**
	Retirement type	Normal health	67.0	63.9	69.8	68.9	70.3	70.3	71.8	72.5	74.7	73.4	75.6	75.4	74.4	76.3	78.1	78.0	75.5	74.8	76.0
		Ill health	59.6	57.0	60.9	61.6	55.2	63.3	65.8	59.8	60.1	56.2	64.9	65.5	66.4	65.8	61.4	68.0	66.9	62.6	65.7
		Unknown	-	-	-	-	-	-	-	-	68.0	-	-	-	-	66.0	70.0	-	54.0	-	-
		Average	**65.8**	**61.6**	**67.6**	**66.5**	**65.8**	**69.5**	**70.1**	**68.5**	**70.7**	**70.4**	**71.4**	**72.9**	**72.3**	**72.9**	**73.6**	**75.9**	**73.4**	**71.9**	**73.9**
	Widows		70.8	72.7	74.3	74.8	73.3	77.1	74.7	74.6	75.7	79.4	80.8	80.6	77.9	82.3	83.5	82.6	83.5	83.6	83.5
	Overall female average		**66.7**	**63.7**	**69.3**	**69.4**	**69.4**	**72.3**	**71.9**	**70.8**	**72.4**	**73.9**	**75.5**	**74.9**	**74.1**	**76.3**	**76.6**	**78.2**	**77.0**	**75.8**	**77.3**
OVERALL AVERAGE			**67.2**	**68.6**	**69.9**	**70.5**	**70.7**	**72.9**	**74.1**	**72.7**	**73.8**	**74.3**	**75.7**	**75.3**	**75.8**	**76.5**	**76.9**	**77.9**	**77.7**	**77.4**	**78.0**

Appendix F – Summary statistics for VitaBank on a lives basis

Exposed to risk

			1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Men	Former employment	Manual	15,703	37,334	41,329	46,093	61,828	83,942	91,390	96,014	101,039	104,110	105,087	117,063	118,630	131,357	135,444	140,016	140,940	139,965	137,382	111,321	99,946
		Non manual	10,879	26,350	30,130	36,049	64,347	78,447	85,994	92,241	101,170	105,865	108,589	119,261	122,856	144,809	153,222	164,741	169,559	171,574	172,854	149,295	138,285
		Unknown	15,743	18,512	20,601	33,330	38,293	53,071	64,137	70,160	79,857	98,172	104,314	106,130	133,202	144,672	177,291	183,221	218,004	223,701	229,402	204,840	181,651
		Total	**42,326**	**82,196**	**92,060**	**115,472**	**164,468**	**215,461**	**241,521**	**258,415**	**282,065**	**308,146**	**317,990**	**342,454**	**374,688**	**420,838**	**465,956**	**487,977**	**528,503**	**535,241**	**539,638**	**465,456**	**419,881**
	Retirement type	Normal health	33,051	59,841	65,730	78,829	112,374	147,119	167,192	179,493	198,227	220,389	228,271	243,195	271,944	307,530	343,050	359,001	394,709	402,363	409,208	355,826	321,520
		Ill health	8,193	19,098	22,013	25,735	35,599	50,150	56,385	60,604	65,046	68,752	70,999	80,700	84,341	90,248	96,219	99,396	104,357	103,414	101,256	83,596	74,337
		Unknown	1,082	3,257	4,317	10,908	16,495	18,191	17,944	18,318	18,792	19,006	18,720	18,559	18,402	23,060	26,687	29,580	29,437	29,464	29,174	26,033	24,024
		Total	**42,326**	**82,196**	**92,060**	**115,472**	**164,468**	**215,461**	**241,521**	**258,415**	**282,065**	**308,146**	**317,990**	**342,454**	**374,688**	**420,838**	**465,956**	**487,977**	**528,503**	**535,241**	**539,638**	**465,456**	**419,881**
	Widowers		160	330	531	764	1,194	2,012	2,610	3,248	3,881	5,265	6,177	7,474	9,096	11,230	13,036	15,080	17,172	18,872	20,601	18,581	17,603
	Total		**42,486**	**82,526**	**92,591**	**116,235**	**165,662**	**217,472**	**244,130**	**261,662**	**285,946**	**313,411**	**324,167**	**349,928**	**383,784**	**432,068**	**478,992**	**503,057**	**545,675**	**554,113**	**560,239**	**484,037**	**437,484**
Women	Former employment	Manual	6,217	15,246	18,395	21,943	32,710	47,473	53,364	57,346	61,194	67,044	69,928	79,494	82,758	90,616	95,296	100,695	103,460	105,065	105,676	87,963	79,937
		Non manual	8,885	20,468	24,401	29,726	54,009	70,290	79,209	86,991	97,561	105,229	111,927	126,859	134,706	154,109	167,863	187,066	199,473	207,911	215,713	190,707	181,907
		Unknown	5,512	6,282	6,794	11,682	14,194	18,825	21,934	25,927	31,049	42,783	45,865	49,324	61,568	66,316	75,180	79,122	88,475	94,052	100,752	85,933	71,635
		Total	**20,614**	**41,995**	**49,590**	**63,351**	**100,914**	**136,587**	**154,507**	**170,264**	**189,804**	**215,056**	**227,719**	**255,677**	**279,033**	**311,041**	**338,339**	**366,883**	**391,408**	**407,027**	**422,141**	**364,603**	**333,479**
	Retirement type	Normal health	16,365	31,299	36,735	43,495	69,202	92,606	105,128	115,981	129,726	148,570	156,930	175,277	194,101	217,512	239,251	260,397	282,166	296,646	312,617	274,593	255,791
		Ill health	3,897	9,277	11,243	13,593	21,404	32,240	37,772	42,485	47,152	53,125	57,309	66,805	71,120	76,098	80,781	85,214	88,110	89,031	88,677	73,690	66,295
		Unknown	352	1,419	1,612	6,264	10,307	11,741	11,607	11,798	12,925	13,360	13,480	13,595	13,812	17,431	18,307	21,272	21,133	21,350	20,847	16,320	11,392
		Total	**20,614**	**41,995**	**49,590**	**63,351**	**100,914**	**136,587**	**154,507**	**170,264**	**189,804**	**215,056**	**227,719**	**255,677**	**279,033**	**311,041**	**338,339**	**366,883**	**391,408**	**407,027**	**422,141**	**364,603**	**333,479**
	Widows		15,640	30,186	33,646	40,756	56,438	75,322	82,511	87,529	94,562	105,136	109,331	120,263	132,517	152,360	171,250	179,592	194,655	196,273	196,195	167,309	148,675
	Total		**36,253**	**72,181**	**83,236**	**104,107**	**157,351**	**211,909**	**237,018**	**257,793**	**284,366**	**320,191**	**337,050**	**375,940**	**411,550**	**463,401**	**509,588**	**546,476**	**586,063**	**603,300**	**618,336**	**531,911**	**482,154**
TOTAL			**78,739**	**154,707**	**175,827**	**220,342**	**323,013**	**429,382**	**481,148**	**519,455**	**570,312**	**633,602**	**661,217**	**725,868**	**795,334**	**895,469**	**988,580**	**1,049,533**	**1,131,737**	**1,157,412**	**1,178,575**	**1,015,948**	**919,637**

Number of deaths

			1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Men	Former employment	Manual	764	1,953	2,037	2,209	2,867	3,819	4,147	4,247	4,307	4,632	4,681	4,973	4,985	5,542	5,661	5,681	5,888	5,888	5,589	4,448	4,047
		Non manual	391	883	1,017	1,161	2,300	2,774	2,993	3,233	3,335	3,479	3,715	3,967	3,925	4,833	5,079	5,313	5,528	5,428	5,439	4,698	4,369
		Unknown	612	759	778	1,256	1,592	2,093	2,398	2,431	2,847	3,459	3,598	3,672	4,662	5,114	6,330	6,310	7,183	7,115	7,300	6,264	5,414
		Total	**1,767**	**3,595**	**3,832**	**4,626**	**6,759**	**8,686**	**9,538**	**9,911**	**10,489**	**11,570**	**11,994**	**12,612**	**13,572**	**15,489**	**17,070**	**17,304**	**18,599**	**18,431**	**18,328**	**15,410**	**13,830**
	Retirement type	Normal health	1,377	2,672	2,785	3,205	4,604	5,842	6,518	6,862	7,363	8,222	8,566	9,021	10,014	11,294	12,570	12,727	13,747	13,613	13,522	11,429	10,427
		Ill health	371	804	868	946	1,331	1,791	2,036	2,055	2,124	2,279	2,435	2,613	2,613	2,957	3,115	3,179	3,481	3,483	3,452	2,837	2,620
		Unknown	19	119	179	475	824	1,053	984	994	1,002	1,069	993	978	945	1,238	1,385	1,398	1,371	1,335	1,354	1,144	783
		Total	**1,767**	**3,595**	**3,832**	**4,626**	**6,759**	**8,686**	**9,538**	**9,911**	**10,489**	**11,570**	**11,994**	**12,612**	**13,572**	**15,489**	**17,070**	**17,304**	**18,599**	**18,431**	**18,328**	**15,410**	**13,830**
	Widowers		7	19	28	34	49	115	121	126	184	169	182	219	305	378	436	536	632	699	731	682	682
	Total		**1,774**	**3,614**	**3,860**	**4,660**	**6,808**	**8,801**	**9,659**	**10,037**	**10,673**	**11,739**	**12,176**	**12,831**	**13,877**	**15,867**	**17,506**	**17,840**	**19,231**	**19,130**	**19,059**	**16,092**	**14,512**
Women	Former employment	Manual	170	382	477	572	840	1,301	1,532	1,475	1,505	1,787	1,788	1,984	2,018	2,342	2,627	2,689	2,820	2,811	2,777	2,467	2,073
		Non manual	181	378	456	561	1,275	1,532	1,698	1,853	2,115	2,317	2,506	2,733	2,813	3,357	3,617	3,866	4,208	4,172	4,249	3,776	3,559
		Unknown	129	154	174	294	488	507	599	691	767	1,114	1,164	1,247	1,585	1,734	1,918	1,917	2,123	2,135	2,226	1,787	1,375
		Total	**480**	**914**	**1,107**	**1,427**	**2,603**	**3,340**	**3,829**	**4,019**	**4,387**	**5,218**	**5,458**	**5,964**	**6,416**	**7,433**	**8,162**	**8,472**	**9,151**	**9,118**	**9,252**	**8,030**	**7,007**
	Retirement type	Normal health	366	685	815	910	1,728	2,122	2,538	2,657	2,873	3,509	3,666	4,103	4,396	5,080	5,586	5,800	6,434	6,417	6,569	5,722	4,972
		Ill health	112	185	241	282	455	702	795	846	917	1,047	1,148	1,250	1,363	1,457	1,630	1,715	1,913	1,921	1,889	1,723	1,656
		Unknown	2	44	51	235	420	516	496	516	597	662	644	611	657	896	946	957	804	780	794	585	379
		Total	**480**	**914**	**1,107**	**1,427**	**2,603**	**3,340**	**3,829**	**4,019**	**4,387**	**5,218**	**5,458**	**5,964**	**6,416**	**7,433**	**8,162**	**8,472**	**9,151**	**9,118**	**9,252**	**8,030**	**7,007**
	Widows		599	1,159	1,265	1,594	2,441	3,354	3,737	3,921	4,272	4,700	5,034	5,496	6,189	7,304	8,498	8,619	9,862	9,830	10,179	8,789	7,746
	Total		**1,079**	**2,073**	**2,372**	**3,021**	**5,044**	**6,694**	**7,566**	**7,940**	**8,659**	**9,918**	**10,492**	**11,460**	**12,605**	**14,737**	**16,660**	**17,091**	**19,013**	**18,948**	**19,431**	**16,819**	**14,753**
TOTAL			**2,853**	**5,687**	**6,232**	**7,681**	**11,852**	**15,495**	**17,225**	**17,977**	**19,332**	**21,657**	**22,668**	**24,291**	**26,482**	**30,604**	**34,166**	**34,931**	**38,244**	**38,078**	**38,490**	**32,911**	**29,265**

Appendix G – Summary statistics for VitaBank on an amounts basis

Exposed to risk (£'000s)

			1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Men	Former employment	Manual	24,715	66,033	80,262	97,023	134,586	187,823	213,687	232,368	253,093	274,231	283,833	333,648	346,111	382,203	410,561	439,608	459,911	472,539	488,092	417,866	371,804
		Non manual	48,148	117,096	144,469	185,350	343,284	432,585	495,901	556,778	634,091	699,658	737,332	847,842	905,328	1,156,479	1,266,803	1,400,577	1,499,283	1,571,647	1,667,038	1,509,580	1,380,380
		Unknown	46,603	60,901	75,121	104,204	121,143	167,374	231,230	269,324	316,934	398,695	441,921	479,254	579,403	687,459	862,339	919,192	1,322,865	1,397,932	1,499,516	1,422,462	1,247,906
		Total	**119,466**	**244,029**	**299,851**	**386,577**	**599,013**	**787,782**	**940,817**	**1,058,469**	**1,204,117**	**1,372,584**	**1,463,086**	**1,660,744**	**1,830,842**	**2,226,141**	**2,539,702**	**2,759,378**	**3,282,058**	**3,442,118**	**3,654,646**	**3,349,908**	**3,000,090**
	Retirement type	Normal health	97,540	188,112	226,925	292,964	457,644	597,336	718,140	811,335	930,056	1,071,192	1,145,855	1,291,277	1,438,426	1,738,876	1,993,947	2,166,453	2,624,600	2,767,586	2,959,008	2,714,949	2,420,668
		Ill health	18,312	45,124	57,404	73,603	107,920	153,366	181,172	202,700	225,932	251,394	267,075	318,186	341,015	374,665	420,319	451,925	514,546	527,645	544,266	478,303	422,375
		Unknown	3,614	10,793	15,522	20,010	33,450	37,079	41,505	44,434	48,129	49,998	50,156	51,281	51,401	112,600	125,436	140,999	142,912	146,887	151,372	156,656	157,048
		Total	**119,466**	**244,029**	**299,851**	**386,577**	**599,013**	**787,782**	**940,817**	**1,058,469**	**1,204,117**	**1,372,584**	**1,463,086**	**1,660,744**	**1,830,842**	**2,226,141**	**2,539,702**	**2,759,378**	**3,282,058**	**3,442,118**	**3,654,646**	**3,349,908**	**3,000,090**
	Widowers		94	174	276	461	728	1,230	1,943	2,762	3,390	4,388	5,319	6,845	8,413	11,514	14,147	17,069	21,152	24,244	27,922	26,688	25,251
	Total		**119,560**	**244,203**	**300,128**	**387,038**	**599,741**	**789,012**	**942,760**	**1,061,232**	**1,207,507**	**1,376,973**	**1,468,405**	**1,667,589**	**1,839,255**	**2,237,655**	**2,553,849**	**2,776,446**	**3,303,210**	**3,466,362**	**3,682,567**	**3,376,596**	**3,025,342**
Women	Former employment	Manual	4,638	12,577	16,262	20,699	32,378	48,968	57,686	64,292	70,845	80,263	84,045	97,534	102,003	112,016	121,034	130,384	136,842	141,354	146,594	124,131	109,769
		Non manual	17,474	43,941	56,091	72,855	144,270	191,582	225,163	256,482	295,953	333,592	358,377	419,790	453,230	525,796	586,932	664,615	730,058	783,129	846,955	773,323	731,954
		Unknown	6,573	8,223	9,744	11,693	13,149	19,570	26,327	33,980	44,178	60,220	66,807	74,894	93,163	109,416	134,632	146,899	181,861	199,939	224,103	205,999	175,736
		Total	**28,685**	**64,741**	**82,098**	**105,247**	**189,797**	**260,120**	**309,177**	**354,754**	**410,976**	**474,075**	**509,229**	**592,218**	**648,397**	**747,228**	**842,598**	**941,898**	**1,048,761**	**1,124,423**	**1,217,652**	**1,103,453**	**1,017,459**
	Retirement type	Normal health	22,017	46,530	58,694	74,687	136,516	182,767	216,077	247,316	286,535	330,699	353,513	407,105	448,378	515,074	587,264	659,885	747,699	811,506	891,249	813,469	754,908
		Ill health	6,263	15,855	20,544	26,323	44,560	67,309	82,800	96,664	111,542	129,944	142,233	171,470	186,548	204,056	226,255	247,539	267,186	278,626	291,012	254,622	229,426
		Unknown	405	2,356	2,860	4,238	8,722	10,044	10,300	10,773	12,900	13,432	13,483	13,643	13,471	28,097	29,079	34,474	33,876	34,292	35,391	35,362	33,125
		Total	**28,685**	**64,741**	**82,098**	**105,247**	**189,797**	**260,120**	**309,177**	**354,754**	**410,976**	**474,075**	**509,229**	**592,218**	**648,397**	**747,228**	**842,598**	**941,898**	**1,048,761**	**1,124,423**	**1,217,652**	**1,103,453**	**1,017,459**
	Widows		18,616	38,010	46,196	57,640	82,286	114,225	131,200	145,632	163,258	186,876	200,564	230,906	256,907	338,611	399,400	437,188	543,658	571,745	609,483	570,064	520,121
	Total		**47,300**	**102,751**	**128,294**	**162,887**	**272,083**	**374,345**	**440,377**	**500,386**	**574,234**	**660,951**	**709,793**	**823,124**	**905,303**	**1,085,838**	**1,241,998**	**1,379,086**	**1,592,419**	**1,696,168**	**1,827,136**	**1,673,517**	**1,537,580**
TOTAL			**166,861**	**346,954**	**428,422**	**549,925**	**871,824**	**1,163,356**	**1,383,137**	**1,561,618**	**1,781,741**	**2,037,924**	**2,178,198**	**2,490,713**	**2,744,558**	**3,323,493**	**3,795,847**	**4,155,532**	**4,895,629**	**5,162,530**	**5,509,703**	**5,050,113**	**4,562,921**

Note: Please note that all pension amounts have been revalued in line with RPI to the year of exposure.

Pensions ceasing (£'000s)

			1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Men	Former employment	Manual	1,050	1,767	2,071	4,178	5,743	7,693	8,607	9,239	9,510	10,577	10,820	12,439	13,009	14,146	14,708	15,330	16,782	17,395	17,154	14,401	13,275
		Non manual	1,361	2,369	3,001	5,157	10,618	13,398	14,622	16,831	17,113	18,675	21,203	22,445	23,365	31,617	33,294	34,608	37,797	39,169	40,831	36,024	34,771
		Unknown	1,493	1,868	2,429	2,965	3,256	4,269	5,426	5,536	6,212	6,746	8,167	8,794	9,260	11,915	15,803	17,213	25,736	26,545	26,829	27,954	27,105
		Total	**3,905**	**6,003**	**7,501**	**12,300**	**19,617**	**25,360**	**28,655**	**31,607**	**32,835**	**35,998**	**40,190**	**43,678**	**45,634**	**57,677**	**63,805**	**67,151**	**80,315**	**83,109**	**84,814**	**78,379**	**75,152**
	Retirement type	Normal health	3,037	4,652	5,786	9,429	14,695	18,667	21,305	23,619	24,352	26,970	29,666	32,187	34,256	41,529	46,981	49,251	59,816	62,055	63,750	58,697	56,833
		Ill health	850	1,073	1,269	2,374	3,807	5,180	5,880	6,378	6,678	7,125	8,072	8,877	9,121	10,628	11,370	11,923	14,427	14,718	14,974	13,500	13,514
		Unknown	18	279	446	497	1,115	1,513	1,471	1,610	1,805	1,903	2,452	2,613	2,257	5,520	5,454	5,976	6,072	6,335	6,090	6,182	4,805
		Total	**3,905**	**6,003**	**7,501**	**12,300**	**19,617**	**25,360**	**28,655**	**31,607**	**32,835**	**35,998**	**40,190**	**43,678**	**45,634**	**57,677**	**63,805**	**67,151**	**80,315**	**83,109**	**84,814**	**78,379**	**75,152**
	Widowers		6	17	12	35	21	49	51	97	131	131	119	162	195	308	325	410	522	597	655	678	815
	Total		**3,911**	**6,020**	**7,513**	**12,335**	**19,639**	**25,409**	**28,706**	**31,704**	**32,966**	**36,129**	**40,309**	**43,840**	**45,829**	**57,985**	**64,131**	**67,561**	**80,837**	**83,706**	**85,469**	**79,057**	**75,967**
Women	Former employment	Manual	104	159	235	476	714	1,144	1,424	1,452	1,531	1,950	1,974	2,191	2,369	2,780	3,226	3,369	3,760	3,732	3,996	3,611	3,079
		Non manual	350	460	696	1,279	2,936	3,875	4,345	5,041	5,888	6,790	7,328	8,146	8,560	11,155	12,248	13,057	14,406	15,197	15,393	13,983	13,996
		Unknown	151	185	242	209	326	343	402	427	453	652	839	894	1,201	1,483	1,848	1,938	2,341	2,841	2,792	2,857	2,580
		Total	**605**	**803**	**1,173**	**1,964**	**3,976**	**5,362**	**6,170**	**6,920**	**7,873**	**9,393**	**10,142**	**11,231**	**12,131**	**15,418**	**17,322**	**18,363**	**20,507**	**21,770**	**22,181**	**20,452**	**19,655**
	Retirement type	Normal health	406	585	811	1,305	2,902	3,796	4,286	4,887	5,389	6,324	6,921	7,596	7,978	9,585	10,806	11,393	13,370	14,583	15,150	13,904	12,964
		Ill health	195	162	299	523	885	1,289	1,596	1,757	2,020	2,461	2,564	2,956	3,350	3,642	4,191	4,435	5,324	5,607	5,616	5,181	5,565
		Unknown	4	56	64	136	189	277	288	276	464	608	656	679	803	2,191	2,324	2,535	1,813	1,580	1,416	1,367	1,126
		Total	**605**	**803**	**1,173**	**1,964**	**3,976**	**5,362**	**6,170**	**6,920**	**7,873**	**9,393**	**10,142**	**11,231**	**12,131**	**15,418**	**17,322**	**18,363**	**20,507**	**21,770**	**22,181**	**20,452**	**19,655**
	Widows		568	883	1,016	1,788	3,087	4,528	5,154	5,722	6,432	7,552	8,244	9,129	8,869	12,403	15,124	15,919	21,434	21,808	24,234	24,337	24,436
	Total		**1,173**	**1,686**	**2,190**	**3,751**	**7,063**	**9,890**	**11,324**	**12,642**	**14,305**	**16,945**	**18,386**	**20,360**	**20,999**	**27,821**	**32,446**	**34,283**	**41,940**	**43,578**	**46,415**	**44,789**	**44,091**
TOTAL			**5,084**	**7,706**	**9,703**	**16,087**	**26,701**	**35,299**	**40,030**	**44,346**	**47,271**	**53,074**	**58,695**	**64,200**	**66,828**	**85,805**	**96,577**	**101,843**	**122,778**	**127,284**	**131,884**	**123,846**	**120,059**

Note: Please note that all pension amounts have been revalued in line with RPI to the year of exposure.

Appendix H – Average ages & pensions for VitaBank

Average annual pension amounts for in-force pensioners (£'s)

			1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Men	Former employment	Manual	1,574	1,769	1,942	2,105	2,177	2,238	2,338	2,420	2,505	2,634	2,701	2,850	2,918	2,910	3,031	3,140	3,263	3,376	3,553	3,754	3,720
		Non manual	4,426	4,444	4,795	5,142	5,335	5,514	5,767	6,036	6,268	6,609	6,790	7,109	7,369	7,986	8,268	8,502	8,842	9,160	9,644	10,111	9,982
		Unknown	2,960	3,290	3,647	3,126	3,164	3,154	3,605	3,839	3,969	4,061	4,236	4,516	4,350	4,752	4,864	5,017	6,068	6,249	6,537	6,944	6,870
		Average	**2,823**	**2,969**	**3,257**	**3,348**	**3,642**	**3,656**	**3,895**	**4,096**	**4,269**	**4,454**	**4,601**	**4,850**	**4,886**	**5,290**	**5,451**	**5,655**	**6,210**	**6,431**	**6,772**	**7,197**	**7,145**
	Retirement type	Normal health	2,951	3,144	3,452	3,716	4,072	4,060	4,295	4,520	4,692	4,860	5,020	5,310	5,289	5,654	5,812	6,035	6,649	6,878	7,231	7,630	7,529
		Ill health	2,235	2,363	2,608	2,860	3,032	3,058	3,213	3,345	3,473	3,657	3,762	3,943	4,043	4,152	4,368	4,547	4,931	5,102	5,375	5,722	5,682
		Unknown	3,339	3,314	3,596	1,834	2,028	2,038	2,313	2,426	2,561	2,631	2,679	2,763	2,793	4,883	4,700	4,767	4,855	4,985	5,189	6,017	6,537
		Average	**2,823**	**2,969**	**3,257**	**3,348**	**3,642**	**3,656**	**3,895**	**4,096**	**4,269**	**4,454**	**4,601**	**4,850**	**4,886**	**5,290**	**5,451**	**5,655**	**6,210**	**6,431**	**6,772**	**7,197**	**7,145**
	Widowers		589	527	521	604	609	611	745	851	874	834	861	916	925	1,025	1,085	1,132	1,232	1,285	1,355	1,436	1,435
	Overall male average		**2,814**	**2,959**	**3,241**	**3,330**	**3,620**	**3,628**	**3,862**	**4,056**	**4,223**	**4,394**	**4,530**	**4,766**	**4,792**	**5,179**	**5,332**	**5,519**	**6,053**	**6,256**	**6,573**	**6,976**	**6,915**
Women	Former employment	Manual	746	825	884	943	990	1,031	1,081	1,121	1,158	1,197	1,202	1,227	1,233	1,236	1,270	1,295	1,323	1,345	1,387	1,411	1,373
		Non manual	1,967	2,147	2,299	2,451	2,671	2,726	2,843	2,948	3,034	3,170	3,202	3,309	3,365	3,412	3,496	3,553	3,660	3,767	3,926	4,055	4,024
		Unknown	1,192	1,309	1,434	1,001	926	1,040	1,200	1,311	1,423	1,408	1,457	1,518	1,513	1,650	1,791	1,857	2,056	2,126	2,224	2,397	2,453
		Average	**1,392**	**1,542**	**1,656**	**1,661**	**1,881**	**1,904**	**2,001**	**2,084**	**2,165**	**2,204**	**2,236**	**2,316**	**2,324**	**2,402**	**2,490**	**2,567**	**2,679**	**2,763**	**2,884**	**3,026**	**3,051**
	Retirement type	Normal health	1,345	1,487	1,598	1,717	1,973	1,974	2,055	2,132	2,209	2,226	2,253	2,323	2,310	2,368	2,455	2,534	2,650	2,736	2,851	2,962	2,951
		Ill health	1,607	1,709	1,827	1,937	2,082	2,088	2,192	2,275	2,366	2,446	2,482	2,567	2,623	2,681	2,801	2,905	3,032	3,130	3,282	3,455	3,461
		Unknown	1,149	1,660	1,775	677	846	856	887	913	998	1,005	1,000	1,004	975	1,612	1,588	1,621	1,603	1,606	1,698	2,167	2,908
		Average	**1,392**	**1,542**	**1,656**	**1,661**	**1,881**	**1,904**	**2,001**	**2,084**	**2,165**	**2,204**	**2,236**	**2,316**	**2,324**	**2,402**	**2,490**	**2,567**	**2,679**	**2,763**	**2,884**	**3,026**	**3,051**
	Widows		1,190	1,259	1,373	1,414	1,458	1,516	1,590	1,664	1,726	1,777	1,834	1,920	1,939	2,222	2,332	2,434	2,793	2,913	3,107	3,407	3,498
	Overall female average		**1,305**	**1,424**	**1,541**	**1,565**	**1,729**	**1,767**	**1,858**	**1,941**	**2,019**	**2,064**	**2,106**	**2,190**	**2,200**	**2,343**	**2,437**	**2,524**	**2,717**	**2,811**	**2,955**	**3,146**	**3,189**
OVERALL AVERAGE			**2,119**	**2,243**	**2,437**	**2,496**	**2,699**	**2,709**	**2,875**	**3,006**	**3,124**	**3,216**	**3,294**	**3,431**	**3,451**	**3,711**	**3,840**	**3,959**	**4,326**	**4,460**	**4,675**	**4,971**	**4,962**

Note: Please note that all pension amounts have been revalued in line with RPI to the year of exposure.

Average annual pension amounts for deceased pensioners (£'s)

			1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Men	Former employment	Manual	1,375	905	1,017	1,891	2,003	2,014	2,075	2,175	2,208	2,283	2,311	2,501	2,610	2,552	2,598	2,698	2,850	2,954	3,069	3,238	3,280
		Non manual	3,482	2,682	2,951	4,442	4,616	4,830	4,886	5,206	5,131	5,368	5,707	5,658	5,953	6,542	6,555	6,514	6,837	7,216	7,507	7,668	7,959
		Unknown	2,440	2,461	3,122	2,361	2,045	2,039	2,263	2,277	2,182	1,950	2,270	2,395	1,986	2,330	2,497	2,728	3,583	3,731	3,675	4,463	5,007
		Average	**2,210**	**1,670**	**1,957**	**2,659**	**2,902**	**2,920**	**3,004**	**3,189**	**3,130**	**3,111**	**3,351**	**3,463**	**3,362**	**3,724**	**3,738**	**3,881**	**4,318**	**4,509**	**4,628**	**5,086**	**5,434**
	Retirement type	Normal health	2,206	1,741	2,078	2,942	3,192	3,195	3,269	3,442	3,307	3,280	3,463	3,568	3,421	3,677	3,738	3,870	4,351	4,559	4,715	5,136	5,451
		Ill health	2,291	1,334	1,462	2,510	2,860	2,892	2,888	3,104	3,144	3,126	3,315	3,397	3,491	3,594	3,650	3,751	4,145	4,226	4,338	4,759	5,158
		Unknown	927	2,346	2,491	1,045	1,353	1,437	1,495	1,620	1,802	1,781	2,469	2,672	2,388	4,459	3,938	4,275	4,429	4,746	4,498	5,404	6,137
		Average	**2,210**	**1,670**	**1,957**	**2,659**	**2,902**	**2,920**	**3,004**	**3,189**	**3,130**	**3,111**	**3,351**	**3,463**	**3,362**	**3,724**	**3,738**	**3,881**	**4,318**	**4,509**	**4,628**	**5,086**	**5,434**
	Widowers		863	873	430	1,029	436	429	420	773	714	776	653	741	640	814	746	766	827	854	897	994	1,195
	Overall male average		**2,204**	**1,666**	**1,946**	**2,647**	**2,885**	**2,887**	**2,972**	**3,159**	**3,089**	**3,078**	**3,310**	**3,417**	**3,302**	**3,654**	**3,663**	**3,787**	**4,203**	**4,376**	**4,484**	**4,913**	**5,235**
Women	Former employment	Manual	613	416	493	833	850	879	929	984	1,018	1,091	1,104	1,105	1,174	1,187	1,228	1,253	1,333	1,328	1,439	1,464	1,486
		Non manual	1,932	1,217	1,526	2,280	2,303	2,529	2,559	2,721	2,784	2,931	2,924	2,980	3,043	3,323	3,386	3,377	3,424	3,643	3,623	3,703	3,933
		Unknown	1,173	1,200	1,392	709	667	677	670	618	591	585	721	717	758	855	963	1,011	1,103	1,331	1,254	1,599	1,876
		Average	**1,261**	**879**	**1,060**	**1,376**	**1,527**	**1,605**	**1,611**	**1,722**	**1,795**	**1,800**	**1,858**	**1,883**	**1,891**	**2,074**	**2,122**	**2,168**	**2,241**	**2,388**	**2,397**	**2,547**	**2,805**
	Retirement type	Normal health	1,110	854	995	1,434	1,680	1,789	1,689	1,839	1,876	1,802	1,888	1,851	1,815	1,887	1,935	1,964	2,078	2,273	2,306	2,430	2,607
		Ill health	1,741	878	1,240	1,854	1,945	1,836	2,008	2,077	2,202	2,351	2,234	2,365	2,458	2,499	2,571	2,586	2,783	2,919	2,973	3,007	3,361
		Unknown	1,979	1,281	1,253	580	449	537	581	534	777	918	1,019	1,112	1,222	2,445	2,457	2,649	2,255	2,025	1,783	2,336	2,971
		Average	**1,261**	**879**	**1,060**	**1,376**	**1,527**	**1,605**	**1,611**	**1,722**	**1,795**	**1,800**	**1,858**	**1,883**	**1,891**	**2,074**	**2,122**	**2,168**	**2,241**	**2,388**	**2,397**	**2,547**	**2,805**
	Widows		948	762	804	1,121	1,265	1,350	1,379	1,459	1,506	1,607	1,638	1,661	1,433	1,698	1,780	1,847	2,173	2,218	2,381	2,769	3,155
	Overall female average		**1,087**	**813**	**923**	**1,242**	**1,400**	**1,477**	**1,497**	**1,592**	**1,652**	**1,709**	**1,752**	**1,777**	**1,666**	**1,888**	**1,948**	**2,006**	**2,206**	**2,300**	**2,389**	**2,663**	**2,989**
OVERALL AVERAGE			**1,782**	**1,355**	**1,557**	**2,094**	**2,253**	**2,278**	**2,324**	**2,467**	**2,445**	**2,451**	**2,589**	**2,643**	**2,524**	**2,804**	**2,827**	**2,916**	**3,210**	**3,343**	**3,426**	**3,763**	**4,102**

Note: Please note that all pension amounts have been revalued in line with RPI to the year of exposure.

Average ages of in-force pensioners

			1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Men	Former employment	Manual	67.0	67.1	66.9	66.6	66.4	66.2	66.1	66.1	66.1	66.2	66.4	66.4	66.7	67.2	67.6	67.9	68.3	68.6	68.9	69.1	69.3
		Non manual	67.7	67.0	67.0	66.8	67.3	67.4	67.5	67.3	67.3	67.4	67.6	67.7	67.9	68.3	68.5	68.9	69.1	69.4	69.5	69.7	69.9
		Unknown	68.6	68.4	68.0	68.0	68.1	68.4	68.0	67.9	67.9	68.2	68.3	68.2	68.4	68.5	68.7	68.8	68.7	68.8	68.9	69.0	69.0
		Average	**67.8**	**67.4**	**67.2**	**67.1**	**67.1**	**67.2**	**67.1**	**67.0**	**67.1**	**67.2**	**67.4**	**67.4**	**67.7**	**68.0**	**68.3**	**68.6**	**68.7**	**68.9**	**69.1**	**69.2**	**69.4**
	Retirement type	Normal health	69.3	69.2	69.1	68.8	68.8	69.0	68.9	68.8	68.8	68.9	69.1	69.2	69.4	69.5	69.7	69.9	69.9	70.0	70.1	70.1	70.2
		Ill health	61.8	61.3	61.2	61.0	61.0	60.9	60.8	60.9	61.0	61.1	61.4	61.5	61.9	62.3	62.8	63.3	63.9	64.3	64.8	65.3	65.8
		Unknown	66.7	68.3	67.8	69.2	69.2	69.7	69.8	69.7	70.0	70.1	70.1	70.1	70.0	70.5	69.8	70.4	70.4	70.5	70.5	69.9	69.5
		Average	**67.8**	**67.4**	**67.2**	**67.1**	**67.1**	**67.2**	**67.1**	**67.0**	**67.1**	**67.2**	**67.4**	**67.4**	**67.7**	**68.0**	**68.3**	**68.6**	**68.7**	**68.9**	**69.1**	**69.2**	**69.4**
	Widowers		64.4	60.6	62.0	61.8	61.8	62.9	63.5	64.0	63.9	64.4	64.7	64.8	65.5	66.1	66.3	66.6	67.0	67.4	67.8	68.1	68.3
	Overall male average		**67.8**	**67.3**	**67.1**	**67.0**	**67.1**	**67.1**	**67.0**	**67.0**	**67.0**	**67.2**	**67.4**	**67.4**	**67.7**	**68.0**	**68.3**	**68.5**	**68.7**	**68.9**	**69.0**	**69.2**	**69.3**
Women	Former employment	Manual	65.9	65.9	65.8	65.8	65.6	66.0	66.1	66.2	66.3	66.3	66.6	67.0	67.4	67.9	68.3	68.7	69.1	69.4	69.7	69.8	70.0
		Non manual	66.6	66.3	66.2	66.1	67.2	67.0	67.0	66.8	66.8	66.8	66.8	66.9	67.1	67.4	67.6	67.9	68.2	68.4	68.5	68.7	68.8
		Unknown	67.6	67.5	67.4	68.6	69.1	68.6	68.2	68.3	68.0	68.0	68.0	68.2	68.3	68.2	68.1	68.1	68.0	67.9	67.8	67.7	67.0
		Average	**66.6**	**66.3**	**66.2**	**66.5**	**66.9**	**66.9**	**66.8**	**66.8**	**66.8**	**66.9**	**67.0**	**67.2**	**67.4**	**67.7**	**67.9**	**68.2**	**68.4**	**68.6**	**68.6**	**68.7**	**68.7**
	Retirement type	Normal health	67.8	67.8	67.7	67.7	68.1	68.3	68.3	68.4	68.4	68.5	68.7	69.0	69.2	69.4	69.5	69.6	69.7	69.7	69.6	69.5	69.3
		Ill health	61.7	61.0	60.9	60.7	61.4	61.4	61.3	61.2	61.2	61.2	61.4	61.7	62.1	62.4	62.9	63.3	63.8	64.3	64.8	65.3	65.7
		Unknown	65.7	69.2	69.2	70.5	70.8	71.1	71.3	71.3	71.6	71.2	71.0	70.6	70.0	70.2	69.6	70.1	69.9	69.9	70.0	71.4	73.7
		Average	**66.6**	**66.3**	**66.2**	**66.5**	**66.9**	**66.9**	**66.8**	**66.8**	**66.8**	**66.9**	**67.0**	**67.2**	**67.4**	**67.7**	**67.9**	**68.2**	**68.4**	**68.6**	**68.6**	**68.7**	**68.7**
	Widows		71.2	71.5	71.8	72.1	72.5	72.6	72.7	73.0	73.2	73.2	73.5	73.8	74.1	74.4	74.7	75.0	75.2	75.5	75.7	76.1	76.3
	Overall female average		**68.6**	**68.5**	**68.5**	**68.7**	**68.9**	**68.9**	**68.9**	**68.9**	**68.9**	**69.0**	**69.1**	**69.3**	**69.6**	**69.9**	**70.2**	**70.4**	**70.7**	**70.8**	**70.9**	**71.0**	**71.0**
OVERALL AVERAGE			**68.2**	**67.9**	**67.8**	**67.8**	**68.0**	**68.0**	**68.0**	**67.9**	**68.0**	**68.1**	**68.2**	**68.4**	**68.7**	**69.0**	**69.3**	**69.5**	**69.7**	**69.9**	**70.0**	**70.2**	**70.2**

Average ages of deceased pensioners

			1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Men	Former employment	Manual	73.3	73.4	73.5	73.3	73.6	73.2	73.5	73.7	74.0	73.8	74.4	74.6	75.0	75.5	75.9	76.1	76.1	76.6	77.2	77.4	77.5
		Non manual	73.1	73.5	73.3	73.6	75.2	74.9	75.5	75.5	75.8	76.2	76.3	77.0	77.0	77.3	77.5	78.1	78.4	78.7	78.7	78.9	79.3
		Unknown	73.7	74.3	74.5	75.2	75.5	75.9	75.5	75.9	75.5	76.1	76.1	76.3	76.8	77.0	77.4	77.7	77.6	77.9	78.0	78.1	78.3
		Average	**73.4**	**73.6**	**73.6**	**73.9**	**74.6**	**74.4**	**74.6**	**74.8**	**75.0**	**75.2**	**75.5**	**75.9**	**76.2**	**76.6**	**76.9**	**77.3**	**77.4**	**77.7**	**78.0**	**78.1**	**78.4**
	Retirement type	Normal health	75.0	75.5	75.5	75.5	76.2	76.2	76.5	76.6	76.6	76.7	77.1	77.4	77.7	78.1	78.2	78.6	78.7	79.0	79.2	79.3	79.5
		Ill health	67.8	67.4	67.5	67.6	68.0	67.2	67.9	67.5	68.3	68.5	69.0	69.4	69.5	69.6	70.7	70.9	71.5	71.9	72.4	72.7	73.3
		Unknown	63.5	74.2	73.7	75.6	76.4	76.8	76.5	77.2	77.2	77.9	78.1	78.6	78.7	79.3	79.7	79.9	79.3	79.8	79.8	79.8	80.0
		Average	**73.4**	**73.6**	**73.6**	**73.9**	**74.6**	**74.4**	**74.6**	**74.8**	**75.0**	**75.2**	**75.5**	**75.9**	**76.2**	**76.6**	**76.9**	**77.3**	**77.4**	**77.7**	**78.0**	**78.1**	**78.4**
	Widowers		70.6	57.0	66.3	63.5	68.3	67.7	66.1	67.1	68.5	71.0	73.0	72.5	73.6	74.7	74.9	74.7	75.8	75.3	76.0	77.3	77.3
	Overall male average		**73.4**	**73.6**	**73.6**	**73.8**	**74.5**	**74.3**	**74.5**	**74.7**	**74.9**	**75.1**	**75.5**	**75.8**	**76.1**	**76.5**	**76.9**	**77.2**	**77.3**	**77.6**	**77.9**	**78.1**	**78.3**
Women	Former employment	Manual	71.3	71.8	71.1	70.7	71.1	72.1	72.4	73.4	72.6	73.5	73.4	74.2	74.7	75.1	76.2	76.4	77.4	78.0	78.2	78.5	78.4
		Non manual	74.4	73.1	74.9	74.1	76.6	76.0	76.6	76.5	76.2	76.7	77.0	77.4	76.9	77.7	77.9	78.1	78.0	77.9	78.5	79.0	78.2
		Unknown	75.9	76.8	76.0	80.0	79.0	78.3	78.7	78.4	78.4	77.6	78.0	77.8	78.6	78.2	78.4	78.4	78.3	78.7	78.8	78.7	76.6
		Average	**73.7**	**73.2**	**73.4**	**73.9**	**75.3**	**74.8**	**75.2**	**75.7**	**75.3**	**75.8**	**76.0**	**76.4**	**76.6**	**77.0**	**77.4**	**77.6**	**77.9**	**78.1**	**78.5**	**78.8**	**77.9**
	Retirement type	Normal health	75.2	74.5	75.0	74.8	76.3	76.2	76.6	77.3	76.6	77.1	77.4	77.9	78.2	78.3	78.7	78.9	79.4	79.7	80.1	80.2	79.8
		Ill health	69.3	68.3	67.4	66.4	68.0	68.2	68.1	68.9	68.5	68.5	68.5	69.1	69.0	69.2	70.1	70.5	70.9	71.0	71.5	72.5	71.0
		Unknown	56.0	73.2	76.4	79.8	79.4	78.2	79.7	78.6	80.1	80.5	81.7	81.8	82.3	82.3	82.6	82.5	82.3	81.9	81.8	82.7	83.4
		Average	**73.7**	**73.2**	**73.4**	**73.9**	**75.3**	**74.8**	**75.2**	**75.7**	**75.3**	**75.8**	**76.0**	**76.4**	**76.6**	**77.0**	**77.4**	**77.6**	**77.9**	**78.1**	**78.5**	**78.8**	**77.9**
	Widows		80.0	79.3	79.5	80.1	80.5	80.2	80.8	81.1	81.1	81.7	81.8	82.5	82.5	83.0	83.0	83.4	83.8	84.0	84.3	84.7	84.8
	Overall female average		**77.2**	**76.6**	**76.7**	**77.2**	**77.8**	**77.5**	**78.0**	**78.4**	**78.2**	**78.6**	**78.8**	**79.3**	**79.5**	**80.0**	**80.3**	**80.5**	**80.9**	**81.2**	**81.5**	**81.9**	**81.5**
OVERALL AVERAGE			**74.8**	**74.7**	**74.7**	**75.1**	**75.9**	**75.7**	**76.0**	**76.3**	**76.4**	**76.7**	**77.0**	**77.5**	**77.8**	**78.2**	**78.5**	**78.8**	**79.1**	**79.4**	**79.7**	**80.0**	**79.9**

Appendix I – Your fund, your peer-group and VitaBank

The following table contrasts the Cambridgeshire County Council Pension Fund with your peer group (LGPS Schemes) and the combined dataset of the first 150 occupational pension schemes to participate in the Club Vita pilot.

		Men			Women			Combined		
		Within your fund	Within your peer group	VitaBank	Within your fund	Within your peer group	VitaBank	Within your fund	Within your peer group	VitaBank
Population Profile (2010)	Active	31%	35%	27%	39%	42%	36%	37%	40%	32%
	Deferred	39%	29%	35%	43%	32%	34%	42%	31%	34%
	Pensioners (excluding widow(er)s)	28%	34%	37%	16%	21%	22%	19%	25%	28%
	Widow(er)s and dependants	3%	3%	2%	3%	6%	8%	3%	5%	6%
	Split by gender	39%	40%	47%	61%	60%	53%	-	-	-
Pensioner Profile (2010) Retirement Type	Proportion retiring on 'normal health'	83%	72%	77%	84%	76%	78%	84%	75%	77%
	Proportion retiring on grounds of ill health	16%	27%	16%	15%	23%	18%	16%	25%	17%
	Proportion retiring where retirement reason is unknown	1%	1%	7%	1%	1%	4%	0%	0%	6%
Pensioner Income (2010) excl. widow(er)s (revalued to 2008)	Proportion with pensions of less than £2,000 p.a.	29%	21%	24%	52%	46%	47%	42%	35%	35%
	Proportion with pensions of between £2,000 and £5,000	29%	32%	29%	29%	33%	32%	29%	32%	30%
	Proportion with pensions of between £5,000 and £10,000	20%	26%	23%	13%	16%	15%	16%	20%	20%
	Proportions with pensions in excess of £10,000 p.a.	22%	21%	24%	6%	5%	6%	13%	13%	15%
Average Pensions in Payment (revalued to 2008)	All former employment types	£6,681	£7,004	£7,513	£2,784	£3,265	£3,211	£4,091	£4,558	£5,211
	Former manual employees	£2,973	£4,042	£3,920	£1,038	£1,433	£1,435	£2,007	£2,831	£2,803
	Former non-manual employees	£9,514	£9,776	N/A	£3,590	£4,314	N/A	£5,799	£6,511	N/A
Average Salary at Retirement/Exit (revalued to 2008)	All former employment types	£22,191	£20,543	£21,917	£16,688	£15,815	£15,966	£18,169	£17,562	£18,549
	Former manual employees	£15,795	£16,899	£16,951	£13,136	£12,452	£12,483			
	Former non-manual employees	£27,799	£27,480	N/A	£18,299	£18,039	N/A			
Average Ages (inc widow(er)s)	Pensioners (1993)	65.7	67.0	67.1	64.3	68.7	68.9	65.1	67.9	68.0
	Pensioners (2010)	69.8	69.3	69.5	68.6	70.4	71.1	69.0	70.0	70.3
	Age at death of pensioners (1993)	67.5	74.3	74.5	66.7	77.3	77.8	67.2	75.7	75.9
	Age at death of pensioners (2010)	78.9	78.2	78.6	75.8	81.1	82.0	77.4	79.8	80.3
Period Life Expectancy (2005-2009)	Pensioners inc widow(er)s	83.4	82.4	82.8	86.2	85.5	85.5	85.0	84.1	84.2

Club Vita LLP

Reliances and Limitations

This report is provided for the benefit of the party set out on the cover page. It has been prepared by for the Cambridgeshire County Council Pension Fund, pursuant to your membership of Club Vita LLP as governed by the Club Vita Rules ("the Rules"). It has been prepared for your exclusive use and must be used by you solely for the purpose of monitoring the longevity experience of your pension fund (the "Purpose"). It must not be used for any other purpose, recited, referred to, published, quoted, replicated, reproduced or modified (in whole or in part) except as required by law, regulatory obligation or as set forth in the Rules, without Club Vita LLP's prior, written, express consent. Club Vita LLP

This report contains commercially sensitive and proprietary confidential information (including copyright and other intellectual property rights) of Club Vita LLP and its licensors. You shall not do anything to infringe Club Vita LLP or its licensors' copyright or intellectual property rights.

This report must not be released or otherwise disclosed to any third party (in whole or in part) except as required by law, regulatory obligation or as set forth in the Rules, (in which case it should be released in its entirety including any limitations contained therein) without Club Vita LLP's prior, written, express consent. The sole exception to this is that you may share this report for the Purpose, with your Scheme Actuary and/or sponsoring employer(s) and/or appointed longevity consultant ("Permitted Third Parties"), but without creating any duty or liability to them on the part of Club Vita LLP or its licensors. Prior to sharing this report with any Permitted Third Parties you must inform such Permitted Third Parties, that the contents of this report are confidential, must not be disclosed to any other party, replicated, reproduced, published, referred to or quoted, whether in whole or in part, without Club Vita LLP's express written consent and that if they, or any other third person, place reliance on the report they do so at their own risk and have no recourse against Club Vita LLP or its licensors in respect of such reliance.

For the avoidance of doubt, this report does not constitute actuarial advice. Furthermore, this report should not be construed as providing advice on the appropriateness of any mortality assumption for the purposes of scheme funding as required under Part 3 of the Pensions Act 2004 and The Occupational Pension Schemes (Scheme Funding) Regulations 2005.

The information in the report has been compiled by or on behalf of Club Vita LLP and is based upon our understanding of legislation and events as at 19 July 2012. It should be noted that Club Vita LLP does not provide legal services and therefore, we accept no liability to you or to any other third party in respect of any legal opinions expressed in this report. You are advised to take independent legal advice in respect of any legal matters arising out of this report.

Utilisation of Data

The contents and conclusion of this report are reliant upon the extract of the current and historic data held by the fund's administrators. This was supplied to us by Mark Whitby of Cambridgeshire Administration Team on 29 May 2012. This data is summarised in Appendices C, D and E.

continued overleaf...

Reliances and Limitations (continued)

We have carried out a number of checks on the data to ensure that it is suitable for the purposes of longevity analysis. The results of this analysis are summarised in our **VitaCleansing**^{TM} report dated July 2012 and has resulted in the data from your fund having been included in our longevity analyses from 1 January 1993. Please be aware that the checks we have performed are designed to verify the data as adequate for the purposes of longevity analysis and does not warrant the data as suitable for other purposes.

The data analysed within this report relates solely to pensions in payment. In all of the analyses, pensioners aged below 40 have been excluded as the data on child dependants' (or young widow(er)s) pensions is sparse and unreliable.

Within this report we have identified a number of predictors of longevity which explain a considerable proportion of the variation observed in the mortality experience of the contributing schemes. However, not all of the variations between schemes are explained in terms of the factors identified within this report. There may be additional factors which explain the residual variation in mortality experience. To the extent that some of these additional factors are found more or less frequently in the membership of the Cambridgeshire County Council Pension Fund it may be particularly important for the trustees of the Cambridgeshire County Council Pension Fund to appreciate the impact of these factors on longevity.

Compliance statement

The following Technical Actuarial Standards are applicable in relation to the information referred to in this report:

- TAS R – Reporting;
- TAS D – Data;
- TAS M – Modelling; and
- TAS P - Pensions

This report complies with each of the above Standards.