

Age of retirement and longevity

Institute/Faculty Pension Provision Taskforce paper

1. SUMMARY

- 1.1 During the 20th century, the UK experienced significant increases in longevity. The expectation of life at birth is now 25 years more than it was 100 years ago, and further increases are expected in the future. The combination of increased longevity and the pattern of births experienced during the last 60 years, in particular the post-war and 1960's "baby-boomers", is expected to lead to an increase in the proportion of the population who are elderly during the coming decades.
- 1.2 Despite these changes, there is not expected to be a significant increase in the cost of providing State pensions. This is mainly because the principal State benefit, the basic retirement pension, is currently increased annually in line with price inflation whereas National Insurance contributions, which are the principal source of income for this benefit, increase at a faster rate, broadly in line with earnings growth. There is debate as to whether the resulting level of the State pension will be sufficient for pensioners in the future.
- 1.3 Increased life expectancy increases the cost of private occupational and personal pension provision. If other factors remain equal, employees or employers will need to contribute more to private pension arrangements in the future, or retire later, in order to receive the same level of pension as current pensioners. As a partial solution, more flexible patterns of working and retirement should be encouraged for people nearing retirement.

2. INTRODUCTION

- 2.1 During the next few decades the UK, in line with most other OECD countries, is expected to experience what has been called "the demographic timebomb", or an ageing population. The combination of increased life expectancy and changing fertility rates is expected to lead to an increase in the proportion of the population who are elderly.
- 2.2 An ageing population will have implications for many parts of society, including the provision of healthcare, the role of the family, and the cost and means of providing pensions. The effects which demographic ageing will have on the costs of pensions will depend on a number of factors. One key factor is the age at which people retire, and whether this will increase in line with changes in longevity.
- 2.3 Many possible solutions have been proposed for alleviating the problems of an ageing population on pension provision. Among them is that as life expectancy increases, people should retire later. This may seem to be a natural solution, since if an individual can expect to live longer, why should the increased lifetime be concentrated in the economically inactive, post-retirement, stage of life? This

argument depends on healthy life expectancy increasing along with total life expectancy, which may not be the case.

- 2.4 This paper starts by summarising past improvements in life expectancy and examining how longevity is projected to increase in the future. The possible effects of these changes on pension provision, considering both State and private provision, are then discussed. Finally, the effects, and merits, of increases in the age of retirement reflecting increased longevity are considered.

3. PAST AND EXPECTED FUTURE DEMOGRAPHIC TRENDS

- 3.1 The UK experienced significant reductions in mortality rates during the 20th century. Table 3.1 below shows the percentage reduction in mortality rates for males and females in England and Wales between 1901 and 1991, for selected ages. For example, the mortality rate for a 5 year old male in 1991 was only 3% of the rate in 1901, corresponding to the 97% reduction shown in the table.

Table 3.1 – percentage reduction in mortality rates between 1901 and 1991 – England and Wales population

Age	Male	Female
5	97%	97%
25	84%	93%
45	82%	85%
65	50%	66%
85	33%	45%

Source: Willets, 1999

- 3.2 The causes of these reductions are numerous, but include increases in general living standards and improvements in medical care. Table 3.2 below shows how the expectation of life (EOL), both at birth and at age 60, increased during the 20th century, and how it is expected to increase over the next 30 years.

Table 3.2 – changes in the expectation of life, at birth and at age 60 – United Kingdom population

	1911	1951	1991	2031
EOL at birth				
Males	50.4	66.1	73.2	79.3
Females	53.9	70.9	78.8	83.5
EOL at age 60				
Males	13.7	14.8	17.7	22.5
Females	15.3	17.8	21.9	25.7

Source: 1911 to 1991 - ONS

2031 – mid-1998 based GAD (Government Actuary's Dep) population projections

Note: The figures shown are based on period mortality rates

- 3.3 Given the trends which have occurred in the past, there is some debate over the extent to which UK mortality will continue to improve in the future. One opinion is that the

rate of improvement which has occurred in the past is unlikely to continue, since it largely resulted from significant improvements in medical care and living standards which are unlikely to continue indefinitely. Another argument is that mortality improvements may continue at the same rate, or even at a faster rate, due to medical research in fields such as genetics. There are differing opinions over whether there is a “limiting” human age since any reduction in mortality from one cause of death may lead to an increase in mortality from a different cause, or whether continued improvements will lead to people living longer and longer. Because of these uncertainties, it is important to remember that population projections are dependent on subjective assumptions which have been made, and to consider the effects on the results of the projections of using other assumptions.

- 3.4 Another uncertainty relates to the age groups at which future mortality improvements will occur. Mortality improvements during the 20th century occurred to a greater degree at younger ages than older ones, as shown in Table 3.1. Improvements at older ages are more significant in terms of the costs of providing pensions. It may be the case that future improvements in mortality rates among older ages will be less than those at younger ages, continuing past trends. Alternatively, research has highlighted an ‘ageing of mortality improvements’ in the past, suggesting that future mortality improvements may be more concentrated towards older ages (Willettts, 1999).
- 3.5 Mortality rates are only one factor, albeit a very significant one, affecting demographics. Fertility rates and migration also influence the level and the age structure of the population. In particular, the pattern of births during the last 60 years contributes significantly to the projected ageing of the population. Birth rates were comparatively high following the end of the Second World War and during the 1960’s, when the “baby-boomers” were born. Since then, fertility rates have fallen steadily. As a result, when the “baby-boomers” approach State pension age during the next 20 to 30 years, there will be fewer people replacing them at working ages from subsequent cohorts.
- 3.6 Table 3.3 below shows the change in the number of people at working ages relative to the number of people above State pension age during the 20th century and the expected changes over the next 30 years, in Great Britain. The current State pension ages are 65 for males and 60 for females, although female pension age will be increased to 65 between 2010 and 2020.

Table 3.3 – changes in the relative numbers of people at working ages and over State pension age – Great Britain

	1901	1931	1991	2031
Number of people at working ages (<i>million</i>)	22.7	29.7	33.7	37.6
Number of people over State pension age (<i>million</i>)	2.3	4.3	10.1	14.4
Number of people at working ages per person over State pension age	9.9	6.9	3.3	2.6

Source: 1901 to 1991 - Government Actuary’s Department, from ONS data
2031 – mid-1998 based GAD population projections

Note: The figures for 2031 allow for the increase in female State pension age to 65

- 3.7 If female State pension age were not increased to age 65 between 2010 and 2020, there would be an extra 2.1 million women over State pension age in 2031, and a corresponding reduction in the number at working ages, from the figures shown in Table 3.3. This would result in there being 2.2 people at working ages per person over State Pension age in 2031 compared to 2.6 as shown in Table 3.3.
- 3.8 Old age dependency ratios, as shown in the last row of Table 3.3, do not illustrate the full impact of demographic changes. They do not consider the number of children in the population, who must also be supported by people at working ages, at a different economic cost to that of supporting pensioners. Such ratios also do not take account of the level of economic activity or inactivity among people at various ages. However, the figures are useful in indicating the main demographic trends.

4. EFFECT OF DEMOGRAPHIC TRENDS ON PENSION PROVISION

State benefit expenditure

- 4.1 The principal State retirement benefits are the flat-rate basic retirement pension and the State Earnings Related Pension Scheme (SERPS), with the latter being replaced by the State Second Pension (S2P) for accruals from 2002-03 onwards. These benefits are paid from the National Insurance Fund (NIF), a pay-as-you-go scheme, with benefit expenditure in each year being financed by contributions paid by employees and the self-employed in the same year. As a result, the projected increase in the number of people over State pension age relative to the number of people at working ages which is shown in Table 3.3 may be expected to lead to an increase in the contribution rates which will be required in order to meet benefit expenditure in the future.
- 4.2 When considering the future financial position of the National Insurance Fund, the relative number of pensioners to contributors is a more useful indication of demographic changes than solely considering numbers in the population at various ages. The relative number of pensioners to contributors allows for features such as economic activity rates and the number of overseas pensioners which are not reflected in population numbers. Table 4.1 below shows the projected number of contributors and pensioners for the Great Britain NIF over the next 60 years.

Table 4.1 – projected number of contributors and pensioners for the Great Britain National Insurance Fund

	2000-01	2020-21	2040-41	2060-61
Number of contributors (<i>million</i>)	20.2	22.2	21.4	21.0
Number of pensioners (<i>million</i>)	11.0	12.6	16.4	15.6
Number of contributors per pensioner	1.8	1.8	1.3	1.3

Source: GAD, 1999

- 4.3 The reduction in the number of contributors per pensioner from 1.8 to 1.3 would, other things being equal, lead to an increase of nearly 40% in the required rates of National Insurance Contributions between 2000-01 and 2060-61. However, other things are not equal, since the rates at which flat-rate National Insurance benefits,

mainly the basic retirement pension, are paid are currently increased annually in line with price inflation. The earnings of contributors, which determines contribution income, have tended to increase at between 1.5% to 2.0% per annum above the rate of price inflation, and hence above the rate at which flat-rate benefits are increased. Table 4.2 below shows the joint employee and employer contribution rates, excluding the part of contributions which is allocated to the National Health Service, which are estimated to be required over the next 60 years.

Table 4.2 – estimated required joint employee and employer National Insurance contribution rates

	2000-01	2020-21	2040-41	2060-61
Required contribution rate (%)	20.2	19.5	19.8	17.4

Source: GAD, 2000a

Note: the current contribution rate is 20.25%

4.4 Similar figures to those shown in Table 4.2 are often used as evidence that Britain has managed to control the demographic timebomb, or at least that Britain may suffer less from the effects of an ageing population than other countries (Daykin and Lewis, 1998). The main policies which have been credited with this success are the increase in female pension age to 65 and the fact that flat-rate benefits are now increased in line with price inflation rather than in line with average earnings growth. Various reductions have also been made to SERPS benefits, although S2P increases the pensions paid to lower earners and to people qualifying for certain credits. These policies have been successful in controlling the cost of State pensions, but they also result in a gradual reduction in income from State pensions relative to living standards of workers, for most pensioners. It is possible that over time, these policies may necessitate increased expenditure on benefits such as income support, in which case the problem of an ageing population has been passed from one system to another, rather than controlled (Jollans, 1997).

Occupational and private pension provision

4.5 The realisation that pay-as-you-go pension systems in various countries may be vulnerable in an ageing population has led to many people advocating funded pension systems as a solution to the demographic timebomb (eg World Bank, 1994). However, there now appears to be agreement that funded pensions are not immune to the effects of an ageing population.

4.6 In a funded defined benefit occupational pension scheme, the cost of the scheme depends on the level of benefit and the experience of the scheme. The rate of contributions to the scheme paid by the employer varies over time, taking account of the expected future costs of the scheme and adjustments for past experience. Employee contributions, if any, are usually fixed. Increases in the life expectancy of pensioners in such a scheme will lead to increases in the costs of the scheme, because pensions, at the fixed or “defined” level, will be paid for longer. This reasoning depends on other factors, such as the rate of investment returns and the age of retirement, remaining unchanged, which may not be the case. The time at which these increased costs affect the contribution rate paid by the employer will depend on the

extent to which the increasing longevity is anticipated in advance, and the method used for funding the scheme.

- 4.7 In a funded defined contribution scheme, whether it is an occupational scheme or a personal pension, the level of pension which is paid depends on the individual's accumulated fund at retirement, and on the cost of purchasing an annuity with that fund. If other factors remain unchanged, increases in longevity result in increased annuity rates, or equivalently a reduction in the pension which can be purchased from a given fund. This could lead to members of such schemes needing to pay increased contributions while they are working in order to secure the same level of retirement income. Alternatively, if the increases in annuity rates are not anticipated, and contributions are not increased, then the eventual level of retirement income would be lower. Table 4.3 below shows the cost of purchasing an inflation-linked annuity of £1,000 per annum at age 60 in 2000, 2015 and 2030, based on United Kingdom population mortality rates, and assuming a real interest rate of 3% per annum.

Table 4.3 – cost of an annuity of £1,000 per annum at age 60, based on United Kingdom Population mortality rates

£	2000	2015	2030
Males	14,100	15,200	15,700
Females	16,000	16,800	17,300

Source: Own calculations, from mid-1998 based GAD population projections

Note: The figures shown are based on population period mortality rates, assuming a real interest rate of 3% per annum, with no allowance for expenses

- 4.8 Miles, 1999, and other research suggest that an effect of demographic ageing on funded pension schemes could be to reduce the rate of investment return from assets, further increasing the costs of funded defined benefit pension schemes, or reducing levels of pensions from funded defined contribution pension schemes. This effect could potentially be much more significant on the costs of providing pensions than the effects of increased longevity which are illustrated in Table 4.3 above. For example, if long-dated index-linked gilt yields were to fall from 3% to 2%, as happened during 1998 for example, the cost of an annuity of £1,000 per annum to a male aged 60, based on year 2000 mortality rates, would increase from £14,100 to £15,600. This is almost identical to the effect of mortality improvements over 30 years which is shown in Table 4.3.

5. INCREASING THE AGE OF RETIREMENT

State pension age

- 5.1 Many countries are currently increasing State pension age, or plan to do so, in order to reduce the costs of pay-as-you-go schemes in the face of ageing populations (see Johnson, 1999, or SSA 1999 for examples). Some countries, such as Sweden, Italy and Germany either plan to increase pension age automatically as longevity increases in the future, or to adjust the pension benefits paid in line with changing life expectancy. In the UK, female State pension age is being increased from 60 to 65

between 2010 and 2020, partly in order to align it with the State pension age for males, and partly in order to reduce expenditure on retirement benefits.

- 5.2 Table 5.1 below shows the estimated age at which State pension age would need to be set, over the next 60 years, in order for the number of people at working ages per person above State pension age in Great Britain to remain at the current (2000-01) level.

Table 5.1 – required State pension age in order for the number of people at working ages per person above State pension age to remain constant – Great Britain

	2010	2020	2030	2040	2050	2060
Required State pension age (male/female)	66/61	65/65	68/68	70/70	70/70	70/70

Source: mid-1998 based GAD population projections

Note: For 2010 it has been assumed that the female State pension age will be 5 years less than the corresponding age for males. For later years, it has been assumed that the female State pension age will equal the corresponding age for males

- 5.3 The results from Table 4.2 suggest that it may not be necessary for such increases to State pension age to occur, since the required National Insurance contribution rates are not projected to rise much above current levels. As noted in paragraph 4.4, though, this occurs partly because the level of benefit, for many pensioners, is falling relative to living standards of workers. If it were to be considered appropriate to increase the level of pensions in the future in order to deal with this situation, then increases to State pension age may be desirable in order to reduce the costs of such a proposal. If, for example, the rate of the basic retirement pension were to be increased in line with earnings growth rather than price inflation in the future, then increases in State pension age similar to those shown in Table 5.1 may be required if National Insurance contribution rates were to remain around their current levels.
- 5.4 Brown and Bilodeau, 1997 considered an alternative approach to this issue, in the Canadian context. They assigned different relative support costs to various economically inactive groups, children, the unemployed, and pensioners, and projected the pension ages which would be required in the future in order to keep the economic cost of supporting these groups at a constant level. It would be interesting to see research which reproduced these calculations for the United Kingdom environment.
- 5.5 Any savings in benefit expenditure and increases in contribution revenue arising from increases to State pension age may not be as large as might be expected, if such measures do not lead to any change in employment patterns. If the main effect of increasing State pension age were to be a transfer of benefit expenditure from retirement pensions for people over pension age to disability benefits and income support for people under pension age, and if there were to be no significant increase in contribution income, then increasing State pension age may have little effect on Government finances. This issue is discussed further in the following section.

5.6 It should be noted that there are incentives for people to defer receipt of both the basic retirement pension and SERPS, if they do not wish to draw these pensions from State pension age. The level of pension payable is increased accordingly, reflecting the fact that it will not be paid for as long. The terms on which the pension is increased will be improved in 2010, and are generous compared to actuarially neutral factors. Despite this, very few people currently take up this option.

The age of retirement

5.7 The age at which people retire depends on many factors, of which State pension age is only one. Other factors include accumulated wealth, including the level of private pension provision, the availability and level of State benefits, health, family circumstances, and the availability of work at older ages. Currently, 2.8 million people in the UK between age 50 and State pension age, one-third of the population at these ages, do not work. Of these people, 1.25 million are claiming State benefits for being long-term sick or disabled, 0.3 million are looking for work, and the majority of the remainder are retired or are looking after their home or family. The proportion of men between age 50 and State pension age who are not working has doubled over the last 20 years. (Source: PIU, 2000)

5.8 Table 5.2 below shows how the average age at which older workers transfer from economic activity to inactivity has fallen since 1950.

Table 5.2 – estimated average age of transition from work to inactivity among older workers in the UK

	1950	1970	1995
Male	67.2	65.4	62.7
Female	63.9	62.4	59.7

Source: OECD, 1998a

5.9 These two sources of data indicate that many people currently retire before State pension age, and that the average age of retirement has fallen over the last 50 years. This raises issues in many areas of society, but this paper is concerned with the issues which relate to pension provision and pensioner incomes.

5.10 As noted in Section 4, the longer a pension or annuity is in payment, the greater the cost of providing the pension. Any reduction in the age of retirement, particularly combined with increased longevity, leads to increased costs of providing a given level of pension, or a reduction in the level of pension which can be provided from a given fund.

5.11 Some people who retire before State pension age do so because they wish to, and because their accumulated pension entitlements are sufficient for their required standard of living in retirement, even allowing for the longer time for which they will receive a pension. It does not seem unreasonable for such people to be able to retire early, if their doing so does not increase the costs for, or reduce the benefits of, others (as would be the case if a member took early retirement from a funded defined benefit scheme with the pension not being reduced accordingly). However, problems can

occur where early retirement terms in a defined benefit scheme are generous, because a high level of early retirement can significantly increase the costs of the scheme, as has happened in some public sector pension schemes. It is also undesirable if an individual who chooses to retire early receives a low level of pension income which needs to be supported by the State at a later time. One of the conclusions from PIU, 2000 is that Inland Revenue should raise the minimum age at which a pension can be paid from a tax-approved pension scheme from 50 to 55 between 2010 and 2020, in order to increase the number of people working between these ages.

- 5.12 People who stop working before State pension age but who wish to work, such as people who are made redundant and then cannot find another job, may receive smaller retirement incomes as a result of the combination of early retirement and increased longevity. These people may, in time, also need to have their retirement income supported by the State. PIU, 2000 contains various proposals for increasing work opportunities for people between age 50 and State pension age who wish to work. Some research indicates that work opportunities for people at these ages may increase naturally in the future, due to changes in the demand for and supply of labour.
- 5.13 One way of increasing the level of economic activity among people nearing State pension age, and increasing the level of pensioner incomes, is if a gradual switch to part-time work before retirement is encouraged. This allows people to reduce their working hours, which may be necessary on health grounds as well as for other reasons, whilst remaining in the workforce and possibly accruing further pension entitlements. It is currently not permissible for a member of a tax-approved occupational scheme to draw a pension whilst continuing to work for the same employer, unless there is a break in service, although a pension may be paid while working for a different employer. This discourages any switch to part-time work by disallowing the person from drawing part of their pension to supplement their income, unless the member changes employer. A discussion paper, Inland Revenue, 1998, invited comments on proposals to change this situation, although these have not yet been implemented.

6. CONCLUSIONS

- 6.1 Longevity increased significantly in the UK during the 20th century, and further improvements are expected. However, the extent to which mortality rates will continue to fall, and the age groups which will experience the most significant changes, are uncertain. Increased co-operation between the medical and actuarial professions may be beneficial in estimating the extent of these future changes.
- 6.2 An ageing population is not expected to lead to significant increases in the rate of National Insurance contributions that will be required in order to pay for State retirement benefits. However, this will occur largely because the rate of the basic retirement pension is expected to continue to fall relative to living standards of workers, which may lead to increased expenditure on means-tested benefits. If it were considered necessary to increase the level of State retirement benefits, then alternative proposals for controlling the costs of State benefits may need to be considered, such as increasing State pension age. Calculations reproducing those in Brown and

Bilodeau, 1997, but set in the United Kingdom context, would be useful in informing the debate on these issues.

- 6.3 Increased longevity results in members of funded pension schemes either being required to pay increased contributions to the pension scheme, or to retire later, in order to receive the same level of pension as current pensioners, if other factors remain equal. The importance of making sufficient contributions to a pension scheme should be communicated to members of the public, and members of pension schemes should receive clear, realistic forecasts of their likely retirement income. Increased flexibility regarding working and retirement patterns at older ages should be permitted and encouraged.

7. REFERENCES

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