The comparative effects on UK public expenditure of implementing long-term care systems as practised in Japan, Germany and Sweden

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Long-term care is administered to people who are dependent on others for social, personal and medical needs.

There is little by way of comparative analysis to help governments to decide which approach to the provision of long-term care provides best value. Best value might be defined as a system that is affordable, fair and equitable, and strikes the right balance between personal and family responsibility and the public interest.

This paper considers the public expenditure implications of adopting a Japanese, Swedish or German approach to financing long-term care in the UK. The distributional effects on each generation in the context of a rapidly ageing UK population are also considered.

The paper finds that under any of the 3 systems referred to above, the public expenditure would need to increase to reflect the greater coverage and access that would be the consequence.

CONTENTS

1 INTRODUCTION

The subject of long-term care (LTC) is receiving increasing attention both in the research community and by various governments because of the belief that an ageing population will greatly swell the demand for long term care services and create huge public expense. One of the issues which needs to be determined is by how much demand will increase; another is to address the ambiguity over whether long-term care is a response to a medical condition, a social need or both. The corollary is to decide how the burden is to be shared between the individual, the family and the state.

Long-term care is administered to people who have reached a stage in life in which they are dependent on others for social, personal and medical needs. It is usually associated with the very old, but, in fact, could begin at any age depending on the reasons for their disability – perhaps a road accident, a mental or a congenital condition. For some people, long-term care may be needed over an extended period but, for others, it is required in the immediate period leading up to death. In this paper the focus is mainly on the elderly since they are the most likely to require long-term care.

As yet, there is little by way of comparative analysis or study to help Governments decide which approach to the provision of LTC provides best value in policy terms. Best value in this case might be defined as a system that is fair and equitable, strikes the right balance between personal and family responsibility and the public interest and, above all, is affordable. All these criteria are open to debate and interpretation.

In this paper, we compare and contrast long-term care arrangements in four countries: Japan, Germany, Sweden and the UK. There are three main reasons for analysing these countries.

- It is evident that they are all taking the issue very seriously, since they have each undertaken a range of reforms in recent years.

- Ageing is proceeding rapidly in each of the countries and the numbers of elderly are predicted to grow substantially.

- The policy responses have been different and fairly radical, as well as starting from different bases and social traditions.

The systems are described briefly below, but discussed in more detail in section 4.

In Sweden, long-term care is universal and services are for the most part publicly owned and operated with responsibility falling on municipalities. The Swedish government takes on a regulatory role in order to impose national standards. Under the law a local authority has to offer appropriate care to all inhabitants in need. On top of that, the law stipulates that local authorities (LAs) should actively investigate the needs within the elderly population. In recent years, cost pressures have forced Sweden to examine the basis and incentives for long term care and the country is turning increasingly to the private sector for service delivery.

In Germany, the system is modelled on the same social insurance principles that underpin other areas of social protection, including health care with emphasis on inter-generational solidarity. In 1995, the Government introduced a form of compulsory long-term care insurance, covering 90 per cent of the population. The remainder, including high earners, self employed and certain civil servants, are allowed to opt out of the system.

Japan, the country with the fastest ageing population in the world, has also reformed the way in which it finances long term care. However, it has taken a different and, arguably, more pragmatic path with a long history of incremental health care reform. In this case, it had found that the cost of providing free long-term care introduced under the 'Gold Plan' was becoming increasingly prohibitive. Following a national debate, it decided to introduce a form of compulsory long-term care insurance – one that would be fair to the different generations and equitable in terms of affordability. This is also a tax on wages.

The UK system is relatively similar to that of the US. Eligibility to free or subsidised care is based on means testing, although unlike the US, the UK system takes the home into account among the assets. The UK has a system that is characterised by dual arrangements, in which different principles apply to health care services – provided by the National Health Service (NHS) – and social services which are financed by local authorities. The central government grant and locally raised revenues are not earmarked, but there are recommendations and management targets on how to spend the money and the service levels expected.

The NHS is responsible for funding some nursing home places and also finances nursing care in all care settings. The NHS is financed by the constituent countries and is largely financed out of income taxation (Robinson & Dixon, 1999). Apart from the public payers, there is a small market for private long-term care insurance. Up to the end of the year 2000, fewer than 40,000 policies had been sold. Thus, private insurance currently accounts for a negligible share of total LTC expenditure in the UK (Werth, 2001).

However, not every part of the UK operates the system in the same way and there are local variations in the way rules and assessments are carried out and priority cases determined. For example, the Royal Commission on Long Term Care (Royal Commission, 1999) recommended that free personal care should be made available for those residents of retirement and nursing homes who required long-term care. This recommendation was not implemented by the Government. In practice, however, devolution in the countries making up the UK has meant that Scotland has implemented the recommendation whereas the other countries have implemented minor reforms only.

The UK has a mixed economy of long term care provision that sits alongside these statutory arrangements. This includes a large informal care sector that is underpinned by families and friends, and a large private nursing care sector, which tends to be based on privately owned nursing and residential homes. However, unlike the US, the market for long-term care is far less developed. This is not for the want of trying and several insurance products are available to suit different types of need. These include standard insurance products with premiums related to factors such as age and benefit needs, and so-called immediate-needs products, which are related to annuities.

A key question for the UK is whether current arrangements represent an appropriate long-term basis for providing long-term care, particularly over the next three decades. There are many aspects to consider and it is arguably the case that it is the uncertainty surrounding policy directions in recent years, together with most people's belief that this is a health issue and, as such, the 'state should pay', that has held back the development of private long-term care insurance.

In general, however, the broad aims are clear. The UK approach is based on the premise that the system needs to be affordable in public expenditure terms and strike the right balance with regard to distributing the burden between individuals, the family and the state. Secondly, it should, as far as possible, be equitable in the sense of access - that is, no one who needs care should be denied it on the grounds of cost. Thirdly, there should be minimum standards of care. The UK approach is therefore what is classically termed a 'residual' type system in which the state only assumes responsibility when the family or the market fails (Titmuss, 1958). The problem is that such a system can be interpreted and applied in a wide variety of ways, with the potential for a significant re-apportionment of costs depending on where public eligibility boundaries are drawn.

1.1 Aims of this research

The purpose of this paper is to compare and contrast the long-term care systems in four developed countries and how they operate, with particular emphasis placed on the methods of financing. Our aim is to undertake a comparative analysis of the financial and other effects each of these systems would have on UK public expenditure if any of them were to be transplanted into the UK. The idea is that such an analysis will help illuminate the debate on which is the most appropriate system for the UK to adopt in the future and how much it might cost.

To make a fair comparison, it is important to apply the analysis both to the current and future elderly population of the United Kingdom. This is not as straightforward as it seems; since we will also need to take into account not only demographic changes, but also trends in need based on shifts in health. Evidence from recent health surveys indicates that this might be changing and therefore it will be important to take the financial and other implications into account as far as possible.

However, further unknowns are the type of care setting in which long-term care is delivered (e.g. in an institution or at home), the role of the informal sector, the future supply of carers and so forth. Each system will also carry distributional effects in terms of how costs and benefits are shared between genders and generations. This is because women tend to live longer than men and because of intergenerational effects transmitted through demographic change and, therefore, taxation.

If such an analysis is to carry weight it must also be firmly grounded in economic theory. However, for long-term care the question of what is economically the optimum approach turns out to be ambivalent, depending on the weight given to certain factors such as the risk of market failure and ethical considerations. In this regard, if the answer were clear

and countries were rational then we would expect most countries to devise similar systems. However, this is evidently not the case.

1.2 The demography of long term care

As far as this paper is concerned, the basic demographic trends are taken as 'given,' but it is important to understand how these trends have emerged in general terms and what the implications are in terms of the demand for long term care. An ageing population is a trend common to all developed countries that manifests itself in terms of an increasing proportion of elderly people among the population. This has arisen not only because people are living longer but also because women are having fewer children than in the past. In several countries, the population has stagnated or is set to decline (the US being a notable exception).

Table 1.1 shows the effects in countries included in our research at 10-year intervals from 2000 to 2030. The table demonstrates several points of interest. Firstly Japan is the fastest ageing society such that by 2030 it is expected that over 27.3% of the population will be aged 65 or over and 10.2% aged 80 or over (compared with 17.1% and 3.7% in 2000). However, all the other countries are following fast on Japan's heels. The UK is evidently moving at a slightly slower rate principally because of its slightly higher birth rates, slightly lower life expectancy and different immigration effects.

Table 1.1. *Percentages of elderly by country in 2000, 2020 and 2030.*

Country	*2000*	*2000*	*2020*	*2020*	*2030*	*2030*
	% age 65+	*% age 80+*	*% age 65+*	*% age 80+*	*% age 65+*	*% age 80+*
Japan	17.1	3.7	26.2	7.5	27.3	10.2
Germany	16.4	3.6	21.6	6.3	26.1	6.8
Sweden	17.4	5.0	23.1	5.9	25.5	8.4
UK	16.0	4.2	19.8	5.1	23.1	6.5

Source: United Nations.

The long-term effects of changes in life expectancy are illustrated in *Figure 1.1* which shows how life expectancy has evolved over the last century for females aged 50 in three of the countries considered in our research and the United States. After 1950, it is apparent the trend appears to take off into a new and uncharted phase, which has continued, uninterrupted, through to 2000 suggesting a more or less simultaneous transition around this time in each country.

Also remarkable is the fact that Japanese life expectancy, which begins from a low base, overtakes the other countries by the mid-1980s. Further analysis indicates that, in Japan, life expectancy increases are progressing at a rate of 1 year every 4.1 years, in Sweden

every 7.5 years, the US 8.6 years and the UK 9.2 years. Simple linear projections have been added to show the direction of trend to 2025; if these extrapolations are to be believed, Japanese females can expect to live a further 43 years once they have turned 50 by the end of this period.

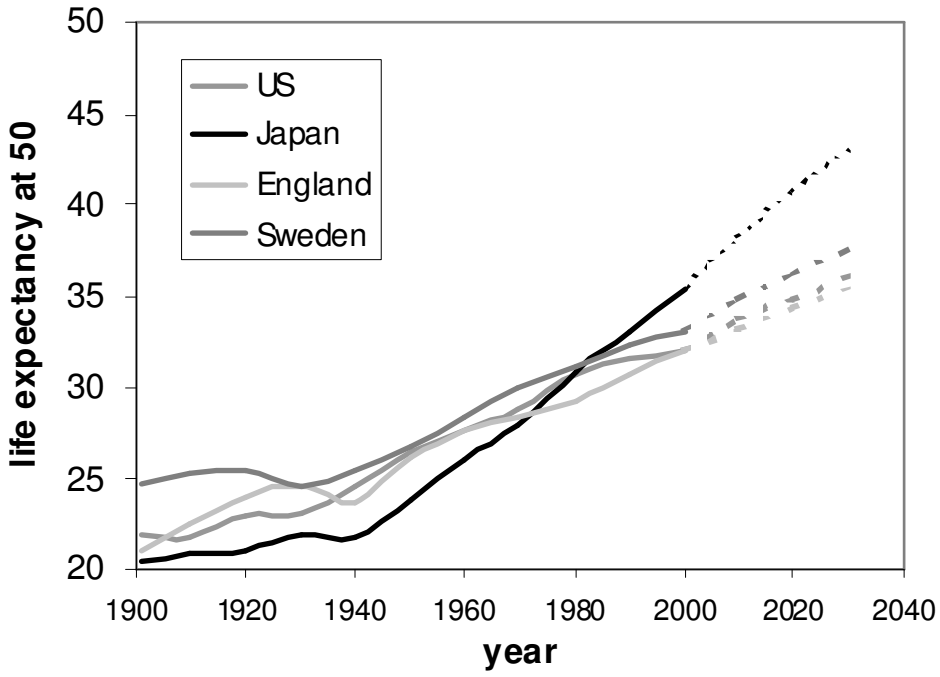

Figure 1.1. *Trends in life expectancy among women at age 50. Source: Mayhew (2001).*

1.3 Trends in health

Living longer does not necessarily mean living longer in poor health. There are broadly two cases to consider. If the increase in life expectancy comes entirely from an increase in "healthy life expectancy" (ie life expectancy with periods of long term care disregarded) then the amount of time spent in long term care would be unchanged for the average individual. This would, in fact, be beneficial since it would mean that, over time, the onset of severe disablement requiring long term care would be deferred and therefore so would the associated cost. On the other hand, if the increase in life expectancy comes from a combination of an increase in the healthy life expectancy and an increase in time spent requiring long-term care then there would be an upward pressure on the cost.

Figure 1.2 is a survival curve for men and women combined based on the standard English life table, English Life Tables Number 15 ("ELT15"). This table is based on the mortality of the population of England and Wales during the years 1990, 1991 and 1992. A life table does not represent the actual population, but what the population would look like if age-specific mortality were to apply to a notional population (conventionally 100,000 new-borns) as they age, hence the values on the vertical scale. Mortality in the modern age does not take any significant toll until people have reached at least 50 years of age after which it accelerates. The shaded area of the figure represents the portion of

the surviving population that is disabled according to the OPCS disability rates (Martin et al, 1988). OPCS graded disability on a scale of 1-10 from least severe (category 1) to most severe (category 10). The OPCS survey of disability in Great Britain from which the disability rates have been derived is described in more detail in section 3.1.

The average "stock" of disabled persons of a given age is found by measuring length AC; the duration of disability faced by a person of a given age is found by measuring length AB. It is striking how the duration tends to be constant at older ages but is longer if disability begins at a younger age, say, between 40 and 50 years. If we were to construct the same diagram but only represent the most severely disabled group needing long-term care (for example, using only higher OPCS categories 8–10) our shaded strip would be much narrower.

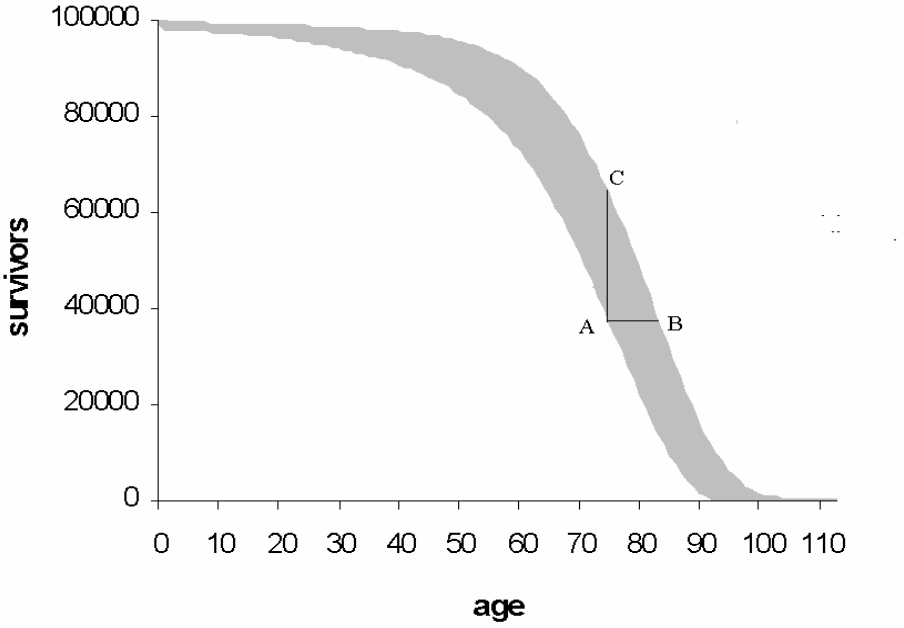

Figure 1.2. *Survival curve based on English Life Table 15. Source: Mayhew (2003).*

To show how important this period is before death, consider the following simple example. In a country with a population of 50 million, we might expect, say, 500,000 deaths a year. If the average time spent in long-term care prior to death is 1.5 years (allowing for deaths which are not preceded by long term care) and the cost of care per person per annum is £25,000, then the total annual cost is 500,000 x £25,000 x 1.5, or £18.75 billion or £375 per capita.

The key implication, even based on this simplified illustration, is that trends in health could make a significant difference to costs and therefore public policy. We therefore needed to ensure that our analysis takes into account a range of possible health scenarios. For this part of the analysis we used previous work by Rickayzen and Walsh (2002) who

developed a methodology for projecting disability prevalence rates, allowing for health trends.

The model is described in more detail in section 3.1. In summary, however, the authors quote results using the central ("Basis C"), the most optimistic ("Basis N") and the most pessimistic ("Basis A") sets of assumptions.

What do these scenarios show in terms of years spent in disability? *Figure 1.3* shows the results, which underlie the UK projections presented and are financially evaluated in later chapters. This example is for women who were aged 20 in 2000 who become severely disabled at the given age according to each basis and the expected years they would be in a state of severe disability. It can be seen that at young ages the expected period spent is much longer than at older ages.

However, the probability of becoming severely disabled is very low before age 70 and the peak is not reached until age 80 and above. If we focus on this older age group, then it is evident that the period of severe disablement does not change substantially with age; however, the difference between each basis can vary from around one year (optimistic) to 4 years (pessimistic). Note that when we apply the same analysis to males, our results show that the expected time spent in severe disability is less even though the probability of becoming severely disabled starts at a younger age, whilst the difference between each scenario is less extreme than with females. The key point is that estimates of the future cost of long-term care depend crucially on how long people require care that is concentrated in the period prior to death. Our work shows that there is an element of doubt depending on the rate of health gains, relative to the rate of increase in life expectancy. The research described in this paper takes this into account.

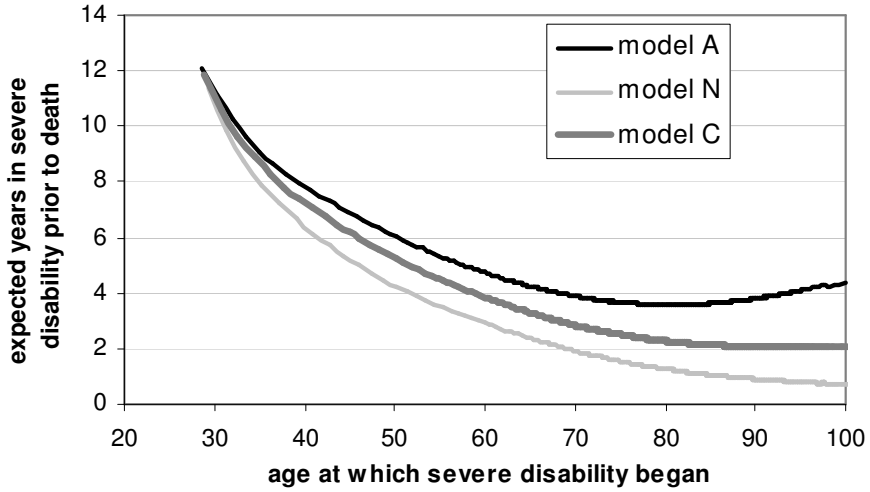

Figure 1.3. *Expected years in severe disability based on models A, N and C for women age 20 in year 2000.*

1.4 Conclusion

It is rare in work of this kind to take health trends into account as well as demographic change. Inevitably there is a certain circularity of argument as to whether increases in life expectancy are occurring in spite of changes in health or because of them. A concrete example could be the administering of drugs that keep people alive but not necessarily in an independent state. Our purpose here has not been to debate that issue but to develop scenarios that would reflect what would be the case if either were true. In other words, we seek to underpin our results with plausible scenarios about future health trends arguing that these could make a significant difference to conclusions particularly on issues relating to cost.

The rest of the paper is structured as follows. In the next section, we define long-term care. In Section 3 we present the disability projection model that has been used in the analysis. Section 4 provides a brief overview of the LTC systems in the four countries and then proceeds to a quantitative evaluation of the systems, their long run sustainability and their distributive effects. Section 6 concludes. The appendix at the end provides an overview of results, pictorial representations of the modelling approach used, and sensitivity analysis. A more complete overview of the methodological approach, as well as a more in-depth evaluation of the LTC systems analysed, may be found in Karlsson et al (2004).

2 DEFINITIONS

Long-term care (LTC) is a complex matter and it may be defined in a variety of ways. The American Institute of Medicine (1986) gives one such definition as "a variety of ongoing health and social services provided for individuals who need assistance on a continuing basis because of physical or mental disability". The characteristics of long-term care might become clearer if compared with medical care, as Norton (2000) does. He points out that LTC

(a) is care for chronic illness or disability for which hospital care is no longer deemed appropriate and

(b) is often provided by unpaid care providers, instead of professionals.

We shall use this definition in our paper, with the further qualification that we only study services provided to the elderly, that is, people above age 65.

One of the difficulties involved when analysing LTC is the wide array of services that the concept includes. The most important divide is between institutional and domiciliary care. However, these categories are very broad and incorporate a vast diversity of services themselves. Concerning *institutional care*, in most countries a distinction is made between nursing homes and residential homes – where nursing homes generally entail more intensive care. *Domiciliary care* includes services such as personal care, meals and home adaptations. Finally, as a separate category, one might distinguish community care services from, for instance, day care centres.

On top of the wide diversity in services, a complicating factor when comparing LTC systems in different countries is that definitions differ – including the definition of LTC itself (e.g. the boundary with mainstream health care) as well as the definitions of different kinds of services. Furthermore, the assessment of need and the mapping from severity into a particular service will typically differ between countries. To circumvent the difficulties implied by those differences, in this paper, we generally work with UK definitions and UK standards, and restrict the comparative analysis to differences in the *financing* of LTC.

So which are the services we include in our analysis? Obviously, there is a wide range of services that might be considered long-term care services and one has to draw a line somewhere. In this paper, we concentrate on the core services that make up the bulk of the LTC system in all developed countries; that is

1. Care provided in *institutions* such as nursing home and residential homes

2. *Personal Care* provided at home by professionals

3. *Informal Care* (i.e. care provided at home without remuneration).

Hence, we leave aside services such as long-stay hospital care and community nursing. The main advantage with focusing on this set of services is, firstly, that there are

relatively good data available concerning the characteristics of the typical consumers concerning age, gender and degree of disability. Hence, the restriction to these services should increase the precision in our estimates and still represent the lion's share of (public and private) spending.

3 THE DISABILITY PROJECTION MODEL

Our projection model consists of several different components. An overview is given in *Figure 3.1* which will be explained in more detail in this section. From our projections, we derive two kinds of results; firstly, an estimate of the future costs of LTC to the public purse, expressed as a proportional income tax and secondly, an estimate of the future surplus or shortfall of the number of informal carers relative to the demand for informal care. In this paper, only the provision and funding of formal care is analysed and the informal care side is present in the figure only for the sake of completeness.

In *Figure 3.1*, arrows going downwards represent factors determining demand, whereas arrows going upwards represent factors determining supply. We now describe the steps in more detail.

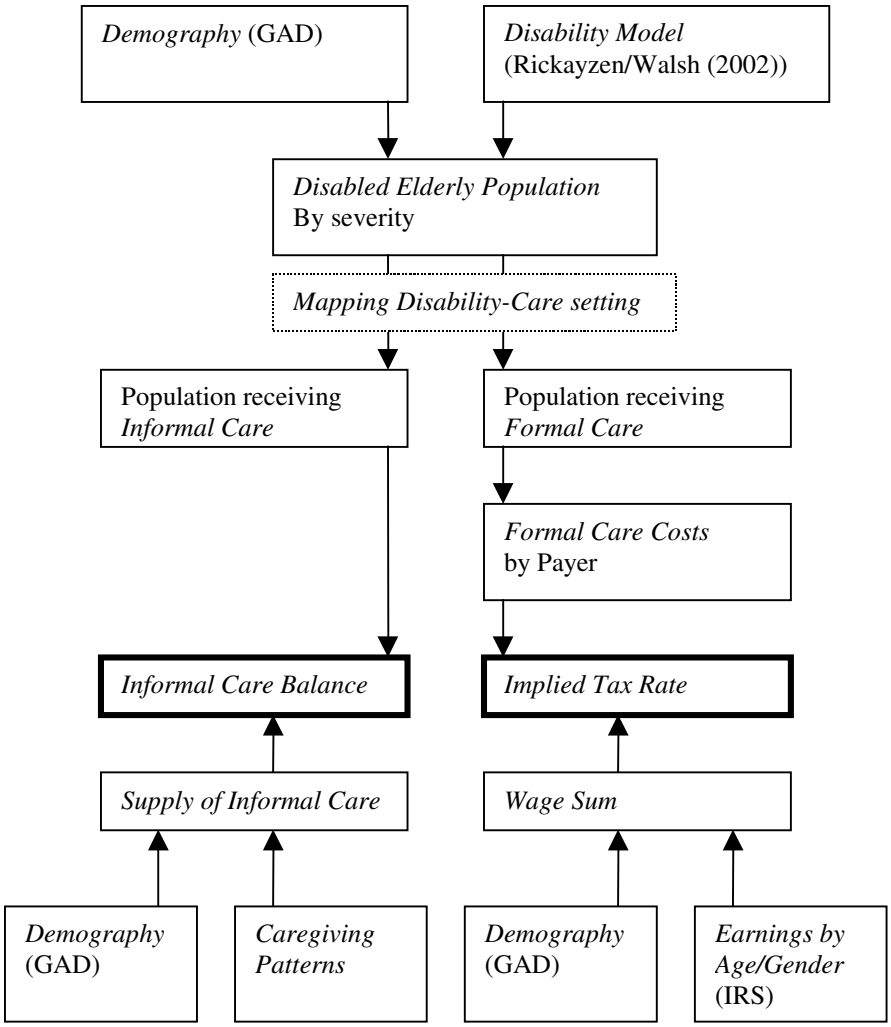

Figure 3.1. *The Projection Model.*

3.1 The Disability Projection Model

The long term care projection model referred to in this paper is described in detail in Rickayzen and Walsh (2002). For convenience, a brief outline of the model is given below.

The model requires 3 main pieces of data:

- Prevalence rate data are required as a starting point, which show the proportion of the UK population at each age with a particular level of disability.
- Transition rate data are required in order to project the current healthy and disabled population forward. Transitions include, for example, healthy people becoming disabled, disabled people becoming more severely disabled and people dying.

- Trend data are required to indicate how the transition rates might change over time. For example, general improvements in the health of the UK population might make it less likely that a healthy person of a certain age becomes disabled over the following year.

The data set used to provide the prevalence rate data comes from the OPCS survey of disability in Great Britain (Martin et al (1988)). This entailed the screening of representative samples of private households and communal establishments in 1985 and 1986, respectively. Although the survey took place nearly 20 years ago, it still represents the richest source of data for UK long term care models.

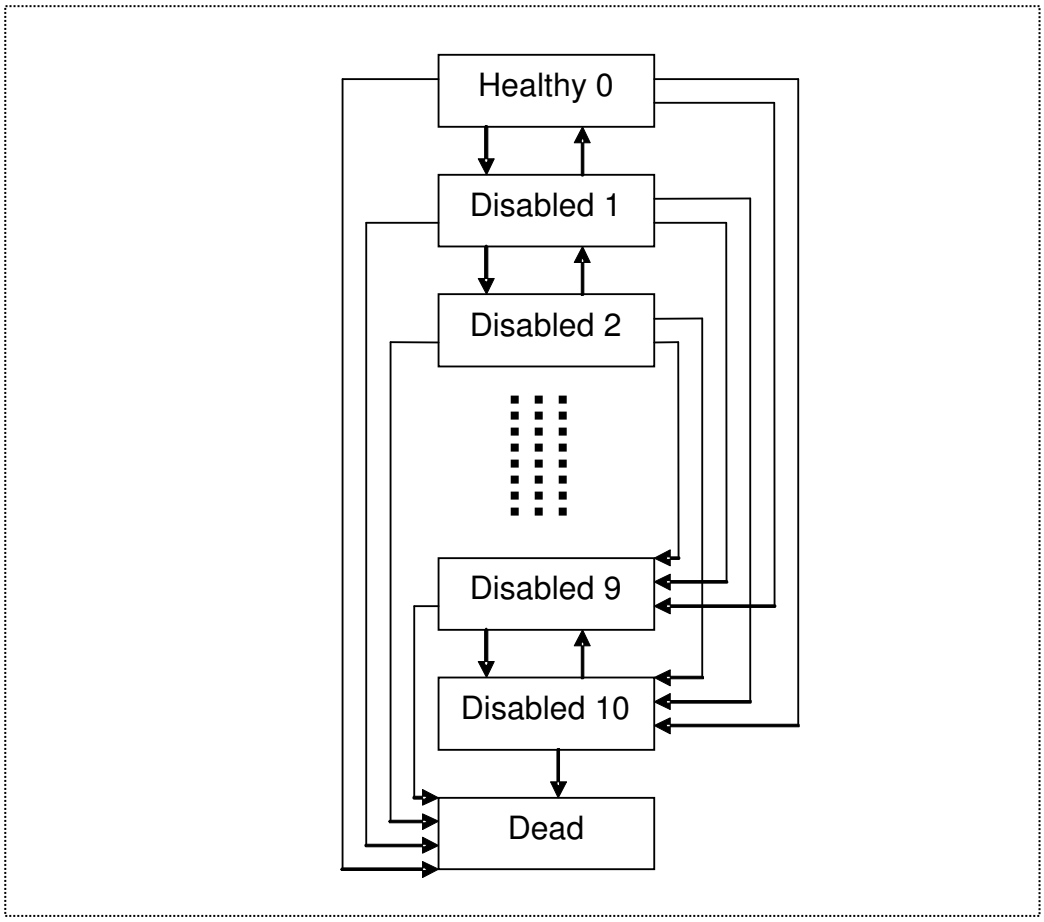

Figure 3.2. *The disability model.*

The published report on the survey allocated disabled people to one of ten categories of disability with Category 1 the lowest and Category 10 the highest levels of disability. Rickayzen and Walsh (2002) use a 12-state multiple state model comprising the healthy state ("category 0"), 10 states of disability and the dead state. A pictorial representation of the model is given in *Figure 3.2*. The arrows indicate the annual transitions allowed in the model. It can be seen that a person can deteriorate to any other level of disability during the course of a year, but can improve by at most one level of disability in a year.

The transition rate part of the model was developed from considering data available in respect of the different transition components: mortality rates, disability inception rates and recovery rates. The parameters were chosen such that the transition rate model generated the prevalence rates obtained from the OPCS survey.

Trends in healthy life expectancy data were then used to shape the assumptions made regarding changes in the transition rates over time. Due to the level of uncertainty in this part of the model, projections were made using 16 different sets of trend assumptions from the base year of 1996. Rickayzen and Walsh (2002) quote the results from the central ("Basis C"), the most optimistic ("Basis N") and most pessimistic ("Basis A") sets of assumptions. The results for all 16 sets of assumptions can be found in Walsh and Rickayzen (2000).

In this paper we have used Bases C, N and A in order to obtain central, optimistic and pessimistic results, but with an alteration made to the mortality rate assumption.

The overall mortality assumed throughout this paper is the IL92 mortality table (males and females, as appropriate) rather than the Government Actuary's Department central population projection for the period 1996 to 2036 (Government Actuary (1988)) which was assumed in Rickayzen and Walsh (2002). The reason for this is that using the IL92 tables will result in smoothed mortality rates being incorporated. This change has an insignificant effect on the results.

We conclude our summary of the long term care model by highlighting the differences between the 3 sets of assumptions used in this paper.

With Basis A (the most pessimistic assumptions), we assume no trends in the transition rates other than an improvement in overall mortality (which is implicit within both the IL92 tables and the GAD projections).

With Basis C (the central assumptions), in addition to the trend regarding overall mortality, we allow for the following improvement in disability rates: we assume that the probability that a healthy person aged x in year y becomes disabled in the following year is equal to the probability that a healthy person aged x+1 in year y + 10 becomes disabled in the following year. This one year shift in age every 10 calendar years in relation to the probability of becoming disabled leads to this trend being described as "1 in 10". Since it is assumed that the probability of becoming disabled in the following year increases with age, this represents an improvement in disability rates over time.

Basis N (the most optimistic assumptions) is similar to Basis C except that we assume a "1 in 5" rather than "1 in 10" trend regarding disability probabilities. We also assume a slight reduction in the probability that a disabled person becomes more severely disabled in the following year.

The Rickayzen & Walsh (2002) work provides us with two pieces of information that are necessary for our analysis. Firstly, we obtain an estimate of the aggregate population split by age, gender and severity of disability for each year of the projection period. Secondly, we have an estimate of the probability that an individual is in a certain disability state – a

severity level on the OPCS scale – at some time in the future given that they were healthy at the outset.

3.2 Mapping from Disability to Care Setting

In this paper, we assume that the mapping from severity of disability to care setting remains constant over the projection period. In other words, we assume that the probability of ending up in a certain care setting given a certain level of disability does not change over time. The Rickayzen and Walsh (2002) model gives us, for each year of the projection period, an estimate of the entire UK population partitioned by severity of disability and gender. The Health Survey of England (Bajekal, 2002) provides an account of the number of residents in institutions and the prevalence of disability among them.[1] Together with additional information from the Health Survey, provided by the Department of Health, we are able to get a picture of the elderly population receiving formal home services, showing the aggregate numbers by gender and the prevalence of disability. Then, the population receiving no formal care can be treated as a residual, and we have a complete partition of the elderly population by care setting (nursing home, residential home, formal home care, no care) and disability (severe, moderate, no disability).[2]

The only other care setting which needs to be considered is in respect of people receiving informal care. To derive their numbers and distribution over different levels of disability, we use the following assumptions:

- Among the people receiving any domiciliary care (formal or informal), 80 per cent receive informal care only, 10 per cent receive informal *and* formal care and 10 per cent receive formal care only. This is consistent with the findings of Pickard et al (2000).

- Nobody who is entirely healthy receives informal care.

- Everybody with severe disability receives some form of care. This means that people who are not covered by any other care setting are assumed to receive informal care.

Together, these three assumptions uniquely determine the size and distribution over different disability levels of the population receiving informal care. Thus, for all care settings under consideration, we have derived a conditional probability of ending up in that particular setting given gender and a certain level of disability. In doing this, we

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[1] This survey covers England only, and thus it is an implicit assumption in our work that the distribution over care settings and disability levels are common to the entire UK.

[2] The Health Survey of England is less detailed than the OPCS scale used in the Rickayzen & Walsh (2002) model in that it only distinguishes three different severity levels: healthy, moderate disability and severe disability. However, these categories correspond fairly well to OPCS scale 0, 1-5 and 6-10, respectively. This means that we use a relatively wide definition of 'severe' disability, which also explains the relatively high probability in *Table 3.1* that 'severely' disabled people only receive informal care.

account for the heterogeneity – in terms of disability – of people within every care setting, a fact that has been ignored in most previous studies. On the other hand, limitations in the availability of data forces us to define long term care quite 'narrowly'. For instance, certain community care services – day care, community nursing – and long-stay hospital care have been excluded. This will have implications for the projections of aggregate costs and implied tax rates.

The mappings from disability into care setting are provided in *Table 3.1*.

Table 3.1. *Probability of being in different care settings, given gender and disability*

Category	*Nursing Home*	*Residential home*	*Informal Care*	*Informal + Formal*	*Formal Only*	*No care*	*Total*
Men							
No disability	0.001	0.006	0.000	0.000	0.035	0.958	1
Moderate Disability	0.003	0.009	0.305	0.047	0.014	0.622	1
Severe Disability	0.040	0.064	0.812	0.085	0.000	0.000	1
Women							
No disability	0.002	0.012	0.000	0.000	0.043	0.943	1
Moderate Disability	0.003	0.018	0.425	0.052	0.015	0.487	1
Severe Disability	0.105	0.192	0.622	0.080	0.000	0.000	1

3.3 Formal Care

3.3.1 Care Costs

Costs for formal care have been acquired from Laing & Buisson (2002) for institutional care and Netten et al (2002) for domiciliary care. Annual figures are provided in *Table 3.2*. It should be noted that although the sums are expressed in pounds, we are not producing monetary projections but projections of the cost of care in terms of labour. Thus, the most relevant measure of the overall burden of LTC costs is the implied contribution rate, to be given below. It should also be noted that the formal home care item only covers personal care services in the strict sense – nursing care, meals and so on – are not included.

Table 3.2. *Average cost of care by setting in 2001.*

Setting	*£ per annum*
Residential Home	18,356
Nursing Home	23,868
Formal Home Care	3,016

3.3.2 The Economy

The real interest in a projection of LTC costs is not how many pounds LTC expenditure will be required in the future, but how much the LTC sector will burden the economy. We adopt a simple method here that circumvents many of the dynamic problems which characterise forecasts of this kind. We assume that the relative prices of LTC services in terms of labour remain constant throughout the period. This assumption seems reasonable at first glance, since LTC services are very labour-intensive. However, it could still be criticised since the increased demand for carers might trigger higher wage increases in the caring professions than for the labour force in general. On the other hand, in the last few decades wage increases amongst the low qualified members of the care professions have tended to be below the average for the economy as a whole. Thus, assuming the ratio between LTC and non-LTC labour to be constant seems to be reasonable.

To project the future wage sum, which is used as a basis to fund LTC, we took the average income by age group (in five year bands) and sex in 2000 – obtained from the Inland Revenue Statistics (Inland Revenue, 2003) – and multiplied it by the total population in each age and gender group in all subsequent years (as given by the GAD forecasts).

Thus, the implicit assumptions we make are that

(i) there is no productivity growth in the LTC market, and

(ii) the costs of LTC services (that mainly consist of wages) increase at the same rate as labour remuneration in the economy in general.

3.4 Informal Care

3.4.1 Care Costs

We have assumed that informal care is provided for 30 hours per week.[3] To assess the value of one hour of informal care, we use an opportunity cost approach for non-retired carers and apply the minimum wage (£ 4.20 per hour until October 2003) for retired carers. The average wage for full-time workers was £ 10.66 per hour in 2001 (National Statistics, 2002). Since carers below retirement age provide around 75 % of all informal care (Department of Work and Pensions, 2001), this would imply an average cost of informal care of £ 9.05 per hour or £ 14,103 per year.

3.4.2 Supply of Care

We have projected the supply of care under the assumption that the relative supply by age and sex remains constant over the next couple of decades. Our data source in this section is the Family Resources Survey (Department of Work and Pensions (2001). A summary of the data we use is given in *Table 3.3*. It should be noted that the percentages given in

[3] The figure is consistent with the Family Resources Survey (Department of Work and Pensions, 2001).

the columns labelled "Carers in total population" refer to the total population within that subgroup of the population, and thus the percentages are not expected to sum to 100.

Table 3.3. *Informal carers in population and amount of care provided.*

	Male			**Female**		
Age	*Average care (hours per week)*	*Carers in total population*	*Carers in healthy population*	*Average care (hours per week)*	*Carers in total population*	*Carers in healthy population*
11-15	9.38	1.5%		9.95	2.1%	
16-24	12.30	3.5%	3.5%	17.70	4.4%	4.5%
25-34	19.09	4.5%	4.6%	19.08	9.1%	9.4%
35-44	19.88	6.9%	7.1%	20.45	13.3%	13.8%
45-54	16.31	11.7%	12.2%	18.30	21.5%	22.6%
55-59	17.78	12.8%	13.6%	20.03	20.3%	21.8%
60-64	22.83	13.2%	14.4%	20.65	19.3%	21.4%
65-74	22.85	13.2%	15.2%	24.75	13.4%	16.0%
75-84	30.64	10.4%	14.2%	28.28	7.6%	11.3%
85+		6.8%	16.0%		3.6%	9.6%

Source: Family Resources Survey (Department of Work and Pensions, 2001)

We assume that only relatively healthy people (OPCS levels 0-3) provide informal care. Thus, in *Table 3.3* we have converted the frequencies from the survey into frequencies for the relatively healthy population. It is then straightforward to project the number of informal carers available in the future. Due to lack of data, we disregard the small number of carers who are under 20 years old.

4 COMPARISON OF LTC SYSTEMS

There is a wide variety of LTC systems at work in the developed world. Countries have generally chosen very different paths and reforms have normally borrowed inspiration more from national traditions in the realms of health care and public pensions, than from other countries' models (Scheil-Adlung, 1995). LTC systems may be evaluated in many dimensions and there is thus a multitude of possibilities for public policy. The most important decisions that the policy-makers and the society as a whole have to consider are, as suggested by Wittenberg et al (2002):

- The boundary between LTC and health care
- The role of the family in provision and financing of LTC
- The balance between residential and home-based services
- The provider roles of public and private bodies
- The form of the public subsidy

All these dimensions certainly have implications for the aggregate costs and overall equity of the LTC system. In this paper, however, the focus is solely on the last point – the design of the public subsidy – and we assume that all the other aspects listed above may be treated as exogenous. This allows us to focus on effects stemming solely from the principles of financing LTC. Needless to say, this analysis has to be complemented by more qualitatively-oriented comparisons (see also Karlsson (2002) and Karlsson et al (2004)).

In this section, we give a brief overview of the LTC financing systems used in the four countries included in our study. Focus is put on financial eligibility, reliance on taxes or social insurance, the role of out-of pocket payments and the public benefits attached to different care settings. The appendix contains a flow diagram for each country, indicating how the system works in more detail (section A.2).

4.1 Germany

In Germany, a social insurance scheme for LTC was introduced in 1995. The introduction of the scheme followed several years of increasing costs of income support related to LTC, and so one of the main objectives of the insurance was to reduce the dependency on social assistance among the elderly (Evers, 1998).

German insurance shares many traits with the older social insurances in Germany. Thus, all low earners who earn income below a certain threshold (€ 3,825 (£ 2,455) per month in 2003) are covered by the compulsory scheme, whereas high earners can choose to opt out of the system and purchase private insurance instead. Workers covered by social

insurance pay a contribution proportional to their income (currently 1.7 per cent) that is shared between them and their employer. Family members who are not working are also covered by the insurance. Insurance is provided by semi-public care funds, that are all affiliated to corresponding sickness funds (currently there are 400 of them). The scheme is run on a pay as you go basis, and only accumulates a small balance, corresponding to 1.5 months' expenditure (Bundesministerium für Gesundheit und soziale Sicherung[4], 2003).

German LTC insurance offers three kinds of benefits, depending on the severity of the need; a cash benefit (to be used at the recipient's discretion), domiciliary care and institutional care. Benefits in kind are also denominated in monetary terms and normally cover roughly half of the actual charges. There is outlier compensation for particularly severe cases, but for these benefits there is a spending limit. In any event they are not allowed to comprise more than 3 per cent of any care fund's budget. Since the social insurance benefits are insufficient for many elderly to cover actual LTC costs, income support still accounts for somewhere between 5 and 10 per cent of total LTC costs.

The mandatory scheme covers approximately 90 per cent of the German population (see section 1). Most of the rest of the population have signed up for voluntary private insurance. According to the ministry responsible, some 300,000-500,000 people (who are mainly small business owners and people dependent on income support), do not have insurance coverage. The mandatory scheme has a yearly turnover of around 16 bn euro (£ 10 bn) which comprises slightly less than 1 per cent of GDP (Bundesministerium für Gesundheit und soziale Sicherung, 2003).

4.2 Japan

In Japan, a social LTC insurance scheme was launched in 2000. This mandatory LTC insurance, which is comprehensive and relatively generous, represents a quite distinct break with the Japanese tradition of having a quite limited welfare state.

The new social insurance covers the entire population. Half of the revenues are raised from general taxation, and half through insurance contributions from people aged 40 and over. Insurance contributions are income related. For the working population they amount to 0.6 per cent of income (up to a certain ceiling) and retired people pay a certain multiple (depending on their income) of the so-called 'standard premium'. The insurance also covers family members (Campbell & Ikegami, 2001).

People aged 65 and older can apply for benefits in respect of any kind of disability, whereas people between 40 and 65 are only entitled to care related to cognitive impairments. Eligibility for benefits is based solely on need. Thus, there is no means testing and the availability of informal carers does not change the entitlement to formal care. The assessment of need follows a quite complex procedure which ultimately divides needy persons into seven different severity categories. All but the lowest level of severity

[4] Federal Ministry of Health and Social Security.

are allowed to choose between different care settings[5]; but recipients are required to make an out-of-pocket payment of 10 per cent of the costs (Tokyo Metropolitan Government, 2000).

The Japanese LTC market had a turnover of ¥ 8.4 trillion (£ 46 billion) in the year 2000. This corresponds to around 1.5 per cent of GDP. The bulk of this is financed by public institutions (Ogawa, 2001).

4.3 Sweden

In Sweden, the provision and financing of long term care is the responsibility of the municipalities. The national government takes on a regulatory role in order to impose national standards.

Since 1992, the provision and financing of long-term care has been almost entirely the responsibility of local authorities (LAs). LTC costs are financed out of general income taxation; most of it local income taxes, but the national government also transfers some resources targeted at LTC for the elderly. To compensate for regional differences, there is a risk adjustment system that redistributes revenues among LAs (Karlsson et al, 2000).

A local authority has to offer appropriate care to all inhabitants in need. On top of that, the law stipulates that LAs should actively investigate the needs within the elderly population. Services provided are mainly domiciliary and institutional care, but there is a great variation across municipalities in the procedures for assessment of need and the care provided for given conditions. Care is partly financed by income-related out-of-pocket charges that are also determined locally. To reduce the risk of impoverishment of the elderly, the central government has recently introduced national standards for personal needs allowances and caps on the out-of-pocket payments.

In the last twenty years, there has been an ongoing trend towards concentrating care on the most severe cases. Nevertheless, the total cost for publicly financed long-term care was SEK 68.3 billion (£ 4.8 billion) in 2001 (3.2 per cent of GDP). Out of this, the bulk came from institution-based care (73.7 per cent); home-based care accounted for 24.2 per cent and transport and allied services 2.1 per cent (Socialstyrelsen, 2002).

4.4 The United Kingdom

The essential features of the UK system are described in the introduction to this paper. The total cost of LTC in the UK was £14 bn. in 2001, which corresponds to 1.4 per cent of GDP. Benefits are provided in the form of institutional and domiciliary care of which institutional care account for two-thirds of the total (Laing and Buisson, 2001). Local authorities are obliged to appoint qualified social services personnel to asses the needs of potential clients. The care services provided are subject to means testing in which an individual's income and assets are taken into account. Each individual however is entitled

[5] All benefits are in kind.

to retain a personal needs allowance so as to ensure there is enough income left over to cover essential needs. If the client qualifies for NHS care all services are provided free of charge (Laing and Buisson, 2001).

4.5 Methodology

Our main focus in this paper is to analyse the distributive impact of different systems to finance LTC. There are many possible dimensions in which this comparison could be made, and there are several methodologies available. We have decided to focus on three main dimensions, namely income, gender and age. Thus, we want to see how different systems of financing LTC redistribute between different income groups (high versus low income earners), men and women, and people of different ages.

Our methodology entails comparing the 'money's worth' of the public LTC system from different individuals' points of view. For this purpose, we consider certain 'stylised' individuals and compare the expected contributions to, and benefits from, the public LTC system. We calculate the 'money's worth' of the public LTC system by inserting parameters of the public system of the different countries considered into the projection model presented in section 3.

Our main aim is to analyse which groups benefit and which groups lose from each system. Furthermore, we want to analyse changes over time, as the demographic structure and the prevalence of disability changes. For this purpose, we have created 18 different 'cases' that differ in terms of gender, age and income. Following this, the payments into, and benefits taken from, the public system are analysed over the entire life span (from age 20 to 120). The characteristics of the cases are presented in *Table 4.1*. By 'medium income' we mean a hypothetical individual who earns the average (full-time) wage of his age and gender throughout his active working life.

Table 4.1. *Charateristics of cases.*

	Earnings Function	*Average Wage*	*Pension Replacement Rate (%)*
Male			
High Income	1.375*Medium Income	33,000	56
Medium Income	-28,420 + 2,497*AGE – 27*AGE^2	24,000	56
Low Income	0.625*Medium Income	15,000	60
Female			
High Income	1.375*Medium Income	28,000	56
Medium Income	-19,567 + 1,921*AGE – 21*AGE^2	20,000	56
Low Income	0.625*Medium Income	13,000	65

The earnings functions are derived from the age-specific mean earnings in the Inland Revenue Statistics for 2001 (Inland Revenue, 2003). We derived the 'earnings functions' by age by regressing average income by age and sex on age and squared age. Pension replacement rates refer to the wage just before retirement and are chosen in accordance with estimates of Brooks et al (2002). We assume that all individuals are completely healthy at the starting age. Furthermore, we assume that income and disability are not correlated with age. Given that we have projected the probability of being in any particular state of disability at any particular future age, we can compute the expected care costs of each individual for each individual age. Since we disregard care costs before retirement age, the potential link between disability and earnings is of minor importance. We have used a cross-tabulation of net wealth and income to derive the expected net wealth for different income brackets. The assumption throughout is that our stylised individuals have the 'expected net wealth' of their income bracket.[6]

[6] This is relevant for the means testing of the British LTC system.

5 RESULTS

In this section we present the result of the projection model. Firstly, we give a brief record of how the aggregate figures – number of disabled elderly and total costs – are sensitive to assumptions concerning trends in health of the elderly. For a more complete account, see the appendix (section A.1) and Karlsson et al (2004). After that, we proceed to analyse the consequences for public finances of introducing another country's system into the UK. Finally, we turn to an analysis of the distributive impact of such a reform, using the methodology introduced in section 4.5 above.

5.1 Projection results

Figure 5.1 shows the projected number of disabled people, as well as the entire projected elderly population. According to our *baseline* projection (which corresponds to Basis C in Rickayzen and Walsh (2002)), the number of disabled elderly will increase continuously up to the second half of the 21st Century. However, it can be seen that the increase in the number of disabled people is out of step with the increase in the total elderly population, which reflects a general improvement in health status amongst the elderly implicit in this scenario.

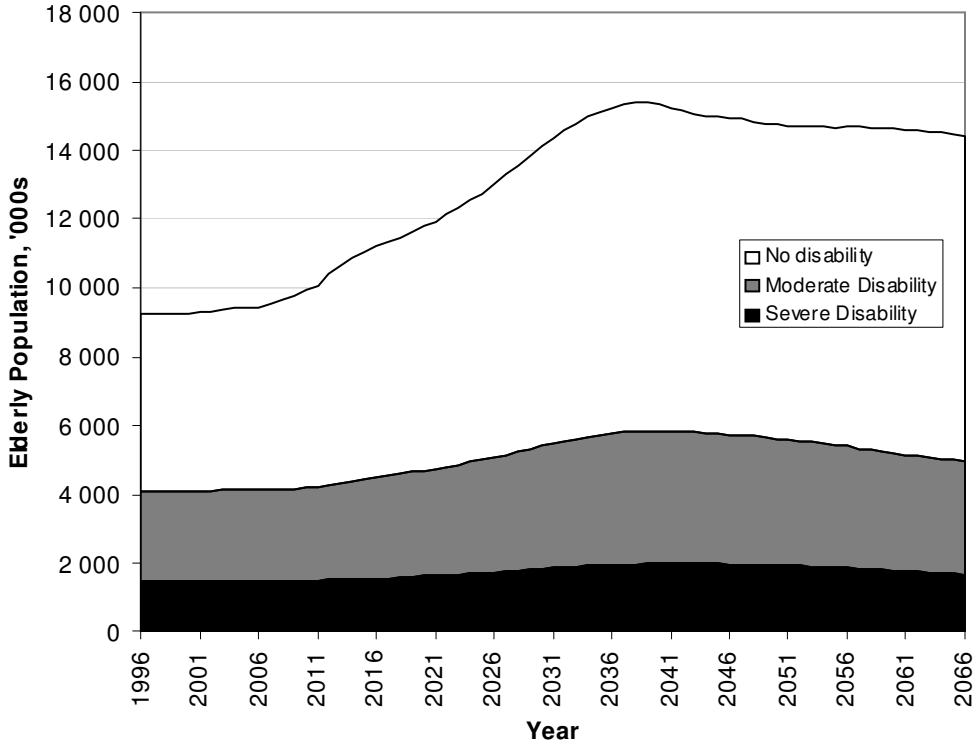

Figure 5.1. *Projected number of elderly by severity of disability. Baseline scenario, United Kingdom.*

Hence, the disabled elderly population is projected to increase significantly over the first half of the projection period, and this increase has implications for the utilisation of

services. As expected, the largest increase – in absolute terms - will be in the number of elderly receiving informal care. This population is projected to increase from around 2.2 million today to some 3.0 million in 2050. In relative terms, the changes are all of the same magnitude: the institutionalised population is projected to increase by 32 % over the next 50 years, compared to 36 % for recipients of informal care. The number of recipients of formal home care services is projected to rise more rapidly in the first three decades but then the growth slows down, so that the total relative increase over the next 50 years is 53 %.

The next step is to estimate the total costs of formal care, using the figures in *Table 3.2*. According to the projection, formal care costs are going to rise from around £ 11 bn in 1996 to around £ 15 bn in 2040 (in 2001 prices). Despite this increase, the proportions spent on the different settings remain fairly constant over the projection period, with residential care comprising more than 50 per cent of total spending and domiciliary care less than 20 per cent.

The *pessimistic* scenario (Basis A in Rickayzen and Walsh (2002)) assumes that transition rates between disability levels remain constant throughout the projection period. The assumption that no further improvements in health occur has a strong impact on the results. Whereas in the baseline scenario the number of severely disabled peaks at 2.0 million around 2050, the corresponding figure for the pessimistic scenario is 3.5 million. Also the number of care recipients increases accordingly. In this pessimistic scenario, the total number of recipients peaks slightly below 6 million, compared to 4.2 million in the baseline scenario.

The *optimistic* scenario assumes some further health improvement in the population over and above the baseline scenario. With this scenario, the proportion of the elderly population that suffers from some degree of disability falls considerably throughout the projection period. The proportion of the elderly with any disability starts at 43 % in 1996, falls to 30 % in 2040 and reduces to 23 % in 2066.

The optimistic scenario also changes the results considerably. Whereas in the baseline scenario the number of severely disabled peaks at 2.0 million around 2050, the corresponding figure for the optimistic scenario is 1.3 million. Also the number of care recipients decreases accordingly. In the optimistic scenario, the total number of recipients peaks at around 3.4 million, compared to 4.2 million in the baseline scenario. Total LTC costs (informal and formal care) follow the same pattern, reaching a peak at £ 45 billion around 2040, compared to £ 57 billion in the baseline scenario.

The next step in the argument is to divide the projected public LTC cost by the wage sum, to arrive at an implied contribution rate (assuming LTC to be financed out of general and approximately proportional income taxes). The projection is shown in *Figure 5.2* where the three scenarios are compared. It is quite clear from the graph that the contribution rates necessary will depend crucially on the trends in health of the elderly population. However, the three scenarios agree quite well up until around 2015, after which they tend to diverge.

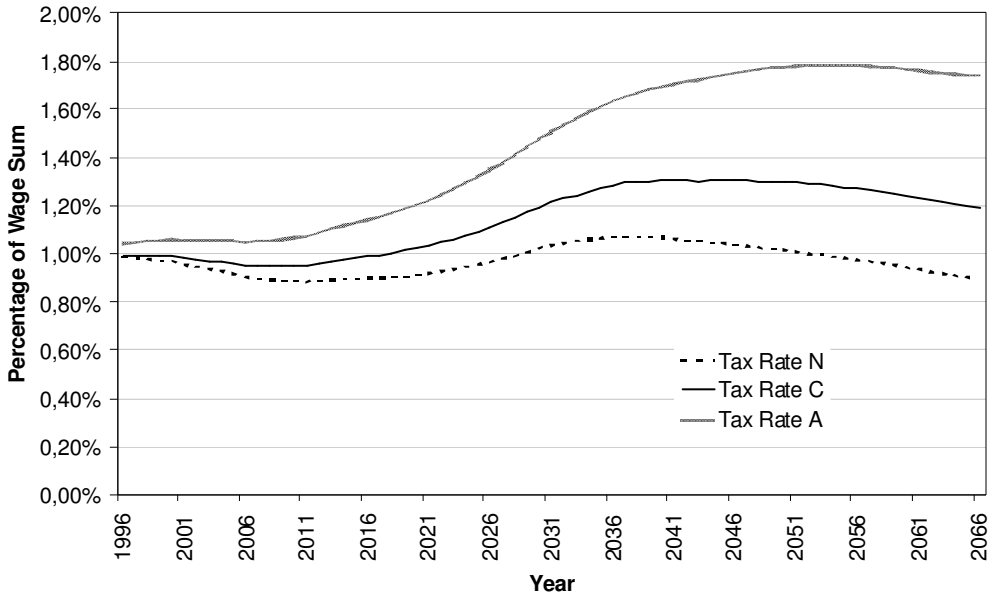

Figure 5.2. *Implied contribution rate for different scenarios.*

In the *baseline* scenario, the contribution rate is expected to decrease slightly over the next decade from 1.0 %, reaching a low at 0.95 % in 2010. After that, it increases continuously until around 2040, when it reaches 1.3 %, reflecting, first, the increase in LTC costs and later, also, the decrease in the wage sum. In the *pessimistic* scenario, the tax burden increases almost continuously over the projection period, reaching a peak at 1.8 % around 2050. The *optimistic* scenario, on the other hand, would temporarily allow for some tax cuts, and the required contribution rate remains fairly constant throughout.

5.2 Comparison of Contribution Rates

Now we turn to the international comparison, initially by considering the contribution and tax rates associated with the costs and benefits of each system. For Sweden and the UK, all costs (apart from out-of-pocket payments) are covered by taxes, whereas in Germany and Japan public LTC spending is split between insurance contributions and general income taxes according to the rules described in section 4. The public costs of each system are expressed as the combined contribution plus tax rate that would be necessary for the system to break even year on year, assuming that the rules concerning entitlement to public support are constant over the projection period. A comparison of the

effects is given in *Figure 5.3*. For Japan and Germany, the general tax rate applying to all is shown as well as the higher rate applying to some groups.

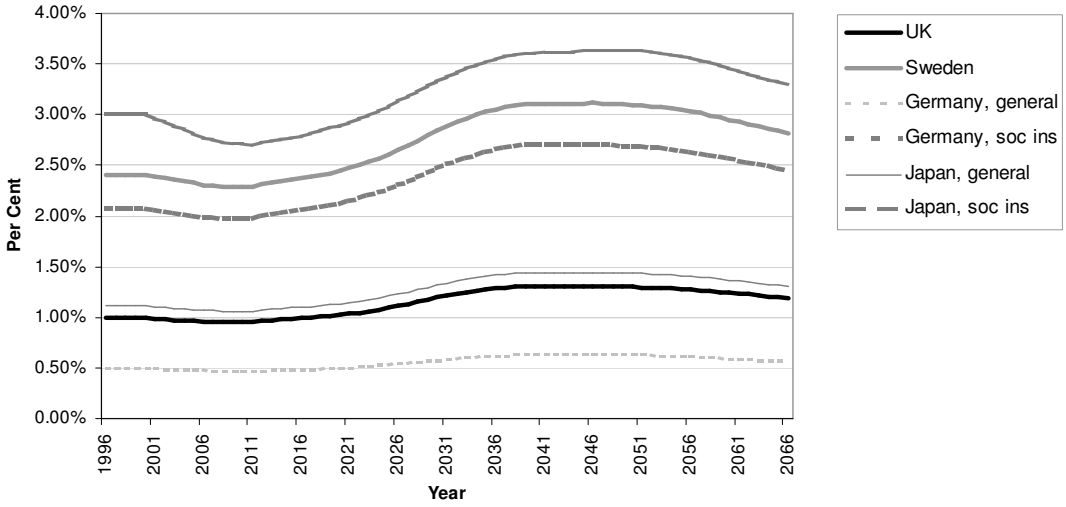

Figure 5.3. *Implied contribution rates from different LTC systems.*

Figure 5.3 reveals that the UK system is by far the 'cheapest' in terms of public spending. The Swedish system is the most 'expensive' as far as the overall tax rate is concerned, but Japanese taxpayers actually end up paying more once they have reached the age of 40. Secondly, it is quite clear that the implied tax rate plots are parallel to each other throughout the projection period, despite the differences in the generosity of provision in different care settings. For clarity, we have summarised the figures in *Table 5.1*.

Table 5.1. *Implied tax rates from different LTC systems.*

	2000	*2010*	*2020*	*2030*	*2040*	*2050*	*2060*
UK	0.99%	0.95%	1.02%	1.19%	1.30%	1.30%	1.24%
Sweden	2.40%	2.29%	2.45%	2.84%	3.11%	3.10%	2.95%
Germany, general[7]	0.50%	0.47%	0.50%	0.58%	0.63%	0.63%	0.59%
Germany, soc ins[8]	2.08%	1.98%	2.13%	2.48%	2.71%	2.70%	2.58%
Japan, general[9]	1.11%	1.06%	1.13%	1.32%	1.44%	1.43%	1.37%
Japan, soc ins[10]	3.00%	2.71%	2.89%	3.33%	3.60%	3.63%	3.46%

[7] This is the tax rate charged from those who are not covered by social insurance.

[8] This is the total rate (tax + social insurance) paid by those covered by the social insurance

[9] This is the general tax rate.

[10] This is the total rate (tax + social insurance) paid by those aged 40 and over.

5.2.1 Net Present Value

Next, we turn to a comparison of costs and benefits of the public system from the point of view of the individuals described above. In order to compare the redistribution in the system, we use two measures; firstly, the net present value of benefits minus costs, and secondly the ratio between benefits and costs. The net present value (NPV) for all cases is presented in *Table 5.2*. For sensitivity analysis regarding the discount rate, see the appendix (section A.3).

Table 5.2. *Net present value of public LTC system (in £'s).*

	AGE		G	J	S	UK
Female	20	Low	-3,247	174	-254	-250
		Medium	-8,524	-5,138	-6,384	-3,249
		High	-7,537	-10,697	-12,746	-6,866
	40	Low	2,074	5,047	7,935	3,064
		Medium	-1,951	-543	3,207	396
		High	-3,710	-6,468	-1,808	-3,273
	60	Low	10,495	17,699	20,236	8,057
		Medium	8,997	15,592	18,378	6,254
		High	-1,572	13,064	16,123	3,012
Male	20	Low	-6,957	-7,088	-7,154	-2,960
		Medium	-5,359	-12,885	-13,222	-5,673
		High	-7,608	-20,920	-23,781	-10,348
	40	Low	-5,247	-7,085	-4,739	-1,925
		Medium	-3,212	-13,774	-10,361	-4,530
		High	-4,417	-20,831	-16,322	-7,448
	60	Low	1,244	1,933	3,301	1,433
		Medium	-1,678	-494	1,214	179
		High	-1,789	-3,375	-1,288	-1,489

The results suggest that most young individuals have a negative NPV from the public LTC system. This is due to the pay-as-you-go (PAYG) character of all the LTC systems being compared; the contributions of the individuals accrue long before any benefits are received from the system.

It is possible to make observations directly from the figures in *Table 5.2*. Firstly, all systems – with the notable exception of Germany – are progressive in the sense that the expected net present value decreases with income. Secondly, all systems favour women – in every country and in every income group, the expected outcome for women is better than for men.

To get an estimate of how the different systems distribute the costs and benefits of LTC among different age groups, we present in *Table 5.3* the NPV for the different age groups, computed by simply averaging the NPV of male and female medium income earners (using the fact that men and women comprise roughly half of the population each).

Table 5.3. *Average NPV by age.*

	G	**J**	**S**	**UK**
20 avg	-6,942	-9,012	-9,803	-4,461
40 avg	-2,581	-7,158	-3,577	-2,067
60 avg	3,659	7,549	9,796	3,217

It is clear from *Table 5.3* that the NPV increases with age in all countries. This result is quite expected, since all LTC systems include some intergenerational transfers. Furthermore, we note that young and middle-aged people would prefer the UK system, whereas relatively old people would prefer a Swedish-style system. On the other hand, the Swedish system is the worst for young people and the UK system is the worst for old people. The Japanese system is the worst for the middle-aged population, primarily due to the fact that they pay a considerable share of the costs without being entitled to many benefits. The German system falls in between, but is generally better for young than for old people.

When represented graphically, the results shown in *Table 5.3* give a good overview of the intergenerational distribution of costs and benefits for LTC (*Figure 5.4*).

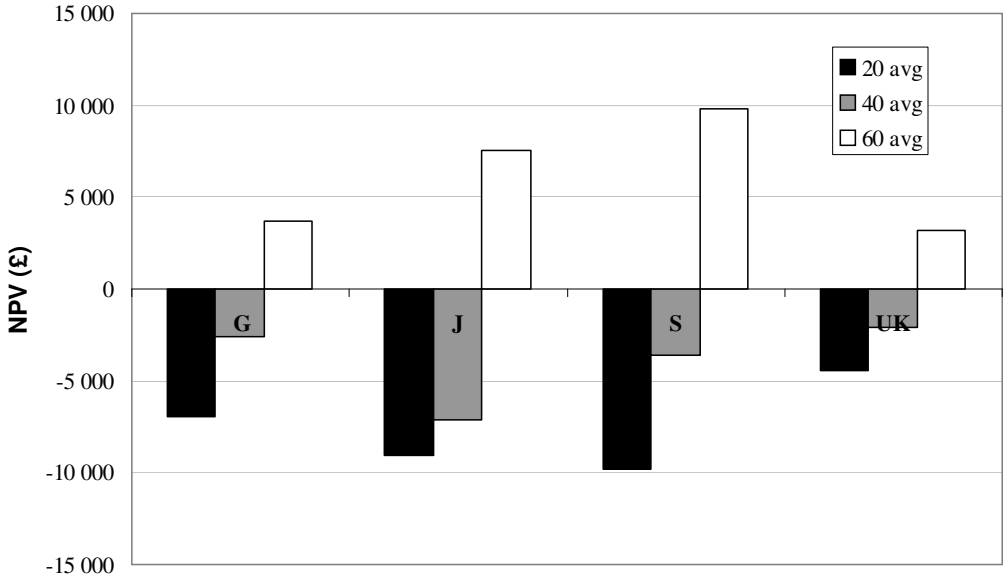

Figure 5.4. *NPV of public LTC benefits, by age.*

Next, we turn to a graphical representation of the NPV for men and women. These are provided in *Figure 5.5* and *Figure 5.6*. A comparison of the two figures shows that the difference in NPV between males and females is considerable. Generally, the difference between the sexes is larger in Sweden and Japan and smaller in Germany and the UK. In Sweden and Japan, the gender difference is generally more than £ 10,000 for otherwise 'identical' individuals, whereas it is normally less than £ 5,000 in the UK and Germany. These differences are mainly attributable to differences on the benefits side, since women are more likely to be disabled and have a higher probability, for a given severity level, to end up in a more costly care setting. Differences in earnings and hence contributions only explain a small part of this 'gender gap'.

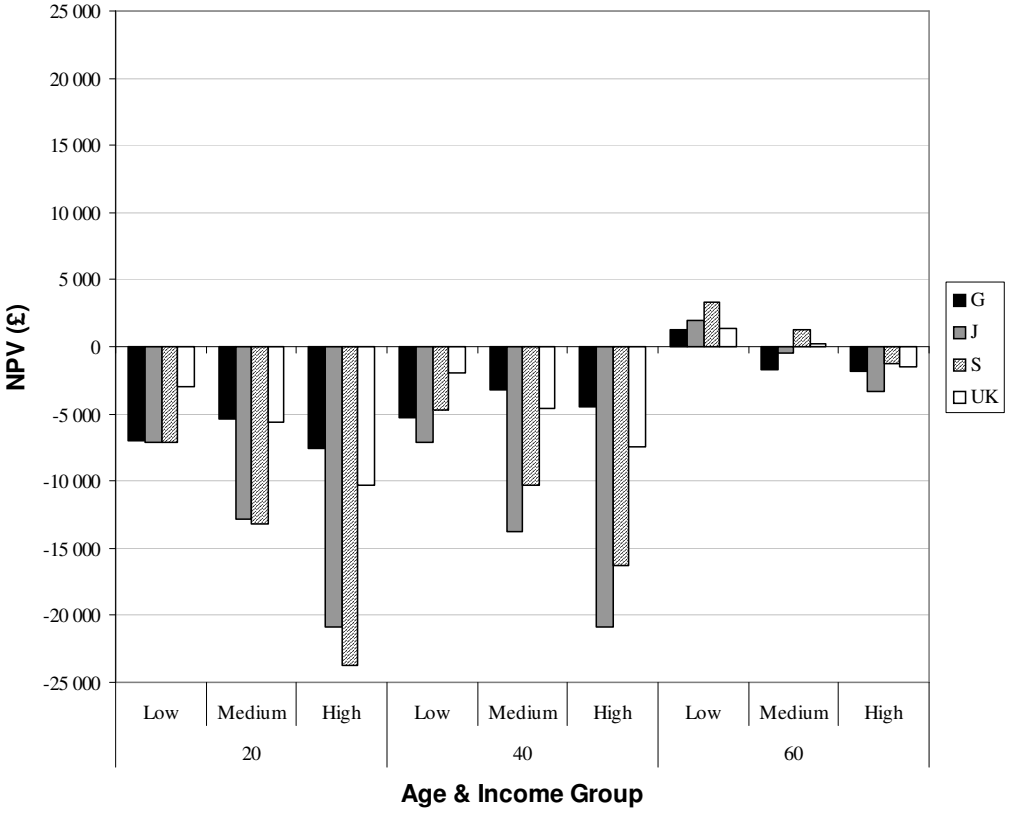

Figure 5.5. *NPV of different age and income groups, males.*

Taking a closer look at *Figure 5.5*, we may conclude that young and middle-aged men are generally better off in the UK and German systems, whereas the Swedish and Japanese systems seem less attractive. For older men this relationship is partly reversed; in this case Sweden seems to be the most favourable system whereas the German and Japanese systems are worse.

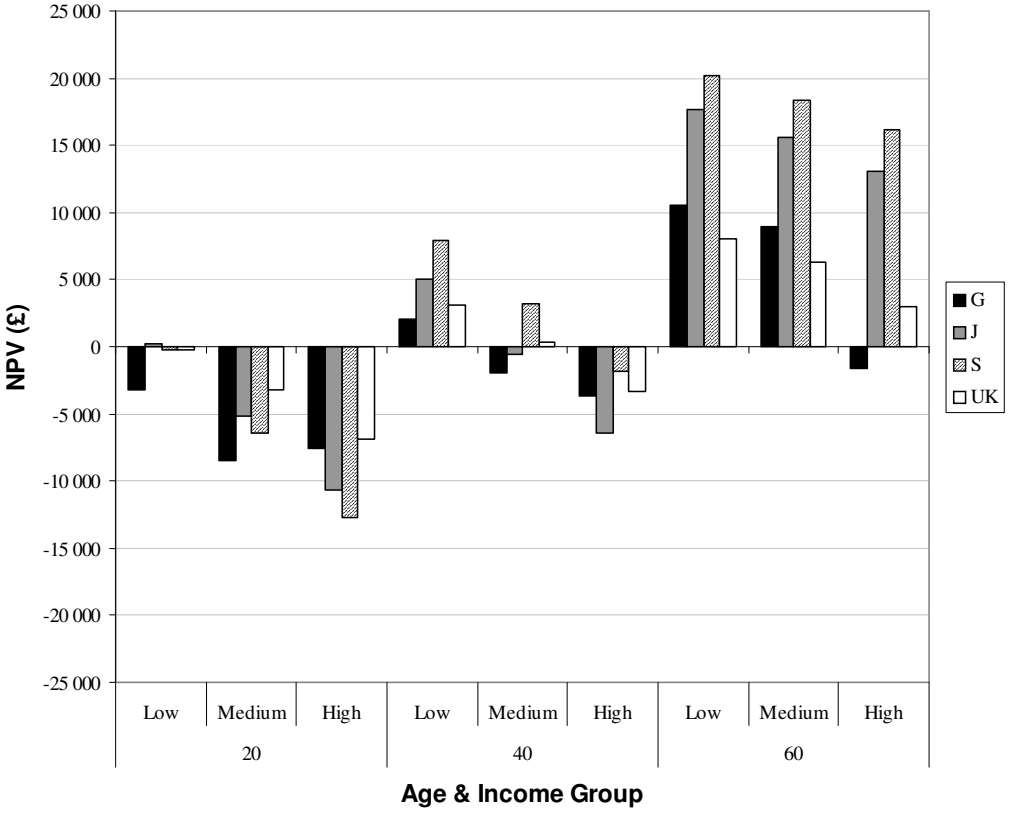

Figure 5.6. *NPV of different age and income groups, females.*

Turning to *Figure 5.6*, we conclude that the British system is the most favourable system to young women of all income groups, whereas the Swedish and the German systems tend to be the worst. For middle-aged and older women, the Swedish system is the most favourable, whereas the German and the British system are the worst ones.

5.2.2 Money's Worth

We now turn to the ratio between present value of costs and benefits of different systems. The general results for all cases considered are provided in *Table 5.4*.

Germany systematically offers the worst benefit-to-cost ratio of all the countries compared. This result arises because high-income earners do not receive any benefits from the system, whereas individuals in lower income groups face disproportionately high social insurance contributions. Sweden generally offers the best ratios for women and medium- and high-income earners, whereas the United Kingdom offers the best ratio for male low-income earners and Japan for young people. These results reflect the fact that the Swedish system is a comprehensive one, offering relatively generous benefits for everyone, whereas in the British system, the public sector takes on a more residual role. These effects will be studied in particular below.

Table 5.4. *Money's worth from public coverage in different systems.*

	Age	Income	G	J	S	UK
Female	20	Low	0.65	**1.02**	0.98	0.94
		Medium	0.41	**0.65**	0.62	0.54
		High	0.00	**0.48**	0.45	0.28
	40	Low	1.28	1.49	**1.93**	1.87
		Medium	0.83	0.97	**1.24**	1.07
		High	0.00	0.70	**0.90**	0.56
	60	Low	4.17	4.82	**6.30**	6.09
		Medium	2.87	3.31	**4.31**	3.72
		High	0.00	2.41	**3.11**	1.95
Male	20	Low	0.25	0.32	0.33	**0.34**
		Medium	0.00	0.21	**0.21**	0.19
		High	0.00	**0.14**	0.13	0.09
	40	Low	0.40	0.42	0.53	**0.54**
		Medium	0.00	0.27	**0.34**	0.30
		High	0.00	0.19	**0.24**	0.17
	60	Low	1.33	1.37	1.76	**1.80**
		Medium	0.00	0.94	**1.19**	1.07
		High	0.00	0.68	**0.85**	0.59

In *Table 5.5*, we present the average cost-benefit ratios for three different ages (again averaging the ratio of the male and female medium income ratio). The picture that emerges is different from the one in *Table 5.3*. Now, Japan offers the most advantageous system for young people (when comparing NPV it was the UK) and Sweden offers the best system for middle-aged and old people. Germany offers the worst ratios, for the reasons given above.

Table 5.5. *Average MW by age.*

	G	J	S	UK
20 avg	0.21	0.43	0.41	0.36
40 avg	0.41	0.62	0.79	0.69
60 avg	1.44	2.12	2.75	2.39

To go into more detail, we provide graphical representations of the results in Figure 5.7 and *Figure 5.8*. Again, the difference between males and females is remarkable. The difference is generally bigger in Sweden and smaller in Germany, whereas the UK and

Japan fall in between. In the UK, women get between 20 pence and 4 pounds more for each pound paid in contributions, than their male counterparts.

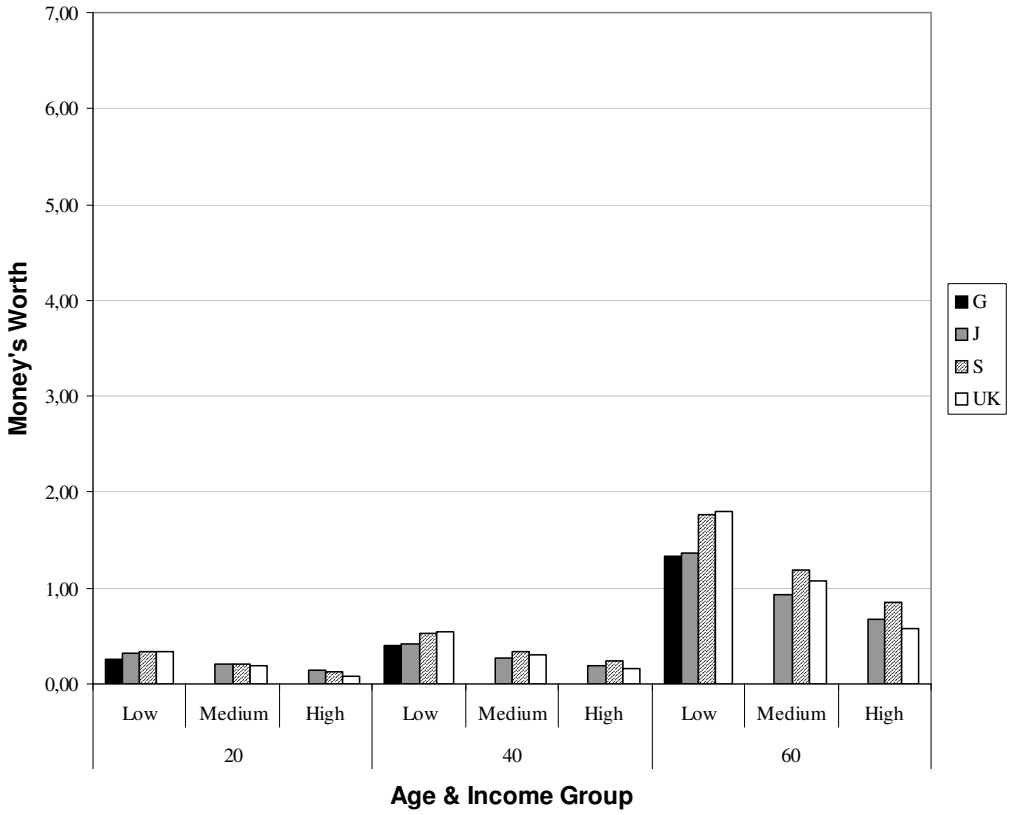

Figure 5.7. *Money's worth of public LTC system. Males.*

Taking a closer look at the results for males, we note that the Swedish and British systems generally offer quite similar returns, which are higher than those of the Japanese and German systems. The Japanese system offers relative advantages to the young and to those with high income.

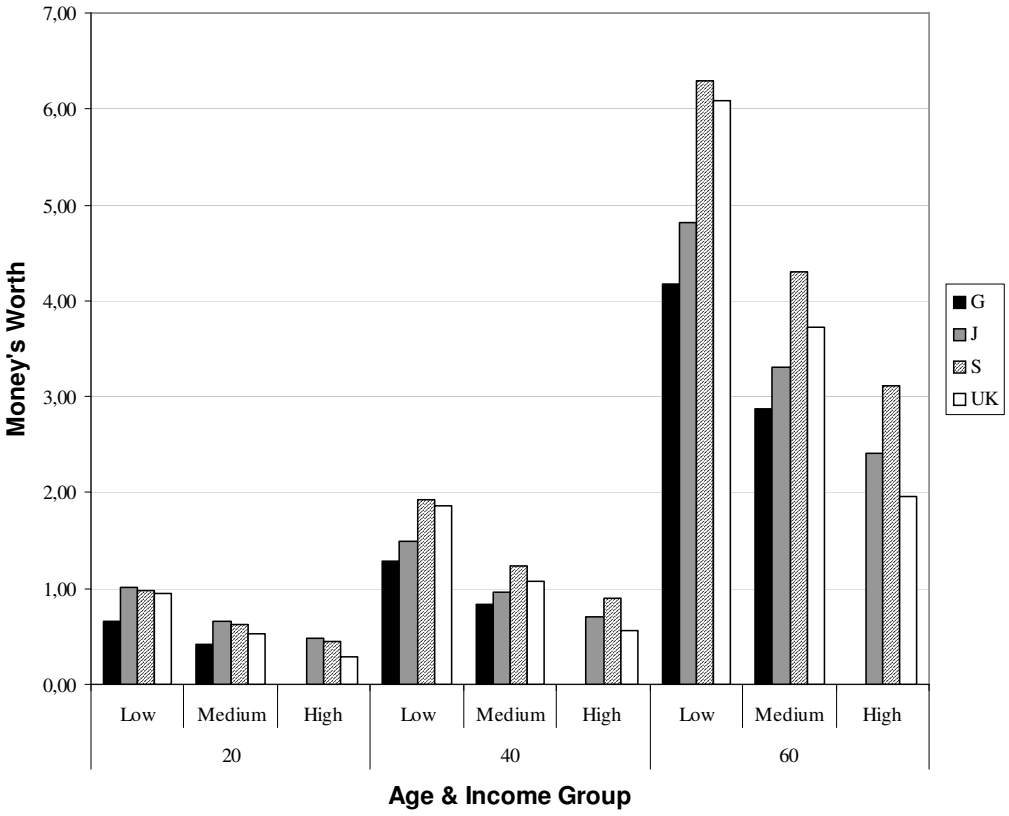

Figure 5.8. *Money's worth of public LTC system. Females.*

Regarding women, the Japanese system is the most advantageous for young people at all income levels, whereas the Swedish system offers the best ratio for middle-aged and older women. The U.K. system is relatively more advantageous for low-income earners, at least at higher ages, whereas the Japanese system is slightly less progressive than the other systems, so that high-income earners get a relatively favourable deal. This is due to the fact that benefits are not means-tested at all.

6 CONCLUSIONS

Long term care has become a topical subject of research in recent years. Some of that interest has been generated by a wider concern about the ageing population. One of the concerns about ageing has to do with important accompanying social changes in society, which are partly driving the long term care issue. It is evident that the prospect of security in old age has been adversely affected by changing household structures, including smaller family sizes and increasing divorce rates as well as other related factors.

This weakening in the traditional support systems for older people is expected to lead to a rapid increase in the demand for formal care provided by institutions such as nursing and residential homes but also services provided in the community. Wider demographic changes will result in a tightening in the supply, and therefore cost, of care workers in the formal sector with financial repercussions not only for individuals, but also for society as a whole. This is because long term care is very expensive (being labour intensive) and, by definition, the burden falls on individuals and close relatives at a difficult time in the life cycle especially with the trend in increasing life expectancy.

In this research, we analysed systems from four different countries: Germany, Japan, Sweden and the UK. Among our findings is the observation that each country has developed quite different long-term care policies and systems in response to similar demographic and other pressures. In particular, we found systems of care provision that are based on different mixes of state and individual financial support as well as insurance schemes, which range from a voluntary basis to full compulsion.

In Japan and Germany somewhat different motivations have led to compulsory, hypothecated long term care insurance systems being set up outside the ambit of health care provision. In Japan, for example, long term care insurance was introduced, because the system introduced a few years earlier under the 'Gold Plan' which was based on essentially free long-term care services was becoming unsustainable financially. Eligibility in Japan is now based on a universal needs-based assessment with the right of appeal, and in this regard Japan appears to be one of the few countries that has succeeded in introducing such an approach. In Germany, the reason for setting up such a system was that long term care had become the fastest growing component within the income support system.

In the UK, public provision for long term care is tax-based and means-tested which means in effect a relatively high degree of top-down public control. Public financial arrangements operate alongside a large, privately financed long-term care market, although private insurance for long-term care appears to be far less developed in the UK than in the US. The Swedish system is also tax funded but differs from the UK in that users make a small out of pocket payment for any given service, although the level and enforcement of such payments appears to vary locally.

A common feature in all systems examined is that long term care exists as a system in its own right and is not administered by public health providers. However, interfaces with health care are extremely important and can profoundly affect how much people have to pay – for example medical decisions that determine whether a person is eligible to

receive free care with a medical rather than long term care setting. The effective distinction between long term care provided in a health environment and health care provided in a long term care environment has a powerful effect on who bears the cost – the health care provider or the user. This has undoubtedly been one of the reasons why the UK has resisted calls to put health and social services under a single programme.

In the paper we considered what would be the effect on UK tax rates if any of the other systems were to be transplanted into the UK. In all cases, we found that UK taxes would need to increase over and above any implied increase in UK tax and contribution rates based on current UK practice. This suggests that the UK has a choice of whether it wishes to pursue the paths taken by Japan, Germany or Sweden which are essentially compulsory systems or whether it wants to continue as now with a mixture of public and private provision, underpinned by means testing.

In terms of fairness, our analysis suggests that a switch to a Swedish-style system would benefit females, relatively old people and low-income earners, whereas young people would be clear "losers" of such a reform. This is due to the fact that a very comprehensive system benefits people with low incomes and people with higher needs (i.e. women and old people). A switch to a Japanese-style system would, on the other hand, benefit young people, since they play a minor role in the financing system. The German system on the other hand should, by our measure, benefit young males only, whereas all other groups would fare worse.

To date, however, there have been no signs that the UK wishes to alter its path. If it does choose to change, then this research shows that there would need to be significant changes to taxation and legislation as well as in the systems of provision. If, on the other hand, it continues on its current path, as seems more probable at the moment, increasing pressures in the system will lend support to the theory that there will be a rise in the demand for private long term care insurance. However, based on the UK experience to date and despite UK insurers' best endeavours, the market for long-term care insurance remains weak.

The reasons for this are

1. The proportion of the population who are liable to pay for their own long term care hold most of their assets in the form of owner-occupied residential property. Owner-occupied residential property currently enjoys significant tax advantages over other forms of investment.

2. Whether an individual will require LTC before death is a matter of chance. For those who do not require such care, their funds are not reduced by LTC costs. For those who do require care, the use of immediate entry products will limit the liability to funding future LTC costs.

3. The market for release of monies from owner-occupied residential property by equity release methods has been limited until recently. The development of the

equity release market will encourage some pre-funding by these members of the population particularly disadvantaged e.g. single and divorced people.

In the future, and for the reasons we have stated above, current incentives may change and this could alter fundamentally the conditions and prospects for the long term care insurance market. We have already mentioned the increasing number of older people expected over the next decade and connected with this trend there is the prospect that there could be a shortfall in the supply of carers at current market rates of pay (see Karlsson et al, 2004). This suggests that there could be further changes on the supply side; restructuring and possibly expansion as well as a continuation in the trend towards contracting out the delivery of long term care services. These are issues that were not addressed directly in this research but are nevertheless important.

Both for individuals and researchers, a key question is to identify the stage in life when an individual is most susceptible and therefore inclined to buy long term care insurance.

This will help insurance companies to design appropriate products and target customers and suppliers of long term care to make long-term investment decisions. Purchase will involve several calculations as to future risk, costs and also benefits – in other words a calculated gamble. It is still unclear as to the best time or age to purchase insurance. At the moment there does not seem to be much close working between long term care providers and insurers that could enable better planning and investment strategies. The Government plays a crucial role here. If the state provides a universal high quality system as in Sweden the incentives are effectively zero at any age for most people except perhaps the very rich. Government decisions therefore have a powerful effect on people's behaviour with regard to insurance products. These are hence important questions for future research.

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APPENDIX

A.1 Summary of results

Table A.1. ***Summary of Results.***

	2000	**2020**	**2040**	**2060**
Disabled elderly population, '000s				
Scenario A	*4,251*	*5,360*	*7,397*	*7,276*
Baseline	**4,098**	**4,688**	**5,833**	**5,204**
Scenario N	*3,956*	*4,095*	*4,546*	*3,607*
Formal LTC consumers, '000s				
Scenario A	*999*	*1,245*	*1,695*	*1,683*
Baseline	**950**	**1,106**	**1,401**	**1,301**
Scenario N	*937*	*1,023*	*1,222*	*1,083*
Informal LTC population, 65+, '000s				
Scenario A	*2,441*	*3,089*	*4,316*	*4,305*
Baseline	**2,243**	**2,532**	**3,144**	**2,810**
Scenario N	*2,234*	*2,254*	*2,468*	*1,939*
Total Costs, formal care, £ bn				
Scenario A	*11,5*	*14,1*	*19,6*	*19,9*
Baseline	**10,6**	**11,9**	**15,0**	**13,8**
Scenario N	*10,4*	*10,4*	*11,8*	*9,9*
Total costs, £bn.				
Scenario A	*44,1*	*55,4*	*77,4*	*77,5*
Baseline	**40,6**	**45,7**	**56,8**	**51,1**
Scenario N	*40,3*	*40,5*	*44,8*	*35,9*
Implied Contribution Rate				
Scenario A	*1.06%*	*1.21%*	*1.70%*	*1.77%*
Baseline	**0.99%**	**1.02%**	**1.30%**	**1.24%**
Scenario N	*0.97%*	*0.91%*	*1.07%*	*0.95%*
Excess supply of Informal Care, %				
Scenario A	*-3.91%*	*-9.20%*	*-28.32%*	*-34.44%*
Baseline	**0.31%**	**8.02%**	**-3.03%**	**-0.35%**
Scenario N	*1.20%*	*21.61%*	*22.62%*	*40.64%*

A.2 Derivation of Tax and Contribution Rates

The following flow diagrams give a picture of how we have derived the tax and contribution rates that would be necessary to finance different models of LTC in a British environment.

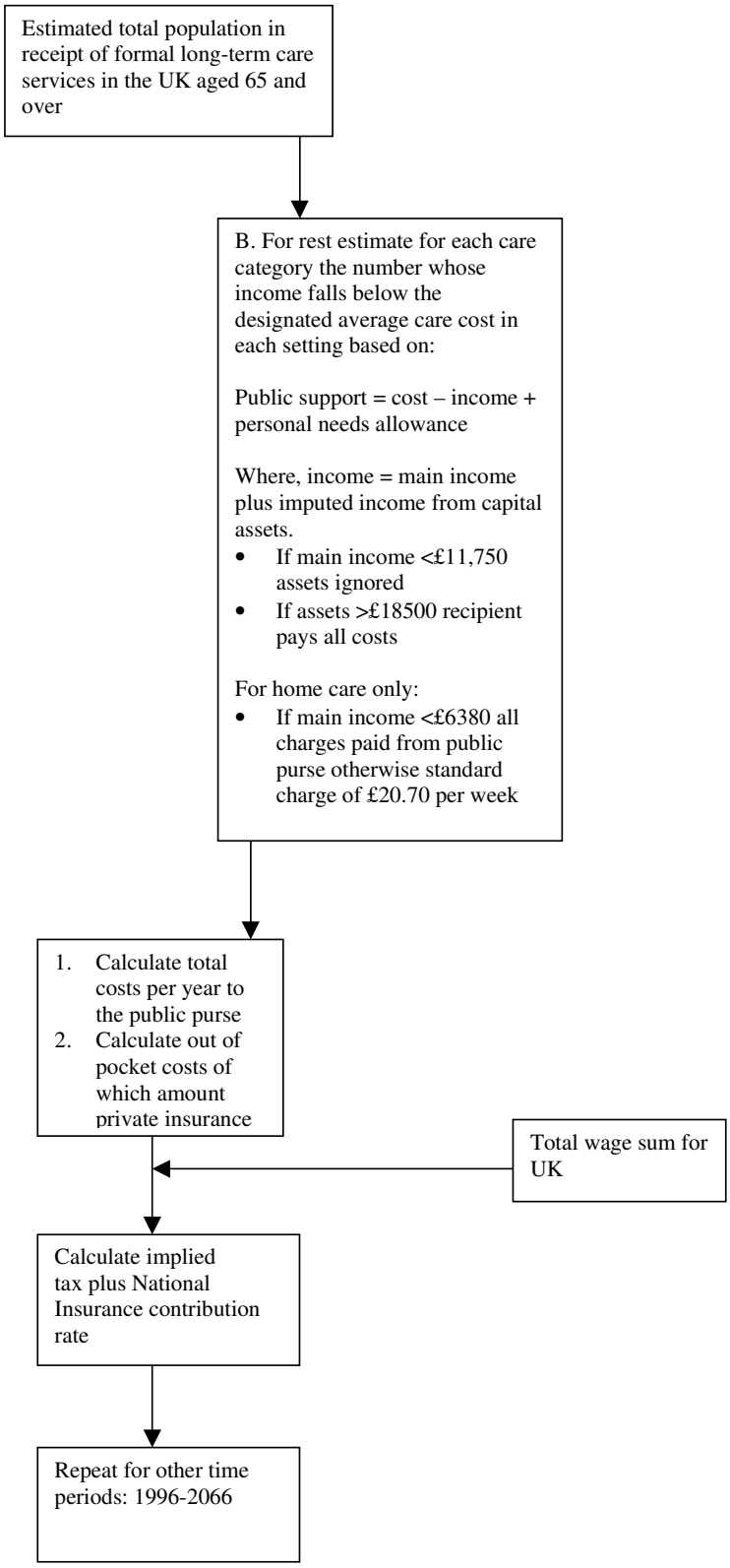

Figure A.1. *Method for estimating implied tax rate for long term care based on UK system.*

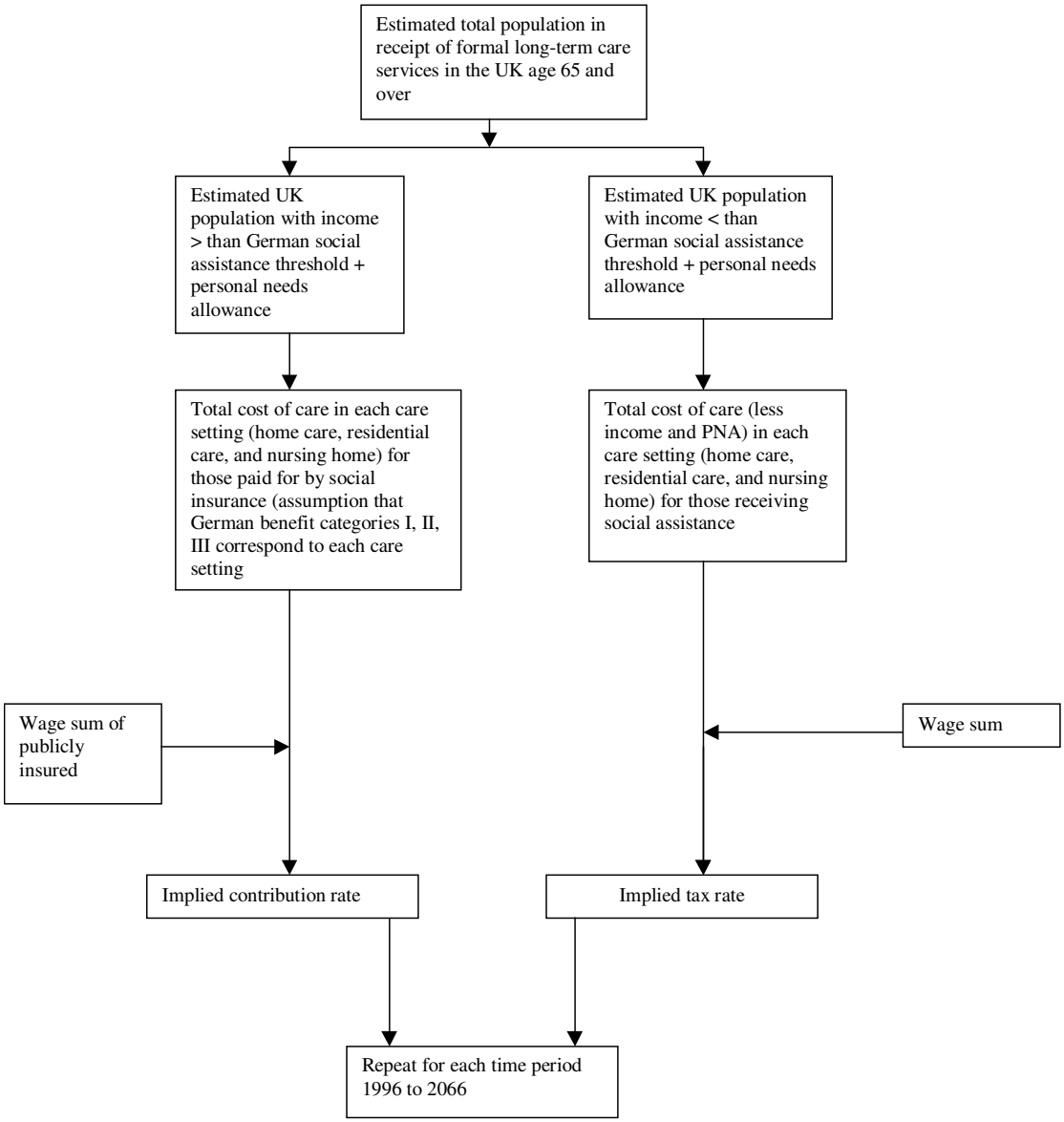

Figure A.2. *Method for transposing German LTC system to UK.*

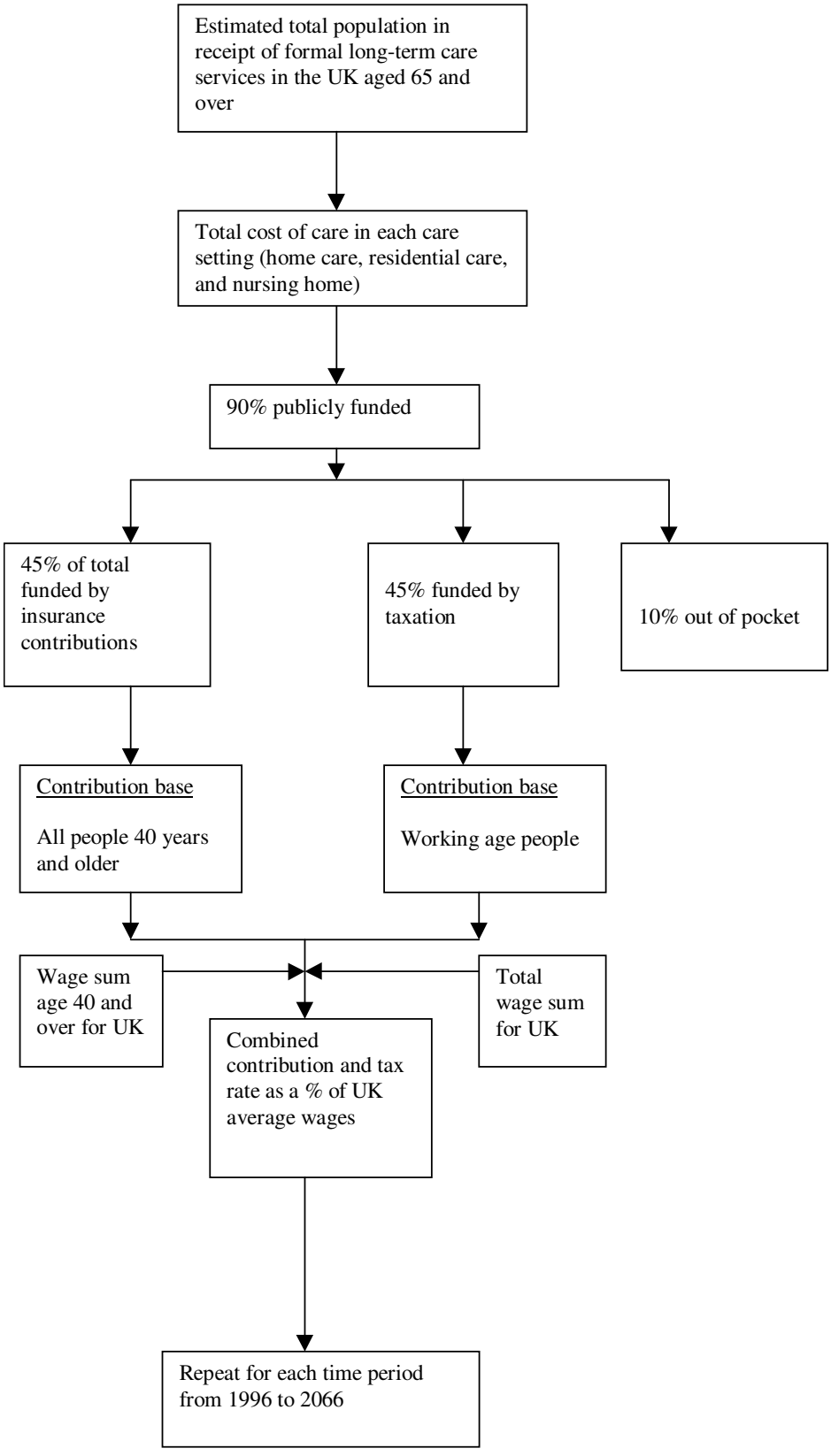

Figure A.3. *Method for transposing Japanese LTC system to UK.*

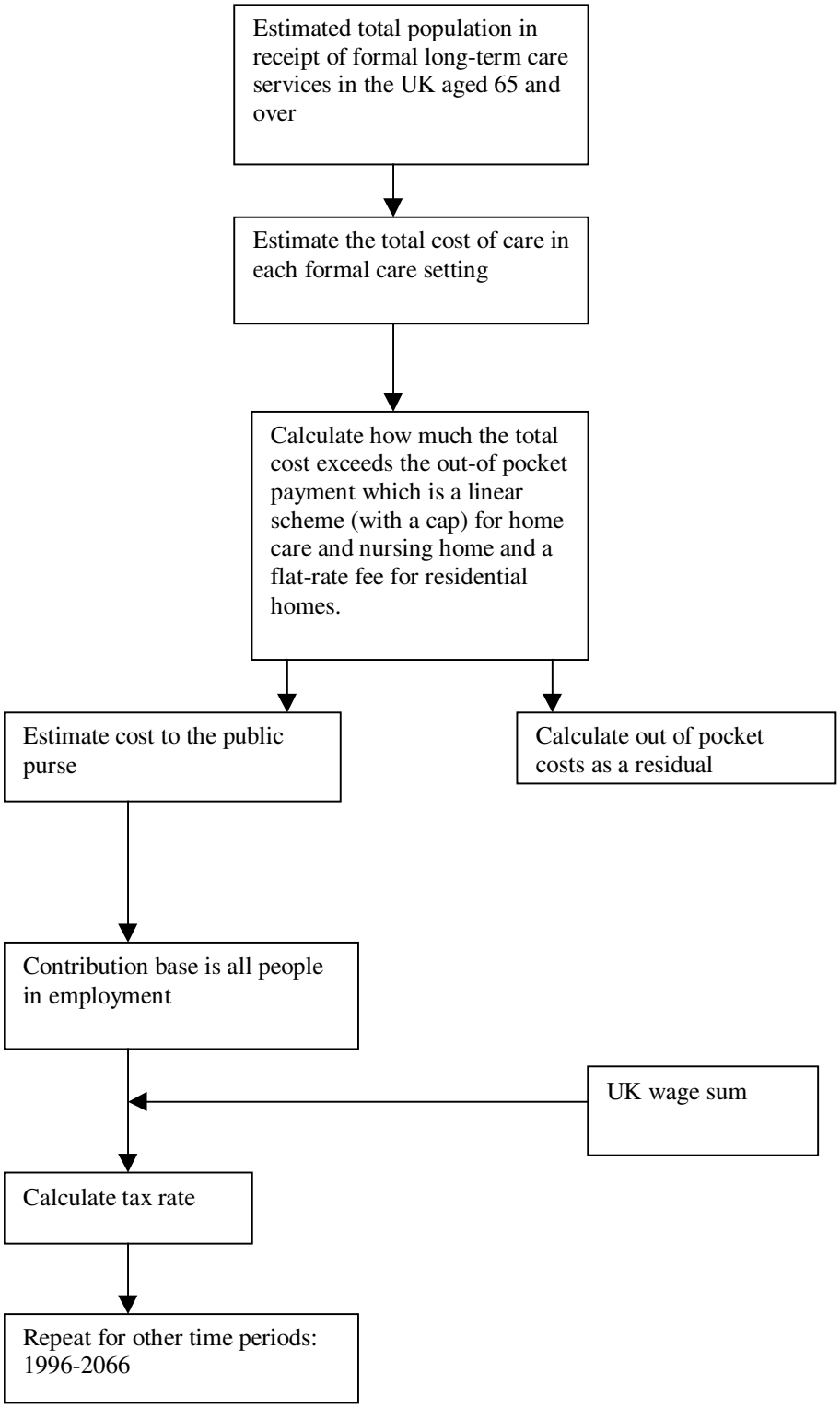

Figure A.4. *Method for transposing Swedish LTC system into UK.*

A.3 Sensitivity Analysis

In order to check the robustness of our results in Section 5, we altered the discount rate. We consider two different cases, one with a discount rate of 0 per cent per annum and the other with a discount rate of 4 per cent per annum. Results are provided in the tables below.

Some, but not all results are robust when we change the discount rate. In general, systems with a relatively 'generous' provision of LTC fare worse when the discount rate increases. However, the results that are insensitive to those changes are that the Swedish system is generally favourable to women – especially middle-aged and old women, and that the UK system is favourable to male low-income earners.

Discount Rate: 4 per cent per annum

Table A.2. *Net Present Value. Discount Rate 4 per cent per annum.*

	AGE	INCOME	G	J	S	UK
Female	20	Low	-3,975	-2,416	-3,514	**-1,497**
		Medium	-7,393	-5,538	-7,470	**-3,280**
		High	-5,595	-8,742	-11,504	**-5,252**
	40	Low	-1,125	-647	**1,209**	416
		Medium	-4,224	-4,974	-2,409	**-1,403**
		High	**-2,804**	-9,468	-6,170	-3,685
	60	Low	6,699	11,293	**13,127**	5,258
		Medium	5,443	9,519	**11,587**	3,931
		High	-1,292	7,436	**9,755**	1,630
Male	20	Low	-8,525	-9,333	-9,534	**-3,973**
		Medium	**-5,359**	-15,130	-15,571	-6,552
		High	**-5,472**	-12,899	-16,181	-6,867
	40	Low	-4,906	-6,784	-5,055	**-2,064**
		Medium	**-2,451**	-12,001	-9,400	-3,992
		High	**-3,371**	-17,403	-13,915	-6,071
	60	Low	434	675	**1,767**	802
		Medium	-1,467	-1,403	**-1**	-199
		High	-1,499	-3,824	-2,081	**-1,495**

Table A.3. *Money's Worth. Discount Rate 4 per cent per annum.*

	Age	Income	G	J	S	UK
Female	20	Low	0.65	1.02	0.98	0.94
		Medium	0.41	0.65	0.62	0.54
		High	0.00	0.48	0.45	0.28
	40	Low	1.28	1.49	1.93	1.87
		Medium	0.83	0.97	1.24	1.07
		High	0.00	0.70	0.90	0.56
	60	Low	4.17	4.82	6.30	6.09
		Medium	2.87	3.31	4.31	3.72
		High	0.00	2.41	3.11	1.95
Male	20	Low	0.25	0.32	0.33	0.34
		Medium	0.00	0.205	0.208	0.19
		High	0.00	0.137	0.125	0.09
	40	Low	0.40	0.42	0.53	0.54
		Medium	0.00	0.27	0.34	0.30
		High	0.00	0.19	0.24	0.17
	60	Low	1.33	1.37	1.76	1.80
		Medium	0.00	0.94	1.19	1.07
		High	0.00	0.68	0.85	0.59

Discount Rate: 0 per cent per annum

Table A.4. *Net Present Value. Discount Rate 0 per cent per annum.*

	Age	Income	G	J	S	UK
Female	20	Low	3,859	14,397	**16,527**	6,302
		Medium	-5,189	4,427	**5,938**	348
		High	-11,367	-6,304	**-5,372**	-7,759
	40	Low	10,759	20,183	**25,283**	9,876
		Medium	5,182	12,485	**18,664**	5,495
		High	-5,281	4,079	**11,446**	-1,172
	60	Low	16,872	28,501	**32,186**	12,741
		Medium	15,010	25,897	**29,851**	10,163
		High	-1,992	22,704	**26,955**	5,370
Male	20	Low	-11,947	-11,116	-10,885	**-4,492**
		Medium	-11,763	-22,948	-23,320	-10,278
		High	-11,904	-35,624	-36,532	-16,753
	40	Low	-4,844	-6,090	-2,602	-1,043
		Medium	-4,499	-15,181	-10,334	-4,868
		High	-6,186	-25,033	-18,771	-9,367
	60	Low	2,611	4,079	5,869	2,478
		Medium	-1,985	1,149	3,319	833
		High	-2,212	-2,403	197	-1,414

Table A.5. *Money's Worth. Discount Rate 0 per cent per annum.*

	Age		G	J	S	UK
Female	20	Low	1.23	1.77	**1.87**	1.79
		Medium	0.80	1.15	**1.20**	1.03
		High	0.00	0.84	**0.87**	0.54
	40	Low	2.01	2.37	**3.05**	2.92
		Medium	1.32	1.56	**2.00**	1.70
		High	0.00	1.13	**1.44**	0.89
	60	Low	4.97	5.82	**7.57**	7.27
		Medium	3.46	4.04	**5.24**	4.48
		High	0.00	2.94	**3.78**	2.34
Male	20	Low	0.39	0.49	0.51	**0.52**
		Medium	0.00	0.321	**0.328**	0.29
		High	0.00	0.2335	**0.2340**	0.16
	40	Low	0.61	0.65	0.82	**0.83**
		Medium	0.00	0.42	**0.53**	0.47
		High	0.00	0.31	**0.38**	0.25
	60	Low	1.56	1.62	2.09	**2.11**
		Medium	0.00	1.12	**1.42**	1.26
		High	0.00	0.82	**1.02**	0.68