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Distributional Effects of Reform in Long-term Care

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Abstract

Population ageing will intensify the distributional dilemmas related to provision and funding of long-term care (LTC) services. Several OECD countries have recently reformed their LTC systems, but as yet there is a paucity of evidence on how different reform options affect the financial position of different socioeconomic groups. Another neglected issue is how individuals adapt to changes as a result of LTC policy reform. One complication in the analysis of LTC reform is the great uncertainty in projections. This is largely due to the long planning horizon needed, and also the nature of LTC services themselves. The aim of this paper is to review two recent contributions to the literature: Hancock *et al*. (2006) and Karlsson *et al*. (2007). Particular emphasis is placed on the policy implications of these findings, but we also identify key issues for future research.

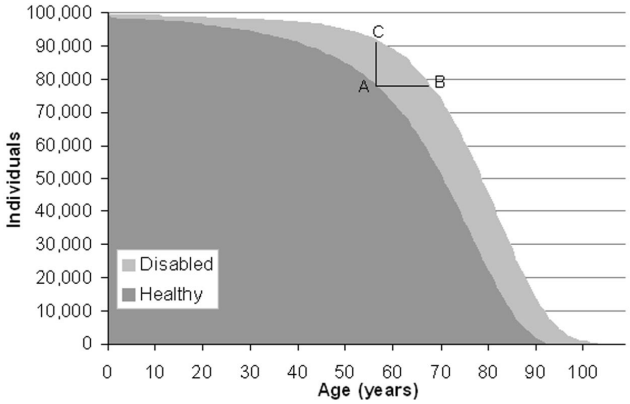

Figure 1: Survival curve based on English Life Tables 15 (ONS, 1997)

1. Background

The subject of long-term care (LTC) is receiving increasing attention both in the research community and in the governments of various countries due to the belief that an ageing population will greatly swell the demand for LTC services and create a huge public expense. One of the pressing issues is to determine by how much the demand for LTC will increase. Since all LTC systems by necessity entail a great degree of redistribution – over the life-cycle, from the young to the old, and between generations – another pressing issue is to address distributional concerns. It is the objective of this article to review recent research findings concerning these two issues.

1.1 Dependency and Ageing

LTC 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, it could begin at any age depending on the reasons for the disability (perhaps, a road accident, a mental or a congenital condition). The age gradient in disability does however become very clear in Figure 1. The latter depicts a survival curve for males and females based on English Life Tables 15 (ONS, 1997). 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 synthetic population, usually, 100,000 people. The light shaded area of the figure represents the proportion of the surviving population that is disabled.

The average 'stock' of the disabled of a given age and the duration of their disability are represented by the vertical line A-C and horizontal line A-B, respectively. It is striking that the duration of disability tends to be constant if it begins in older ages but it is significantly longer if it begins in younger ages, say, between 40 and 50 years. The overall average is 9.91 years. If we were to construct the same diagram for the most severely disabled only, the light shaded area would be much narrower. It would represent those who are likely to be in need of intensive nursing or palliative care. For this group, the duration of severe disability averages 1.48 years.

1.2 Systems for funding and providing LTC

As yet, there is little by way of comparative analysis to help governments decide which approach to the provision and funding of LTC strikes the right balance between the various objectives of public policy. To date, the main focus has been on aggregate costs, but the policy-maker also needs to be concerned with economic efficiency as well as intra- and intergenerational equity. This in turn requires a careful analysis of the distributional effects of the various funding regimes for LTC, which is the topic of this paper.

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 (cf. Scheil-Adlung, 1995). LTC systems may be evaluated in many dimensions and there is thus a multitude of possibilities for public policy. As suggested by Wittenberg *et al*. (2002), the most important decisions that policy-makers and society as a whole have to consider are:

- 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.

These differences in the role of the state have implications for the aggregate costs. In Sweden, total public expenditure on LTC for elderly comes to 3.0 per cent of GDP (Socialstyrelsen, 2006). This is several times more than in Southern Europe, where total expenditure – public and private – falls short of one per cent of GDP (cf. Comas-Herrera *et al.*, 2006). Most countries lie somewhere in between. For instance, in the UK around 1 per cent of GDP is contributed from the public purse each year. It is clear in Figure 2 that these differences between countries are not entirely attributable to different demographic situations. For example, Italy has a relatively high proportion (4.0 per cent) of very old people, but spends only 0.6 per cent of GDP on LTC. In the Netherlands, on the other hand, the very old are a smaller group (3.2 per cent of the population) and yet LTC costs are much higher (2.5 per cent of GDP).

Given that the projection of needs of and costs for LTC is complicated by several uncertainties, a formal assessment of the various LTC funding regimes displayed in Figure 2 is difficult. Moreover, analysis of intergenerational equity will typically need to involve very long time spans – which further aggravates the problems related to uncertainties. This means that projections and analyses of LTC costs have to be interpreted with more caution than, for example, pension projections.

1.3 Uncertainties in trends

Various uncertainties concerning future LTC costs appear on the demand as well as on the supply side. On the supply side, the main issues are whether relative wages of care workers change in the long term (possibly, but not only, as an effect of the surge in demand for LTC services) and whether technological improvements allow for increased efficiency in provision. Furthermore, the availability of informal carers is a key issue also as far as formal services are concerned, due to the high degree of substitutability between the two types of services. In this part, there seem to be countervailing trends, the relative importance of which is difficult to assess at present. Trends in supply seem to depend on who provides the care. Care provided by children can be expected to decrease in the future. Although reduction in supply due to increased female labour market participation could be compensated by the growing pool of fit younger retirees, changes in social norms and geographical distances between generations seem to be a growing barrier to intergenerational care. Spouses, on the other hand, can be expected to take on greater responsibilities in the future (Pickard *et al.*, 2000). Hence, the overall supply of informal care remains an open issue. There seems to be a widespread agreement, however, that the availability of informal carers is unlikely to keep up with the need for care (cf. Karlsson *et al.*, 2006).

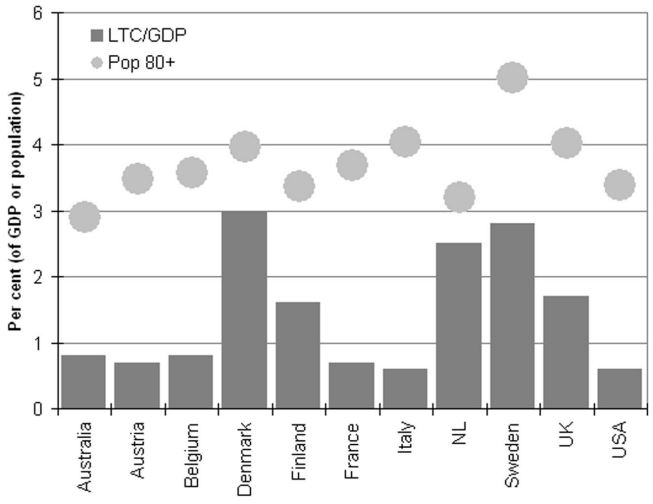

Figure 2: Public Expenditure on Long-Term Care and Demographic Situation; adaptation from Casey (2003)

On the demand side, there is uncertainty concerning the future income and asset distribution of older people, but the main uncertainty is of course related to the future development of morbidity. Over the past 30 years, there has been an intense academic debate on the implications for healthy life expectancy (HLE) of falling mortality rates. Three competing hypotheses have been proposed. The most optimistic one, suggesting a compression of morbidity, was proposed by Fries (1980). According to this perspective, adult life expectancy is approaching its biological limit so that if disability spells can be postponed to higher ages the result will be an overall reduction in the time spent disabled. By contrast, Gruenberg (1977) suggested an expansion of morbidity based on the argument that the observed decline in mortality was mainly due to falling accident rates. The third hypothesis was proposed by Manton (1987) according to whom the development in mortality and morbidity is a combination of the two, which could lead to an expansion of the time spent in good health as well as the time spent in disability.

There is, however, not yet enough empirical evidence available to draw a definite conclusion on how the gap between healthy life expectancy and total life expectancy is behaving in all countries. Concerning the UK, the estimates based on the General Household Survey suggest that the prevailing trend largely depends on the definition of disability. Hence, there is relatively strong evidence of a contraction of the time spent in severe disability as a proportion of total life expectancy. For moderate disability, trends are less clear and partly dependent on the definition of disability used (Bone *et al.*, 1995; Bebbington and Darton, 1996; Bebbington and Comas-Herrera, 2000).

1.4. LTC Projections

How to treat the ambiguity concerning future morbidity has been one of the main challenges of previous projection models. Existing models for projections of future needs for LTC are either cell based macrosimulation models or microsimulation models (cf. Nutall *et al.*, 1994; Wittenberg *et al.*, 2006; Richards *et al.*, 1996; Hancock *et al.*, 2003). Microsimulation has two main advantages. Firstly, since it deals with the entire distribution of certain variables in the population, it allows for a very detailed analysis of various aspects of policy changes – such as, for example, their implications for spend-down of care recipient's assets. Secondly, microsimulation also allows for modelling behavioural responses – such as responses in demand to changes in public subsidies (O'Donoghue, 2001). To date, however, it has been common to assume that there are no such behavioural changes. The main downside of microsimulation is that there are severe limitations to the interactions between variables which microsimulation analysis can take into account due to either a lack of rich datasets or computing constraints. Hence, microsimulation runs the risk of giving an illusion of realism that may, in fact, be unfounded.

One of the first rigorous reports on the future costs of long term care was provided by Nuttall *et al.* (1994). The projection was based on a multi-state model of disability, where the three states are assumed to be healthy, disabled and dead. Separate series of models were built to incorporate the severity of disability in which no recovery was allowed once the particular disabled state has been reached. The 1980s OPCS study (Martin *et al.*, 1988) of disability provided the basis for prevalence rates (with the implicit assumption that prevalence rates by age had remained constant between 1986 and 1991, the base year). The study projected a rapid increase in the demand for long term care from 2011 onwards. In order to estimate the future costs of LTC, it was assumed that LTC costs remain constant in terms of GNP (alternative scenarios with changing relative prices were also considered). According to the central projection, LTC costs as a share of GNP would increase by 47 per cent (from 7.3 per cent to 10.8 per cent).

More recent projections have been provided by the PSSRU (Wittenberg *et al.*, 1998; see Wittenberg *et al.,* 2006 for the most recent version). The PSSRU model, originally developed for the Royal Commission on Long-Term Care (1999), assumes that dependency rates by age and sex remain constant over the projection period and uses a cell-based model to project the future demand for LTC services and the implied costs. The dependency measure used in the PSSRU model is based on Activities of Daily Living (ADLs) and Instrumental Activities of Daily Living (IADLs) failed by the individual. Sensitivity analysis allows for different assumptions concerning trends in life expectancy and disability. Karlsson *et al.* (2006), on the other hand, use continuing improvement in prevalence of disability as their baseline assumption, and then consider constant disability rates as a "pessimistic" scenario.

Most developed countries use some kind of projection model to assess future costs of long-term care. In Germany, it has been suggested that the current social insurance arrangement is untenable in the long term, since projections suggest that contribution rates will explode in the future (SVR, 2004). For Sweden, on the other hand, a projection model based on longitudinal data suggests that the demography-driven increases in LTC spending might be almost completely offset by improvements in morbidity (Lagergren, 2005). In a study commissioned by the European Commission, finally, projection models for Germany, Spain, Italy and the UK were compared, showing that projections for Southern European countries are more sensitive to changes in policy (Comas-Herrera and Wittenberg, 2003; Comas-Herrera *et al.*, 2006).

2. The Redistributive effects of LTC systems

Aggregate cost projections for long-term care have received considerable attention in media and in the policy debate, whereas the distributional impact of various reforms to the funding formula have largely been neglected. Nevertheless, there are clear indications that the system currently operating in England and Wales is not perceived as 'fair' (Hirsch, 2005) and there seems to be "widespread dissatisfaction with the current means-tested funding arrangements" (Wanless, 2006). Besides, the great diversity in long-term systems among OECD countries (Karlsson *et al.*, 2004) suggests that it is far from obvious which is the most equitable system for funding and provision of long-term care.

2.1 Equity in Long-Term Care

Discussions of equity normally make the distinction between horizontal and vertical equity – where horizontal equity requires that equal cases be treated equally, and vertical equity requires different cases to be treated differently. Concerning long-term care, however, there are several dimensions of such 'vertical' equity which have to be taken into account. The most important dimension is, of course, the distribution between people in need of care and others. However, distributive justice also requires the system to strike a fair balance between the young and the old, the poor and the rich, and between men and women. Furthermore, there have been some concerns in the UK that the current system fails to deliver 'horizontal equity' as well – such as the 'diagnostic equities' identified by Hancock *et al.* (2006). 'Diagnostic inequities' are due to the fact that people suffering from illnesses for which treatments exist get personal care free of charge within the NHS, whereas those who suffer from conditions for which no treatments exist (such as Alzheimer's disease) do not. Similarly, there have been concerns that the decentralised system for LTC in Sweden leads to unacceptable regional variation in eligibility criteria (Karlsson *et al.*, 2004). In summary, equity in the funding and provision of LTC is a complex issue.

Moreover, even if we had a clear concept of distributional fairness, the formal analysis of different funding formulae

faces several methodological challenges. For instance, in the presence of behavioural responses on the part of the individuals affected, any policy analysis will face the difficulty of determining the appropriate baseline scenario (cf. Bergh, 2005). Besides, the long time perspectives complicate the analysis of distributional effects somewhat – for instance, in the presence of systematic differences in life expectancy, it is unclear whether total lifetime redistribution is the appropriate measure.

Two recent contributions have analysed the distributional effects of changing the system for funding LTC in the United Kingdom: the PSSRU-CARESIM model (Hancock *et al.*, 2006; Malley *et al.*, 2006; see Hancock *et al.* 2006b for a summary) and the model by Karlsson *et al.* (2007). Both models take the current system as their starting point and analyse the effects of different alterations to this system. The techniques used are very different, however. The PSSRU-CARESIM model uses microsimulation techniques and focus mainly on the distribution within the group of older people. Karlsson *et al.* (2007) use a simpler approach to analyse the distributional impact of different regimes, but are able to do the analysis in a life cycle perspective.

2.2 The PSSRU-CARESIM Model

The PSSRU-CARESIM model was used to assess the cost implications of the Wanless Review (Malley *et al.*, 2006). In this article, however, we focus on the distributional analysis undertaken in Hancock *et al.* (2006). The paper uses the already mentioned PSSRU model (Wittenberg *et al.*, 2006) to project future needs for long-term care, and the CARESIM model (Hancock, 2000) for the distribution of incomes and assets in the older population. The main advantage of the CARESIM model is that it allows taking into account the non-linearities in the means testing formula and the spend-down of assets that is bound to happen in such a system. In the means testing formula operating in the UK, personal assets are treated differently depending on whether they exceed £21,000 (in which case the individual has to cover the full care costs out of pocket), fall between £12,500 and £21,000 (in which case an income is imputed) or are below £12,500 (in which case they are disregarded altogether in the means test). The value of the recipient's home is disregarded for three months – and longer if a close relative is still living there. The CARESIM model uses the British Family Resources Survey to derive the joint distribution of incomes and assets among older people, and can thus assess the eligibility to a public subsidy under various regimes and the implied total costs.

Hancock *et al.* (2006) consider a host of different reform scenarios. Most of them are to do with the means testing formula for capital mentioned above. The authors allow for four different types of reform:

- An increase of the capital threshold from £21,000 to £150,000. The amount was chosen so as to correspond to the average value of homes owned by older people. This reform scenario would benefit people with assets between £21,000 and £150,000 – a group which pays all LTC costs out of pocket in the current regime.
- Increases in the upper and lower capital thresholds to £50,000 and £150,000 respectively. This option would benefit all care recipients with assets between £12,500 and £150,000.
- Abolishing the upper capital threshold, and changing the imputed income from capital from £1 per £250 to £1 per £500. This reform scenario would benefit most care recipients with assets above £21,000.
- Full and permanent disregard of housing wealth.

Furthermore, the authors analyse two reforms to the funding of residential care:

- An increase in the Personal Expenses Allowance – the income that every care home resident is allowed to retain for personal needs – from £18.05 to £73.10 per week. This reform option is likely to benefit residents on lower incomes. The new allowance was chosen so as to achieve equivalence, from a public expenditure point of view, with offering free personal care.
- A lifetime limit on the amount an individual is required to pay towards institutional care costs. An overall limit of £100,000 is considered. This reform option is believed to promote the market for private long-term care insurance, since it removes some of the less insurable risks related to LTC – such as cost inflation and the risk of catastrophic care needs.

Finally, the paper also analyses the implications of offering free personal care in institutions. This was one of the reforms suggested by the Royal Commission (1999). It was later dismissed by the government in the 2001 *Health and Social Care Act* since it was expected to benefit relatively well-off older people. The Scottish Executive, however, did introduce free personal care in Scotland. The paper analyses two different methods of indexation for the personal care subsidy, and assumes that the costs are to be covered by an increase in marginal tax rates for high earners.

The paper by Hancock *et al.* delivers two types of results: estimates of aggregate costs and of distributional effects. Concerning the aggregate costs, the various reform options are expressed as percentage of GDP devoted to long-term care. Since there are no behavioural changes in the model, total costs are the same for each scenario (but vary over time) whereas the distribution between public and private spending is different in the different scenarios. According to these estimates, total costs devoted to LTC will increase by around 20–25 per cent between 2002 and 2022, irrespective of reform scenario.

If implemented, the different reform options studied would lead to increases in public spending on LTC of between 3 and 20 per cent, depending on scenario. The most costly reform option is to provide free personal care, as already practiced in Scotland. Such a change

would increase aggregate costs from 0.96 per cent of GDP to around 1.1 per cent of GDP. In the long term, that reform option would cost as much as 1.3 per cent of GDP. Conversely, the cheapest reform option by far is to introduce a lifetime limit on LTC costs, which would increase costs only marginally compared with keeping the current funding formula. This finding is expected since only relatively few people with very high LTC costs would be affected by the change.

Concerning the *distributive* effects of the reform, the paper focuses on the short-term gainers and losers from changes in the public benefits – whereas the revenue side is largely ignored. In general, it seems to be difficult to rank the different options according to their "progressiveness", since the gains or losses from some changes are concentrated in both tails of the income distribution. For example, the proposal to disregard all housing assets has the gainers concentrated in the middle classes whereas the poor (who are unlikely to own their houses) and the rich (who have enough non-housing assets to be exempt from public funding) stand to gain less. Raising the upper capital limit to £150,000, on the other hand, benefits low earners disproportionately – presumably because their assets tend to be below that amount. The most striking distributive effect, however, is that all reform proposals concerning means testing of assets imply tremendous gains to home owners compared with non-owners.

For the two scenarios specific to residential care – increasing the personal expenses allowance or introducing a lifetime limit on contributions, the gains are relatively unevenly distributed, as illustrated in Figure 3. The figure shows how the relative gains from the reform are distributed over different income quintiles – as well as between home owners and non-owners. An increase in the personal expenses allowance is more favourable to low earners, since these are more likely to be affected by it. Home owners, however, only get 64 per cent of the average gain.

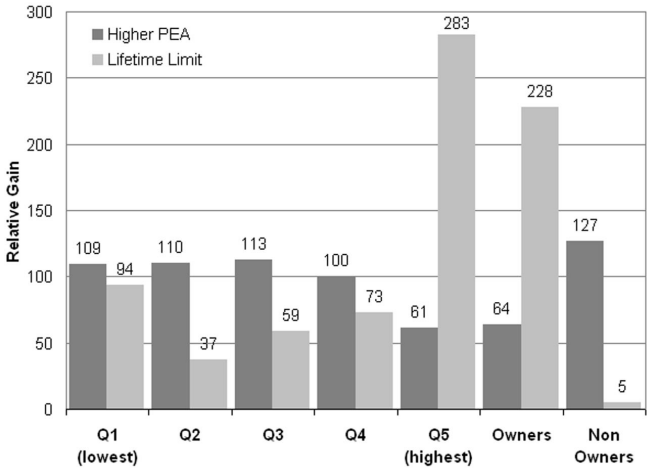

Figure 3: Relative gain from scenarios specific to residential care: recipients of residential care aged 85+, 2002

Concerning *free personal care*, the authors consider three different variants which have very similar implications. If the revenue side is ignored, introducing free personal care is clearly a regressive reform, since high earners stand to gain disproportionately. If the reform is financed from an increase in income taxes on higher incomes, however, the gains are instead concentrated in the middle of the income distribution.

2.3 The model by Karlsson et al.

The study of Hancock *et al.* (2006) can be contrasted with a study by Karlsson *et al.* (2007). The issues discussed in the two studies are very similar, but the methodological approaches differ substantially. Karlsson *et al.* (2007) use a projection model based on the OPCS disability survey from the 1980s (Martin et al, 1988) to estimate the life cycle redistribution implied by various reform options. Using data from the OPCS survey, the model has been calibrated so as to replicate official population projections from the Government's Actuary Department. The OPCS uses a 10–graded scale of disability which is slightly different from the ADL and IADL measures which form the basis of the PSSRU model used by Hancock *et al.* (2006).

The main advantage of the model of Karlsson *et al.* (2007) is that it is based on a so-called multiple state model and hence allows tracing an individual over the entire life course (details of the underlying disability model are provided in Karlsson *et al.*, 2006). This way, individual contributions to, and benefits from, the public LTC system can be measured in a life cycle perspective. The main limitation of the model is, however, that it does not allow for analysis of the entire distribution of assets and incomes in the population. Hence, the authors restrict themselves to analysing a set of 'stylised individuals', which differ in various dimensions, such as

- sex and the generation they were born;
- their earnings potential (low/middle/high).

In contrast to Hancock *et al.*, this model does not focus on the UK debate concerning funding of long-term care, but instead analyses the implications of introducing LTC systems as practiced in other OECD countries into the UK. The current system for financing LTC is contrasted with three different alternatives:

- One scenario similar to the *German* model for LTC. This includes a mandatory social insurance scheme (from which high earners can opt out), covering roughly half of actual costs in the various care settings. Furthermore, people with insufficient resources to cover remaining costs get income support financed through general taxation.
- One scenario similar to the *Japanese* model for LTC. This includes a universal social insurance which covers roughly 90 per cent of long-term care costs in any care setting. The social insurance benefits are financed in equal shares from contributions from

people aged 40 and over and general income taxes.
- One scenario similar to the *Swedish* system for LTC. This includes small but income-related out of pocket-payments in residential care. The public subsidy is financed out of proportional income taxes.

As in Hancock *et al*. (2006), the authors provide projections of the overall costs implied by the different regimes, as well as analysis of distributive effects. One main difference, however, is that the analysis of distributive effects takes contributions paid into the system into account, and also studies the entire life course of individuals. Due to the very long time perspectives involved when LTC is concerned, however, the authors study a period of transition from the current system to another one, and not how different 'mature' systems would fare in comparison. One consequence of this is that it makes little sense to compare the estimates of gains and losses within a certain scenario – as contributions already made to the current system are disregarded – whereas a systematic comparison of the different scenarios can be very informative.

Concerning overall costs, the authors find that all three of the alternative systems considered would imply increased public costs and thus increased taxes. In Table 1, the LTC costs expressed as a tax rate are set out for period 2000–2040 for the LTC systems used in Germany, Sweden, Japan and the UK.

*Table 1: Implied tax rates from different countries' LTC systems**

Scenario		**2000 (%)**	**2020 (%)**	**2040 (%)**
UK		0.99	1.02	1.30
Sweden		2.40	2.45	3.11
Germany	*General*	0.50	0.50	0.63
	Social insurance	2.08	2.13	2.71
Japan	*General*	1.11	1.13	1.44
	Social insurance	3.00	2.89	3.60

* For the German and Japanese scenarios, 'general' refers to the tax rate paid on earnings by everybody, whereas 'social insurance' refers to total contributions (social insurance and tax) paid by non-high earners (Germany) or people aged 40+ (Japan).

It is clear that, despite the differences between the systems, the tax rates necessary to finance LTC will increase by roughly the same percentage regardless of which system is employed. The tax rate would increase by approximately 30 per cent by 2040 in all cases. The only exception is the Japanese scenario, where those making social insurance contributions benefit from the increase in the proportion of people aged 40 and over. As a result, the social insurance contribution rate needs to increase much less. However, general tax rates would still have to increase quite substantially over the period. This finding highlights a dilemma the policy maker faces: the trade-off between comprehensiveness and cost control. A less comprehensive system, such as the Japanese one, is less sensitive to demographic changes, but it also allows for less redistribution and less mitigation of certain risks (e.g. health, longevity, or cost risks).

The model predictions could also be compared with projections made in the countries from which the scenarios have been borrowed. For example, a recent study by Lagergren (2005) shows that Swedish LTC costs can be expected to increase by 25 to 69 per cent between 2000 and 2030, depending on trends in health. A German projection, on the other hand, suggested that the social insurance contributions could amount to between 2 and 8 per cent in 2040, depending on how relative costs of care develop (SVR, 2004). This discrepancy is in part due to the adverse demographic situation in Germany, and in part due to more conservative assumptions concerning improvements in health.

Turning to the distributive aspects, Karlsson *et al*. provide a range of measures of how the different scenarios perform in various dimensions of equity. Since we are considering life cycle redistribution, there are at least two alternative measures available for this exercise: one is net contributions to the system (Net Present Value, NPV) and the other is the internal rate of return, measured as the ratio between benefits received and contributions paid to the system (i.e. Money's Worth).

One important result is that, in monetary terms, all the systems considered are remarkably favourable to women. This is not a surprise in itself, but it is the differences between systems that are noteworthy. In net present value terms, the typical difference is between £3,000 (Germany) and £13,000 (Sweden), and in terms of 'money's worth', women get between 91 pence (Germany) and £1.60 (Sweden) more in return for each pound spent on LTC than their male counterparts. These differences are mainly due to the fact that women are more likely to become disabled, and that they tend to be in more expensive care settings for a given disability severity level. Differences in income are of secondary importance.

For the rest, the results are quite as expected. A Swedish-style system would above all benefit low earners and old people, whereas a Japanese-style system is particularly favourable for young males. The 'intergenerational' profile of the different scenarios is summarised in Figure 4. Since we are studying a transition period, the age gradient in the net present values is hardly surprising. However, useful comparisons of relative effects between the different scenarios can still be made, since they give an indication of where a certain system puts its emphasis and what cohorts are particularly advantaged, in relative terms. In doing so, 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

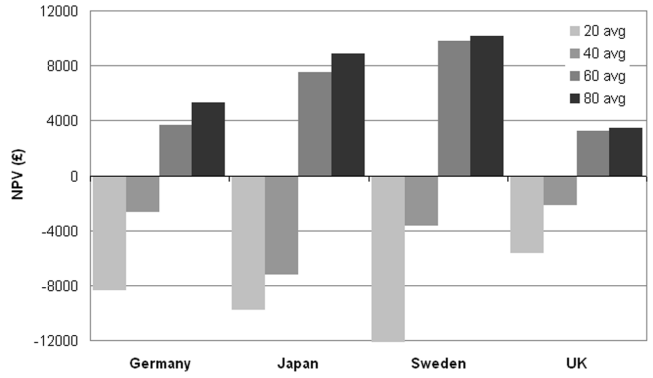

Figure 4: Net present value of public LTC benefits, by age

is the worst for old people. The Japanese system is the worst for 40–year olds, 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.

2.4 Assessment

The two studies compared here address the same type of issues, but the approaches chosen are so different that it is scarcely possible to make meaningful comparisons between the two. Hancock *et al.* (2006) focus on short-term effects and largely disregard contributions paid to the system, whereas Karlsson *et al.* (2007) study the redistribution in a life cycle perspective. On the other hand, the PSSRU-CARESIM model allows for a more complete analysis of the entire distribution of income and assets in the elderly population. Hence, apart from the estimates of aggregate costs there is very little overlap between the two studies.

Concerning these aggregate costs, there is a striking difference between the two studies in the timing of the increase. According to Karlsson *et al.* (2007), LTC costs take off only after 2020, whereas Hancock *et al.* (2006) project a significant increase already by 2022. One reason is that the study by Karlsson *et al.* expresses aggregate costs as a proportion of total earnings in the economy, whereas the PSSRU model takes costs as a proportion of GDP. Since there is a growing group of pensioners – who earn income without contributing to the GDP – the two measures diverge. Furthermore, the model by Karlsson *et al.* (2006) allows for improvements in morbidity which are consistent with recent empirical evidence.

Concerning the distributional side, the issues studied and the time perspectives involved make direct comparison difficult. What both studies highlight, however, is that it is typically not possible to rank different reform options according to some simple criterion such as 'progressiveness'. This is mainly due to the fact that when LTC is concerned, several dimensions of redistribution overlap – from men to women, from the young to the old, between home owners and non-home owners, and from the healthy to the ill. It follows – as was mentioned initially – that the issue of equity in funding and provision of long-term care is very complex and needs to be analysed with great care.

3. Concluding Remarks

The existing models for projecting LTC costs are very sophisticated in some respects, but disregard other important aspects of LTC funding completely. Hence, there is a wide scope for future improvements in projection models for dependency and long-term care. In this section, we discuss the policy implications of the articles reviewed and then give a brief overview of possible future research developments.

Firstly, the research by Hancock *et al.* (2006) suggests that the widely discussed reform option of free personal care might not be the most efficient way to relieve care recipients in the middle income brackets. It is a very costly option – leading to an immediate ten per cent increase in public LTC costs – and yet it benefits many care recipients who are not really in need of public interventions. Changes to the means testing of capital, on the other hand, come at slightly lower cost, yet tend to benefit the middle income brackets much more. In conclusion, there might still be strong reasons to treat health care and long-term care differently, despite the perceived 'diagnostic inequities' inherent in such a system.

On the other hand, their research also shows that trends in the various factors determining the needs and ability to pay for LTC may change considerably over time. Although free personal care is the most expensive reform option in the short term, changes in home ownership could make the suggested reforms to means test of capital more expensive in the long term. It follows that it might be ill-advised to perform public policy by means of incremental changes, since these are likely to be too concerned with present-day issues. Conversely, a more far-reaching reform approach might be better at handling the long-term issues.

A related issue is the finding by Karlsson *et al.* (2006) that the long-term sustainability of different LTC systems varies somewhat with the distribution of public costs for long-term care. In a Japanese-style system, where a substantial part of the public LTC costs are borne by the older half of the population, contributions need not rise as much as in other funding regimes. This could in turn be seen as an argument for partly funded long-term care insurance, since such an arrangement insulates the public funding from demographic fluctuations. The case for funding of LTC might be stronger than for pensions, since, firstly, the costs might be more sensitive to demographic changes than pension costs, and secondly, they constitute a smaller share of total public expenditure and hence the transition would be less costly.

Thirdly, a distributional analysis needs to take the distribution between men and women into account. Due to systematic differences in earnings, assets, cohabitation patterns, health, life expectancy and provision of informal

care, men and women are bound to fare very differently in any funding regime, and this raises the issue as to whether the differences are perceived as 'fair'. Karlsson *et al.* (2006) show that the funding regimes practiced in different countries differ significantly in this respect; for example, changing to a Swedish-style system would increase average redistribution from men to women by around £10,000 over a life cycle. Interestingly, there seems to be no correlation between informal caregiving patterns – where women typically provide more – and the redistribution in the formal care system.

Most projection models are in effect extended population projections, and as such they tend to disregard systematic differences between different population strata. One reason, however, why the empirical evidence on trends in morbidity is so incomplete could be that different subgroups of the population are diverging over time. Hence, models of disability and LTC could benefit from allowing for more *heterogeneity* within the population. Introducing such heterogeneity would be useful from several points of view. Educational attainment, for example, is correlated with health and morbidity as well as with savings and income (and possibly also with preferences and behaviour). Thus, projections could and should be done separately for different educational groups – as well as for other subgroups of the population.

Another serious limitation of previous models is that they do not allow for *behavioural responses*. One example where policy reform could induce behavioural change is the popular suggestion of a tax on bequests (cf. Casey, 2003), in which case there is a risk that intra-family transfers will offset the tax at least partly. It is clear that incentives do matter, as the UK experience demonstrates: changes in the funding formula for residential care in the 1980s lead to a rapid expansion of care homes which could not at all be attributed to changes in demography or morbidity (cf. Howe and Healy, 2005). In fact, the system for LTC funding and benefits is likely to influence a wide range of decisions on the part of the individual, such as

- the choice between informal and formal care (cf. Pudney *et al.*, 2006), and between domiciliary and institutional care;
- the supply of informal care;
- labour market decisions – how much to work, how long to work.

Given a lack of systematic studies, it is impossible to tell how important these possible changes in behaviour are.

Incentives clearly matter if individuals behave rationally. But do they? There are new developments in **behavioural finance** which suggest that individuals are bad at handling costly events which occur with a very low probability (cf. Mitchell and Utkus, 2003). This is probably particularly true for long term decisions as whether to make financial arrangements for LTC or not. On the other hand, it has been suggested that the low take-up of private long term care insurance is perfectly rational in the presence of a means tested public subsidy (Pauly, 1990). Further research should investigate to what extent and under which circumstances individuals can be expected to behave rationally in the face of future LTC risk – which is a precondition for any analysis of incentives and their effects. On the other hand, if individuals do *not* behave rationally, it is equally important to assess the implications of their misperceptions.

Finally, the *macroeconomic* assumptions of LTC models are particularly naïve. LTC unit costs are normally assumed to follow labour costs or the GDP per capita closely, and sensitivity analysis is undertaken to see what happens when LTC costs diverge in some direction. This approach is probably reasonable given that LTC services are very labour intensive and there is little potential for efficiency gains over time. Historical data, however, suggest that LTC costs in the UK have been growing at a slower pace than unit labour costs – despite the surge in demand for these services (Curtis and Netten, 2006). For the future, it could be argued that shortage of labour and increases in demand would push LTC costs upwards. On the other hand, trade liberalisation is believed to have put a downward pressure on unskilled worker's wages in rich countries (Wood, 1995). Hence, there is a considerable uncertainty regarding the future costs of care, and a more comprehensive model of the economy could provide some insights into this. Furthermore, to the extent that the funding of LTC affects savings and labour market behaviours, the funding formula will have repercussions in the macro-economy which should be taken into account. In summary, projections of LTC costs would benefit from more explicit macroeconomic modelling.

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