PSSRU

Projections of demand for residential care for older people in England — Report for BUPA

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1. Introduction

This paper, commissioned by BUPA, reports on the impact that changes in assumptions about household composition, housing tenure and the balance of domiciliary to institutional care could have on the future numbers of older people in care homes. It uses the PSSRU model of demand for long-term care. The impact of the new scenarios developed for this project is compared to that of scenarios investigated in previous research about variant population projections, marital status and rises in the real costs of care.

The results show the impact of the scenarios in terms of the distribution between public and privately funded residents in care homes, projected numbers of recipients of local authority (LA) funded home care, total expenditure on long-term care (LTC) and workforce requirements for care homes.

2. The PSSRU model

The PSSRU model makes projections of demand for long-term care for older people in England and associated expenditure, under clearly specified assumptions. The model was constructed as part of a project on long-term care finance, which is funded by the Department of Health. The model is a cell-based or macrosimulation model. A full account of the model, and of the data and assumptions used, can be found in Wittenberg et al. (2006). The model has recently been updated and adapted to make projections for England to 2032.

The PSSRU model makes projections of four key variables: the future numbers of disabled older people, future demand for long-term care services and disability benefits, future public and private expenditure on long-term care and the future social care workforce. The projected levels of expenditure are broken down between public expenditure by the NHS and local authority social services and private expenditure by older people themselves. The model also includes a separate estimation of expenditure by the Department for Work and Pensions (DWP) on disability benefits that are used to fund care.

The PSSRU model does not make forecasts about the future. It makes projections on the basis of specific assumptions about future trends. The approach involves simulating the impact on demand of specified changes in demand drivers, such as demographic pressures, or specified changes in policy, such as the introduction of free personal care. It does not involve forecasting future policies or future patterns of care. Projected levels of public and private expenditure are compared with projected national economic output, Gross Domestic Product (GDP). This means that the model can be used to make projections both of the future balance between public and private expenditure on long-term care and of the future proportion of GDP spent on long-term care.

A central base case projection takes account of expected changes in factors exogenous to long-term care policy, such as demographic trends and trends in housing tenure. It holds constant factors endogenous to long-term care policy, such as patterns of care and the funding system. The main assumptions used in the central base case are summarised in Box 1 below. The base case is used as a point of comparison when the assumptions of the model are subsequently varied in scenarios.

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BOX 1

Key assumptions of the central base case are as follows:

- The number of people by age and gender changes in line with the Government Actuary's Department 2006-based population projections for England (GAD, 2007).
- Prevalence rates of disability by age and gender remain constant, at the rate reported in the 2001/2 General Household Survey (GHS) for Great Britain.
- Marital status changes in line with GAD 2003-based marital status and cohabitation projections for England and Wales (ONS, 2005).
- Rates of living alone and with others remain constant over time by age, gender, marital status and disability, at the rate reported in the 2001/2 General Household Survey (GHS) for Great Britain.
- Home-ownership rates, as reported in the 2003/4 Family Resources Survey (FRS), change in line with projections produced by the University of East Anglia CARESIM model (Hancock et al., 2006a).
- The probabilities of receiving formal community-based services or residential care services remain constant, by age, disability, household composition and other needs factors.
- The probability of receiving informal care remains constant, by age, disability, household composition and other needs factors.
- Health and social care unit costs rise by 2 per cent per year in real terms (this includes capital and staff costs but not other costs).
- The proportion of care home residents who are private payers rises in line with the proportion who were owner occupiers living alone before admission to residential care.
- The proportion of care home residents funded by the NHS remains constant.
- The proportion of the gross costs of publicly funded services recovered in user charges remains constant.
- GDP follows the latest HMT projections (HM Treasury, 2008).
- The ratio of staff numbers to volume of services received remains constant in future years.

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The model has 2006 as its base year though unit costs are based on 2007 prices. Results are reported for 2007 and 2032.

3. Scenarios

Because the estimates produced by the model are based on assumptions about future trends inevitably there is some uncertainty around these estimates. In past work PSSRU has explored the sensitivity of these estimates to alternative assumptions about key variables in scenarios. These scenarios have examined the sensitivity of the projections to changes in demographic and socio-economic variables such as life expectancy, prevalence of disability, availability of informal care by spouses and children, and the unit costs of care (Wittenberg et al., 2006; Pickard et al., 2007a). This work has demonstrated the importance of these factors for projections of demand for and expenditure on long-term care.

PSSRU have also designed a series of scenarios that explore how changes in policy might affect the projections. These scenarios have examined changes to the funding system, for example by introducing a policy of free personal care, and changes to the pattern of services delivered (patterns of care). Patterns of care scenarios examined include a shift in the balance of care, making entry to residential care less likely and receipt of home care more likely, an entitlement to care and increased support to carers through provision of a 'carer-blind' domiciliary care service (Pickard et al., 2000; Pickard et al., 2007b; Hancock et al., 2007).

BUPA commissioned PSSRU to develop a further set of scenarios not examined in previous studies and to examine the impact of these scenarios on, in particular, demand for and expenditure on care homes. The proposed scenarios relate to trends in household composition, housing tenure, and the balance of care between home care and residential care. The impact of these new scenarios is then compared to that of scenarios previously developed by the PSSRU.

3.1 Changes in household composition

There have been significant changes in the pattern of living arrangements for older people over the latter half of the 20th and early 21st century. In particular it is increasingly common for older people to live alone or with a spouse whereas living with relatives is becoming more unusual (Keilman, 1987; Pampel, 1992; Wolf, 1995; Tomassini et al., 2004). We have previously explored the impact of using alternative marital status projections using the PSSRU model (Pickard et al., 2007a). There is some debate over the cause of the decline in the proportion of older people living with relatives (other than their spouses). Improvements in income, which allow older people to maintain separate households are argued to be important (Michael et al., 1980; McGarry and Schoeni, 2000). Other factors such as improvements in health status, housing and adaptations and transport and communication make it easier to provide assistance to those who need care (Hoenig et al., 2003; Freedman et al., 2006). The decline in kin availability may be a contributing factor, although recently the availability of kin has increased so this is unlikely to account for the most recent trends (Murphy and Grundy, 2003; Murphy et al., 2006). Increasing individualism and declining feelings of family responsibility combined with increased female participation in the labour force are also often cited as drivers (European Commission, 1995; Johnson and Lo Sasso, 2004). There is clearly room for policy to have a significant effect on the continuation or otherwise of this trend, through policies of pension and income support and benefits which serve to increase the financial resources of older people, and through policies which promote adaptations to housing, telecare and lifetime homes and enable older people to live alone without fear for their safety.

Studies have shown that declining health is associated with changes in residence and household composition (Speare and McNally, 1992; Al-Hamad et al., 1997). In particular those people who are single living alone are more likely to enter residential care compared to individuals who are living with kin (Grundy, 2008). Thus changes in the proportion of single individuals living alone could have an impact on demand for residential care. In the base case of the PSSRU model the ratio of single individuals living alone to single older people living with others remains constant over time. Given the observed trend over time towards increasing numbers of older people living alone, we explore two scenarios in which we decrease the ratio of single older people living with others to single older people living alone by 1 per cent and 1.5 per cent per year.

3.2 Tenure

In the past century we witnessed a huge growth in the rate of home ownership, driven by changes in policy, such as the 'right to buy' and the expansion of mortgages. However, that such a trend should continue is not certain. As we have seen in recent months the availability of credit can suddenly contract and this could in future lead to a reduction in home ownership. A question remains as to whether or not such a

retraction in credit is likely to impact on home ownership rates in the age 65 and over populations in the near future, since those people who will be 85 or over in 2032 are now in their 60s and those who will be 65 or over are in their 40s. Such effects seem more likely to affect younger cohorts. However, the projections of home ownership under the base case assume that there is no movement out of home ownership into renting, yet such a scenario, albeit in small numbers, does seem plausible. In addition the base case projections of home ownership do not take account of any differential in mortality rates by housing tenure. Since mortality is greater among those in rented accommodation this would have the effect of increasing the proportion of owners to renters (Hancock et al., 2006b).

We consider scenarios in which home ownership rates rise between 2007 and 2032 by 25 per cent above and below the projections produced by the University of East Anglia that are currently used as the base case (CARESIM model; Hancock et al., 2006a). We also consider a projection in which home ownership rates remain constant by age, gender and marital status as projected from the 2003/4 Family Resources Survey (and PSSRU surveys of residential care).

3.3 Balance of care

We also explore a set of scenarios that make changes to the balance of recipients of community-based and residential care. Since the community care reforms of the 1990s there has been a significant decline in the use of residential care alongside a large expansion of the domiciliary care market. Policy-makers continue to promote care at home and if this trend continues we will see a further shift in the balance of care towards community care and away from residential care. However, there are reasons to suggest that this trend cannot continue indefinitely and may even shift back towards residential care. Reasons include a lack of informal care to support those in the community (Pickard, 2008) or sufficient home care leading to increased demand for residential care.

We explore both these possibilities in scenarios that assume a 1.5 per cent decrease or increase per annum in the probability of entry to residential care. In the scenario assuming a 1.5 per cent decrease in the probability of entering residential care per annum, the 'extra' people who would have received residential care under the base case are assumed to receive community-based services. In one variant of this scenario we assume that the 'extra' people receiving community-based services receive the average package of domiciliary care. In another variant we assume that the 'extra' people receive a package of domiciliary care that is twice the average package, reflecting the possibility that those currently in residential care are likely to be more disabled than those in the community. We also consider the impact of a constraint on care home supply by fixing the number of care home places at 2007 levels.

3.4 Other scenarios

The impact of these new scenarios are compared to the impact of scenarios developed in previous work such as variant population projections, marital status projections and variant assumptions on the rate of inflation of health and social care unit costs. With respect to changes in life expectancy, we present the projected results for the high and low life-expectancy variants produced by the Government's Actuary Department (GAD, 2007). We also present the GAD marital status projections from 1996 and 1992 as alternatives to the 2003 projections for sensitivity analysis of the relative impact of changes in marital

status. These earlier marital status projections have been chosen as potential alternative projections in preference to choosing arbitrary variant changes in marital status rates over time. Also, the marital status projections for 1996 and 2003 differ appreciably from those in 1992 as they incorporate a projection of greater life expectancy in men. Results are also presented for annual real increases of 1.5 per cent and 2.5 per cent in health and social care unit costs. More details on how these scenarios act can be found in various publications (e.g. Wittenberg et al., 2006).

4. Outcomes

The outcomes of interest to be compared across scenarios are:

(i) the number of publicly funded care home residents by type of care home and users of (intensive) home care to illustrate the impact of scenarios changing the balance between residential and home care

(ii) the number of privately funded residents by type of care home

(iii) the number of recipients of (intensive) local-authority funded home care

(iv) total public and private expenditure on long-term care

(v) total public and private expenditure on long-term care as a percentage of GDP

(vi) the total workforce in LA funded residential care, including nurses and residential care staff

5. Results

The impact of changes in key assumptions in the central base case are not easy to predict as these changes will be compounded by other demographic variables and assumptions about how these changes impact on the use of long-term care resources over time. Take home-ownership rates as an example. In the model base case, home-ownership rates are set at a rate projected from the 2003/4 FRS and are increased over time according to the projections produced by the University of East Anglia (Hancock et al., 2006a). These projections are that the rate of home ownership will increase by 5 per cent between 2007 and 2032. If, rather than applying the projected trend, we assume that the rate of home-ownership remains at the 2007 level for the duration of the period to 2032, the percentage of homes that are owner-occupied actually slightly decreases. If the rate of home-ownership is increased by 25 per cent (above the rate projected by CARESIM), the percentage of the sample who would be owner occupiers in 2032 would be 81 per cent (see Table 1a) as compared to 80 per cent under the base case. Conversely, if the rate of home-ownership is reduced by 25 per cent, the percentage of owner-occupiers in 2032 would be 79 per cent.

Table 1a: Percentage of owner-occupiers *

	2007	2032	Difference
Base case	74.7	79.6	4.9
No change in tenure	74.7	74.5	-0.2
Tenure rate increases by 25 per cent (relative to base case)	74.6	80.7	6.1
Tenure rate decreases by 25 per cent (relative to base case)	74.6	78.6	4.0

Source: PSSRU model estimates
* of older people living in the community

Under the base case, the GAD 2003 marital status projections are applied in future years. These projections indicate that between 2007 and 2032, the percentage of the age 65 and over population who will be single will increase by only 0.1 percentage points (see Table 1b). If marital status is held at the rate projected in the GAD 2003 projections and not allowed to increase further as per the GAD projections, the percentage of single people is projected to increase from 46 per cent in 2007 to 47 per cent by 2032. Previous GAD projections have suggested that the percentage of single older adults would increase at faster rates than the current projections. Using the 1996 projections, the percentage of single people is estimated to increase by 1.2 percentage points by 2032. The 1992 projections estimated this increase to be 6 per cent.

Table 1b: Percentage single *

	2007	2032	Difference
Base case – 2003 projections	45.6	45.7	0.1
No change in marital status	45.9	47.1	1.2
Marital status – 1996 projections	45.8	47.0	1.2
Marital status – 1992 projections	46.0	51.7	5.7

Source: PSSRU model estimates
* of the entire age 65+ population

In the model, household composition is primarily a function of marital status rates. Under the base case, the GAD 2003 marital status projections suggest a decline of 2 percentage points in the percentage of older people living alone from 42 per cent to 40 per cent by 2032 (see Table 1c). As with the percentage of people who are single, the most recent projections suggest that a smaller proportion of older people will be living alone in the future. The 1996 projections suggest only a very small decrease in the percentage of older people living alone between 2007 and 2032, while the 1992 projections suggest an increase of 4.1 percentage points in those living alone. Assuming a 1 per cent increase per annum in the percentage of dependent older people living alone projects no change in the percentage living alone in 2032, while assuming a 1.5 per cent increase projects to a 0.8 per cent increase in the percentage living alone in 2032.

Table 1c: Percentage of dependent older people living alone **

	2007	2032	Difference
Base case – 2003 projections	42.2	40.2	-2.0
Marital status – 1996 projections	42.4	42.3	-0.1
Marital status – 1992 projections	42.5	46.6	4.1
1 per cent increase pa in single living alone	42.3	42.3	0.0
1.5 per cent increase pa in single living alone	42.3	43.1	0.8

Source: PSSRU model estimates
** of dependent older people living in the community

The percentage of dependent older people projected to be living in a care home by 2032 under the base case of the model is 15 per cent (see Table 1d). This is an increase from 14 per cent in 2007. Assuming a 1.5 per cent per annum decrease in the probability of entering residential care, the model predicts that the percentage in a care home would fall by 3.2 percentage points. An identical movement the other way, i.e. a 1.5 per cent per annum increase in the probability of entering residential care predicts an increase in the

number of care home residents of 4 percentage points. Holding care home places constant produces a reduction of the percentage in care homes by 5.8 percentage points from the 2007 rate. Thus a greater decline in the percentage in care homes results from holding care home places constant compared to assuming a 1.5 per cent per annum decrease in the probability of entering residential care. The model estimates that holding care home places constant is equivalent to a 2.4 per cent per annum decrease in the probability of entering residential care.

Table 1d: Percentage in a care home *

	2007	2032	Difference
Base case	14.1	15.0	0.9
1.5 per cent decrease pa in probability of entering residential care	13.9	10.7	-3.2
1.5 per cent increase pa in probability in entering residential care	14.2	18.0	3.8
Care home places held constant	13.9	8.1	-5.8

Source: PSSRU model estimates
* of dependent older people

5.1 Distribution of publicly and privately funded residents in care homes

Under the base case assumptions, the model projects that between 2007 and 2032, the number of older people in care homes who will be funded through public spending will increase by 68 per cent from 227,700 to 383,500 (see Table 2). The model predicts a much greater increase in the private funding of care home places: an increase of 126 per cent from 106,300 to 239,800. Alternate marital status projections do not change the projected public spending on care homes. Using the 1992 marital status projections, public spending on care homes, as projected by the model, would be 67 per cent. There is a greater effect of these assumptions on private funding of care homes, however. The model projects that if the 1992 marital status projections are assumed, private spending on care homes would increase by 143 per cent as compared to 126 per cent under the base case which uses the 2003 GAD marital status projections.

As with changes in marital status projections, changes in the assumption around the proportion of single older people living alone has an impact on the number of privately funded care home recipients while leaving public funded numbers relatively unchanged. Assuming a 1.5 per cent increase per annum in the proportion of single older people living alone increases the number of privately funded care home residents by 145 per cent between 2007 and 2032, as compared to an increase of 126 per cent under the base case. This assumption projects the number of publicly funded care home residents to increase by 65 per cent as compared to a 69 per cent increase under the base case.

Life expectancy variants have a significant impact on the projections of the number of care home residents. The high life expectancy projections suggest an increase in publicly financed care home residents of 80 per cent by 2032, as compared to 69 per cent under the base case. The increase in privately funded home care residents under this variant, at 141 per cent, is comparable to the increase projected when assuming a 1.5 per cent per annum increase in the number of single people living alone. Under the low life expectancy variant, the number of publicly funded care homes residents is projected to increase by 57 per cent.

Similarly, the number of privately funded care home residents is expected to increase at a significantly slower rate than under the base case: 111 per cent under low life expectancy as compared to 126 per cent under the base case. Note however that this increase in demand for places at 111 per cent is still substantial.

Table 2: All care home residents * – publicly and privately funded ('000s) *includes respite care

	Publicly funded			Privately funded			Total		
	2007	**2032**	**% change**	**2007**	**2032**	**% change**	**2007**	**2032**	**% change**
Base case	227.7	383.5	68.4	106.3	239.8	125.6	334.0	623.3	86.6
No change in marital status	227.8	378.6	66.2	106.6	254.4	138.5	334.4	633.0	89.3
Marital status 1996 projections	228.1	381.1	67.1	106.6	248.0	132.5	334.8	629.1	87.9
Marital status 1992 projections	227.8	380.2	66.9	106.6	259.2	143.0	334.4	639.4	91.2
1 per cent increase pa in single living alone	227.7	311.0	66.0	106.6	254.8	139.0	334.2	631.8	89.0
1.5 per cent increase pa in single living alone	227.6	374.3	64.5	106.7	261.0	144.5	334.4	635.3	90.0
High life expectancy	227.7	408.9	79.6	106.3	255.9	140.8	334.0	664.8	99.0
Low life expectancy	227.7	358.3	57.3	106.3	223.8	110.6	334.0	582.1	74.3
No change in tenure rate	227.7	433.9	90.5	106.3	197.7	86.0	334.0	631.6	89.1
Tenure rate increases 25 per cent	227.7	371.3	63.0	106.3	250.1	135.3	334.0	621.3	86.0
Tenure rate declines 25 per cent	227.7	395.7	73.8	106.3	229.5	115.9	334.0	625.2	87.2
1.5 per cent pa decrease in the probability of entering residential care	224.4	260.8	16.2	104.6	159.9	52.9	329.0	420.7	27.9
1.5 per cent pa increase in probability of entering residential care	230.3	480.1	108.4	107.0	271.5	153.7	337.3	751.6	122.8
No increase in care home supply	223.9	204.9	-8.5	104.4	123.5	18.3	328.3	328.3	0.0

Source: PSSRU model estimates

If it is assumed that there is no change in tenure rates between 2007 and 2032, the number of publicly funded care home residents would increase by 91 per cent during this period. This is well above the 69 per cent increase projected under the base case. This occurs because we assume that the number of private funders of residential care increases in line with changes in owner-occupation, such that the ratio of owner-occupiers to private funders remains constant over time. This scenario also projects the increase in privately funded care home places to be substantially less than under the base case: 86 per cent as compared to 126 per cent.

A 1.5 per cent per annum decrease in the probability of entering residential care would slow the increase in care home places substantially. Publicly funded places would increase by 16 per cent as compared to 69 per cent under the base case, while privately funded places would increase by 53 per cent as compared to 126 per cent under the base case. An opposing scenario that increases the probability of entering residential care by 1.5 per cent per annum increases publicly funded care home places by 108 per cent as compared to 69 per cent under the base case. This scenario is associated with an increase of 154 per cent in privately funded care home residents as compared to 126 per cent under the base case.

The greatest impact on the number of care home residents is observed in a scenario where care home supply is held constant. As defined, this scenario results in no increase in the overall number of residents, though it projects an increase in the ratio of privately funded residents relative to publicly funded residents. Under this scenario, the model projects that the number of publicly funded residents would decline by 9 per cent by 2032 while the number of privately funded residents would increase by 18 per cent.

It is also interesting to examine the balance between the numbers of publicly and privately funded care home residents under the different scenarios. Under the base case, in 2007, there are 130,400 more publicly funded care home residents as compared to privately funded care home residents (see table 2b). The general trend is for the ratio of publicly funded care home places to privately funded places to decline over time. This is because home ownership is projected to increase, and the private financing of residential care is assumed to increase at a rate that is directly proportional to increases in home ownership. This is a simple assumption, however. In other work we have incorporated into the modelling projections of the proportion of care home costs met by users (Hancock et al., 2006b).

Table 2b: All care home residents * – Balance between publicly and privately funded ('000s) *includes respite care

	2007			2032		
	Publicly funded	Privately funded	Ratio	Publicly funded	Privately funded	Ratio
Base case	236.7	106.3	2.23	399.1	239.8	1.66
No change in marital status	236.7	106.6	2.22	394.3	254.4	1.55
Marital status 1996 projections	237.1	106.6	2.22	396.8	248.0	1.60
Marital status 1992 projections	236.7	106.6	2.22	396.2	259.2	1.53
1 per cent increase pa in single living alone	236.6	106.6	2.22	392.6	254.8	1.54
1.5 per cent increase pa in single living alone	236.6	106.7	2.22	390.0	261.0	1.49
High life expectancy	236.7	106.3	2.23	425.3	255.9	1.66
Low life expectancy	236.7	106.3	2.23	373.1	223.8	1.67
No change in tenure rate	236.7	106.3	2.23	449.7	197.7	2.27
Tenure rate increases 25 per cent	236.6	106.3	2.23	386.8	250.1	1.55
Tenure rate declines 25 per cent	236.7	106.3	2.23	411.3	229.5	1.79
1.5 per cent pa decrease in probability of entering residential care	233.3	104.6	2.23	276.4	159.9	1.73
1.5 per cent pa increase in probability of entering residential care	239.3	107.0	2.24	495.7	271.5	1.83
No increase in care home supply	232.9	104.4	2.23	220.5	123.5	1.79

Source: PSSRU model estimates

5.2 Local authority funded home care

The base case of the model projects that 296,300 older persons will receive local authority funded home care in 2007. This is projected to rise to 523,100 by 2032, an increase of 77 per cent (see Table 3). Changes in the assumption about the marital status rate during the period from 2007 to 2032 have a modest impact on projections of local authority funded home care relative to the base case. Assuming no change in marital status during this period would result in an increase in LA funded home care recipients of 81 per cent as compared to 77 per cent under the base case.

Similarly, changing the percentage of older people living alone does not alter the projections substantially. If a 1.5 per cent per annum increase in the number living alone is assumed, the projected number of LA funded home care recipients is 531,300, an increase of 79 per cent on the number of recipients estimated for 2007. This is marginally greater than the increase projected under the base case of 77 per cent.

Changes in assumptions around life-expectancy alter the projections by about 10 percentage points. Under the high life-expectancy variant projections, the model projects an 86 per cent increase in LA funded home care recipients to 552,300 as compared to a 77 per cent increase under the base case. The low life-expectancy variant results in projections of a 67 per cent increase in LA funded home care recipients to 493,800.

Changing the tenure assumption has little effect on the projections of recipients of LA funded home care. This is because receipt of home care is a function of level of dependency and household composition as opposed to home ownership.

The balance of care scenario that assumes a 1.5 per cent per annum decrease in the probability of entering residential care has a large impact on the number of recipients using LA funded home care. Such a shift in the balance of care is projected to increase the number of LA funded home care recipients by 112 per cent from 299,000 in 2007 to 633,100 in 2032. This is a significant increase over the estimated 523,100 recipients estimated under the base case. A shift in the balance of care in the opposite direction, that is a 1.5 per cent per annum increase in the probability of entering residential care does not have as sizeable an effect. The model projects that such a change would result in 476,600 LA funded home care recipients in 2032, an increase of 62 per cent from 2007.

A scenario that fixes care home supply at current levels illustrates the considerable excess burden this would place on LA funded home care places. The result of this scenario would be an increase in the number of recipients of LA funded home care from 299,400 in 2007 to 683,300 in 2032, an increase of 128 per cent. This is substantially greater than the increase estimated under the base case of 77 per cent.

Table 3: Number of local authority funded home care users

	2007	2032	% change
Base case	296.3	523.1	76.5
No change in marital status rates	297.0	538.3	81.3
Marital status – 1996 projections	297.5	531.8	78.8
Marital status – 1992 Projections	296.9	546.7	84.1
1 per cent increase pa in single living alone	296.5	528.9	78.4
1.5 per cent increase pa in single living alone	296.6	531.3	79.2
High life expectancy	296.3	552.3	86.4
Low life expectancy	296.3	493.8	66.6
No change in tenure rate	296.3	526.8	77.8
Tenure rate increases 25 per cent	296.3	522.2	76.2
Tenure rate declines 25 per cent	296.3	523.9	76.8
1.5 per cent pa decrease in probability of entering residential care	299.0	633.1	111.7
1.5 per cent pa increase in probability of entering residential care	295.2	476.6	61.5
No increase in care home supply	299.4	683.3	128.2

Source: PSSRU model estimates

5.3 Total expenditure on long-term care

The model projects that under the base case, total public expenditure on long-term care would increase from £11.3 billion to £31.1 billion in 2032, an increase of 175 per cent (see Table 4). Private expenditure is projected to rise from £7.3 billion to £22.4 billion, an increase of 208 per cent, during the same period.

As before, the projections are not altered much by changing the assumption around marital status rates. If the 1992 marital status projections are used instead of the 2003 projections, the model projects public expenditure to rise by 175 per cent to £31.2 billion in 2032 and private expenditure to rise by 218 per cent to £23.2 billion. Similarly, the projections are not significantly different when rates of living alone are changed. Assuming a 1.5 per cent per annum increase in the number living alone results in the projections for public expenditure in 2032 falling from £31.1 billion under the base case to £30.9 billion. The same scenario projects private expenditure to rise to £23.4 billion in 2032 from £22.4 billion under the base case.

Table 4: Total expenditure on long-term care (£ billion)

	Public expenditure			Private expenditure			Total expenditure		
	2007	**2032**	**% change**	**2007**	**2032**	**% change**	**2007**	**2032**	**% change**
Base case	11.3	31.1	175	7.3	22.4	208	18.6	53.5	199
No change in marital status	11.3	31.2	175	7.3	23.2	218	18.6	54.3	192
Marital status 1996 projections	11.3	31.1	175	7.3	22.9	213	18.6	54.0	190
Marital status 1992 projections	11.3	31.4	177	7.3	23.6	224	18.6	55.0	196
1 per cent increase pa in single living alone	11.3	30.9	174	7.3	23.1	217	18.6	54.0	191
1.5 per cent increase pa in single living alone	11.3	30.9	173	7.3	23.4	221	18.6	54.3	192
High life expectancy	11.3	32.8	190	7.3	23.8	227	18.6	56.6	205
Low life expectancy	11.3	29.3	159	7.3	21.1	190	18.6	50.4	171
2.5 per cent increase in unit costs	11.4	35.1	209	7.3	25.3	246	18.7	60.4	224
1.5 per cent increase in unit costs	11.3	27.5	144	7.2	19.9	175	18.5	47.4	156
No change in tenure rate	11.3	32.5	187	7.3	20.9	187	18.6	53.3	187
Tenure rate increases 25 per cent	11.3	30.7	172	7.3	22.8	214	18.6	53.5	188
Tenure rate declines 25 per cent	11.3	31.4	178	7.3	22.0	203	18.6	53.4	188
1.5 per cent pa decrease in probability of entering residential care – average package	11.3	31.1	175	7.2	18.3	153	18.5	49.3	167
1.5 per cent pa decrease in probability of entering residential care – 2 x average package	11.3	33.1	192	7.2	18.5	157	18.5	51.6	178
1.5 per cent pa increase in probability of entering residential care	11.4	33.1	192	7.3	24.4	234	17.9	57.5	208
No increase in care home supply	11.3	31.1	175	7.2	16.4	127	18.5	47.5	157

Source: PSSRU model estimates

Under the high life expectancy variants the model projects that by 2032 public expenditure would have increased to £32.8 billion. This is an increase of 190 per cent as compared to a 175 per cent increase under the base case. Private expenditure is projected to increase by 227 per cent to £23.8 billion in 2032, as compared to a 208 per cent increase under the base case. Using the low life expectancy variant projections public expenditure is projected to increase by 159 per cent during the period from 2007 to 2032 and private expenditure is projected to increase by 190 per cent.

As with the changes in assumptions around marital status and the number of older people living alone discussed above, changing the assumption about tenure rates only marginally affects the projections of both public and private expenditure on long-term care.

However, the projections of public and private expenditure are sensitive to assumptions about changes in unit costs over time. If unit costs are assumed to rise by 2.5 per cent per year in real terms, public expenditure is projected to increase by 209 per cent by 2032 as compared to an increase of 175 per cent under the base case where unit costs are assumed to rise by 2.0 per cent per year. A 246 per cent increase in private expenditure is associated with annual 2.5 per cent increases in unit costs to 2032, whereas a 208 per cent increase is projected under the base case. If unit costs are assumed to rise by 1.5 per cent per year in real terms (0.5 per cent per year less than under the base case), public expenditure is projected to increase by 144 per cent by 2032 and private expenditure is projected to increase by 175 per cent.

If the balance of care is altered such that there is a 1.5 per cent per annum decrease in the probability of entering residential care, there is no significant effect of total public expenditure, but total private expenditure would decline appreciably. Private expenditure would increase by 153 per cent (to £18.3 billion) whereas under the base case the increase is much greater at 208 per cent.

Under this scenario, the 'extra' people who would have received residential care under the base case are assumed to receive the average package of domiciliary care. However, we have also modelled a scenario where these extra people receive twice the average package of domiciliary care. This may be more appropriate as these extra people are likely to have higher levels of dependency relative to individuals currently receiving care in the community. Under this more generous scenario between 2007 and 2032 public expenditure on long-term care would increase from £11.3 billion to £33.1 billion, an increase of 192 per cent. This is a greater increase than that estimated under the base case. The scenario has no effect on private expenditure beyond that estimated for the average package of care scenario. This is because we have not made assumptions about the likelihood of receipt of additional privately funded services since this makes assumptions about an individual's ability to pay.

The opposite shift in the balance where the probability of entering residential care is increased by 1.5 per cent per annum results in a projected increase in public expenditure of 192 per cent from £11.4 billion in 2007 to £33.1 billion in 2032. This scenario also projects a 234 per cent increase in private expenditure from £7.3 billion in 2007 to £24.4 billion in 2032. The comparable increases in the base case are 175 per cent and 208 per cent for public and private expenditure respectively.

Under a scenario where current levels of care home supply are held constant with no increases in care home places to 2032, public expenditure is not projected to change from 2007 levels. Fixed care home supply does not limit private expenditure, however, with the model estimating that by 2032 private expenditure would have increased by 127 per cent as compared to a 208 per cent increase under the base case. The summated effect on total expenditure on long-term care under this scenario is an increase of 157 per cent as compared to an increase of 199 per cent under the base case.

It is also helpful to assess estimates of future expenditure relative to GDP. Under the base case total expenditure on long-term care would increase from 1.5 per cent of GDP in 2007 to 2.9 per cent in 2032 (see Table 5). Public expenditure on long-term care would increase from 0.9 per cent of GDP to 1.7 per cent of GDP in 2032 and private expenditure would increase from 0.6 per cent of GDP to 1.2 per cent in 2032.

The scenario which assumes 2.5 per cent annual increases in real unit costs has higher projected public and private expenditure than all other scenarios. Public expenditure on long-term care is projected to reach 1.9 per cent of GDP in 2032 and private expenditure to reach 1.4 per cent of GDP under this change in unit costs. The next most costly scenarios are those assuming high life expectancy and shifts in the patterns of care. Using the high life-expectancy variants, public expenditure is projected to increase to 1.8 per cent of GDP in 2032 and private expenditure to increase to 1.3 per cent of GDP. In the balance of care scenario where there is a 1.5 per cent per annum decrease in the probability of entering residential care and those extra recipients of community care are given twice the average package of home care, public expenditure is projected to increase to 1.8 per cent of GDP. Under a scenario where there is a 1.5 per cent increase in the probability of entering residential care, private expenditure would increase to 1.3 per cent of GDP by 2032. Where care home supply does not increase between 2007 and 2032, private expenditure on long-term care as a percentage of GDP would increase at a much slower rate, reaching 0.9 per cent of GDP by 2032.

5.4 Workforce in care homes

The base case projects of care home workforce requirements are that by 2032 an additional 145,500 nurses and residential care workers would be required to meet demand for care homes places (see Table 6). This represents an 86 per cent increase above current workforce levels. Changes to the assumption about how marital status rates change over the period 2007 to 2032, results in a modest increase over the base case estimate for the size of the required care home workforce. For example, using the 1992 marital status projections, a 91 per cent increase would be required. Similarly, a 1.5 per cent per annum increase in the number of single older people living alone projects an additional 150,600 care home workers, or an increase of 89 per cent.

The high life expectancy projections result in the model projecting the need for an additional 166,400 individuals working in care homes. This almost doubles the current workforce levels. Using the low life expectancy projections the model projects that an additional workforce of 124,900 would be required to look after the care home population, which is an increase of 74 per cent on current levels.

Table 5: Total expenditure on long-term care (as a percentage of GDP)

	Public expenditure			Private expenditure			Total expenditure		
	2007	2032	Difference	2007	2032	Difference	2007	2032	Difference
Base case	0.9	1.7	0.8	0.6	1.2	0.6	1.5	2.9	1.4
No change in marital status	0.9	1.7	0.8	0.6	1.3	0.7	1.5	3.0	1.5
Marital status 1996 projections	0.9	1.7	0.8	0.6	1.2	0.6	1.5	2.9	1.4
Marital status 1992 projections	0.9	1.7	0.8	0.6	1.3	0.7	1.5	3.0	1.5
1 per cent increase pa in single living alone	0.9	1.7	0.8	0.6	1.3	0.7	1.5	2.9	1.4
1.5 per cent increase pa in single living alone	0.9	1.7	0.8	0.6	1.3	0.7	1.5	3.0	1.5
High life expectancy	0.9	1.8	0.9	0.6	1.3	0.7	1.5	3.1	1.6
Low life expectancy	0.9	1.6	0.7	0.6	1.2	0.6	1.5	2.7	1.2
2.5 per cent increase in unit costs	0.9	1.9	1.0	0.6	1.4	0.8	1.5	3.3	1.8
1.5 per cent increase in unit costs	0.9	1.5	0.6	0.6	1.1	0.5	1.5	2.6	1.1
No change in tenure rate	0.9	1.8	0.9	0.6	1.1	0.5	1.5	2.9	1.4
Tenure rate increases 25 per cent	0.9	1.7	0.8	0.6	1.2	0.6	1.5	2.9	1.4
Tenure rate declines 25 per cent	0.9	1.7	0.8	0.6	1.2	0.6	1.5	2.9	1.4
1.5 per cent pa decrease in probability of entering residential care – average package	0.9	1.7	0.8	0.6	1.0	0.4	1.5	2.7	1.2
1.5 per cent pa decrease in probability of entering residential care – 2 x average package	0.9	1.8	0.9	0.6	1.0	0.4	1.5	2.8	1.3
1.5 per cent pa increase in probability of entering residential care	0.9	1.8	0.9	0.6	1.3	0.7	1.5	3.1	1.6
No increase in care home supply	0.9	1.7	0.8	0.6	0.9	0.3	1.5	2.6	1.1

Source: PSSRU model estimates

Table 6: Workforce* in care homes ('000)

	2007	2032	% change
Base case	168.4	313.9	86.4
No change in marital status rate	168.6	318.8	89.0
Marital status – 1996 projections	168.8	316.8	87.7
Marital status – 1992 projections	168.6	322.1	91.0
1 per cent increase pa in single living alone	168.5	317.7	88.5
1.5 per cent increase pa in single living alone	168.6	319.2	89.3
High life expectancy	168.4	334.8	98.8
Low life expectancy	168.4	293.3	74.1
2.5 per cent increase in unit costs	168.4	313.9	86.4
1.5 per cent increase in unit costs	168.4	313.9	86.4
No change in housing tenure	168.4	318.1	88.9
Tenure increases 25 per cent	168.4	313.0	85.8
Tenure decreases 25 per cent	168.4	314.9	87.0
1.5 per cent pa decrease in probability of entering residential care – average package	165.9	211.9	27.7
1.5 per cent pa increase in probability of entering residential care	170.2	381.2	124.0
No increase in home care supply	165.6	165.6	0.0

Source: PSSRU model estimates
* Staff categories included are nurses, care home non-medical staff

Varying assumptions about tenure rates does not have a significant impact on projections of care home workforce requirements. Assuming the rate of owner-occupation declines by 25 per cent by 2032, the model projects a 87 per cent increase in the care home workforce. Assuming no change in the owner-occupation rate between 2007 and 2032 projects a 89 per cent increase in the required care home workforce.

Scenarios which switch the balance of care between residential and community care have the greatest impact on care home workforce requirements of the scenarios modelled. In the scenario where there is a 1.5 per cent per annum decrease in the probability of entering a care home, the model projects that the care home workforce would need to increase by 46,000 or 27.7 per cent by 2032. This is significantly lower that the projected workforce needed in the base case: 313,900 (an increase of 86.4 per cent over 2007). A scenario which increases the probability of entering a care home by 1.5 per cent per annum finds that an additional 211,000 individuals would be required to staff care homes. This represents an increase of 124.0 per cent over 2007 staffing levels.

While the focus here has been on staffing in care homes, the scenarios that shift the balance of care will, of course, also impact on staff requirements in domiciliary care. For example, the scenario where there is a 1.5 per cent per annum decrease in the probability of entering a care home would suggest a 109 per cent increase between 2007 and 2032 in the number of home care staff. A scenario which increases the probability of entering a care home by 1.5 per cent per annum would suggest a 66 per cent increase in home care staff between 2007 and 2032. Under the base case, home care staff is projected to increase by 81 per cent between 2007 and 2032.

6. Discussion

There are several ways in which the scenarios analysed have limitations and could be developed further. For example, in those scenarios where we increase or decrease unit costs, we have assumed that the demand for long-term care services is neither price elastic nor price inelastic (i.e. price elasticity = 1). That is, we assume that changes in the unit costs of services do not impact on people's proclivity to purchase more or fewer services. It should be noted, however, that the price sensitivity of the consumers of long-term care may be diluted by subsidies which offset a portion of private costs for many care recipients. Changes in unit costs may also impact on the sustainability of many providers of long-term care, particularly in residential care (Kendall et al., 2003).

In the balance of care scenario where there is a decrease in the probability of entering residential care we are currently limited in how we can model the care choices of those 'moved to' community care. We assume, for this group, that there is no availability of informal care and that they receive publicly and privately funded services with the same probability as those in experiencing difficulty with 2 or more activities of daily living. This, however, makes assumptions about the resources of these individuals and their proclivity to pay for services.

Another limitation of the model is that some of the data included is quite dated. The projections would be improved if more recent data became available. This is particularly an issue with regards to data on care home recipients. Much of the data currently used in the model on care home residents was obtained in a 1995 survey.

The model projections make quite a simple assumption about the split between private and public funding. We assume that the proportion of care home residents who are private payers rises in line with the proportion who were owner occupiers living alone before their admission to residential care. One reason why this is important is that controlling for age, care home residents are disproportionately likely to have lived alone and to have rented rather than owned their homes. At the same time, housing tenure and whether previously living alone are both characteristics which affect liability for care home charges. Therefore the relationship between future private financing of residential care and housing tenure may not be as simple as assumed in modelling reported in this report. The results are driven heavily by this assumption and future development would incorporate alternate assumptions about this relationship.

The model also does not currently consider the extent to which choices that older people (and their families) make regarding entering housing with care are driven by the types of such housing available to them. The introduction of new forms of housing with care such as Extra-Care Housing (ECH), may be more attractive to potential residents. We do not make assumptions about changes in expectations over time that may result from changes such as the introduction of ECH.

Finally, the analyses reported here have considered the impact of changes to only a subset of the variables. The model is sensitive to changes in other variables such as the rate of disability in the older population.

Despite these limitations the analysis provides some interesting results. In particular, it suggests that projections of future demand for residential care are very sensitive to assumptions regarding the rate of change in the probability of entering residential care and this is also likely to impact significantly on the

distribution of funding of residential care between public versus private spending. The rate of change in the probability of entering residential care is also likely to have a significant impact on the future demand for workers employed in care homes. Even small changes in the numbers of older people in care homes will warrant substantial shifts in the required workforce, thus suggesting a need for focussed management of workforce within care homes.

It is also apparent that restrictions in the supply of care home places in the future may reduce the growth in spending on long-term care, but this would depend significantly on the level of home care that would be required to support older people living in the community.

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