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Impact of changes in length of stay on the demand for residential care services in England:

Estimates from a dynamic microsimulation
model

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Introduction

Residential care services constitute the largest component of social care expenditure in England (approximately 60% of gross service expenditure). Recent Department of Health figures show that gross social care expenditure on supported, residential and nursing accommodation has grown from just below £1.9bn in 1994-95 to £4.8bn in 2009-10 (see Figure 1).

Understanding the level of demand for residential care services in the future, and the associated costs, is therefore paramount to planning for an efficient and equitable social care system in the future. This paper explores the impact of changes in the length of time that individuals spend in residential care once admitted, in order to gauge the impact of likely improvements in the survival of residents in the future. The paper also considers the sensitivity of future projections of care home expenditure requirements to different assumptions about the real-terms growth costs of labour and capital.

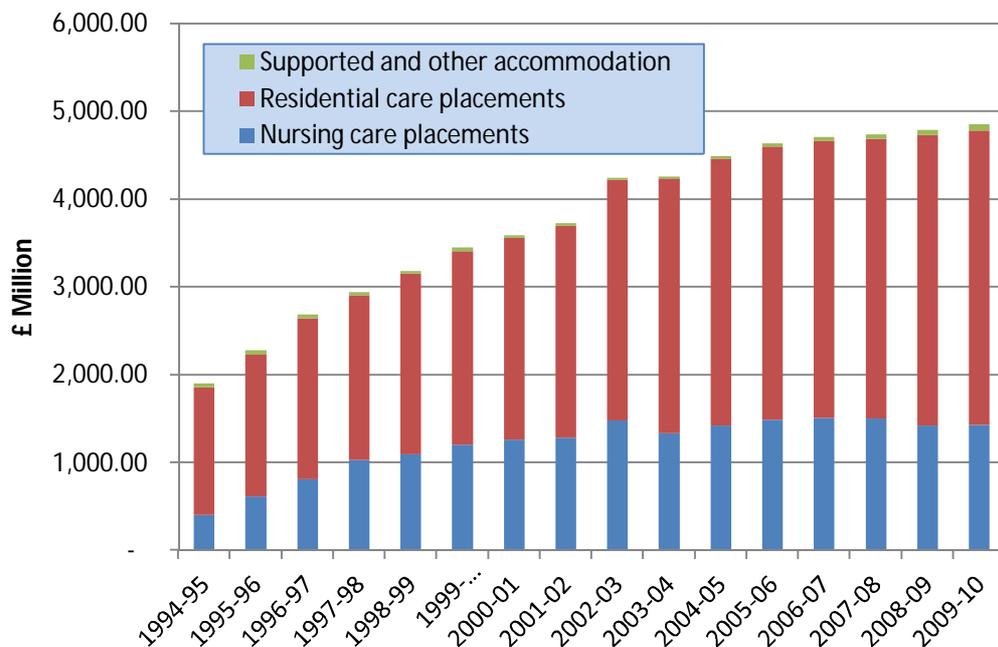
The implications of length of stay and costs are made in terms of their impact on the projected level of funding required to support future numbers of older people with care needs. Using the PSSRU microsimulation model¹, projections are made as to future expenditure requirements on the assumption that other relevant factors remain unchanged.

The results of this work are intended to help policy makers develop reform options for the funding of social care. A range of reform proposals have been developed including the 1999 Royal Commission report, the 2006 Wanless Social Care Review (Wanless, Forder et al. 2006), the 2009 Green Paper, *Shaping the Future of Care Together* (Department of Health 2009) and most recently by the Dilnot Commission on the funding of care (Commission on Funding of Care and Support 2011). One particular area of reform concerns the very high care costs incurred by a small number of

¹ The model uses BHPS (University of Essex. Institute for Social and Economic Research 2010) and ELSA data (Marmot, Nazroo et al. 2011) (supplied by the UK Data Archive) – (See Forder and Fernández 2011, for details).

people and the ways in which these costs can be capped. To gain a good understanding of these 'tail-end risks' requires good data and analysis of care home length of stay. To date there has been very little research available in England to quantify length of stay and its impact on aggregate care costs. The last relevant research was the longitudinal study on care homes in England carried out in 1995/6 (Bebbington, Darton et al. 2001). This study did not however consider the aggregate cost implications of changes in length of stay.

Figure 1 Gross state expenditure on institutional care for older people, England



Source: EX1 returns, Department of Health

Methods

This analysis uses a dynamic microsimulation model to estimate future changes in demand and levels of use of residential care services in England.

Relative to previous analyses, the estimations have used new assumptions about the processes associated with the risk of institutionalisation. Rather than assuming that a constant proportion of the population of older people with disabilities remains in residential care at any point in time, the analysis assumed a constant risk of institutionalisation for disabled people in the community. Amongst other things, this allowed the analysis to explore the impact on the estimates of demand for residential care of varying assumptions about changes in the length of stay in the future. In other words, it allowed us to observe separately the effect of changes in the risk of institutionalisation and of changes in the probability of survival once individuals are admitted into residential care.

Exploring the implications of different lengths of stay in residential care is important given the expected gains in life expectancy for new cohorts of older people. Whereas no information exists at the moment about the extent to which these gains also apply to individuals in residential care, factors such as improvements in clinical practice, and in particular in the treatment of long term conditions, are likely to lead to improvements in the rate of survival of residential care users.

Evidence about survival rates and hence length of stay in care homes has been limited. This study uses a recent analysis of the length of stay of over 10,000 people in Bupa care homes – re-weighted to reflect the national picture – to provide estimates that have been incorporated into the PSSRU model (see Forder and Fernandez, 2011).

Results

Costs and recipients - base case scenario

This section reports estimates of the costs and service volume of residential care services under the central assumptions of the model, which include an assumption of constant age and gender specific prevalence of disability, changes in life expectancy as described by GAD (2006 central projections) and real-terms increases in unit costs. Care home unit costs are assumed to start at £550 per week on average and grow by 1.5% in the period 2009/10 to 2016/7, and of 2% thereafter.

A base assumption is that new cohorts of 65 year olds entering the over 65 population each year are 2% in real terms more wealthy than previous cohorts. This assumption is made in particular to reflect the long-term growth in the real value of housing assets. As far as possible, the estimates take into account likely behavioural changes (demand effects) linked to the costs of services (see Forder and Fernández 2009, for further details).

All expenditure figures below are in 2009/10 prices and so reflect real-terms changes. They are made on the assumption that the nature of the care system remains unchanged so that people with a certain level of need would be assessed to receive the same intensity of care support in the future as they do now. Furthermore, the eligibility conditions and means-test rules remain the same in the future as they are in the current funding system.

Private and public residential care costs

Table 1 shows a significant projected growth in residential care expenditure in the period 2009/10 to 2025/26. The figures indicate faster growth in private levels of expenditure (predicted to more than double over the period), which reflects a growing proportion of older people becoming excluded from the means-tested state support system (by virtue of the assumed growth in their wealth).

Table 1 Costs to the state and private individuals of residential care services, England (£bn)

Year	State system			Private expenditure	Total
	Public Gross residential spend	Net res spend	Res care charges		
2009/10	5.08	3.54	1.54	3.38	8.46
2010/11	5.22	3.65	1.57	3.67	8.89
2011/12	5.53	3.84	1.69	3.69	9.22
2012/13	5.75	4.01	1.74	3.96	9.71
2013/14	6.02	4.18	1.83	4.20	10.21
2014/15	6.07	4.23	1.84	4.52	10.60
2015/16	6.30	4.39	1.91	4.69	10.99
2016/17	6.44	4.48	1.96	4.99	11.43
2017/18	6.64	4.61	2.03	5.12	11.76
2018/19	6.72	4.68	2.04	5.45	12.17
2019/20	6.89	4.77	2.11	5.80	12.68
2020/21	7.02	4.85	2.17	6.02	13.05
2021/22	7.43	5.15	2.28	6.24	13.67
2022/23	7.55	5.23	2.33	6.49	14.04
2023/24	7.84	5.44	2.40	6.72	14.55
2024/25	8.18	5.69	2.48	6.92	15.09
2025/26	8.45	5.87	2.58	7.36	15.81

Private and public residential care recipients

Similar patterns are found in terms of the volume of residents projected in England for the period 2009/10 to 2025/26. In particular, the volume of private residents is projected to increase by 65%, compared with a 25% growth in the numbers of supported residents. By the end of the period considered, the results project almost equal numbers of private and publicly supported residents.

Furthermore, average charges among individuals supported to some extent by the state are expected to increase, in constant prices, by an average of 33% over the period.

Table 2 Numbers of private and public residential care users , England (million)

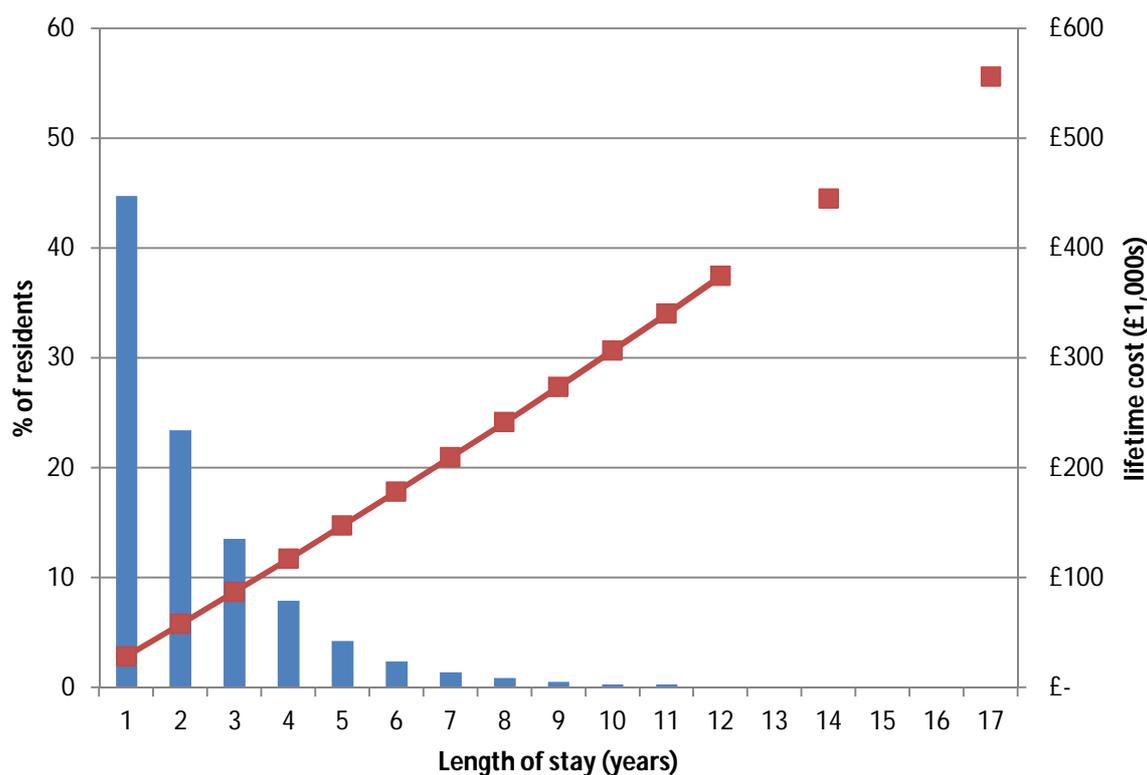
Year	Public	Private	Total
2009/10	0.17	0.12	0.30
2010/11	0.17	0.13	0.31
2011/12	0.18	0.13	0.31
2012/13	0.19	0.14	0.32
2013/14	0.19	0.14	0.34
2014/15	0.19	0.15	0.34
2015/16	0.20	0.16	0.35
2016/17	0.20	0.16	0.36
2017/18	0.20	0.16	0.36
2018/19	0.20	0.17	0.37
2019/20	0.20	0.18	0.38
2020/21	0.20	0.18	0.38
2021/22	0.21	0.19	0.39
2022/23	0.20	0.19	0.39
2023/24	0.21	0.19	0.40
2024/25	0.21	0.19	0.41
2025/26	0.22	0.20	0.42

Lifetime costs in residential care

Given the significant weekly cost of a residential care place and the risk of asset depletion associated with the service, it is useful to explore the distribution of lengths of stay in residential care, and of the projected individual level lifetime residential care costs.

The tables below represent the lifetime care costs of individuals who are projected in the model to be admitted into a home in 2009/10.

Figure 2 Distribution of length of stay in residential care and associated costs



The results in Figure 2 suggest that just below one fifth of people admitted into residential care will stay for a period of 4 years or more, with associated lifetime costs in excess of £100,000. Overall, the average lifetime residential care costs among residents was estimated to be equal to approximately £67,000, with a median of £57,000. A small number of people (around 1% or 3000 residents) are expected to have very long lengths of stay, or 10 years or more, and for these people the cost of their care would exceed £300,000. Clearly, for a significant proportion of residential care users, finding a mechanism for helping them to get cover against the risk of catastrophic care expenditures should be an important policy consideration.

Impact of increase in life expectancy

What are the consequences of changes to mortality rates in care homes? In what follows we present an analysis that assumes an increase of 2.5% in the average survival rate of individuals in residential care. The results allow us to gauge some of the implications of possible future increases in the length of stay in residential care linked to factors such as improvements in the health care outcomes for dependent older people. Improvements in the treatment of dementia patients, for instance, could lead to significant increases in the survival rates for these patients and thus on the length of time that they spend in residential homes.

A change of 2.5% in the average survival of residents is relatively small (the average survival rate of new residents is, for instance, approximately 50%). In the absence of strong evidence to guide the assumptions in the analysis, the figure is used for illustrative purposes, and does not imply a central expectation of how survival rates in residential care homes in England might vary in the future.

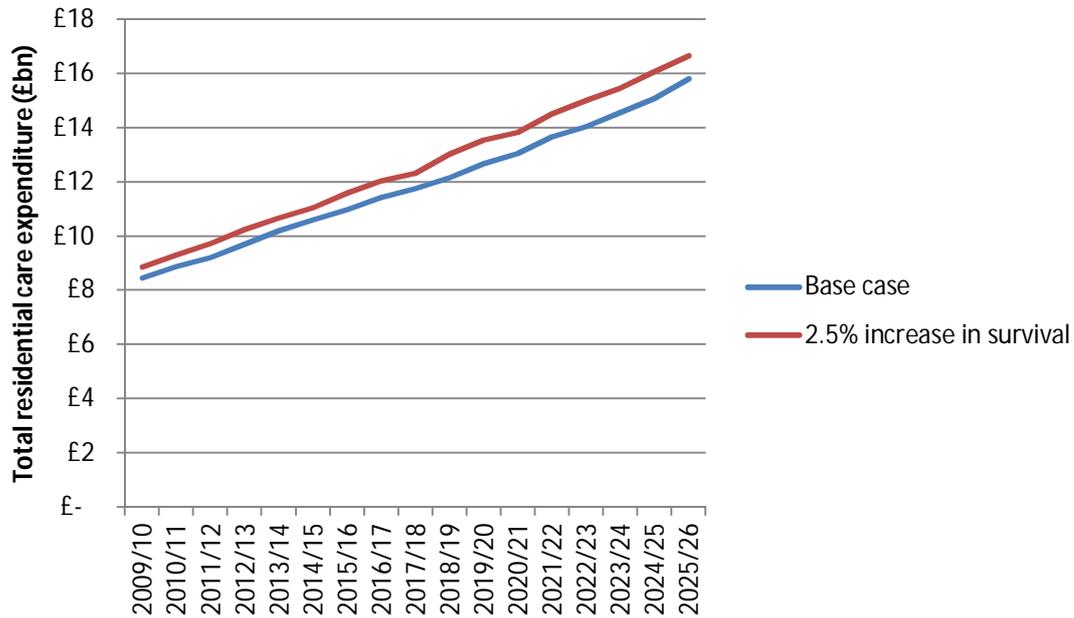
As expected, the results suggest an increase in the volume of residential care users and in the aggregate cost of the service following a reduction in the risk of death, and thus an increase in the average length of stay in residential care – see Table 3.

Table 3 Costs to the state and private individuals of residential care services assuming a 2.5% increase in average survival probabilities for residential care users, England (£bn)

State system					
Year	Public Gross residential spend	Net res spend	Res care charges	Private expenditure	Total
2009/10	5.21	3.63	1.58	3.65	8.87
2010/11	5.38	3.75	1.63	3.92	9.30
2011/12	5.63	3.92	1.71	4.11	9.74
2012/13	5.98	4.15	1.83	4.27	10.26
2013/14	6.23	4.34	1.89	4.44	10.67
2014/15	6.48	4.50	1.99	4.57	11.05
2015/16	6.74	4.69	2.05	4.85	11.59
2016/17	6.73	4.69	2.03	5.31	12.04
2017/18	6.93	4.79	2.14	5.39	12.32
2018/19	7.38	5.11	2.27	5.66	13.04
2019/20	7.63	5.29	2.34	5.93	13.56
2020/21	7.59	5.30	2.30	6.24	13.84
2021/22	7.94	5.48	2.46	6.57	14.51
2022/23	8.06	5.57	2.49	6.95	15.00
2023/24	8.33	5.77	2.57	7.12	15.46
2024/25	8.67	6.04	2.63	7.41	16.08
2025/26	8.78	6.11	2.67	7.88	16.66

The differences in aggregate expenditure between the two scenarios are depicted in Figure 3. By 2026, the annual difference in expenditure between the two scenarios accounts for approximately £0.9bn. This is equivalent to a 1.06 elasticity of expenditure to changes in the probability of death in residential care; that is, a 10% reduction in probability of death of care home residents at any time would lead to a little over 10% increase in care home expenditure requirements.

Figure 3 Aggregate residential care expenditure under different assumptions about length of stay in residential care



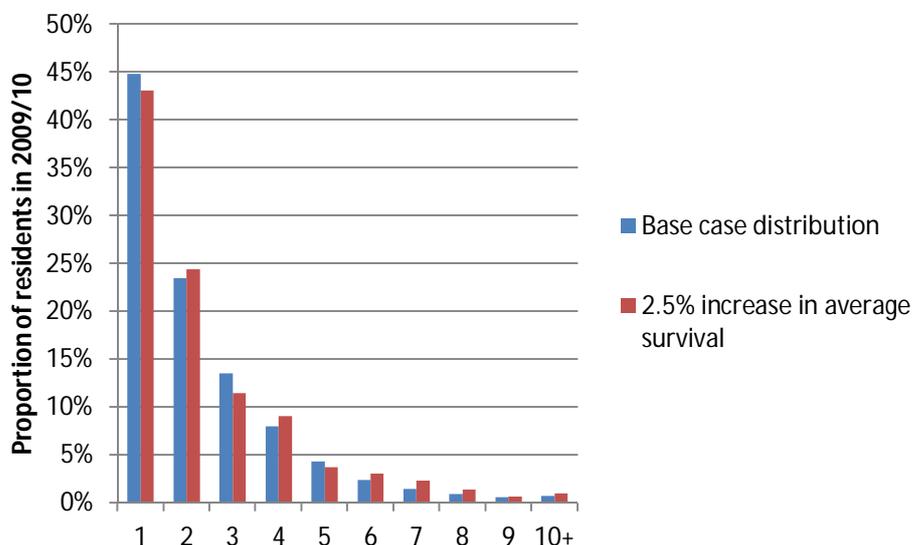
In terms of the volume of residents, the results also suggest increases in the numbers of residents. This does not respond to changes in the likelihood of institutionalisation, which remains constant in the model through time, but rather to the fact that individuals, once admitted, survive for longer periods. As a result, by 2026, the model projects an additional 20,000 to 30,000 residents per year (approximately 5 to 6 % increase in the volume relative to the base case).

Table 4 Numbers of private and public residential care users assuming 2.5% increase in survival in residential care, England (million)

Year	Public	Private	Population increase
2009/10	0.18	0.13	0.01
2010/11	0.18	0.14	0.01
2011/12	0.19	0.14	0.02
2012/13	0.19	0.15	0.02
2013/14	0.20	0.15	0.01
2014/15	0.20	0.15	0.01
2015/16	0.21	0.16	0.02
2016/17	0.21	0.17	0.02
2017/18	0.21	0.17	0.02
2018/19	0.22	0.18	0.03
2019/20	0.22	0.18	0.03
2020/21	0.21	0.19	0.02
2021/22	0.22	0.20	0.02
2022/23	0.22	0.20	0.03
2023/24	0.22	0.20	0.02
2024/25	0.23	0.21	0.03
2025/26	0.22	0.22	0.02

Figure 4 shows the distribution of length of stay of residents that were in care homes in 2009/10. As expected, with an increase in survival chance we see a greater proportion of those residents with longer lengths of stay than before.

Figure 4 Change in the distribution of lengths of stay in residential care



Changes in Unit costs

As noted above, the care home unit costs are assumed to start at £550 per week on average and grow by 1.5% in the period 2009/10 to 2016/7, and of 2% thereafter in the base model. Labour costs (earnings) usually increase at a faster rate than prices (with the CPI price index used in the model). To test the sensitivity of expenditure requirements to unit cost growth assumptions, we present below in Table 5 projections that assume 2.5% growth in unit costs.

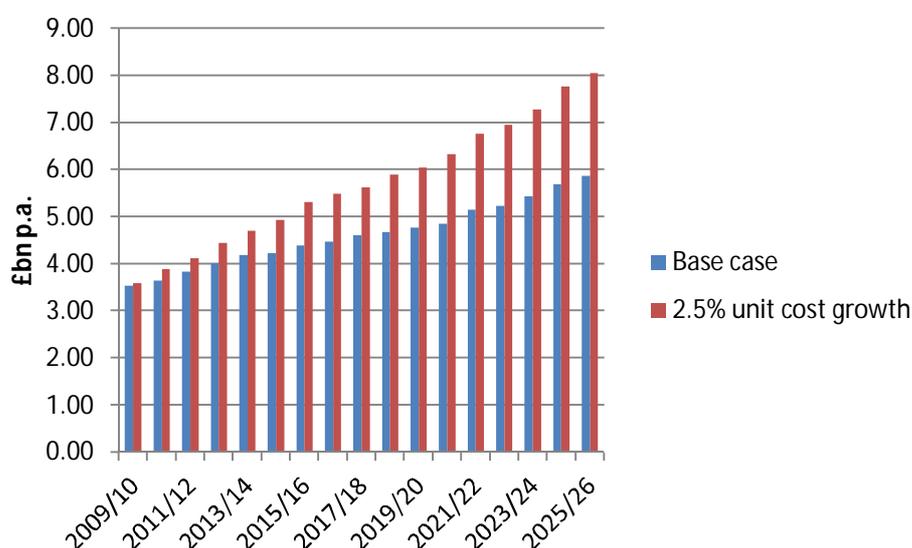
As also shown in Figure 5, the change in unit cost growth assumptions have a significant impact on the level of future projected expenditure. The elasticity of net public spend to unit cost growth changes is 0.97 e.g. a 10% increase in the growth rate over the period 2009/10 to 2025/6 would imply a just under 10% increase in net public expenditure requirements for residential care in 2025/6

Any cost containment strategy would need to limit as far a possible excessive increases in the weekly cost of care.

Table 5 Costs to the state and private individuals of residential care services, England (£bn), 2.5% unit cost growth scenario

Year	State system			Private expenditure	Total
	Public Gross residential spend	Net res spend	Res care charges		
2009/10	5.14	3.59	1.56	3.70	8.84
2010/11	5.52	3.89	1.63	3.85	9.36
2011/12	5.82	4.12	1.70	4.11	9.93
2012/13	6.22	4.44	1.78	4.39	10.61
2013/14	6.60	4.70	1.90	4.60	11.20
2014/15	6.93	4.94	1.99	4.88	11.80
2015/16	7.39	5.31	2.08	5.12	12.51
2016/17	7.59	5.49	2.10	5.50	13.09
2017/18	7.77	5.62	2.15	5.91	13.68
2018/19	8.20	5.90	2.31	6.15	14.35
2019/20	8.38	6.05	2.33	6.70	15.08
2020/21	8.77	6.32	2.45	6.98	15.75
2021/22	9.34	6.76	2.58	7.43	16.77
2022/23	9.65	6.96	2.69	7.66	17.31
2023/24	10.05	7.28	2.77	8.17	18.22
2024/25	10.68	7.77	2.91	8.64	19.32
2025/26	11.05	8.06	3.00	9.07	20.13

Figure 5 Net public costs of residential care p.a., unit cost scenarios



Lifetime expected costs

The expected or average lifetime costs of care for someone at 65 (in 2009/10) is a combination of their risk of needing (formal) care and the intensity and duration (package cost) of that care should a need arise.

There are a number of ways that lifetime cost can be defined. We could assess the lifetime cost of care actually used which reflects people's preferences, but this estimate would vary according to the financial system in place because this affects people's demand for care. To estimate underlying costs it is therefore more appropriate to assess the lifetime cost of care that people would use in the absence of demand effects i.e. if they paid no charges or fees at the point of use. This estimate is affected by the nature of the needs test that is currently in place (as of 2009/10) i.e. it reflects the eligibility thresholds current set by councils and also that the assessment of need takes account of the availability of informal care. Table 6 has lifetime cost estimates including care and accommodation costs and Table 7 present the results for care costs only. These estimates are of (formal) care costs only. No discounting is assumed.

Table 6. Lifetime costs are 65 (in 2009/10), no discounting – care and accommodation costs

	Mean	Median	Min	Max
All	50300	18700	0	806400
Male	34300	8000	0	546200
Female	64800	34900	0	806400

Table 7. Lifetime costs are 65 (in 2009/10), no discounting – care costs only

	Mean	Median	Min	Max
All	34700	16900	0	432700
Male	24500	8000	0	373100
Female	44000	27700	0	432700

The following two charts show the underlying distribution of lifetime costs, indicating the highly skewed nature of the distribution.

Figure 6. Lifetime costs are 65 (in 2009/10), no discounting – care and accommodation costs

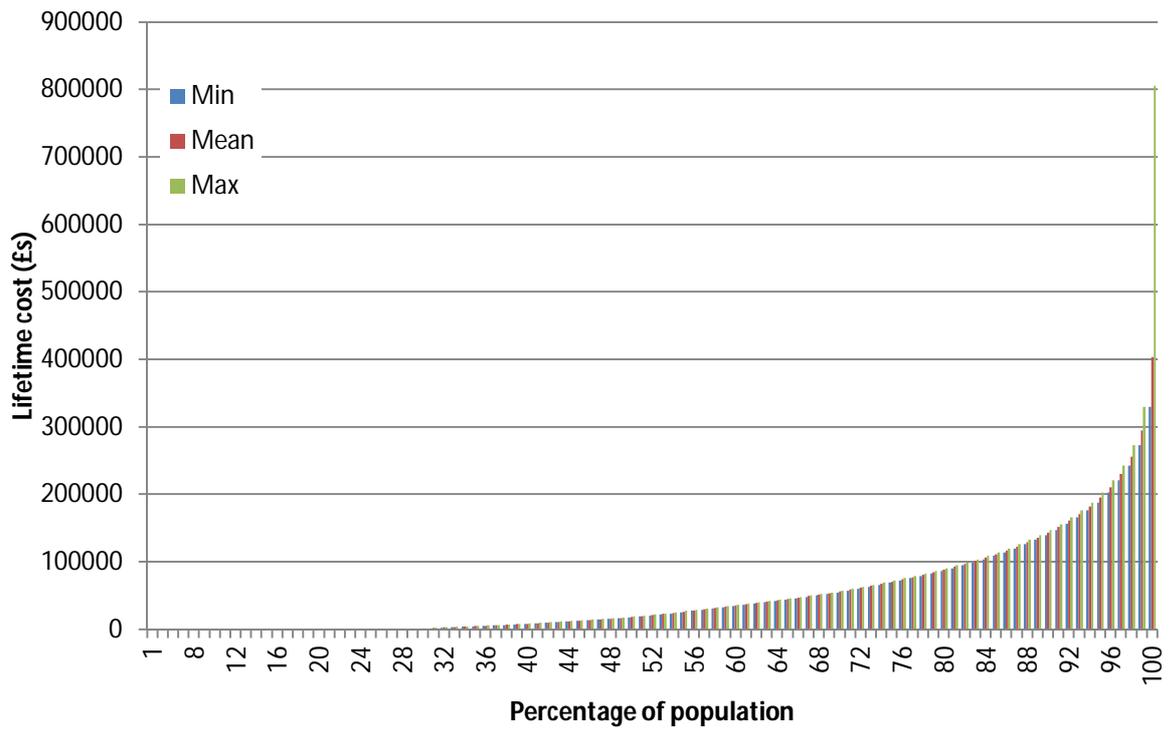
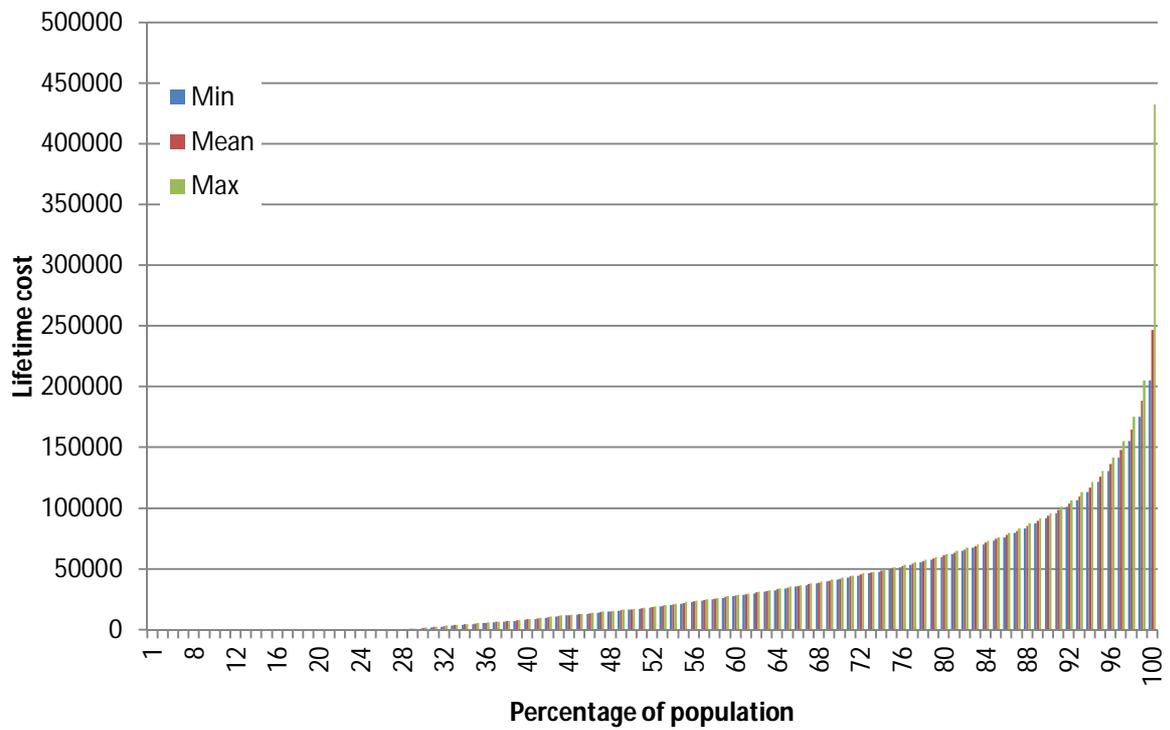


Figure 7. Lifetime costs are 65 (in 2009/10), no discounting – care costs only



Policy implications

Understanding levels of need for residential care, and the financial resources required to meet such demand are critical policy issues. Residential homes support some of the most vulnerable dependent people and insuring that resources are available to commission an appropriate level of service is key to caring effectively for older people now and in the future. From an individual's financial point of view, the costs of a residential care place can often impact very significantly on a person's assets, in particular following long spells in a home.

The results in this paper highlight the significant level of costs faced by self-payers with prolonged stays in residential care. Finding mechanisms for insuring individuals against such costs is now a policy priority across the political spectrum.

There is significant uncertainty, however, about the size of the 'risk' faced by individuals, and about how such risk might evolve into the future. The present work highlights how relatively modest changes in survival in residential care will lead to longer spells and ultimately to a higher levels of demand and expenditure, even assuming the risk of institutionalisation remains constant. The analysis also shows the significant impact of changes in the growth of the unit (weekly person) costs of care home services.

More analysis is needed to ascertain the extent to which the gains in life expectancy that are expected for new cohorts of older people in society will translate into patterns of utilisation of residential care services, and on the distribution of the risk of catastrophic care expenditures.

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