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Relying on informal care in the new century? Informal care for elderly people in England to 2031

LINDA PICKARD*, RAPHAEL WITTENBERG*, ADELINA COMAS-HERRERA*, BLEDDYN DAVIES* and ROBIN DARTON†

ABSTRACT

The research reported here is concerned with the future of informal care over the next thirty years and the effect of changes in informal care on demand for formal services. The research draws on a PSSRU computer simulation model which has produced projections to 2031 for long-term care for England. The latest Government Actuary's Department (GAD) 1996-based marital status projections are used here. These projections yield unexpected results in that they indicate that more elderly people are likely to receive informal care than previously projected. The underlying reason is that the GAD figures project a fall in the number of widows and rise in the number of elderly women with partners. What this implies is that 'spouse carers' are likely to become increasingly important. This raises issues about the need for support by carers since spouse carers tend to be themselves elderly and are often in poor health. The article explores a number of 'scenarios' around informal care, including scenarios in which the supply of informal care is severely restricted and a scenario in which more support is given to carers by developing 'carer-blind' services. This last scenario has had particular relevance for the Royal Commission on Long Term Care.

KEY WORDS – informal care, family care, older people, long-term care, England.

Introduction

Informal care, particularly by the family, is the most important source of care for most elderly people. Older people rely far more on informal than on formal care. As part of the research described in this article, an analysis of the 1994/95 General Household Survey 'Elderly data'

* Personal Social Services Research Unit, London School of Economics.
† Personal Social Services Research Unit, University of Kent.

showed that 80 per cent of people aged 65 and over who had help with domestic tasks relied exclusively on informal help (spouse, other household members, relatives outside the household, neighbours and friends), 10 per cent relied on both informal and formal help and only 10 per cent relied exclusively on formal services (National Health Service, personal social services, and paid and voluntary services).

Informal care is a key factor influencing the extent of formal services. The approach to informal care adopted by social services in the UK, certainly prior to the community care changes of the early 1990s, was characterised by a model that tended to treat carers as resources and to assume that the social care system need only step in when informal support was unavailable (Twigg and Atkin 1994). Local authorities varied greatly in this and, during the late 1980s and early 1990s, new emphasis was placed in government policy on providing positive support for carers (Secretaries of State 1989; Davies *et al.* 1990; Davies 1997; Twigg 1998; Davies *et al.* 2000). The extent to which elderly people continue to rely on informal care, however, suggests that any reduction in informal care could have a substantial influence on demand for formal care.

Yet there is considerable uncertainty about the future of informal care. The literature on informal care reflects a widespread concern about its future availability (Allen and Perkins 1995). A number of reasons have been cited for anticipating a potential decline in informal care. These include the changing age structure of the population (Grundy 1995); rises in divorce rates (Clarke 1995); a decline in family size (Clarke 1995); rising childlessness (Evandrou 1998); rises in employment rates among married women (Doty 1986); the changing household composition of elderly people, with fewer living with their children (Grundy 1995); the changing care preferences of elderly people (West *et al.* 1984; Phillipson 1992); and the nature of kinship obligations, especially in relation to filial responsibilities (Finch 1995). There is by no means universal agreement about the implications of current social trends for informal care, yet this is clearly an issue of great importance affecting future demand for formal care.

Underlying the uncertainty about the future availability of informal care, there is a wider social policy issue, concerned not so much with whether we *can* continue to rely on informal care but whether we *should* continue to rely on it. The emphasis in community care policies on informal care has been queried in recent years by those writing from the disability rights perspective (Oliver 1990; Morris 1991, 1997). From this perspective, the emphasis on informal carers diverts attention and resources from the issue of the support of disabled people themselves.

Policy, it is argued, should not endorse dependence through an emphasis on supporting carers but should underwrite the independence of the disabled people they care for. This type of perspective has found a resonance within social policy for older people, with the view that 'while family care is an important resource that should be nurtured, the primary goal of policy must be to secure the dignity and quality of life of older citizens, and to ensure that they receive the support they need in the place, and manner, they prefer' (Baldwin 1995: 138). This means reducing dependence on the next generation, rather than increasing it. Support to the elderly person is seen as a way of relieving the burden on the carer, as well as being significant in its own right. Baldwin observes that this type of view has been expressed widely.

The debate about the future of policies for the long-term care of elderly people and their carers is particularly relevant at the moment with a number of new policy initiatives on informal carers. In February 1999, the National Strategy for Carers was announced, a key element of which was the provision of £140 million for England over a three-year period, to enable carers to take short-term breaks from caring (A National Strategy for Carers 1999). A month later, the report of the Royal Commission on Long Term Care was published (Royal Commission on Long Term Care 1999). The Commission recommended the provision of better services to people with a carer and a national carer support package, with a budget of £220 million a year in addition to the resources provided by the National Strategy for Carers. The note of dissent by two Commissioners also had proposals about support for carers, recommending a budget of £300 million a year to support carers and stressing, in particular, respite care (Royal Commission on Long Term Care 1999)[1].

There is, then, currently a great deal of interest in the social policies that should be adopted towards carers and the people they care for. This is of particular importance because it is intended to affect policy development in the long term. Central to this debate is the need for greater understanding about the future of informal care.

There are a number of different approaches to understanding the future of informal care. One approach is to explore current social trends within the context of demographic forecasts, an approach that was exemplified in the collection of essays edited by Allen and Perkins (1995). Another approach, in which there is increasing interest, is through the modelling of changes in the older population within a social policy context (Evandrou 1999).

The research reported in this article adopts the second of these approaches. It uses a computer simulation model to make projections

about demand for long-term care, both formal and informal, under clearly specified assumptions. These assumptions are then varied to explore different 'scenarios', including scenarios affecting the future of informal care. The approach allows for the exploration of the consequences of different assumptions about the supply of informal care and of different policies regarding informal carers. It is therefore valuable for exploring policy options for informal carers. It was in modelling of this kind that the Department of Health, and subsequently the Royal Commission on Long Term Care, were particularly interested.

The research arises from a larger study carried out at the Personal Social Services Research Unit (PSSRU). The study as a whole produced a model to make projections to 2031 of likely demand for long-term care services for people aged 65 and over, and of the costs associated with meeting the expected demand (Wittenberg *et al.* 1998, 2001). The PSSRU study informed the report of the Royal Commission on Long Term Care, which used its projections of future demand and costs (Royal Commission on Long Term Care 1999: Chapter 2). The current paper is based on the PSSRU study but explores the issue of informal care in more detail. The paper uses an updated version of the PSSRU model, which incorporates improvements in design and more recently published data. In particular, it uses the 1998-based population projections for England produced by the Government Actuary's Department (GAD), rather than the 1994-based projections used in the original study. It also uses the GAD's 1996-based marital status projections, rather than the 1992-based projections originally used.

The current paper has two main aims: first, to present projections about the numbers of elderly people with informal care to the year 2031; second, to look at the effect of changes in the availability of informal care on demand for formal services, exploring different future scenarios involving a possible reduction in the supply of informal care and changes in policies towards carers.

The article has four parts. The first part briefly explores some theoretical issues around making projections about informal care and demand for formal services. The second then summarises the data and methods adopted in the current study. The third part presents the results of the study, in terms of projections about the numbers of people with and without informal help, key variables underlying changes in informal care and the cost implications of scenarios involving informal care. Finally, in the last part, the implications of the findings are discussed.

Theoretical issues in making projections about informal care

There is a small international literature on projections for long-term care. In the United States, projections have been made by the Urban Institute (Zedlewski *et al.* 1990) and by the Brookings Institution and Lewin-VHI (Wiener *et al.* 1994). Neither of these models has made projections about informal care. In Britain, projections of long-term care finance have been made by at least three agencies: the Institute of Actuaries (Nuttall *et al.* 1994); London Economics with the Institute for Public Policy Research (Richards *et al.* 1996) and the Department of Health (House of Commons Health Committee 1996). All of these agencies considered the effects of future changes in informal care.

The existing approaches to informal care have raised theoretical issues to do with making projections about informal care and with the relationship between informal and formal care.

Estimating informal care in future years

The existing approaches to informal care have been located within economic models but have differed in their approach to informal care in that they have been essentially either 'demand-led' or 'supply-led'. The model of the Institute of Actuaries was primarily concerned with the projected numbers of dependent elderly people and the hours of care they might need (Nuttall *et al.* 1994). They did look at scenarios where the share of informal care declined, but their model was primarily a model of hours of care needed and was, in that sense, demand-led. The model of informal care adopted by London Economics, on the other hand, was supply-led. Here the assumption was made that 'the level of informal care is determined by the supply of informal care' (Richards *et al.* 1996: 36). In the base case of this model, the hours of informal care changed in line with the numbers of potential carers. The analysis was based on constant average hours of care supplied by each subgroup of the population, defined in terms of age, sex, economic status, household type and income.

The problem with a demand-led approach is that it is the supply of informal care that is most critical when looking at the future of informal care. As the opening paragraphs of this article indicate, the uncertainty about informal care in the future is essentially about the availability of carers. Indeed, in economic terms, the concept of demand for informal care has little meaning in practice in the absence of family or friends willing to supply such care; that is, in the absence of potential supply. On the other hand, the problem with an exclusively supply-led approach is that it implicitly assumes that willingness to

supply care is not affected by the needs of the person who may need care. Yet it is one of the central conclusions of the literature on informal care that informal care is not homogeneous but is differentiated according to the nature of the help needed (Parker and Lawton 1994; Twigg 1996). It has been found, in particular, that a wide range of informal sources of support are often available to help with practical or domestic tasks, but informal help with personal and/or physical tasks usually comes from within the household (Parker and Lawton 1994). Thus the supply of informal care is mediated by demand for care.

It therefore seemed important to reflect both supply and demand in modelling informal care. An attempt to do this was made in the study described here by using as predictors of receipt of informal care, both demand and supply variables. The probability of receiving informal care is simulated for future years based on an analysis of the predictors of receipt of informal care in the present. Whether or not a person receives informal care is treated as a function of both the person's need for care (a demand variable) and the likely availability of informal care (a supply variable). The approach adopted in the present study is described further in the section on data and methods below.

The relationship between informal and formal care

One of the purposes of the current article is to explore the effects of changes in informal care on demand for formal services and expenditure on services. In order to do this, it was necessary to theorise the relationship between informal and formal care.

Elsewhere, it has been assumed that a fixed number of hours of long-term care are needed for dependent elderly people and that the formal sector provides whatever the informal sector does not provide. The London Economics/IPPR model used this approach in that it projected the total amount of care needed and the amount of informal care provided up to 2031. Formal care was projected as the amount of care in excess of that provided by the informal sector (Richards *et al.* 1996).

One of the problems with this type of approach, however, is that it assumes that formal and informal care are perfect substitutes. There is a considerable literature on the substitution of formal for informal care, particularly in the United States (Long 1995; Tennstedt *et al.* 1996; Davies *et al.* 1998). This suggests that, although substitution of formal for informal care does occur, formal care does not replace informal care fully on an hour for hour basis and not every informal hour is replaced by formal services (Tennstedt *et al.* 1996). Furthermore, there is evidence that hours of informal care and hours of formal services are not time-equivalent (Tennstedt *et al.* 1996; Davies *et al.* 1998).

For this reason, the PSSRU study does not assume perfect substitution between formal and informal care. Rather, a different approach is used. Here, the likelihood of using formal care is simulated for future years based on an analysis of the predictors of the present use of services. These include receipt of informal care, together with a large number of other needs-related circumstances.

Data and Methodology

Introduction: the PSSRU model

The projections for informal care were developed as part of the PSSRU model. A full account of the model, and of the data and assumptions used, can be found in Wittenberg *et al.* (1998, 2001). A brief outline of the model is given below and a diagram showing the structure of the model, including sources of data, is shown in Figure 1.

The PSSRU model is a cell-based (or macro-simulation) model which has been developed to make projections of likely demand for long-term care for elderly people in England to 2031 under different scenarios. The model makes projections of three kinds. First, it makes projections of the estimated numbers of people aged 65 and over with different levels of dependency by age group, gender, household type and housing tenure. Second, the model makes projections of the numbers of recipients of informal help and of formal residential and non-residential care. Projections for future years are based on patterns of receipt of care in the present. Third, the model makes projections of estimated expenditure by funding source (NHS, social services and service users) given national patterns of costs and current funding mechanisms.

The PSSRU model is ultimately concerned with demand for formal care. However, demand for formal care is partly a function of the availability of informal care. The model is therefore also centrally concerned with informal care, both supply and demand. The way in which informal care is treated in the model is described in more detail below.

Informal help with domestic tasks

In the PSSRU model, informal care is indicated by whether or not dependent elderly people are in receipt of informal help. The 1994/95 GHS 'Elderly data' is used to divide the dependent elderly population into those receiving and those not receiving some informal help. Informal help includes help from a spouse, another member of the household, another relative, a neighbour or a friend.

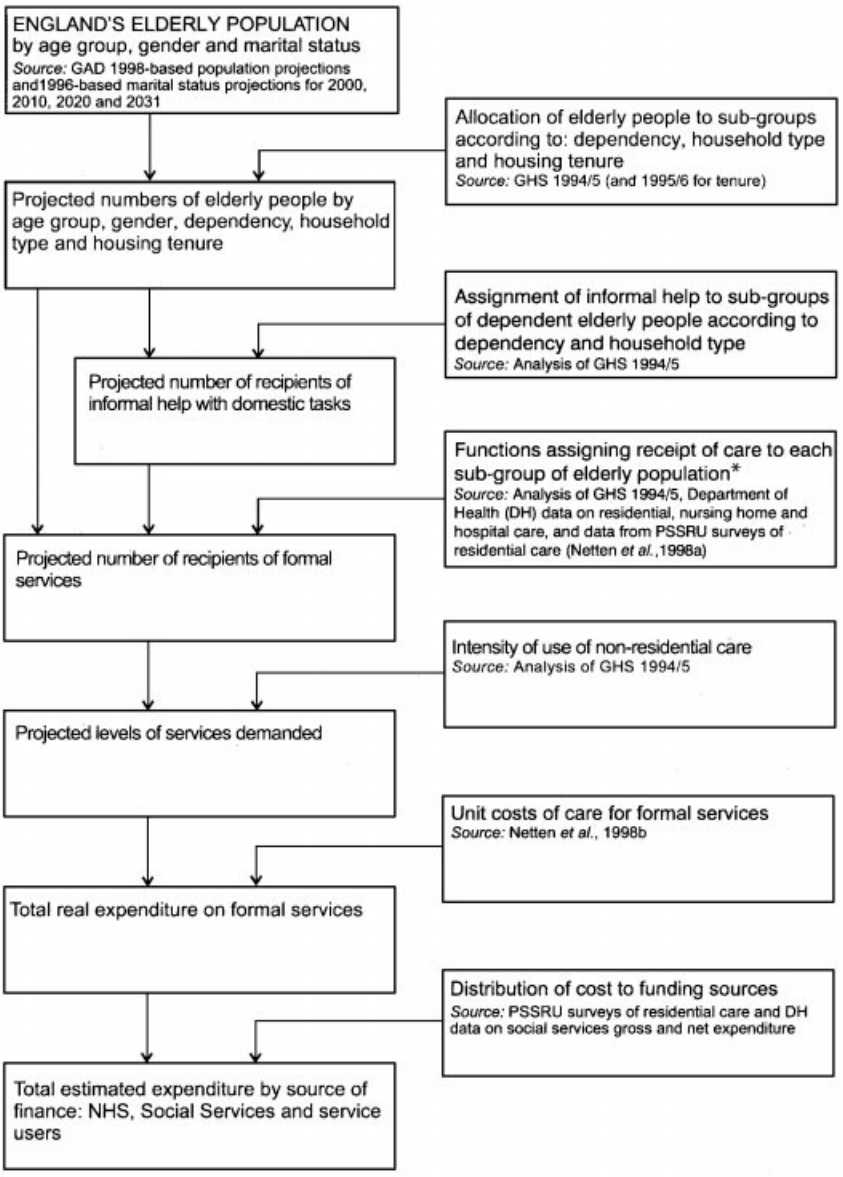

Figure 1. Structure of the PSSRU Model.
* Functions assigning packages of care: (a) Residential care is treated as a function of age group, gender and household type. (b) Non-residential care is treated as a function of age group, dependency, household type, housing tenure, and informal help with domestic tasks.

The model uses the probability of receiving informal care in the present as the basis for projecting the amount of informal care needed in the future. This approach has not been used in the UK before, although it has been used elsewhere. In the Netherlands, the Steering Committee on Future Health Scenarios recently developed a model using the receipt of informal help to project demand for informal care up to 2005 (STG 1996).

Earlier studies suggest that receipt of informal care is associated with such factors as age, disability, gender, household composition and socio-economic group (Wenger 1984; Qureshi and Walker 1989; Arber and Ginn 1991; Allen *et al.* 1992; Wenger 1992). In the PSSRU study, logit regression analysis of the 1994/95 GHS is used to analyse receipt of informal help, with separate analyses conducted for all elderly people and for those who are dependent. The analysis of the factors associated with receipt of informal help by dependent elderly people considers the following independent variables: age group, gender, dependency, household type and housing tenure[2].

The PSSRU model uses GHS data on receipt of informal care by elderly people, not GHS data on the provision of informal care by carers. This reflects the emphasis within the model itself, which is concerned with demand for long-term care rather than supply. Demand for long-term care is clearly affected by informal care as well as by dependency and other needs-related circumstances. A dataset was therefore required that brought together information on dependency, informal care and formal care.

The analysis of receipt of informal help could, however, only be carried out with respect to domestic tasks. A similar analysis of receipt of help with personal care tasks could not be undertaken using the GHS[3]. As a result, the model only includes informal help with domestic tasks.

Informal help and household type

The model does, however, provide another means of exploring informal help indirectly because it includes a measure of household composition (see Figure 1). Household composition has particular relevance for informal help, especially informal help with personal care.

The literature on informal care indicates that household type is an important structural correlate of the availability of informal care (Wenger 1984; Evandrou *et al.* 1986; Evandrou 1987; Arber *et al.* 1988; Arber and Ginn 1991; Wenger 1992; Evandrou and Falkingham 2000). The relationship between household type and informal care seems to be particularly strong with respect to informal help with

personal care, with a strong relationship between co-residency of the carer and the cared-for person and the provision of help with personal care (RIS MRC CFAS 1998).

Because of the strong relationship between household type and informal care, household type has been used elsewhere to measure informal care. Evandrou and Winter (1988), for example, used household type as an indicator of informal care when modelling demand for formal services. More recently, Evandrou used the extent of 'solo living' to indicate trends in the availability of family care, particularly with regard to the availability of co-residential kin (Evandrou 1998; Evandrou and Falkingham 2000).

As the outline of the PSSRU model indicates, the model includes a breakdown of the elderly population into different household types[2]. This enables projections to be made, for example, of the numbers of elderly people living alone in future years. These are important in their own right.

In the modelling, household composition is one of the factors taken into account when analysing receipt of formal services, such as home care and residential care (see Figure 1). Receipt of non-residential services is estimated using logistic regression analysis of the 1994/5 GHS. The regressors include household composition and receipt of informal help with domestic tasks, as well as age band, dependency and housing tenure. As the results section will show, household composition is correlated with both receipt of informal care and receipt of formal services, especially home care.

In the PSSRU model as a whole, informal care is therefore indicated by two variables: household composition, an indirect measure of informal care, and receipt of informal help with domestic tasks, a direct measure of informal care. It is likely that these two variables capture different aspects of informal help. Household composition includes help from within the household, which is particularly important where personal care tasks are concerned. Informal help with domestic tasks reflects, in addition, help from outside the household. Demand for formal services in the PSSRU study's model overall, therefore, reflects not just receipt of informal help with domestic tasks, but also a measure, in household composition, that particularly reflects help with personal care tasks as well[4].

Assumptions in making projections

The PSSRU model does not make forecasts about the future. Rather it makes projections on the basis of specific assumptions about future

trends. The assumptions that have been used in the base case of the model are outlined below. The base case attempts to approximate what may happen if no changes are made in the quality of long-term care services, the patterns of care provided for different needs and the system of funding long-term care. The base case is used as a point of comparison when the assumptions of the model are subsequently varied in alternative scenarios. The scenarios explored later in this article look at what would happen to demand for long-term care if the supply of informal care was severely constrained in the future or if policies towards carers were changed.

Key assumptions of the base case include the following. Age/gender specific dependency rates are assumed to remain unchanged. Marital status rates are assumed to change in line with the GAD's 1996-based marital status and cohabitation projections[5]. These are then used to produce household composition projections, on the assumption of a 'steady state' regarding the propensity *within* marital status groups to live with others. Real unit costs of social care are assumed to rise by one per cent a year, and of health care by 1.5 per cent a year.

Sensitivity analyses have been carried out on the model, using alternative assumptions to show how sensitive the results are to the assumptions chosen (Wittenberg *et al*. 1998, 2001). The implications of the sensitivity analyses for the results reported here are discussed in the conclusions to this article.

Results: analysis of GHS data and projections to 2031

This section summarises the results of the analysis of the GHS data and the projections of the model as they relate to informal care.

Projected numbers of elderly people and dependent elderly people

Changes in informal help to dependent elderly people over the next 30 years will take place within the context of an overall increase in the numbers of elderly people. The numbers of elderly people in England (aged 65 and over) are projected by GAD to grow from 7.8 million in 1996 to 12.4 million in 2031, an increase of over 60 per cent over 35 years. The numbers of very elderly people (aged 85 and over), who are most likely to need long-term care, are projected to grow much faster, by 88 per cent, from 0.9 million in 1996 to 1.7 million in 2031. Associated with these changes, there will be a rise in the numbers of elderly people with dependency needs. The PSSRU model projects

TABLE 1. *Probability of receiving informal help with domestic tasks for elderly people with dependency: regression results*

Regressor	Coefficient	Standard error	Wald
Age band			8.224
65–69	0.000		
70–74	0.743	0.350	4.522*
75–79	−0.050	0.326	0.024
80–84	0.421	0.331	1.618
85+	0.377	0.331	1.295
Dependency			9.620**
IADL only	0.000		
One ADL	−0.643	0.260	6.110*
Two+ ADL	−0.060	0.274	0.049
Household Type			57.057**
Single alone	0.000		
Single with others	1.507	0.363	17.263**
Married	1.844	0.276	44.688**
Married with others	2.056	0.634	10.505**
Gender			
Male	0.000		
Female	0.202	0.226	0.797
Housing tenure			
Owner	0.000		
Tenant	0.363	0.201	3.255
Constant	0.510	0.400	1.621

Dependent variable: Receipt of help with domestic tasks (1 = receipt)
Sample: Dependent elderly people (N = 845)
Correct predictions: 82.7%
Model improvement in log likelihood: 88.7**
* significant at 5%; ** significant at 1%
Source: Analysis of 1994/5 General Household Survey

that the numbers of elderly people living at home with some dependency problems will increase from 2.1 million in 1996 to 3.4 million in 2031, assuming unchanged age-specific dependency rates.

Informal help with domestic tasks

Using logit regression analysis of the 1994/95 GHS, receipt of informal help with domestic tasks for dependent elderly people is significantly associated with household type and level of dependency, but not with age, gender or housing tenure (Table 1). Receipt of informal help is therefore included in the model as a function of dependency category and household type.

Table 2 shows the proportion of elderly people receiving informal help with domestic tasks by household type and dependency. The table shows that those living with others are more likely to receive informal

TABLE 2. *Proportion of dependent elderly people receiving informal help with domestic tasks by type of dependency and household type*

Household type	Level of dependency		
	IADL problems only[1]	One ADL problem[2]	Two or more ADL problems[2]
Living alone	69.5	67.5	75.7
Single living with others	97.2	85.3	90.0
Living as couple	98.8	86.4	93.8
Couple living with others	100.0	87.5	94.4

[1] IADL = Instrumental Activities of Daily Living (domestic tasks)
[2] ADL = Activities of Daily Living (personal care tasks)
Source: Analysis of 1994/5 General Household Survey

TABLE 3. *Numbers of dependent elderly people with and without informal help with domestic tasks in private households, 1996–2031* (*thousands*)

	1996	2031	% change 1996–2031
Without informal help with domestic tasks	356	543	53
With informal help with domestic tasks	1738	2837	63
Total	2094	3381	62

Source: PSSRU Model estimates

help with domestic tasks than those living alone. It also shows that those with one ADL problem are less likely to receive informal help with domestic tasks than other dependent elderly people. This may be because the overwhelming majority of those with one ADL problem (84 per cent) have problems with bathing, a personal care problem for which help with domestic tasks is unlikely to be relevant. For the purposes of the model, people with no dependency are not regarded as receiving informal care. This was because of the large proportion of people without any dependency (amounting to nearly half in the GHS sample) who reported receipt of informal help but did not report difficulty in carrying out domestic or personal care tasks.

Using the base case assumptions of the model outlined earlier, the model's projections suggest that the number of dependent elderly people living at home without informal help with domestic tasks will rise by 53 per cent between 1996 and 2031 (Table 3). At the same time, the number of dependent elderly people living at home with informal help is projected to rise by 63 per cent. The projections therefore suggest that the number of dependent elderly people with informal help

TABLE 4. *Sources of support with domestic tasks and personal care tasks for elderly people* (*percentages*[1])

Source of support	Domestic tasks[2]	Personal care tasks[2]
Spouse	53	66
Other member of the household	12	21
Relatives outside the household	27	3
Friends, neighbours	10	1
Voluntary worker	1	–
Health or personal social services	7	12
Paid help	12	–
Other	1	–
Number reporting a source of informal help (= 100%)	1905	96
Percent of sample reporting a source of informal help	62	3

[1] The percentages add up to more than 100 because some people reported more than one source of informal help.
[2] For definitions of domestic and personal care tasks, see endnote 2.
Source: 1994/95 General Household Survey

with domestic tasks will increase at a faster rate than those without. These projections assume an unchanged relationship between receipt of informal help with domestic tasks and dependency and household composition. They also assume that there are no constraints on the supply of informal care other than those implied by changes in household type or, more specifically, marital status.

Informal help and household composition

In addition to the direct measure of informal help with domestic tasks, an indirect measure of informal help, household composition, is also included in the model in the determination of demand for formal care. Receipt of formal domiciliary services for those with dependency is significantly associated in the GHS with household composition and dependency for nearly all services (Wittenberg *et al.* 1998).

Household composition as an indicator of informal care particularly reflects informal help with personal care tasks. Analysis of the small sample of respondents in the 1994/5 GHS who reported a source of help with personal care tasks (N = 96) suggests a close relationship between household type and informal help with personal care (Table 4). Nearly 90 per cent of respondents who gave a source of help with personal care obtained this help from a spouse or another member of their household. Only four per cent of those who gave a source of help with personal care obtained this help from outside the household (relatives outside the household, friends or neighbours). The re-

TABLE 5. *Projected numbers of dependent elderly people in private households, by household composition and dependency, 1996–2031 (in thousands)*

Household type	IADL problems only[1]	One ADL problem[2]	Two or more ADL problems[2]	All dependent elderly people
1996				
Living alone	205	355	335	895
Living with others	310	436	453	1198
Total in 1996	515	791	787	2094
2031 (using 1996-based marital status projections)				
Living alone	287	509	500	1296
Living with others	533	771	781	2085
Total in 2031	820	1280	1281	3381
2031 (using 1992-based marital status projections)				
Living alone	337	592	555	1484
Living with others	483	688	715	1886
Total in 2031	820	1280	1270	3370

[1] IADL = Instrumental Activities of Daily Living (domestic tasks)
[2] ADL = Activities of Daily Living (personal care tasks)
Source: PSSRU Model estimates

lationship between household composition and help with personal care suggests that those who live alone are unlikely to receive informal help with personal care to any great extent, while those who share a household with others are more likely to receive this. Although the sample size of those who reported on sources of help with personal care is very small, the results are consistent with studies of the provision of informal care using larger sample sizes (for example, RIS MRC CFAS 1998).

Using the base case assumptions of the model, the 1996-based projections for household composition suggest that the number of dependent elderly people living alone will increase by 45 per cent between 1996 and 2031 (Table 5). The numbers of dependent elderly people living with others are projected to increase by 74 per cent over the same period. The model therefore suggests that, between 1996 and 2031, the numbers of dependent elderly people living with others will increase faster than the numbers living alone. The effect is that the proportion of dependent elderly people living alone is projected to fall slightly, from 43 per cent in 1996 to 38 per cent in 2031 (Table 5).

An earlier version of the model produced rather different results. The earlier version had used the 1992-based GAD marital status projections, whereas the current model uses the more recent 1996-based projections. The earlier version had suggested that the number of dependent elderly people living alone would increase faster than the number living with

others. Indeed, it projected a slight increase in the proportion of dependent elderly people living alone, from 43 per cent in 1996 to 44 per cent in 2031 (Table 5). Using the 1996 marital status figures therefore suggests that the number with access to informal care may be greater in future years than was previously anticipated, with 199,000 more dependent elderly people living with others in 2031 than was suggested on the basis of the 1992 figures.

The differences between the 1992-based and 1996-based projections should not, however, obscure the underlying trends. Although the numbers may not be increasing as fast as previously expected, the projections still suggest that there will be a substantial rise (45 per cent) in the numbers of dependent elderly people living alone. In comparison, the difference in the proportion living alone given by the 1992-based and the 1996-based projections (44 per cent versus 38 per cent) is not very great. Moreover, of the estimated 1.3 million dependent elderly people living alone in 2031, three-quarters are projected to have some personal care needs and over a third to have substantial personal care needs (Table 5). This group of elderly people is unlikely to receive informal help with personal care to any great extent.

The supply of informal care in the model

The major factor affecting the supply of informal care in the model is household composition, but what drives the projections for both informal help with domestic tasks and household composition are the underlying projections for marital status. Using the GAD 1996-based marital status projections, the number of dependent elderly people who are married or cohabiting is projected by the model to rise faster than the number who are single. The number of dependent elderly people who are married is projected to rise by 76 per cent between 1996 and 2031, whereas the number who are single is projected to rise by 49 per cent (Table 6)[5].

The projected rise in the number of married and cohabiting elderly people is greater than previously anticipated. Under previous projections, using the 1992-based figures, the number of dependent elderly people who were single was projected to rise faster than the number who were married (Table 6). The difference between the 1996-based and the 1992-based projections is particularly marked for women. Using the 1996-based projections, the numbers of married women are projected to increase by 74 per cent whereas, under the 1992-based projections, the numbers were projected to rise by only 24 per cent (Table 6). What this means is that there are now projected to be more

TABLE 6. *Marital status*[1] *of dependent elderly people in private households, 1996–2031*[2]

Dependent elderly people:	1996		2031 (using 1996-based marital status projections)			2031 (using 1992-based marital status projections)		
	Number[3]	%	Number[3]	%	% change 1996–2031	Number[3]	%	% change 1996–2031
Single men	206	10	469	14	128	486	14	136
Single women	944	45	1247	37	32	1476	44	56
All single	1150	55	1716	51	49	1962	58	71
Married men[1]	468	22	838	25	79	819	24	75
Married women[1]	476	23	827	24	74	588	17	24
All married[1]	944	45	1665	49	76	1407	42	49
Total	2094		3381		61	3369		61

[1] The term 'married' includes both legally married and cohabiting couples.
[2] As the GAD marital status projections only extend to 2021, projections to 2031 in the model assume constant rates between 2021 and 2031.
[3] Numbers are in thousands.
Source: PSSRU Model estimates.

married and fewer single elderly women than previously anticipated. The implication for informal care is that more elderly people, particularly elderly women, will have access to a spouse carer than previously anticipated.

The PSSRU model clearly takes into account a major factor affecting the supply of informal care, that is, changes in household composition or, more specifically, changes in marital status. However, the model has not been able to take into account all the factors affecting the supply of informal care. There are two limitations in this respect. First, a rise in the number of spouses cannot be equated with a rise in the number of informal carers since not all spouses are able to provide informal care. Most spouse carers are themselves elderly, many are in poor health and, as carers, many are themselves in need of support from formal services (Arber and Ginn 1990; Wenger, 1990; Lewis 1998; Tinker *et al.* 1999). An increase in the supply of informal carers therefore raises issues about needs for support by carers. Second, the model takes into account changes in the supply of informal care deriving from marital status, but it does not take into account changes deriving from other relationships, in particular informal care by children. Yet, as the introduction to this article suggested, it is in relation to care by children of their elderly parents that concerns have often been expressed regarding the future supply of informal care (Clarke 1995; Finch 1995; Evandrou 1998).

Clearly then the model does not take into account all aspects of the supply of informal care. However, the model does allow the issue of changes in the supply of informal care to be approached in a slightly different way, by exploring 'scenarios' allowing for changes in the supply of informal care or changes in policy towards carers. Three such scenarios are explored here.

'*Scenarios*' *affecting informal care*

The scenarios described here address issues concerning the supply of informal care raised by the PSSRU model. In each scenario, the assumptions of the base case of the model are varied so that the implications of the scenario can be explored. The first scenario addresses the issue that, in future, more informal carers may be spouse carers who may themselves need more support in caring. The scenario therefore looks at the consequences for demand and costs of services if more support is given to informal carers. The second scenario addresses the issue of a possible fall in the supply of care by children by allowing for a decline in co-resident care by children. The third scenario allows for a more general fall in the supply of informal care, associated here with an increase in institutional care.

Policy scenario for informal carers: increasing support to carers

The first scenario examined here looks at the implications of increasing support to carers. It focuses on providing more support to the most heavily burdened carers. These have been identified as carers providing personal care to elderly people living in the same household (Parker 1992). The scenario looks at the implications of increasing domiciliary services to elderly people with substantial dependency needs (those with two or more ADL problems) who share a household with others. The majority of carers included in the scenario are spouse carers.

The way in which support to carers is increased in the scenario is by looking at the consequences if services were to become more 'carer-blind' in the future. The term 'carer-blind' services was originally used by Twigg and Atkin in 1994 to describe a policy which involved 'treating a disabled person with a carer in exactly the same way as a disabled person without' (Twigg and Atkin 1994: 150). The scenario explores the implications of making services more 'carer-blind' by allowing those living with others to receive the same level of services as those living alone. In summary, then, the scenario gives to elderly people with a substantial dependency (two or more ADL problems) who live with others the same packages of non-residential services as

received by those living alone. The scenario was originally developed as part of the PSSRU model (Wittenberg *et al.* 1998) but is here updated.

The results of the projections under the 'carer-blind' scenario are that, between 1996 and 2031, the numbers of elderly recipients of home care services are projected to rise by 73 per cent, compared to 48 per cent under the base case of the model (Table 7). Overall expenditure is projected to rise by 155 per cent under the carer-blind scenario, compared to 148 per cent under the base case. Overall expenditure in 2031 under the carer-blind scenario is projected to be about £670 million more than under the base case.

Scenario for informal carers: decline in co-resident care by children

The second scenario looks at the possible consequences if the supply of intensive informal care by children were to be severely restricted in the future. One way of looking at this is by assuming a decline in households in which children care for their elderly parents. What the scenario explores is what might happen to demand for long-term care if elderly parents with the most substantial dependency were much less likely to move in with their adult children.

It is plausible to anticipate a decline in arrangements whereby elderly people receive care from children living in the same household. Co-residence of elderly people with adult children has declined rapidly in the recent past, with the proportion of elderly people living with a child falling from 42 per cent in 1962 to 14 per cent in 1986, and a further decline during the late 1980s (Grundy 1995, 1996). The concern here is particularly with households created by dependent elderly people moving in with their children. There is recent evidence that the current generation of elderly people is very strongly opposed to moving in with a child if they become dependent (Tinker *et al.* 1999) and that caring for an elderly dependent parent in a shared household is a particularly stressful form of caring for carers (Healy and Yarrow 1997). To assume a decline in this form of shared household is therefore to assume a decline in a form of caring that is unpopular with elderly people, as well as particularly stressful for carers.

The scenario allowing for a fall in co-residence with adult children draws on a breakdown of the households of dependent elderly people derived from the 1994/95 GHS 'Elderly data'. In the GHS sample, approximately a third (34.5 per cent) of the single dependent elderly people living with others were the parents or parents-in-law of the head of the household. This was true of only two per cent of those who were

TABLE 7. *Scenarios affecting informal carers: an increase in formal support for carers ('carer-blind' scenario), a decline in co-resident care by children and an increase in institutional care*

	1996	2031	% change	% change under base case
'Carer-blind' scenario[1]				
Numbers receiving home care services	509	882	73	48
Numbers receiving community nursing services	446	732	64	64
Total expenditure	9.8	25	155	148
Decline in co-resident care by children[1]				
Numbers with dependency living with others	1198	1945	62	74
Numbers with dependency living alone	895	1423	60	45
Numbers receiving home care	509	778	53	48
Numbers in residential, nursing and hospital care	404	680	68	65
Total expenditure	9.8	24.6	152	148
Increase in institutional care[1]				
Numbers in residential, nursing and hospital care	404	834	106	65
Total expenditure	9.8	28	182	148

Units of measurement:
Numbers of elderly people are measured in thousands.
Expenditure is measured in £billions (where one billion equals one thousand million).
[1] For definitions of scenarios, see text.
Source: PSSRU Model estimates.

married and living with others. Other elderly people sharing a household were themselves the heads of the household. However, it is dependent elderly people whose *children* are the heads of household who are most likely to have moved in with their children because of their dependency needs. Given the small numbers of married couples in this position, the focus here is on the third of single dependent elderly people living with others who were the parents/parents-in-law of the head of household. The scenario uses this information from the GHS by assuming a decline by one-third in the proportion of single dependent elderly people living with others by 2031. In other words, the scenario assumes a sharp decline in households formed by single dependent elderly people moving in with their children.

The results of the projections under the scenario are that fewer dependent elderly people will live with others in 2031 than under the base case, more will live alone and more will be admitted to institutions (Table 7). The proportion of single dependent elderly people sharing a household is projected to fall from 12 per cent in 1996 to eight per cent in 2031. Expenditure is projected to be approximately a third of a billion pounds more in 2031 than under the base case as a result of increased expenditure on domiciliary services and institutional care.

Scenario for informal carers: fall in supply of informal care leading to increase in institutional care

The third scenario allows for a more wholesale fall in the supply of informal care. It does so by assuming that a fall in the supply of informal care would have the effect of increasing admissions to institutional care. There is some evidence that institutional care may act as a substitute for informal care. Grundy, for example, has suggested that the greater availability of long-term care in institutions during the 1980s may have promoted the substitution of institutional for family care (Grundy 1996). What this scenario explores, then, is what might happen to demand for long-term care if elderly people with the most substantial dependency needs, who currently receive informal care from within their own households, moved into institutions in far greater numbers instead.

This scenario is explored by assuming that elderly people who live with others have the same likelihood of admission to residential care as those who live alone. The scenario focuses on elderly people who are most likely to receive informal care, those who share a household with others. It then allocates to them the same probability of admission to institutions as elderly people who are least likely to receive informal care, those who live alone. In this way it allows for a fall in the supply of informal care. A similar scenario exploring a fall in the supply of informal care through increasing admissions to residential care was included in Wittenberg *et al.* (1998).

The results of the scenario in which elderly people living with others have the same likelihood of admission to residential care as those living alone show that the numbers in residential care are projected to increase by 106 per cent between 1996 and 2031 (Table 7). This compares with an increase of 65 per cent under the base case of the model. Expenditure under the increased institutionalisation scenario would increase by 182 per cent in the same period, compared with 148 per cent under the base case. Overall expenditure in 2031 is projected to be about £3.4 billion more under the increased institutionalisation scenario than under the base case.

Comparison of scenarios affecting informal carers

It is clear that the scenarios examined here have very different financial consequences (Table 7). Projected expenditure under the carer-blind scenario is relatively close to the base case of the model, whereas projected expenditure under the increased institutionalisation scenario

is much greater. The relatively low cost implications of the carer-blind scenario arise for three reasons. They arise partly because the scenario is targeted on a particularly vulnerable group of co-resident carers looking after elderly people with the greatest dependency needs, partly because of low levels of service receipt among those living alone, and partly because the scenario only affects home care services, not institutional care. Nevertheless, even where institutionalisation rates are allowed to vary, as in the scenario involving a decrease in co-resident care by children, the financial implications remain relatively small. Thus, the financial implications of the scenario involving a decrease in co-resident care by children are again relatively close to the base case, compared to the increased institutionalisation scenario. This is mainly because the number of elderly people who are co-resident with their children is already very small.

Discussion of findings

The findings reported here are, on the face of it, somewhat unexpected. The literature on informal care has tended to argue that there is likely to be a decline in informal care relative to demand (Allen and Perkins 1995) and that there will be an increase in 'solo living' in the new millennium (Evandrou 1998, Evandrou and Falkingham 2000). However, the projections from the PSSRU model suggest that, over the next 30 years or so, the numbers of dependent elderly people with informal help with domestic tasks will increase faster than those without. It is important to note that these projections assume that there are no constraints on the supply of informal care other than those implied by the projected changes in marital status. However, the marital status projections themselves also suggest that the proportion of dependent elderly people living alone may fall slightly by 2031. Although it has been argued here that the differences between the PSSRU model and those of other studies should not be overstated, these differences do require some discussion.

One of the reasons for the differences between the results from the PSSRU model and those of earlier studies is the use of the 1996-based GAD marital status projections. These anticipate a faster rise in the numbers of elderly people who are married or cohabiting than did the earlier 1992-based projections. The differences in the later GAD figures derive from an improved method of calculation and from the use of the 1991 census rather than the 1981 census. The Office for National Statistics explained the underlying reasons for their later projections in

these terms: 'A rise in the proportion of elderly women with partners will occur both because the proportions of women ever marrying are higher for cohorts now aged 40 and 65 than for older cohorts and because projected improvements in male mortality will lead to a significant fall in the number of widows' (Shaw and Haskey 1999: 16). The 1998-based population projections accentuated these trends further (Shaw 2000).

Another reason for the differences between the PSSRU projections and those of other studies may arise from the definitions of marital status that are used. In the PSSRU study, marital status includes both legally married and *cohabiting* couples and the study projects a slight fall in the proportion of elderly people living alone. In Evandrou's cohort analysis, on the other hand, it was found that 'the marked shift to later and fewer *marriages* interacts with rising *divorce* to increase the propensity to live alone' (Evandrou and Falkingham 2000: 30, emphasis added). However, while it is true that the number of married couples is projected to fall, the number of cohabiting couples is projected to rise at a faster rate (Shaw and Haskey 1999; King *et al*. 2000). It was decided in the PSSRU study to include cohabitation because the salience of legal marriage for social networks is declining and, as ONS puts it, 'legal marital status by itself gives an increasingly incomplete picture of relationships and family circumstances' (Shaw and Haskey 1999). It is important to recognise, however, that relationships based on cohabitation may 'lack some of the formal obligations and ties of a marriage, which could be a crucial difference when considering the care of people in old age' (Clarke 1995: 34).

An important issue when considering the PSSRU model's projections is their reliability. This issue has been approached in the research through the use of sensitivity analyses, using alternative assumptions to show how sensitive the results are to the assumptions used. The results of the sensitivity analyses have been published elsewhere (Wittenberg *et al*. 1998, 2001). They show that future long-term care demand and expenditure is highly sensitive to three assumptions in particular, the projected numbers of very elderly people (aged 85 and over), future dependency rates and assumed real rises in care costs. There is considerable uncertainty about future trends in all three of these areas (Shaw 1994, Bone *et al*. 1995). This uncertainty clearly needs to be taken into account when considering the projections for informal care reported here. If, for example, future dependency rates were considerably lower than those assumed in the base case of the model, then demand for informal care would also be considerably lower.

In the context of this uncertainty, one of the most valuable aspects

of the approach adopted here is that it enables the consequences of alternative scenarios to be explored. In this approach, the central assumptions of the model are held constant while key factors are allowed to vary in turn, thereby allowing the potential impact of each factor to be observed separately. In the context of informal care, as the introduction to this paper suggested, one of the central concerns regarding the future has been uncertainty over the supply of informal care. The scenarios explored in this paper have allowed the potential consequences of a severe restriction in the supply of informal care in future years to be examined. The results suggest that, even if there is a sharp decline in co-resident care by children in future years, the implications for future overall expenditure will be relatively small, under current patterns of service receipt. If, however, a wider decline in the supply of informal care results in admissions to residential, nursing and hospital care for a larger group of elderly people, then the financial consequences will be much greater.

The results of the scenarios using the PSSRU model have proved of relevance for policy. The model was used to explore a policy scenario for carers in which more support was given to carers on a 'carer-blind' basis. The results suggested that a policy of this kind would have a relatively small effect on future overall expenditure, compared with a policy of increasing institutional care. These results are of some significance, since it has previously been assumed that carer-blind policies would be too costly to implement (Twigg and Atkin 1994: 150). The implications of the projections for the carer-blind scenario were of particular interest to the Royal Commission on Long Term Care. The Commission used the same scenario to explore the cost implications of providing more support to older people with carers and the development of carer-blind services subsequently became part of the Commission's recommendations. The Commission recommended that 'the Government ensure services become increasingly "carer blind", offering flexible support services where carers currently take on caring unaided by publicly provided services' (Royal Commission on Long Term Care 1999: 90)[1].

It is recognised that improvements in the design of the model would be valuable and further work is now being carried out. One of the areas that needs further development relates to the supply of informal care. As emphasised above, the projections for informal care in the base case of the model do not take into account changes in the supply of informal care other than those derived from changes in marital status. Other changes in the supply of informal care are considered in the scenarios but are not incorporated in the base case. Yet it is in relation to care

by children that most concerns have been expressed regarding the future supply of informal care. Further work is now being carried out at the PSSRU on the role of children in the informal care of elderly people. This uses data from the 1995/6 GHS on the provision of informal care to analyse recent trends in intergenerational care, with the intention of using the analysis to inform further modelling.

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NOTES

1 The Government's response to the Royal Commission, published in July 2000, emphasised recent policy initiatives for carers, in particular the National Carers Strategy (Department of Health 2000).

2 *Age group* includes five age bands – 65 to 69; 70 to 74; 75 to 79; 80 to 84; and 85 and over. *Dependency* is defined in terms of ability to perform activities of daily living or ADLs (bathing, dressing, feeding, washing, and getting to and from the toilet) and instrumental activities of daily living or IADLs (shopping, laundry, vacuuming, cooking a main meal and handling personal affairs). Four dependency groups are used in the model. The first group includes people able to perform ADL and IADL tasks without difficulty. The second group includes people with difficulty with IADL but not ADL tasks. The third includes people with difficulty with one ADL task. The fourth group includes both people who live in the community and have difficulty with two or more ADL tasks and those who are in institutional care (hospital, nursing home or residential care home). The classification of *household type* has four categories: those living alone; single people living with others; those living with their spouse or partner only; and those living with their spouse or partner and others. *Housing tenure* is classified into those living in owner-occupied tenure and those living in rented accommodation.

3 Questions about sources of help with personal care in the GHS were asked only of those who reported that they could not perform the task without help. Those who could perform a task alone but with difficulty were not asked if they ever received help from an informal carer. The number of people on whom information on help with personal care tasks was collected was so small and incomplete that results from logistic regression analyses would not have been reliable.

4 Other models have included more than one measure to capture the different aspects of informal help, for example, Bowling *et al.* (1991), who included both household size and social networks.

5 As the GAD marital status projections only extend to 2021, projections to 2031 in the model assume constant rates between 2021 and 2031.

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Address for correspondence:
Linda Pickard, Personal Social Services Research Unit, LSE Health and Social Care, London School of Economics, Houghton Street, London WC2A 2AE, UK.
email: L.M.Pickard@lse.ac.uk