Demand for long-term care: projections of long-term care finance for elderly people

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The **PERSONAL SOCIAL SERVICES RESEARCH UNIT** undertakes social and health care research, supported mainly by the United Kingdom Department of Health, and focusing particularly on policy research and analysis of equity and efficiency in community care, long-term care and related areas — including services for elderly people, people with mental health problems and children in care. The PSSRU was established at the University of Kent at Canterbury in 1974, and from 1996 it has operated from three branches:

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Executive summary

1. How best to finance long-term care has become in recent years a highly topical issue. A range of factors have encouraged debate. These include the projected continued growth in the numbers of very elderly people, uncertainty about future levels of family care, and more generally uncertainty about future levels of need for long-term services.

2. To inform debate it would be most valuable to have reliable projections of two key variables. The first is the likely level of demand for long-term care services under different scenarios about changes in life and health expectancy and in socio-economic variables. The second is the costs associated with meeting the expected demand for care and the distribution of these costs under different policies and funding mechanisms.

3. Projections have been made for this country by at least three agencies. The Institute of Actuaries (Nuttall et al., 1994) has made projections of the likely numbers of disabled people and of the costs of caring for them on varying assumptions. London Economics and the Institute for Public Policy Research (Richards et al., 1996) have made projections of future patterns of demand and supply of long-term care and associated costs. The Department of Health has also made broad projections of expenditure on long-term care on a range of assumptions (House of Commons Health Committee, 1996).

4. The Department of Health agreed a new study of long-term care demand and finance as part of the Personal Social Services Research Unit's (PSSRU) long-run programme of research at the London School of Economics. This report describes the model developed by the PSSRU, discusses some of the key issues that were addressed in producing the model, and outlines some illustrative projections made using the model.

AIMS OF THE STUDY

5. The overall aims of the study are to make projections of likely demand for long-term care for elderly people to around the year 2030 under different scenarios and to assess the likely impact of different policies and approaches to funding long-term care for elderly people on the balance of expenditure between sectors.

6. The specific aim is to make projections, to around the year 2030, of the following:

   - estimated numbers of elderly people with different levels of dependency by age group, gender, and household type;
   - estimated levels of long-term care services demanded by type of service under current patterns of utilisation and variants that may display greater cost-effectiveness; and
   - estimated expenditure by funding source given national patterns of costs and current funding mechanisms or specified variants.

7. The study has involved the development of a computer simulation model. It has also involved literature reviews and analyses of various sources of data. This report concentrates on the model. The model is cell-based, or a macro-simulation rather than a micro-simulation model. The first part divides the projected elderly population into sub-groups, or cells, by age, gender, dependency, household type, housing tenure, and receipt of informal help. The second part of the model is concerned with receipt of long-term care services. It attaches a probability of receiving health and social care to each cell. The remainder of the model is concerned with long-term care expenditures and their breakdown between the NHS, social services and service users.

PROJECTED NUMBERS OF ELDERLY PEOPLE BY AGE, GENDER, DEPENDENCY AND HOUSEHOLD COMPOSITION

8. The first part of the model is concerned with projected numbers of elderly people by age, dependency and other key characteristics. The Government Actuary's Department 1996-based population projections (Shaw, 1998) have been used as the basis for the numbers of people in each year under consideration until 2031 by age and gender. There is scope for sensitivity analysis around the central estimate. This is especially important for the very elderly groups as past projections for them have turned out to be considerable underestimates.

9. The numbers of elderly people in England (aged 65 and over) are projected to rise by almost 57% between 1995 and 2031. The numbers of very elderly people (aged 85 and over) are projected to rise more rapidly, by around 79%. Almost half the growth in overall numbers is expected to occur in the period 2020 to 2031. Long-term care would need to expand by around 61% between 1995 and 2031 to keep pace with the rising numbers of elderly people if no account is taken of other factors. This is in terms of home care hours, community nurse visits, residential care weeks etc. If the numbers of very elderly people (aged 85 and over) grew by 1% per year more than expected, long-term care would need to expand by 92% rather than 61%.

10. The projected elderly population by age and gender has been broken down by dependency, as dependency is a key factor influencing receipt of all forms of long-term care. Dependency has been considered in terms of ability to perform activities of daily living (ADLs) and instrumental activities of daily living (IADLs). Information on this was obtained through analysis of the General Household Survey (GHS) for 1994/5, which included questions on the dependency and use of services by elderly people.

11. There is considerable debate about whether age-specific dependency can be expected to rise or fall (Bone et al., 1995). An optimistic view is that there will be a compression of morbidity and that the expansion of life expectancy will be associated with a contraction in the average number of years with disability. A pessimistic view is that there will be an expansion of morbidity and that the expected continued increase in life expectancy will be associated with an increase in the average number of years with disability.

12. Studies by the Institute of Actuaries and by the Department of Health have shown that projections of long-term care expenditure are sensitive to assumptions about future rates of dependency among elderly people. If, on a pessimistic scenario, (age-specific) dependency rates rose by 1% per year, long-term care would need to expand by 121% rather than 61% on the basis on unchanged dependency rates. If, however, on an optimistic scenario, (age-specific) dependency rates fell by 1% per year, long-term care would need to expand by only 18% between 1995 and 2031. These projections do not take account of rises in the real costs of care, which are discussed below.

13. The projected elderly population needs to be divided between elderly people in communal establishments and elderly people in private households. The approach adopted has been to treat institutionalisation as if it were a further dependency state. Information on use of residential care, nursing home care and hospital care by elderly people was obtained from Department of Health statistics and from PSSRU surveys of residential care. This is discussed further below.

14. The receipt of services is influenced by household type, especially whether or not the elderly person lives alone (Evandrou, 1987). The projected non-institutionalised elderly population is broken down between those living alone, single people living with others, those living with their spouse only, and those living with their spouse and others. Relevant information was obtained from the GHS.

15. The Government Actuary's Department has prepared 1992-based projections of the population by legal and by *de facto* marital status. These suggest an increase in the proportion of elderly people, by age group and gender, expected to be single, divorced or widowed and a decrease in the proportion expected to be married or cohabiting, except for very elderly men. If account is taken of these trends, long-term care would need to expand by 63% rather than 61% between 1995 and 2031.

16. The model includes a simple breakdown by housing tenure, between those living in owner-occupied tenure and those living in rented accommodation. The main reason for the inclusion of housing tenure is that it can be regarded as a simple proxy for socio-economic group. It would also be relevant, as discussed below, for the division between privately funded and publicly funded residential care in the case of elderly people living alone.

PROJECTED AMOUNTS OF SERVICES DEMANDED

17. The second part of the model is concerned with projections of the volumes of services demanded. One input is the projected numbers of elderly people, i.e. the output of the first part. The other input is functions assigning packages of care to each cell; that is, to each sub-group of the elderly population. The specification of these functions has been a key part of the study.

18. The services covered include a range of services relevant to meeting long-term care needs. Informal care is included both because it is important in its own right and because it is a key determinant of receipt of formal services. Future trends in the availability of informal care are likely to have considerable implication for demand for formal care, as shown by London Economics (Richards et al., 1996). Information on receipt of help with domestic tasks by elderly people was drawn from the GHS. Information on help with personal care tasks was not available in the GHS on a similar basis.

19. There is much uncertainty about the future supply of informal care (Allen and Perkins, 1995). The changing age structure of the population, rises in employment rates among married women, and rises in divorce rates have all been cited as reasons for a potential decline in informal care supply relative to a growing number of elderly people. However, it is not clear that these factors will actually result in a decline in informal care supply.

20. Key formal social services, such as home care, day care and meals, are covered. Key health services, such as day hospital care, community nursing and chiropody, are also included. Private domestic help is also included, though this should be treated with caution. The probability of receipt of each of these services was estimated, through multivariate analysis of GHS data, by age, dependency, household type, housing tenure, and receipt of informal help with domestic tasks. The numbers of people receiving home care are projected to rise by around 62% and the numbers receiving community nursing by around 61% between 1995 and 2031, on the basis of an unchanged relationship between receipt of services and the factors mentioned above.

21. Residential care home, nursing home and long-stay hospital care are also included in the model. Institutionalisation is, as mentioned above, treated as if it were a separate category of dependency and covered in the first part of the model. The numbers of people in residential care homes are projected to rise by 64%, the numbers in nursing homes by 64% and the numbers in long-stay hospital care by 62% between 1995 and 2031. This is on the basis of an unchanged relationship between receipt of these services and age, gender and whether or not living alone.

22. Future patterns of care are likely to be affected by a variety of factors, including the following:

- policy priorities, such as the *Caring for People* objective of promoting day and domiciliary care (Secretaries of State, 1989);
- developments in the technology surrounding acute health care interventions for elderly people, such as changes leading to more day surgery;
- changes in the caring capacity of the community and the willingness to provide informal care; and
- changes in the relative costs of different forms of care, resulting from changes in the relative supply of inputs.

23. There is scope for the user of the model to vary the probabilities of receiving services and the average amounts of care received in the light of changes in policy and practice, possible constraints on the supply of care and other developments. Different policies may affect the caring capacity of the community with differing implications for appropriate packages of care.

PROJECTED AGGREGATE EXPENDITURE ON LONG-TERM CARE SERVICES

24. The third part of the model is concerned with the real total costs of the formal services demanded. It covers the costs to the health service, social services and users of services, for those services included in the model. This does not comprise the total costs of long-term care to society. That would require inclusion of the costs of a wider range of services to a wider range of public agencies and to service users and the opportunity costs of informal care.

25. A key input is the unit costs of care, for which information has been drawn from the PSSRU study of the unit costs of key community care services (Netten and Dennett, 1996). The other input is the projected levels of services demanded as estimated in the second part of the model.

26. Financial projections over a substantial period of time are highly sensitive to assumptions about changes in the real unit costs of services. These will be affected by changes in input prices especially real wages in the caring sector, changing technical efficiency of service provision, any changes in client dependency, and any changes in the quality of services and expected outcomes.

27. The model allows a range of possibilities to be examined. If the real costs of care rose by 1% per year, for example, long-term care expenditure would need to rise by 132% between 1995 and 2031 rather than by 62% if care costs remained constant in real terms. The study takes as a base case an assumption that social care costs will rise by 1% per year and health care costs by 1.5% per year in real terms. On this basis long-term care expenditure would need to rise by 153% between 1995 and 2031.

PROJECTED BREAKDOWN OF EXPENDITURE BETWEEN FUNDERS

28. The fourth part of the model breaks down projected aggregate expenditure by funder. The costs of the health services included — hospital, day hospital, and some nursing home care, district nursing and chiropody — are assigned to the NHS. The costs of the social services included — residential and nursing home care, home care, day care and meals — are divided between personal social services and service users. The aim is to examine aggregate net costs to health and social services.

29. The division of social care costs between the personal social services and users is based on information from Department of Health and Laing & Buisson data (Laing &

Buisson, 1996) on the proportion of residential care clients who fund their own care and on the proportion of the gross costs of all social services met by user charges. The full costs of privately funded residential and nursing home care and private domestic care, and a proportion of the costs of all other social services, are thus assigned to users.

30. Elderly residents of residential care and nursing homes can be divided into four main groups in terms of main source of funding. Some nursing home residents are funded in full by the NHS. A growing proportion of residents are funded by social services, subject to user contributions. A declining group are funded by higher level income support payments under the preserved rights scheme. The fourth group are those who fund their own care in full (though this may be from general social security benefits).

31. The model does not attempt to divide the publicly funded group between social services and social security preserved rights. It is effectively set in a world where the transfer of responsibilities under the community care reforms is complete. The emphasis is on projecting the breakdown between publicly and privately funded residents. Since privately funded care seems generally to be funded from housing assets, this will be closely related to housing tenure.

32. As mentioned above, the model includes a simple breakdown by housing tenure, between those living in owner-occupied tenure and those living in rented accommodation. The Anchor Housing Trust (Forrest et al., 1996) has made projections of the numbers of elderly people expected to own their homes. The trends in owner-occupation implied in their analyses suggest an increase in the proportion of elderly people in owner-occupier households from around 63% in 1994/5 to around 75% in 2010. The study assumes as a base case that the ratio of privately funded to publicly funded residents will rise in line with the ratio of elderly owner-occupiers living alone to the rest of the elderly household population.

33. Total NHS long-term care expenditure is projected to rise by 174% between 1995 and 2031, social services net expenditure by 124% and private expenditure by 173%. Total long-term care expenditure is projected to rise by 153% over that period. This is on the basis of the base case assumptions discussed above. These projections need to be compared with expected rises in economic output. If GDP rose by 2.25% per year, this would constitute a rise of 123% over the period 1995 to 2031.

34. These projections should be regarded as illustrative only. They are made on the basis of official population projections by age and gender, unchanged age-specific rates of dependency, and a trend toward higher proportions of elderly people being single, divorced or widowed. They also assume an unchanged relationship between age, dependency, household type, etc., and receipt of care for each type of care, and an increase in the proportions of elderly people paying for residential care privately. No allowance is made for changing expectations about quality, types or levels of care.

35. These assumptions, and the sensitivity of the projections to them, are discussed in the chapters that follow. The projections are found to be particularly sensitive to the projected rate of growth of the very elderly population, to trends in age-specific dependency rates and to assumptions about real rises in the unit costs of care.

1. Introduction to the report

BACKGROUND AND CONTEXT

1.1. How best to finance long-term care has become in recent years a highly topical issue. The key issue in the financing debate has concerned how far people should fund their own care and how far they should be publicly funded. The expected substantial demand for long-term care in the coming decades has increased the importance of this issue.

1.2. A number of studies and reports on funding long-term care have been produced in this country in the last five years. These have included the report by the Institute of Actuaries, *Financing Long-Term Care in Great Britain* (Nuttall et al., 1994); the report by London Economics, commissioned by the Institute of Public Policy Research, *Paying for Long-Term Care* (Richards et al., 1996); the House of Commons Health Committee Report, *Long-Term Care: Future Provision and Funding* (July 1996); and the report of the Joseph Rowntree Foundation Inquiry, *Meeting the Costs of Continuing Care* (September 1996). Although each report focused on different aspects of the issue, all were centrally concerned with the financing of long-term care in the future.

1.3. The study reported here is concerned with demand for and financing of long-term care for elderly people up to around the year 2031. It looks at a range of demographic, epidemiological, social and economic factors. The aim is to discuss and investigate the issue rather than produce a definitive answer.

1.4. A range of factors have encouraged the debate about the future funding of long-term care for the elderly. One of the major factors is demographic change, especially the projected continued growth in the numbers of very elderly people. The numbers of elderly people are expected to rise sharply during the first half of the next century, particularly after 2011, and there are expected to be changes in the composition of the elderly population, with significant increases in the number aged over 75. The projected rise in the numbers of very elderly people after 2011 enhances the importance of ensuring adequate funding of long-term care in the next century.

1.5. The second major factor prompting debate about the future funding of long-term care for the elderly has been uncertainty about future levels of informal care by family and friends. Thus, as the Joseph Rowntree Foundation Inquiry put it:

"With a decline in the number of middle-aged women (who are the main care providers) at the same time as the numbers of older people are rising, with an increasing tendency for such women to be in work, fewer family members live close to each other, and with a larger number of single, divorced and widowed people with no children, it is likely that there will be an increase in demand for care from professional services" (Joseph Rowntree Foundation, January 1997, p.3).

While there is by no means agreement about the implications of all these social and demographic factors, the future supply of informal care is clearly of central concern.

1.6. Another issue that has brought the funding of long-term care to the fore recently has been the community care reforms of the early 1990s (Wistow et al., 1996, p.161). The reforms were primarily concerned with changing the provision of care, shifting provision away from institutional towards community care and away from supply-led towards needs-led provision. The reforms were also, however, centrally concerned with ending the perverse *financial* incentives which encouraged local authorities to place individuals in residential care. The funding system was changed from April 1993 to reflect an emphasis on care in the elderly person's own home as far as possible. In ad-

dition, the community care reforms aimed to improve the effectiveness of community care provision, making services more responsive to needs, with local authorities now given greater responsibility for assessing individual needs and arranging services according to assessed needs. These changes to the supply of services can be expected to have implications for their overall costs, but the effects of the reforms are still being investigated.

1.7. A final key area that has made the funding of long-term care so important recently has concerned the interface between health and social care, the different funding and charging regimes associated with them, and the need to balance competing pressures on resources. The community care reforms have not changed the fundamental position whereby social care is means-tested but health care is not. However, the growing proportion of elderly people who own their own homes has increased the numbers who would need to pay for their residential care from their housing assets. These are people who would face a "catastrophic"risk, because almost all their assets would be at risk from means-testing in a way that has increasingly caused concern (e.g. Joseph Rowntree Foundation, January 1997, p.2). The decreasing role of the NHS in providing long-stay hospital care has increased the numbers who enter means-tested residential care rather than hospital care. These developments have contributed to the debate over the balance of finance between public funding and private resources.

1.8. The key financing policy debate therefore concerns the overall level of funding needed for long-term care in the future and the appropriate balance between private funding and public funding. The issue is currently the subject of review by the Royal Commission on Long Term Care for the Elderly, which has been asked to make recommendations by the end of 1998. The Terms of Reference of the Royal Commission are:

"to examine the short and long term options for a sustainable system of funding of long-term care for elderly people, both in their own homes and in other settings and, within 12 months, *to recommend how, and in what circumstances, the cost of such care should be apportioned between public funds and individuals*" (Royal Commission on Long Term Care for the Elderly, Terms of Reference, emphasis added).

RESEARCH ON LONG-TERM CARE

1.9. It is important that the debate on the future funding of long-term care should be informed by information and analysis. It would be most valuable to have reliable projections of two key variables. The first is the likely level of demand for long-term care services under different scenarios about changes in life and health expectancy and in socio-economic variables. The second is the costs associated with meeting the expected demand for care and the distribution of these costs under different policies and funding mechanisms.

1.10. Projections have been made for this country by at least three agencies. The Institute of Actuaries has made projections of the likely numbers of disabled people and of the costs of caring for them on varying assumptions about changes in age-specific mortality and morbidity rates (Nuttall et al., 1994). London Economics and the Institute for Public Policy Research have made projections of future patterns of demand and supply of long-term care and associated costs (Richards et al., 1996). The Department of Health has also made broad projections of expenditure on long-term care on a range of assumptions, presented as evidence to the House of Commons Health Committee (1996a).

1.11 The Health Committee reviewed the evidence from each of these studies (Health Committee Report, 1996a, vol. I, pp.xxxii-vii) and concluded that more information was needed:

"We believe that there is an urgent need *to establish a much better knowledge base* on the costs and benefits of health promotion, rehabilitation, and preventative social care, on the *impact of future demographic, medical and social developments on long-term care costs, and on the costs to the public purse of alternative funding options*" (Health Committee Report, 1996, vol. I, p.lvi, emphasis added).

The Joseph Rowntree Foundation inquiry agreed with the Health Committee's conclusion that more information was needed but referred rather more graphically to "'a funnel of doubt' as to the future health and care needs of older people" (Joseph Rowntree Foundation, 1997, p.3).

1.12. Before the Health Committee completed its report, the Department of Health had agreed a new study of long-term care demand and finance in this country as part of the Personal Social Services Research Unit's (PSSRU) long-run programme of research at the London School of Economics and Political Science. The study was to develop a model with the capacity to make detailed projections of long-term care demand and finance, which would inform policy planning and review (House of Commons Health Committee, 1996, p.xxxvi).

1.13. The study seeks to fulfil a different role from the earlier models. The emphasis is on the links between the circumstances of individuals and the receipt of services. The model focuses first on the projection of the numbers of elderly people in differing needs-related circumstances. It then considers projected demand for services and projected expenditure. This is on the basis on findings about the relationship between needs and services.

1.14. The present report presents some results from the study. In particular it describes the model developed by the PSSRU, discusses some of the key issues that were addressed in producing the model, and outlines some projections produced using the model. The study also involved literature reviews and analyses of various sources of data, but this report concentrates on the model.

PSSRU STUDY AND MODEL

1.15. The overall aims of the study are to make projections of likely demand for long-term care for elderly people to around the year 2031 under different scenarios, and to assess the likely impact of different policies and approaches to funding long-term care for elderly people on the balance of expenditure between sectors.

1.16. By "long-term care" is meant all forms of personal or nursing care and associated domestic services for elderly people who experience difficulty in looking after themselves or who are unable to do so without some degree of support, whether provided in their own homes, in an institution or by the NHS. The study is therefore not concerned with short-term convalescent care but with continuing care needs. As such it covers similar ground as the recent studies/reports described above (Nuttall et al., 1994; Health Committee Report, 1996; Joseph Rowntree Foundation, 1996; Richards et al., 1996).

1.17. The perspective of the study is a long-term one in another sense in that it is looking at demand for care up to 2031. Although the study is able to make projections for intervening years, the aim has been to make projections well into the next century. The year 2031 was seen as the latest to which reasonable projections could possibly be made.

1.18. The focus of the study is on the funding of long-term care for elderly people. The concern is with projections of the real total costs of formal long-term care services for elderly people. This covers the costs to the health services, social services and users of services. It does not include the total costs of long-term care to society. That would require inclusion of the costs of a wider range of services to a wider range of public

agencies and to service users and the opportunity costs of informal care. The focus of the present study is therefore narrower than that adopted by some other similar studies, which have also included the value of informal care and/or the opportunity costs of informal care (Nuttall et al., 1994; Richards et al., 1996). Although the present study has not attempted to estimate the value of informal care, it has made great efforts to incorporate the effects of informal care on demand for formal services.

1.19. The aim of the study is to make projections, to around the year 2031, of the following:

- estimated numbers of elderly people with different levels of dependency by age group, gender, and household type;
- estimated levels of long-term care services demanded by type of service under current patterns of utilisation and variants that may display greater cost-effectiveness; and
- estimated expenditure by funding source given national patterns of costs and current funding mechanisms or specified variants.

OUTLINE OF REPORT

1.20. The chapters that follow describe the model developed in this study and set out results from projections using the model. The report begins with a number of chapters that place the model in its context and introduce its structure. Chapter 2 introduces the policy context of the study, looking at issues in the provision and funding of long-term care. Chapter 3 looks at a number of other models of long-term care financing that have been developed in this country, the United States and elsewhere. Chapter 4 discusses theoretical issues in modelling the demand for and supply of long-term care. Chapter 5 contains a description of the model, providing an outline of its structure, definitions used and data sources. A diagram at the end of this chapter provides a guide to the structure of the model.

1.21. Chapters 6 and 7 are concerned with projected numbers of elderly people with different levels of dependency by age, gender and household type. Chapter 6 focuses on age and dependency, while Chapter 7 focuses on marital status and household composition. This is followed by a chapter on informal care (Chapter 8). This provides a link to the following chapters on demand for services, since the amount of informal care is an important determinant of the demand for formal services.

1.22. Chapters 9 and 10 are concerned with projections of the volumes of services demanded. Chapter 9 is concerned with non-residential services, covering key formal social services, such as home care, day care and meals-on-wheels; key health services, such as day hospital care, community nursing and chiropody; and private domestic help. Chapter 10 is concerned with residential care home, nursing home and long-stay hospital care.

1.23. Chapters 11 and 12 are concerned with the projected aggregate expenditure on long-term care and on the projected breakdown between funders. These chapters are concerned with the total costs of the formal services demanded, covering costs to the health services, social services and users of services. They also deal with the breakdown by funder, with the costs of the health services assigned to the NHS and the costs of the social services divided between the personal social services and service users. The aim is to examine aggregate net costs to health and social services. These chapters also consider trends in the wealth (housing assets) and incomes of elderly people. The issue of housing assets is relevant, in part, for the division between privately funded and publicly funded residential care in the case of elderly people living alone. Incomes are relevant, in part, for the consideration of user contributions to the costs of publicly funded care.

1.24. Chapters 13 and 14 summarise the results of the projections, draw some conclusions from the study, and point to areas that require further investigation. It is important to recognise the considerable uncertainties involved in making meaningful projections so far ahead. It is therefore important that the assumptions behind the projections are noted. Most chapters contain sensitivity analyses, looking at what would happen to the projections under different assumptions. These are summarised in Chapter 13, and some key concluding points are discussed in Chapter 14.

2. Policy context

INTRODUCTION

2.1. A number of factors have encouraged the recent debate about the future funding of long-term care for the elderly. These include the projected continued growth in the numbers of very elderly people, uncertainty about future levels of family care, the interface between health and social care and the different funding and charging regimes associated with them, and the need to balance competing pressures on resources. The key financing policy debate concerns the appropriate balance between private funding from savings or insurance benefits, and public funding from general taxation or social insurance.

2.2. The Audit Commission has commented in a recent report that:

> "It is impossible to determine with certainty how much funding will be required for community care. Much depends on the standards and range of services expected by older people and how far society will go to meet these expectations. The adequacy of the funding for long-term care needs to be reviewed both now and for the future. There is time to anticipate the next increase in the proportion of elderly people in the next century, and planning must start soon" (Audit Commission, 1997).

2.3. Issues to do with funding are inevitably related to the forms of provision of care. During the 1980s and 1990s, the debate initially centred on the provision of care, but subsequently shifted towards the balance of funding more directly.

ISSUES IN THE PROVISION OF LONG-TERM CARE

2.4. During the 1980s and early 1990s, debates on the long-term care of elderly people focused primarily on its organisation. There were two key elements to the debate. The first concerned the balance between residential and community-based care, with the increasing expectation among both local authorities and the Department of Health that community-based services should become an alternative to residential-based care for many clients. The second concerned shortfalls in the equity and efficiency of community-based services and arguments that supply-side considerations were dominating at the expense of the needs of clients and carers. The two issues, reducing demand for residential care and increasing the effectiveness of community care, were linked in that the level of demand for residential care was associated with the degree of effectiveness of community-based services (Davies et al., 1990, pp.8-11).

2.5. These twin themes were evident in a number of reports published in the 1980s. These were concerned with the organisation of community care and with aspects of its financing, especially the system of social security finance for independent residential care. The Firth Committee examined options for changing the arrangements for public support for residential care (Department of Health and Social Security, 1987b). The Audit Commission considered organisational responsibilities for arranging community care for the different client groups (Audit Commission, 1986).

2.6. The report by Sir Roy Griffiths (1988) considered both these issues and made a range of recommendations on the organisation and financing of community care. Sir Roy Griffiths had been asked "to review the way in which public funds are used to support community care policy and to advise [the Secretary of State] on options which would improve the use of these funds as a contribution to more effective community care". He recommended that local social services authorities should, within the re-

sources available, assess the community care needs of their locality, identify and assess individuals' needs, and arrange the delivery of packages of care to individuals. One of the key themes of the Griffiths' Report was its emphasis on the performance of the core tasks of case management, which was seen very much as a tool for reorientating services towards the needs of the client: "The role of the social services authorities should be reorientated towards ensuring that the needs of individuals ... are identified, packages of care are devised and services co-ordinated; and where appropriate a specific care manager is assigned" (Griffiths, 1988, Introductory letter to Secretary of State, para. 24).

2.7. These reports culminated in the proposals for reform of community care. The Conservative Government published in 1989 its proposals for reform in the White Paper *Caring for People* (Secretaries of State, 1989). The White Paper stated that "promoting choice and independence underlies all the Government's proposals". It set out six key objectives for service delivery. These included securing "better value for taxpayers' money by introducing a new funding structure for social care". The new funding structure involved local authorities taking responsibility for financial support of people in private and voluntary homes.

2.8. The proposals were enacted in the NHS & Community Care Act 1990 and implemented in stages with the final stage in April 1993. The reforms gave social services departments the lead role in assessing needs for community care and arranging care for their resident populations. This involved a transfer of responsibility and funds from social security to social services budgets. It marked the end of the open-ended availability of social security monies for residential care. Local authorities became responsible for public funding of residential care. Public funding became subject to an assessment of care needs as well as a financial assessment at the individual level and to overall constraints on local authority expenditure at the global level.

2.9. The community care reforms introduced changes along a number of dimensions relating to the organisation of services (Wistow et al., 1996, p.161). Three main changes can be identified. First, the aim of the reforms was to shift services away from institutional towards community services, encouraging non-residential rather than residential care through the reorganisation of the funding of institutional care and the appointment of local authorities as gatekeepers of publicly funded admissions to care. Second, the reforms aimed to change services from being supply-led to needs-led though a number of mechanisms but principally through the introduction of case management, termed "care management" under the legislation (Wistow et al., 1996, pp.6-7). One of the aims of this was to address some of the anomalies in service receipt and unmet needs for services identified during the 1980s and to improve the targeting of home care, so that services were more focused on the most disabled people in the community. Finally, the reforms also addressed the needs of carers, the Community Care White Paper, *Caring For People*, consistently linking the terms "users and carers" and suggesting the separate assessment of carers' needs when necessary (Twigg, 1992, p.93). More recently, the Carers (Recognition and Services) Act was passed in 1995, coming into effect on 1 April 1996 and giving carers the right to an assessment and services.

ISSUES IN THE FUNDING OF LONG-TERM CARE

2.10. These reforms altered the balance of funding responsibilities between social security and social services but did not directly change the balance of funding responsibilities between public finance and clients and their families. Changes had, however, taken place through less direct routes. The reduction in the numbers of continuing care beds in the NHS had effectively transferred a section of long-term care from the NHS to means-tested care in residential care and nursing homes. The growth in the private

residential and nursing home sector, encouraged by the use of social security monies, had effectively transferred resources from public sector to private sector provision.

2.11. As the debate about funding long-term care heightened, the House of Commons Health Committee decided to conduct an inquiry on the financing of long-term care. The Joseph Rowntree Foundation also decided to set up an inquiry to consider options for financing continuing care for elderly people. Both inquiries reported in 1996.

2.12. The Health Committee disagreed with the view that the country faced a crisis in paying for long-term care in the future. The Committee "believed that much of this speculation has been founded on unsound evidence, or indeed been downright alarmist, and that the problems the country faces in relation to paying for long-term care, although real, are more manageable than many recent commentators have suggested" (House of Commons Health Committee, 1996a). The Committee reviewed various projections as to the future costs of long-term care and concluded that "there is no imminent crisis of affordability".

2.13. The Rowntree Inquiry felt that the evidence about future long-term care costs was "not entirely reassuring" (Joseph Rowntree Foundation Inquiry, 1996). They pointed to the projected rise in the numbers of very elderly people, the likelihood of real rises in labour costs, rising expectations, and possible decline in the supply of informal care. They felt that prudence meant that the issue of long-term care finance could not be ignored. They recommended that a funded "National Care Insurance scheme should be established, with an obligation to contribute on the part of all those who have earnings during their lifetime" (Joseph Rowntree Foundation Inquiry, 1996, p.63).

2.14. The Conservative Government responded to public concern on the financing of long-term care by relaxing the assets element of the means test for local authority supported residential care and by issuing two papers on partnership schemes (Chancellor of the Exchequer et al., 1996, 1997). The papers concerned proposals to increase the asset limits for people purchasing private long-term care insurance or annuity products under a partnership arrangement. The proposal, a form of partnership between private and public finance, was based on schemes operating in some US states.

2.15. The new Labour Government, elected in May 1997, pledged in its Manifesto to establish a Royal Commission to consider the financing of long-term care. They also promised a review of pensions policies and suggested a possible link. The Royal Commission was set up in December 1997 and asked to report within one year. The Commission's terms of reference are:

"To examine the short and long-term options for a sustainable system of funding of long-term care for elderly people, both in their own homes and in other settings, and, within 12 months, to recommend how, and in what circumstances, the cost of such care should be apportioned between public funds and individuals" (Royal Commission on Long Term Care for the Elderly, Terms of Reference).

2.16. The Commission has been asked to have regard to the numbers of people likely to require care through the first half of the next century and their likely income and capital, the expectations of elderly people for dignity and security in the way in which their care needs are met, the strengths and weaknesses of the current arrangements, fair and efficient ways for individuals to make any contribution required of them, constraints on public funds, earlier work by various other bodies on this issue, the deliberations of the Government's comprehensive spending review, including the review of pensions, and the implications of their recommendations for younger people who have long-term care needs. The Commission has been asked to cost their proposals.

2.17. To inform the debate on how best to fund long-term care it would be most valuable to have reliable projections of two key variables. The first is the likely level of demand for long-term care services under different scenarios about changes in life and health

expectancy and in socioeconomic variables. The second is concerned with the costs associated with meeting the expected demand for care and the distribution of these costs under different policies and funding mechanisms. The next chapter discusses some studies that have made projections on these lines and considers some of the issues they have raised.

2.18. The community care reforms and the current debate on the funding of long-term care provide an important context for the study of the future demand for long-term care. The community care reforms are still being worked through, and their continuing impact needs to be taken into account in projecting demand for services in the future. This is considered here through sensitivity analyses in Chapters 9 and 10 of the report. The debate on the funding of long-term care also provides potential scenarios for the future which are examined in Chapters 11 and 12.

3. Modelling long-term care finance

3.1. A number of models of long-term care financing have been developed in this country, the United States and elsewhere. This chapter describes briefly a few of these models and aims to highlight issues of special relevance for further modelling. Such issues include the objectives of the models, the modelling methodology, the base case assumptions, and the treatment of supply.

3.2. Projections of long-term care finance have been made for Britain by at least three agencies. The Institute of Actuaries (Nuttall et al., 1994) has made projections of the likely numbers of disabled people and of the costs of caring for them on varying assumptions about changes in age-specific mortality and morbidity rates. London Economics and the Institute for Public Policy Research (Richards et al., 1996) have made projections of future patterns of demand and supply of long-term care and associated costs. The Department of Health has also made broad projections of public expenditure on long-term care on a range of assumptions (House of Commons Health Committee, 1996b).

3.3. More detailed modelling has been undertaken in the USA. The Brookings Institution and Lewin-VHI Inc. have developed a Long-Term Care Financing Model using microsimulation techniques. The model was originally developed in 1986-7 but updated and refined in 1988-9 using new data. This model projects the size, financial position, disability status, and nursing home and home care use and expenditures of elderly people through the year 2020. Expenditures are further extrapolated on a broader basis to year 2050. The model has been used to simulate the effects of changes in the system for financing long-term care in the USA (Wiener et al., 1994).

3.4. The Urban Institute has also used microsimulation to make projections of the future needs of elderly people (Zedlewski et al., 1990). The Institute's Dynamic Simulation of Income Model (DYNASIM) was used to project the elderly population's characteristics, incomes, and needs to the year 2030. The study considers the future numbers of elderly people with different levels of disability, incomes and other characteristics, under varying assumptions about future mortality and disability rates. It does not include projections of long-term care expenditure.

AIMS AND OBJECTIVES

3.5. These five studies varied in their aims and emphases and in the age groups considered. It is essential to recognise this, as consideration of the appropriate methodology for making projections of long-term care finance should depend on the key questions to be addressed.

3.6. The Institute of Actuaries and Urban Institute studies concentrated on projecting the future numbers of people with different levels of disability under varying assumptions about future mortality and disability rates. The studies then examined the implications for future demand for long-term care services. The Institute of Actuaries made expenditure projections, while the Urban Institute made projections in terms of numbers of elderly people requiring long-term care.

3.7. The London Economics/Institute for Public Policy Research and Brookings/Lewin-VHI studies were both concerned with analysing options for funding long-term care. They, therefore, concentrated on the projected level and breakdown between funders of long-term care expenditure under different financing systems. The former considered the costs of formal (publicly funded and privately funded) care and informal care, while the latter considered only formal care.

3.8. The Department of Health study was concerned to illustrate the sensitivity of projections of long-term care expenditure to a range of factors, including future age-specific disability

rates, future real increases in care costs and future rates of informal care provision. It covered only public expenditure but took a wide view of the relevant services, including (non-acute) hospital, community health and social care for adults of all ages.

3.9. The two US studies considered long-term care for elderly people. The UK studies considered both elderly people and younger adults. Around 70% of disabled adults in the UK are aged 60 years or over, according to the OPCS Surveys of Disabled Adults. Moreover, the numbers of elderly people in the US and UK are rising faster than the numbers of younger adults.

METHODOLOGY

3.10. The studies differ in their modelling methodologies. The three UK studies used cell-based, or macrosimulation, methods. They considered sub-groups of the population, mainly by age, and not individuals. The two US studies used microsimulation methods. The health state, family circumstances, incomes and other characteristics of a sample of individuals were simulated year by year to their deaths. The outputs of the microsimulations were grossed up to match official population projections by age and gender. The characteristics of these different approaches are discussed in the annex to the chapter, and in more detail in Harding (1990).

3.11. The Department of Health model took as its starting point estimates of per capita expenditure by age group on long-term care services. The relative levels of per capita expenditure by age group were assumed to remain constant till 2030. The estimates for each age band were multiplied by the projected population in that age band in each year and the results summed. Adjustments were then made for assumed changes, under varying scenarios, in real costs of care, age-specific disability rates and other factors discussed below. The approach is thus fairly straightforward. The Brookings Institution used a similar approach to take their more detailed projections forward from 2020 to 2050 on a broader basis.

3.12. The Institute of Actuaries study took as its starting point prevalence rates of disability among adults found in the OPCS Surveys of Disability of 1985-88. Incidence rates of disability for the base year were estimated from these prevalence rates on the assumption that there were no transitions to lower levels of disability. The numbers of disabled adults for each year to 2030 were estimated on the basis of a range of assumptions concerning improvements in incidence rates of disability and in disabled mortality rates. Hours of care demanded were estimated by assigning an assumed number of hours per week to each level of disability.

3.13. The London Economics/IPPR study effectively used the Institute of Actuaries' central scenario, with some minor changes in assumptions, as its starting point on projected numbers of disabled people for each year to 2030. It concentrated on estimating the breakdown of the aggregate level of care demanded between informal care, publicly funded care and privately funded care.

3.14. The Brookings/Lewin-VHI model started with a nationally representative sample of the adult population, with a record of each person's age, gender, income, assets, and other characteristics. The sample consists of 28,000 adults of all ages from the 1979 Current Population Survey. The model simulates changes to each individual from 1986 to 2020. The changes simulated include onset and recovery from disability and commencement and termination of receipt of long-term care services. The Urban Institute model uses a similar approach.

POLICY CONSIDERATIONS

3.15. These models have been developed to inform policy debate. They, therefore, start with an assumption of no change in policies. This relates both to policy on financing systems and responsibilities and to policy on the organisation and patterns of supply of long-term care.

The Brookings Institution's base case, for example, "projects what will happen if no changes are made in the way long-term care services are organised, used and reimbursed". The initial concern is to investigate the impact on demand for long-term care of expected changes in factors that are exogenous to policy. The key such factors are demographic, epidemiological and socioeconomic changes.

3.16. None of the earlier studies explicitly modelled policy changes concerning the pattern of supply of formal care. The Department of Health, for example, assumed for the purpose of their analysis no further shift in the balance between health and social services or in the balance of care within each of these sectors. Each study effectively assumed a fixed quantity of care of constant quality for each person of a given age, gender, marital status, disability and other variables considered.

3.17. Two of the studies, the London Economics/IPPR and Brookings/Lewin-VHI studies, investigated the effects of changed policy on financing systems and responsibilities. The former considered social insurance and private financing mechanisms, including long-term care insurance funded by (partial) housing equity release. The latter considered private long-term care insurance, public subsidies for private insurance, more generous public funding rules and full social insurance.

DEMAND AND SUPPLY

3.18. The quantity of long-term care actually provided is clearly a function of both demand and supply. The studies concentrate on factors affecting demand. This is because one of their aims is to consider the implications for supply and financing of changes in demand pressures. The studies do, however, explicitly or implicitly consider some aspects of supply.

3.19. The demand for long-term care is a function of a range of variables including age, marital status and dependency. The demand for formal care services is a function not only of these variables but also of receipt of informal care. It is not realistic to look at the future demand for formal care without considering the future supply of informal care. The impact of possible supply constraints in informal care is examined in greatest detail in the London Economics/IPPR study. It is also considered explicitly, albeit in less detail, in the other two UK studies. The US studies did not consider this matter directly, but covered it to some extent by considering expected trends in marital status.

3.20. The demand for publicly funded long-term care is a function not only of personal characteristics and informal care receipt but also of the availability and price of privately funded care and, in view of means tests for some services, of incomes and assets. Projections of public expenditure in the London Economics/IPPR, Brookings/ Lewin-VHI and (to a more limited extent) Department of Health studies took account of projected changes in incomes and assets.

3.21. Possible constraints in the supply of formal services also require consideration. Public policy on registration standards and reimbursement rates and more especially on aggregate expenditure exert a considerable impact on supply. Such considerations are, however, part of public policy. Exogenous constraints include the need to retain the inputs to formal care, especially care staff. This seems likely to require offering wages that rise broadly in line with wages in the economy generally.

3.22. The studies incorporate assumptions about rises in the real costs of care. These could be understood as assumptions about the real rises in wages and other payments for inputs to care that are necessary to ensure that supply is sufficient. The studies' expenditure projections thus effectively assume that supply of formal care will adjust to match demand for formal care and that demand will be no more constrained by supply in the future than in the base year.

Annex to Chapter 3. Cell-based and microsimulation models

A3.1. A microsimulation model has as its unit of analysis individual people, families or households. A cell-based model has as its unit of analysis aggregates of individuals grouped by their characteristics such as age and gender.

A3.2. For dynamic models there is a marked difference between these two forms of model. The various British long-term care finance models prepared by the Institute of Actuaries, London Economics, the Department of Health and the PSSRU are all cell-based. The Department of Health model, for example, contains cells based on age bands. The numbers in each age band are assumed to vary over time in line with official population projections. Average per capita long-term care expenditure in each age band (cell) is assumed to remain constant, rise or fall in line with the assumptions used.

A3.3. The Department of Social Security pension simulation (PENSIM) model is a dynamic population microsimulation model. It is based on information on a sample of individuals and their characteristics. The model simulates the expected income from different sources of each individual. The Brookings Institution Long Term Care Financing model is similarly a dynamic population microsimulation model. It too is based on information about a sample of individuals and their characteristics. The model simulates the expected health state and use of long-term care services of each individual.

ADVANTAGES OF MICROSIMULATION

A3.4. Microsimulation models permit a more detailed consideration of distributional factors than cell-based models. Analyses using cell-based models are restricted to distribution by the variables used to define the cells. In practice a cell-based model could become unwieldy if it contained too many cells.

A3.5. Dynamic microsimulation models also permit consideration of events over the lifetime. They can be used, for example, to simulate how long a person can expect to live in each of a number of health states and how many spells a person can expect to have in each health state. They can be used to simulate a link between contributions to a pension or other saving/insurance scheme at one stage in the life cycle with expected benefits at a later stage. It is this potential use of microsimulation that seems most relevant in the context of long-term care finance.

REQUIREMENTS FOR MICROSIMULATION

A3.6. Dynamic microsimulation models require data on, or at least estimates of, the probability of transition between different states, for example different health states. This is because the model simulates for each individual for each year, for example, whether they improve in health state, remain in the same state, deteriorate in health, or die. The simulation process requires information or assumptions on the probability of each possible transition.

A3.7. Information on transition rates generally requires longitudinal data where the same sample are interviewed on more than one occasion. The availability of longitudinal data for the UK on health state and use of health and social services is limited. The research report *Health Expectancy and Its Uses* (Bone et al., 1995) and the subsequent report of the Working Group on Health Expectancy Measures (1998) considered the need for longitudinal data on health state and service use in detail.

4. Modelling demand and supply of long-term care

4.1. This chapter discusses theoretical issues in modelling long-term care demand. It develops some of the points made toward the end of the last chapter about the treatment of demand and supply and the relationship between them. The structure of the actual model developed in the study is described in the next and subsequent chapters.

DEMAND FOR LONG-TERM CARE

4.2. The demand by a person for goods or services is generally taken to be a function of the person's income, the price of the good, the price of other goods that may be close substitutes or complements, and the person's tastes. The latter may in turn be a function of the person's age, gender, occupation, health state, and other personal characteristics.

4.3. The demand for long-term care is complicated by at least two issues. First, it is important to consider the relationship between need and demand. Second, it is important to distinguish between demand for different types of care. In particular it seems important to differentiate between demand that could be met by either informal or formal care and demand for formal health and social services.

4.4. Demand is not the same as need. It takes account of the person's ability and willingness to purchase the good or service. There is scope for debate about how to define need for long-term care. In the health care field, need is sometimes equated with ability to benefit from treatment. On this approach, a person could be regarded as in need of long-term care if he or she has difficulties with personal or domestic care and would benefit from assistance. Demand would arise if the person actually sought long-term care and was willing to pay, if required.

4.5. This suggests that demand for long-term care is a function of a person's needs, tastes and income, and of the price of long-term care. Need for assistance with personal or domestic care may arise from a number of sources or combination of sources. It may arise from limitations in physical health and/or in mental health. It may arise from a combination of limitations in health and difficulties in the person's environment, such as poor or unsuitable housing.

4.6. These considerations suggest that demand for long-term care can be regarded as a function of the following variables: age, gender, physical health, mental health, income, assets, preferences, and the costs of care (cf Evandrou and Winter, 1988; Davies et al., 1990). A model of long-term care demand should in theory consider all of these. Preferences, however, are clearly intangible and changes in preferences or expectations are problematic to project.

4.7. Three forms of long-term care need to be distinguished in terms of costs to the care recipient. These are informal care by family and friends, publicly funded formal care, and privately purchased formal care. The first generally involves no financial cost to care recipients, the second may involve a cost depending on whether public support is subject to charges, and the third clearly involves a financial cost to care recipients or their families. This consideration, together with the potentially different nature of formal services and informal care, mean that the different types of care need to be considered as separate subsets of overall demand for long-term care.

DEMAND AND SUPPLY OF INFORMAL CARE

4.8. Informal care covers a wide range of care. One way of distinguishing between different types of care is in terms of the amount or intensity of care provided. Demand for informal care can be regarded as demand for one or more of a range of different forms of assistance of varying intensity.

4.9. Definitions of the amount or intensity of care vary. A broad distinction is often made between "informal helping" and "heavy duty caring" (Parker, 1992; Twigg, 1996). A particularly useful way of defining the difference between these is in terms of the tasks that are performed for the cared-for person, because this correlates well with other measures of the intensity of caring (Parker, 1992). Thus, a distinction has been drawn between, on the one hand, help with practical or domestic tasks, like preparing meals, shopping and housework, and, on the other, help with personal and/or physical tasks, like dressing, bathing, toileting and getting into and out of bed (Parker, 1992). Help with personal and/or physical care tasks is associated with long hours of caring, sole caring and co-resident caring (Parker, 1992). The tasks that elderly people need to have performed for them can then be seen as a central way in which demand for informal care can be differentiated.

4.10. Demand for informal care could in principle be regarded as a function of the same variables as demand for long-term care generally. The concept of demand for informal care, however, 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. Since a proportion of dependent people do not have a surviving close relative or friend, for some people informal care is not an option. A fundamental characteristic of informal care, identified by a number of social theorists, is that it is given on the basis of broad attachments between people regardless of the needs of others and, because of its essentially personalised and subjective nature, it cannot be relied on to provide care where it is needed (Abrams, 1978; Litwak, 1985). What this means is that people who need care do not necessarily receive it from the informal sector, if they lack the appropriate relationships. Demand for informal care cannot, therefore, be realistically considered independently of supply.

4.11. The supply of informal care depends on the availability of a potential carer. The most recent data on informal carers supplied by the General Household Survey (GHS) confirms that the majority of informal care is provided by spouses, children and children-in-law (Rowlands, 1998).

4.12. The supply of care is related to demand for care. As already indicated, demand for care can be differentiated in terms of the tasks that elderly people need to have performed for them, with domestic tasks distinguished from personal care tasks. Sources of support for different types of task are very different. Thus, whereas a wide range of sources of support are available for help with domestic tasks, help with personal care tasks usually comes from within the elderly person's own household. Parker's analysis of the 1985 GHS Carers data showed that help with practical or domestic tasks was provided by a range of "informal helpers", including friends, neighbours or relatives who were not necessarily close and who did not necessarily live in the same household as the person they were helping. However, help with personal and/or physical tasks tended to come from "heavily involved carers", often elderly themselves, providing care in their own households and likely to be looking after a close relative (Parker, 1992; see also Twigg, 1996). Similar points have been made by Wenger, who linked different types of social support network to different types of need or task (Wenger, 1992, pp.114, 148), and underlie the needs typology used by Davies et al. (Davies et al., 1990, p.48; Bebbington et al., 1986) and Litwak's theory of the role of primary groups in support for the elderly (Litwak, 1985).

4.13. The supply of informal care depends not only on the availability of a potential carer but also on the potential carer's ability and willingness to provide care. The carer's

ability and willingness to provide care may be affected by the carer's health and other commitments, including employment and child-care responsibilities. It may also be affected by the carer's income. People with higher incomes may prefer to purchase care for their elderly relative, as the cost of any employment lost, that is, the opportunity cost of caring, would be higher.

4.14. The supply of informal care is clearly central, yet it cannot be considered independently of demand. Not all informal care is supplied to people with a need for care in the sense that they are dependent or disabled in some way. There is evidence that much informal care for elderly people is supplied to people who do not have disabilities and that carers often give care irrespective of need (Daatland, 1983, p.8; Wenger, 1992, p.101). This again relates to a fundamental characteristic of informal care. It is not just that people who need care do not necessarily receive it from the informal sector, it is also that caregivers often give care irrespective of need. If, then, the concern is with the support of dependent elderly people, not all the informal care supplied is relevant.

4.15. To consider the factors influencing whether or not an elderly person receives informal care, it is, therefore, necessary to bring together the factors affecting demand and supply. This suggests that the provision of informal care to an individual is a function of the person's age, gender, dependency, income, preferences, marital status, availability of a child or possibly other relative living nearby, and also of the spouse's or child's age, gender, health, income, employment status, marital status, child-care responsibilities and preferences. This function, which could be regarded as a "reduced form", would clearly be difficult to model in practice.[1]

4.16. Existing models of informal care have, as described in Chapter 3, tended to be either essentially demand-led or essentially supply-led. The model of the Institute of Actuaries seems to be demand-led, in that it implicitly assumes as its base case that the hours of informal care provided will rise in line with the numbers of people with varying degrees of disability (Nuttall et al., 1994). The model adopted by London Economics, on the other hand, seems to be supply-led. London Economics seem to have assumed as their base case that the hours of informal care provided will change in line with the numbers of potential carers (Richards et al., 1996). In essence, their analysis seems to be based on constant average hours of care supplied by each sub-group of carers, defined in terms of age, sex, economic status, household type and income (Richards et al., 1996, pp.37-41).

4.17. The model used in the present study treats the receipt of informal care as a function of the person's dependency (as an indicator of need) and of the person's household type (as an indicator of the likely availability of informal care). The former may be regarded as a demand variable and the latter as a supply variable. The function is thus a reduced form that seeks to model actual receipt of informal help rather than a demand or a supply function.

RELATIONSHIP BETWEEN FORMAL AND INFORMAL CARE

4.18. It is important to consider the nature of the relationship between formal and informal care. One issue is how far formal care is or is not a substitute for informal care. Another issue is whether the amounts of formal and informal care provided are determined jointly, or whether the amount of formal care provided can be considered as a function of the amount of informal care. The latter implies that the amount of formal care supplied does not influence the amount of informal care supplied, while the former implies that each influences the other.

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[1] By a "reduced form" function is meant the summarisation in one equation of a reciprocal inter-relationship between variables requiring two or more equations to describe in full. The single equation takes the perspective of the influence on one only of two causally interdependent variables.

4.19. Theoretical understanding of the first of these issues, how far formal care is or is not a substitute for informal care, tends to be consistent with one of two approaches. These are the hierarchical-compensatory model and the task specificity model (Chappell, 1992). These models suggest very different understandings of the extent to which formal care can substitute for informal care. Neither of these two theories on its own seems to describe accurately the relationship between informal and formal care, but the two theories do confer a great deal of insight important in understanding the logic of the approach adopted in the present study.

4.20. In the first approach, *the hierarchical-compensatory model*, full substitution between formal and informal care is assumed. The theory argues that older people turn to formal organisations for help only when assistance from the informal system is unavailable. In seeking assistance, it is suggested, older people do so in a particular order, preferring kin first, then friends and neighbours, and only finally turning to formal organisations for help (Cantor, 1980; Cantor and Little, 1985). Thus, there is a hierarchy of preferences in terms of who provides support, and each element compensates for other elements that are unavailable. The implication is that each part of the informal network is substitutable for any other and that the formal system is also substitutable for any part of the informal. The implication is also that elderly people will exhaust their informal networks first and only then turn to the formal system. The approach therefore envisages quite a restricted "last resort" role for the formal system. This theory has been put forward most coherently by Cantor in the United States and is consistent with Shanas's substitution hypothesis, but a version of the approach is also found in Qureshi and Walker's "hierarchy of obligations" in this country (Shanas, 1979; Cantor, 1980; Cantor and Little, 1985; Qureshi and Walker, 1989; Qureshi, 1990).

4.21 In the second approach, *the task specificity model*, no substitution between formal and informal care is assumed. The theory argues that whether informal or formal care is used depends on the nature of the task to be performed. The theory is associated particularly with Litwak in the United States (Litwak, 1985) although theories associating types of tasks with sources of support have also been developed in the UK (Parker, 1992; Wenger, 1992). Litwak argues that primary groups (informal care) and formal organisations are best suited to performing different types of task. He characterises formal organisations in terms of their large size and division of labour and argues that they are best at performing technical tasks, such as 24-hour permanent care. Litwak posits that there will be little overlap between primary groups and formal organisations in the tasks that they perform, but argues in terms of shared functions between informal and formal forms of organisation. The implication is that parts of the informal network are not substitutable for other parts and that the formal system is not substitutable for the informal system. The implication is also that elderly people may exhaust their informal networks earlier than is envisaged by the hierarchical-compensatory model but that formal organisations may only be able to respond by providing permanent care. Here again then only a limited role is envisaged for formal organisations in providing services to elderly people at home (Litwak and Meyer, 1966; Litwak and Szelenyi, 1969; Dono et al., 1979; Litwak, 1985).

4.22. The empirical evidence in relation to these two approaches suggests that neither on its own accurately describes the relationship between informal and formal care. With regard to the hierarchical-compensatory model, this has been tested in North America by Chappell (Chappell, 1992). In her review of the evidence, Chappell concluded that "all elements of the informal network are not tapped prior to accessing formal services and there is no evidence of substitutability" between parts of the informal network (Chappell, 1992, p.66; see also Penning, 1990). What this suggests is that elderly people may not have an overwhelming preference for informal help in all circumstances, and support from the formal system may be sought even when informal help is available. In other words there is no straightforward negative correlation between use of informal help and utilisation of formal services (Chappell, 1987; Penning and Chappell, 1990).

4.23. In relation to the task specificity model, as already indicated in looking at informal care, there is considerable evidence, from both this country and North America, to suggest that Litwak's theory is relevant to the understanding of the roles of different primary groups. However, it is not so clear that the task is relevant where *formal support* is concerned (George, 1987, pp.152-153). In fact, there is evidence from both this country and from North American studies to suggest that there is considerable overlap in the areas in which formal and informal help is given, rather than the task division suggested by Litwak. Studies in North America have shown evidence of overlap in the areas in which informal and formal help is given to the same people (Chappell, 1992). The important determinant seems to be the level of dependency, so that where dependency levels are highest, formal as well as informal help is more likely to be provided. Where dependency levels are lower, formal support tends to be provided to elderly people without informal support (Chappell, 1992).

4.24. Additional evidence in relation to the hierarchical-compensatory and task specificity models comes from the "substitution" literature, mainly in the United States. This extensive literature has explored the hypothesis that, as the availability of formal domiciliary-based care increases, so informal care will diminish. Although the studies have not found evidence of widespread substitution of formal for informal care, there is some evidence of limited substitution under certain circumstances, particularly associated with increases in disability (Smith-Barusch and Miller, 1985; Christianson, 1988; Moscovice et al., 1988; Edelman and Hughes, 1990; Hanley et al., 1991; Tennstedt et al., 1993; Ettner, 1994; Long, 1995; Tennstedt et al., 1996). Although much of the substitution literature comes from the US, similar conclusions have been reached by a recent study carried out in England and France (Davies et al., 1998b).[2]

4.25. In relation to the issue of whether formal care is a substitute for informal care, the evidence therefore suggests that substitution between formal and informal care does occur, particularly as dependency levels increase. There is, however, additional evidence that formal care does not replace informal care fully on an hour for hour basis and that not every informal hour is replaced by formal services (Tennstedt et al., 1996, p.87). There is evidence that hours of informal care and hours of formal services are not time-equivalent (Tennstedt et al., 1996, p.87; Davies et al., 1998b). (These points are explored in more detail in the Annex to Chapter 11.)

4.26. The evidence therefore suggests that formal and informal care should not be seen as *full* substitutes. This implies that it is not appropriate to develop a model in which a fixed number of hours of long-term care are required for dependent elderly people and the formal sector provides whatever the informal sector does not provide. This type of model has been developed elsewhere. The London Economics/IPPR model used this approach in that it calculated the total amount of care needed and the amount of informal care provided up to 2031. Formal care was calculated as the amount of care in excess of that provided by the informal sector (Richards et al., 1996, p.42). This is not the approach adopted in the present study because of the complexity of the relationship between formal and informal care. Rather, in the present study, the likelihood of using domiciliary services 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 (described fully in Chapter 9).

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[2] The point of papers like those of Tennstedt et al. (1993) and Davies et al. (1998b) has been to establish whether informal caregivers pass on responsibility for care in circumstances that policy-makers would regard as of dubious justifiability. The sharpest and most elegant test has been that of Tennstedt et al. (1993). However, it investigated only *whether* such unjustifiable substitutions took place, but not the possibility that there could be quantitatively big substitutions from a small number of cases. Davies et al. (1998b) developed indicators measuring the *quantities* of substitutions. It produced the result that what substitution did take place was likely to be the result of changing need-related circumstances and other such justifiable factors.

4.27. The second main issue in looking at the relationship between formal and informal care is whether formal and informal care are consecutively or jointly determined. Consecutive determination implies that formal care follows informal care sequentially and that informal care is taken into account when formal services are provided. Joint determination implies that both informal and formal care are determined at the same time, with the level of informal and formal care jointly determined by the parties involved.

4.28. The hierarchical-compensatory model, described above, assumes a consecutive relationship between formal and informal care, whereby the informal system is exhausted first and only then do elderly people turn to the formal system. However, this is in fact only one way in which the relationship between formal and informal care may be characterised. Twigg has identified four different ways in which service providers may take informal care into account within the service system. Briefly, Twigg's typology distinguishes: first, *carers as resources*, in which the carer is essentially taken for granted by welfare agencies, often treated as a free resource, with the focus of intervention being the cared for person; second, *carers as co-workers*, in which the carer's well-being is recognised by agencies but on an essentially instrumental basis, to ensure the continuance of caring; third, *carers as co-clients*, in which the carer is regarded as in need of help and is the focus of intervention by agencies; and finally, *superseded carers*, where, either to promote the independence of the cared for person or to protect the carer from the burden of caring, the caring relationship is transcended (Twigg, 1992; Twigg and Atkin, 1994). Twigg's typology can be seen as a continuum, with carers treated as resources at one end, and superseded at the other. Where carers are treated as resources, the relationship between formal and informal care can be seen as consecutively determined. Where carers are superseded, the relationship can be seen as jointly determined.

4.29. Empirically, as has already been noted, there is not necessarily a negative correlation between the use of informal help and the utlilisation of formal services (Chappell, 1987; Penning and Chappell, 1990). Nevertheless, the approach to informal care adopted by service providers in the UK, certainly prior to the community care changes of the early 1990s, has been characterised by a model that treats carers as a resource and provides formal services very much in response to the amount of informal care received (Twigg and Atkin, 1994 p.12). This is reflected in the importance of household composition as a variable determining receipt of formal services, since household composition to a large extent reflects the amount of informal care (Evandrou et al., 1986; Evandrou, 1987; Evandrou and Winter, 1988).[3] (This point is discussed further in Chapter 9.)

4.30. For this reason, the model adopted in the present study has a sequential form: that is, in the model, household type is one of the variables which determines receipt of informal care, and receipt of informal care in turn is one of the variables which determines receipt of formal care. This seemed an empirically justified approach to take in modelling long-term care in this country at this time.

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[3] There is some evidence that, since the community care reforms, formal services have been provided to those with informal carers to a greater extent. The reforms have resulted in much higher proportions of the users of community social services having informal caregivers putting in substantial amounts of practical help weekly with personal care and other tasks of daily living. The services are also received by those users whose principal informal caregivers are under greater strain than was the case a decade ago. And there are signs that the services are now more orientated towards relieving caregiver burden than during the mid-1980s, though it also seems that the services are less orientated towards that than to the production of the main benefits to users (Davies, 1997; Davies et al., 1998a).

DEMAND FOR FORMAL CARE

4.31. This discussion of the relationship between formal and informal care suggests that the demand for formal care should be treated as a function not only of the variables affecting overall demand for long-term care but also of the provision of informal care. This is on the basis that formal care can and does sometimes substitute for informal care, especially when it is unavailable, and that informal care provision is often determined before formal care. The demand for formal care can, therefore, be regarded as a function of the person's age, gender, physical health, mental health, income, assets, preferences, and receipt of informal care, and of the costs of care.

4.32. For those with no informal carers, the overall demand for long-term care is effectively a demand for formal services. For those receiving informal care, the demand for formal services may be regarded as a demand for additional types of care or additional hours of care that remain unmet. Alternatively, or additionally, there may be a demand for formal services to provide respite for informal carers. This suggests that carer stress may be a further relevant factor.

4.33. For those eligible for publicly subsidised care, such care is likely to be less costly than privately purchased care. It may, therefore, be reasonable to assume that, subject to any issues of quality of care, those eligible for publicly subsidised care would generally seek such care before considering privately purchased care. Receipt of publicly funded care is dependent on an assessment of care needs. In addition, in the case of social care, receipt of publicly subsidised care depends on the person's income and assets for residential care, and the person's income and the local authority's charging system for non-residential care.

4.34. These considerations suggest that demand for publicly funded long-term care could be treated as a function of the following variables: age; gender; dependency; income; assets; preferences; receipt of informal care; charge for public care; cost of private care; quality of publicly funded care; and quality of private care. Demand for a specific service is likely, additionally, to be a function of the receipt of other services.

4.35. The model developed in the study treats receipt of residential care as a function of age, gender and household type. It treats receipt of formal non-residential care as a function of age, dependency, household type, housing tenure, and receipt of informal help with domestic tasks. Other relevant factors either could not be taken into account because of lack of data or proved in multivariate analyses not to be statistically significantly associated with receipt of services. This is discussed in detail in Chapters 9 and 10.

SUPPLY OF FORMAL CARE

4.36. The supply of formal services also requires discussion. The overall supply of publicly funded care is affected by policy decisions at central and local level about priorities for public expenditure. In modelling demand for formal care, these policy decisions need to be treated as exogenous to the model. This is on the basis that the purpose of the modelling is to inform decisions on public expenditure by providing information on projected changes in demand. To take account of policy constraints on supply in a model aiming to inform policy decisions on supply of public funds would be circular.

4.37. Market constraints on supply also require consideration. A key constraint is the need to retain the inputs to formal care, especially care staff. Expenditure projections need to incorporate assumptions about unit costs of care and about rises in the real costs of care. These could be understood as assumptions about the real rises in wages and other payments for inputs to care that are necessary to ensure that supply is sufficient. Expenditure projections would thus effectively assume that supply of formal care will adjust to match demand for formal care and that demand will be no more constrained

by supply in the future than in the base year. This is on the basis of an appropriate assumption about real rises in care costs.

CONCLUDING CONSIDERATIONS

4.38. The model described in the next chapter seeks to model the demand for formal long-term care services, as a function of some of the key variables discussed in this chapter. These include not only the elderly person's age, dependency and other characteristics but also the person's receipt of informal care. The latter is a function of demand and supply factors relating to informal care.

4.39. The model does not seek to incorporate variables concerning the supply of formal care. It does not seem appropriate to do so, since one of the purposes of the model is to inform policy decisions concerning the supply of publicly funded care. Supply considerations are not, however, absent from the model. Assumptions are made about future rises in the real costs of care. These need to be sufficient to retain the inputs, especially staff, required to provide the levels of care demanded.

5. Description of the PSSRU model

5.1. This chapter provides a broad description of the model prepared as part of the study of long-term care demand and finance. The aim of the chapter is to describe the overall structure of the model. A diagram, figure 5.1, and an annex summarising the structure of the model are at the end of the chapter.

5.2. The model makes broad projections of the numbers of elderly users of key long-term care services and of the expenditures involved to the year 2031. The present chapter is principally concerned with the description of the structure of the model. Specific topics are discussed in later chapters and projections produced using the model are presented in Chapter 13.

5.3. The model is cell-based, or a macrosimulation rather than a microsimulation model. The first part divides the projected elderly population into sub-groups, or cells, by age, gender, dependency, household type, housing tenure, and receipt of informal help. This is discussed in paragraphs 5.4 to 5.16. The second part of the model is concerned with receipt of long-term care services. It attaches a probability of receiving health and social care to each cell. This is discussed in paragraphs 5.17 to 5.22. The remainder of the model is concerned with long-term care expenditures and their breakdown between the NHS, social services and service users. This is discussed in paragraphs 5.23 to 5.28.

POPULATION PROJECTIONS

5.4. The starting point for the model is the Office for National Statistics (ONS) population estimates for England for 1995. Five age bands were considered — 65 to 69, 70 to 74, 75 to 79, 80 to 84, 85 and over — separately for males and females. The model thus starts with ten cells.

5.5. Projections of the numbers in each of these cells for later years were drawn from the 1996-based population projections for England produced by ONS and the Government Actuary's Department (GAD). The model can make projections for any years for which population projections are available. The version described here uses the years 2000, 2010, 2020 and 2031. It is also possible to consider specified variants around the GAD/ONS population projections. This is further discussed in Chapter 6.

INSTITUTIONAL POPULATION

5.6. For the base year the institutionalised elderly population was separated from the private household population, within each age/gender cell, at the start of the modelling. This seemed necessary because data on dependency are not available that cover both the institutionalised and the private household population. Department of Health data on the numbers of elderly people in institutional care were used for this purpose. Three forms of institutions were considered: residential care homes, nursing homes and hospitals. For each, estimates were incorporated of the numbers of residents by age group and gender. These are shown in table 10.1 in Chapter 10, which discusses residential care. For years other than the base year, institutionalisation was treated as a function of age, gender and household type, as discussed below.

DEPENDENCY

5.7. The private household population was divided into four dependency categories. These are: problems with two or more activities of daily living (ADLs); problems with one

ADL; problems with instrumental activities of daily living (IADLs) but not with ADLs; and no problems with ADLs or IADLs. This categorisation is in principle similar to that used in the Brookings/Lewin VHI long-term care financing model. In practice definitions are not the same. This is discussed in more detail in Chapter 6. The proportion of the private household population in each dependency category is shown in table 6.3.

5.8. Rates of ADL and IADL problems by age and gender were drawn from the 1994/5 General Household Survey (GHS), England data. Five ADLs were considered: bathing, dressing, feeding, washing, and getting to and from the toilet. Those who could not perform a task at all, could perform it only with help or could perform it but with difficulty were taken as having a problem with that ADL. Five IADLs were considered: shopping, laundry, vacuuming, cooking a main meal, and handling personal affairs. Those who reported that they did not perform a task but could do so if they had to were regarded as not having a limitation with that IADL. Only those specifically reporting inability to perform the task were taken as having a limitation.

Marital status, gender, household type, housing tenure

5.9. The population was then divided by (*de facto*) marital status. Two categories are used: married or cohabiting and single, separated, divorced or widowed. For the private household population data from the 1994/5 GHS were used by age and gender, and for the institutionalised population data from the 1991 Census by age and gender. Data on the proportion married or cohabiting by age and gender are shown in table 7.1 in Chapter 7, which discusses marital status and household type.

5.10. Multivariate (logistic regression) analysis showed that marital status is not significantly associated with dependency when age and gender are controlled for. Marital status was thus assumed to be a function of age and gender but not dependency. The inclusion of marital status extends the model to one hundred and forty cells: five age bands, two genders, two marital status, four dependency groups for those in private households and three institutional groups for those not in private households.

5.11. Gender was found not to be a significant variable in any of the further analyses. In particular, it was found in multivariate analyses controlling for age and dependency not to be significantly associated with housing tenure, the probability of living alone, the receipt of informal care or the receipt of formal care. The two genders were, therefore, combined. This reduced the model to seventy cells.

5.12. Those in private households were then divided by household type: single people are classified as living alone or with others and married/cohabiting people as living with one other person (presumably their partner) or more than one other person. For single people the probability of living alone was found to be significantly associated with dependency but not with age or gender. For married people the probability of living with a partner only was found to be significantly associated with age but not with dependency or gender. Information from the 1994/5 GHS was used to divide the single people by dependency into those living alone and those living with others and the married group by age band into those living with their partner only and those living in a larger household. The proportions of elderly people in each household type, by age and gender, are shown in table 7.2 in Chapter 7.

5.13. The next stage involved dividing the private household population by housing tenure into two groups: those living in owner-occupied households (with or without mortgage) and those living in rented tenure households. Housing tenure was included as a simple proxy for economic circumstances. It was found in multivariate analysis to be significantly associated with household type and dependency but not age or gender. Tenure rates were, however, estimated from the 1994/5 GHS England data by age band and household type. It seemed unsatisfactory to assume that future changes in dependency would lead to changes in patterns of housing tenure. The proportions of elderly

people, by age band and household type, in owner-occupier tenure are shown in table 12.1 in Chapter 12, which discusses housing tenure.

Informal care

5.14. The groups who are dependent and who live in private households were divided into those receiving informal help with domestic tasks and those not receiving such help. Informal help covered help from a spouse, another member of the person's household, a relative outside the household, or a friend or neighbour. The probability of people with dependency receiving informal care was found, in multivariate analyses of the 1994/5 GHS data for England, to be associated with household type and level of dependency but not with age, gender or housing tenure. Receipt of informal help with domestic tasks is, therefore, included as a function of dependency category and household type. The estimated probability of receiving such help by these variables is shown in table 8.1 in chapter 8.

5.15. Almost one half (46%) of the GHS sample without any ADL or IADL problem also reported receipt of informal help with domestic tasks. In some cases this may be because the person required help for reasons not amounting to a limitation with any ADL or IADL task. In most cases this is probably because of a division of labour within the household. It is for this reason that people with no dependency were not regarded as receiving informal care for the purposes of this model.

5.16. The GHS does also include some limited information about informal help with personal care tasks. This is restricted because questions about sources of help with personal care 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. This information is not, therefore, used. This issue is discussed further in Chapter 8, which considers the difficulties involved in modelling informal care.

Formal long-term care

5.17. The model covers a range of formal health and social services, residential and non-residential. Hospital, nursing home and residential care home services have been discussed above. Institutionalisation is effectively treated in the model as if it was a separate dependency group. The probability of receiving care in a hospital, nursing home or residential care home was modelled as a function of age, gender and household type, or more specifically whether or not the person lived alone. This is discussed in more detail in Chapter 10.

5.18. Key non-residential social services such as home care, day care and meals are covered. Key health services such as day hospital care, community nursing and chiropody are also included. Private domestic help is also included, though this should be treated with caution. The probability of receipt of each of these services was estimated, through multivariate analysis of the 1994/5 GHS data, by age, dependency, household type, housing tenure, and receipt of informal help with domestic tasks. Each service was considered separately.

5.19. Multivariate analyses, using logistic regression, were conducted to investigate factors associated with receipt of formal services by the 1994/5 GHS sample for England. The services considered were receipt in the last month of local authority home help, district or other community nursing at home, meals-on-wheels, meals in a lunch club, day centre attendance and private domestic help, and receipt in the last three months of chiropody. The independent variables considered were age band, gender, household type, dependency, housing tenure, gross income and receipt of informal care. The predicted values from the logistic regression analyses were then used in the model as the estimated probability for those in each cell to receive each service. The results of this analysis are discussed in Chapter 9.

5.20. The proportion of the household population for each sub-group estimated to receive services was applied to the estimated numbers in each sub-group to produce an estimated number of recipients of each service by age group, household type etc. These were summed to produce an estimated number of recipients of each service for England for 1995. These estimates are shown in table 9.7 in Chapter 9, which discusses non-residential services.

5.21. The model then moves from estimated numbers of service recipients to estimated volumes of care, in terms of home help hours, community nurse visits etc. The 1994/5 GHS provides information on intensity of service receipt for most of the non-residential services. The average number of hours of home care per recipient week and the average number of community nurse visits per recipient week varied by dependency. The average number of meals per week and of day care attendances per week did not vary by dependency.

5.22. The model as described so far in this chapter enables projections to be made of the numbers of service recipients and of the amounts of services. The next part of the model attaches costs to the projected levels of services and breaks down those costs between sources of funding.

Costs of formal care

5.23. Data on the unit costs of services at 1995/6 prices were taken, where available, from Netten and Dennett's *Unit Costs of Community Care 1996*. A key factor in projecting expenditure for future years is the assumption made about real rises in the unit costs of care. The Department of Health projections for the House of Commons Health Committee showed how sensitive projections are to the assumed rate of real inflation in care costs. This issue is discussed further in Chapter 11.

5.24. It is assumed as a base case that the costs of social care services will rise by 1% per year in real terms. This is line with the Department of Health assumption, which is based on the finding that the personal social services pay and prices index has on average risen by 1% per year in real terms since 1979. It is assumed as a base case that the costs of health services will rise by 1.5% per year in real terms. This is greater than the Department of Health assumption but is based on the fact that the hospital and community health services pay and prices index rose by around 1.5% in real terms since 1979.

Costs of care by source of finance

5.25. All hospital inpatient care and all community nursing care were assumed to be funded by the NHS. In addition, two-thirds of chiropody expenditure, one third of day care expenditure and a small proportion of nursing home expenditure were assumed to be NHS funded. The basis for these assumptions is discussed in Chapter 11.

5.26. All private domestic help, one third of chiropody treatments, one half of all luncheon club attendances, almost one third of residential care client weeks and over one quarter of nursing home client weeks were assumed to be privately funded. The proportions for residential care and nursing home care seem likely to rise as the real wealth, and especially the housing wealth, of elderly people rises. This is discussed in Chapter 12.

5.27. All local authority home help care, two thirds of day care attendances, all meals-on-wheels, and one half of lunches in luncheon clubs were assumed to be funded by local authority social services gross expenditure, that is subject to income from user charges. In addition, over two-thirds of residential care client weeks and two-thirds of nursing home weeks were assumed in the base year to be funded by local authority social services gross expenditure, and a rising proportion in later years, as discussed in Chapter 12. This is on the basis of the post-April 1993 system of finance for residential care and nursing home care. The numbers of residents who are entitled to higher rates of income support under the preserved rights system, on the basis of admission before 1 April

1993, is declining. The model, therefore, operates entirely under the new financing system.

5.28. Rates of recovery of gross PSS expenditures in user charges were taken from Department of Health data, which are compiled from local authority revenue outturn (RO3) forms. These rates of recovery of gross expenditure in charges may change over the years: this is discussed in Chapter 12, which discusses the assets and incomes of elderly people.

SUMMARY

5.29. The model, as described above, is a cell-based model which enables projections to be made for England to 2031 of the following:

- numbers of dependent elderly people, by age, gender and household type, on the basis of official population projections and assumptions about future rates of dependency;
- volumes of long-term care services, on the basis of projected numbers of dependent elderly people and the current levels and patterns of care or specified alternatives; and
- long-term care expenditures by the health and social services, on the basis of projected volumes of services, assumed rises in real care costs, and the current funding system or specified alternatives.

Annex to Chapter 5. Structure of the model

A5.1. Total projected expenditure on long-term care is estimated as the sum across all health and social services considered of the following: projected number of service recipients *x* intensity of service receipt in terms of hours/visits per week *x* unit cost of care inflated to the year to which the projection relates. This can be shown as:

Total expenditure = Σ recipients *x* hours/visits *x* unit cost,

where the summation is across the different services and population sub-groups (or cells).

A5.2. Total expenditure is divided between expenditure on NHS services, gross expenditure on PSS services and expenditure on private services. Gross PSS expenditure is divided between user charges and net PSS expenditure, i.e. net of user charges. Expenditure on private services and on user charges for PSS are added to give private expenditure:

Total expenditure = NHS expenditure + PSS net expenditure + private expenditure.

A5.3. The rest of this annex is concerned with the projected numbers of service recipients. The model aims to project the number of elderly people demanding formal services on the basis of the current patterns of care. It effectively assumes as a base that demand will be no more or less constrained by supply in the future than currently.

A5.4. Demand for institutional care is assumed to be a function of age, gender and household type (or more specifically living alone or with others). The base assumption is that age-gender-household type probabilities of being in long-stay hospital, nursing home or residential care will remain constant. This means that any change in the projected numbers of elderly people or of their distribution by age, gender or household type will change the projected numbers of elderly people in institutional care.

Probability of institutional care = f(age, gender, household type),

where the three types of institutional care are considered separately.

A5.5. Demand for non-residential care is assumed to be a function of a range of personal characteristics and of the receipt of informal help with domestic tasks. The latter is considered further in the next paragraph. The former comprise age, dependency, household type and housing tenure. These are discussed below. In general:

Probability of service receipt = g(informal care, client characteristics),

where each service is considered separately.

A5.6. The receipt of informal help with domestic tasks is treated as a function of the elderly person's dependency and of their household type. The former may be regarded as a demand variable and the latter as a supply variable. The function is thus a reduced form that seeks to model actual receipt of informal help with domestic tasks rather than a demand or a supply function:

Probability of informal help with domestic tasks = i(dependency, household type).

A5.7. The receipt of informal help with personal care tasks could not be included for lack of suitable data. The probability of receipt of services was, however, treated as a function of household type. Since intensive informal personal care is provided by spouses, children or other relatives within the same household rather than from outside the household, household type is to some extent a proxy for availability of informal care.

A5.8. The intensity of service receipt (in terms of hours or visits per week) is assumed to depend on the level of dependency of each client:

Intensity of receipt = q(dependency)

CLIENT CHARACTERISTICS

A5.9. The most basic level of data in the model is population estimates and projections by age and gender. Other client characteristics are treated as direct or indirect functions of age and gender as discussed in the paragraphs that follow. Housing tenure is treated as a function of age and household type. Household type is treated as a function of age, marital status, and dependency. Marital status is treated as a function of age and gender. Dependency is also treated as a function of age and gender.

A5.10. The model has four dependency categories for people in private households. The three categories of institutionalisation are treated in the base year as further dependency categories. This means that:

Dependency = d(age, gender)

A5.11. Marital status is considered in two categories: currently married or cohabiting and currently not married or cohabiting:

Marital status = m(age, gender)

A5.12. Those not currently married are divided into those living alone and those living with others as a function of dependency. Those currently married or cohabiting are divided into those living with their partner only and those in a larger household by age band.

Household type = h(marital status, dependency, age)

= h[m(age, gender), d(age, gender), age]

A5.13. Two categories of housing tenure are considered: living in owner-occupied or in rented tenure. Tenure is treated as a function of age and household type.

Tenure = t(age, household type)

= t{age, h[m(age, gender), d(age, gender), age]}

RECEIPT OF SERVICES

A5.14. The probability of receiving home care is treated as a function of these characteristics and of receipt of informal care. This means that any change in the projected numbers of elderly people or of their distribution by age, gender, dependency, household type, housing tenure or receipt of informal care will change the projected numbers of elderly people receiving home care.

Home care receipt = g1(informal care receipt, client characteristics)

= g1(age, dependency, household type, tenure, informal care receipt)

A5.15. The probability of receiving other non-residential services is treated in a similar manner, except that not all these variables proved statistically significantly associated with receipt of each service in multivariate (logit) analyses.

CELLULAR STRUCTURE OF THE MODEL

Age and Gender: GAD/ONS projections for 10 sub-groups (5 age bands by gender)

Institutionalisation: 40 sub-groups — age by gender by location (hospital, nursing home, residential care home, community)

Dependency: 70 sub-groups — age by gender by dependency/institution (4 dependency groups for those in community, 3 settings for those in institutions)

Marital status: 140 sub-groups — age by gender by dependency/institution by marital status (2 groups: married/cohabiting, single/separated/divorced/widowed)

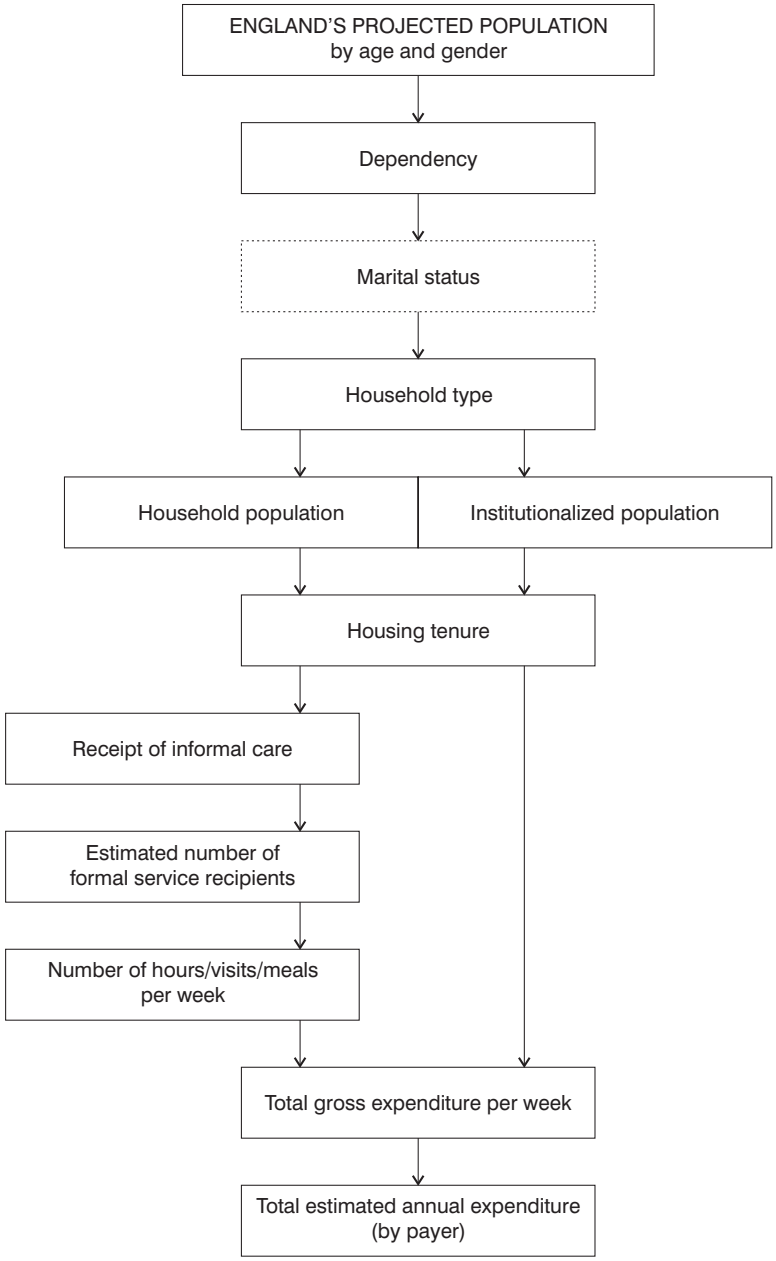
Household type: 280 groups — age by gender by dependency/institution by household type (four household types, encompassing marital status: living alone, single living with others, living with partner, living with partner and others)

Genders combined: 140 groups — age by dependency/institution by household type

Housing tenure: 280 groups — age by dependency/institution by household type by housing tenure (2 tenures: household owns (inc. with mortgage), household rents)

Informal care: 400 groups — age by dependency/institution by household type by housing tenure by receipt of help with domestic tasks (in case of those in community with dependency)

Figure 5.1. Structure of the model



6. Age and dependency

6.1. This chapter considers the projections in the numbers of elderly people by age and gender. Projections by marital status and household type are considered in the next chapter. Dependency is also discussed in this chapter since there is a close link between age and dependency. Although many very elderly people are not dependent, the prevalence of dependency rises markedly with age, as shown in the General Household Survey (Office for National Statistics, 1996).

AGE AND GENDER

6.2. It is dependency rather than age alone that gives rise to need for long-term care. There are, however, two reasons for looking at age as well as dependency. One is to ensure that projections of the numbers of elderly people are rooted in the official population projections. It is important that the study's projections of long-term care demand should be based on the best available projections of the numbers of elderly people by age and gender.

6.3. The other is that the proportion of elderly people who receive long-term care services rises markedly with age. There is an association between age and receipt of care even after controlling for age and household type, as discussed in Chapter 9. It is, therefore, essential to consider the changing age profile of the elderly population.

6.4. Five age bands are considered — 65 to 69, 70 to 74, 75 to 79, 80 to 84, 85 and over — separately for males and females. The starting point for the model is, as explained in Chapter 5, Office for National Statistics (ONS) population estimates for England for 1995 by age group and gender. The base year for the model is thus 1995.

6.5. Data on the projected numbers of elderly people, in each age group by gender, for future years is drawn from the 1996-based population projections for England produced by the Government Actuary's Department (GAD). The future years for which the model can make projections are 2000, 2010, 2020 and 2031. The population estimates for 1995 and projections for 2000, 2010, 2020 and 2031, by age group and gender, are shown in table 6.1 and figure 6.1.

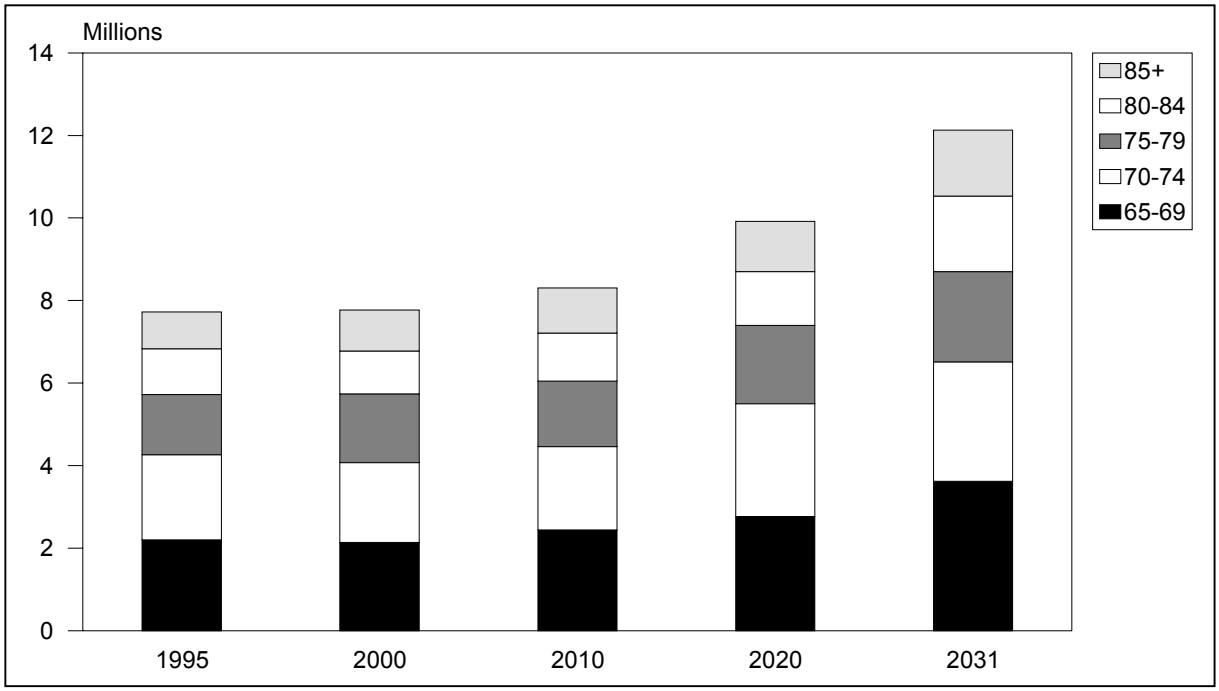
Table 6.1. Population projections

	1995	2000	2010	2020	2031
Males					
65-69	1,037,143	1,028,000	1,184,000	1,349,000	1,804,000
70-74	908,228	879,000	946,000	1,296,000	1,396,000
75-79	583,483	689,000	706,000	856,000	1,003,000
80-84	385,848	375,000	460,000	542,000	773,000
85+	226,724	271,000	330,000	409,000	560,000
Female					
65-69	1,166,893	1,112,000	1,261,000	1,417,000	1,817,000
70-74	1,152,783	1,057,000	1,072,000	1,441,000	1,498,000
75-79	873,612	975,000	884,000	1,039,000	1,187,000
80-84	723,167	662,000	700,000	765,000	1,051,000
85+	666,727	722,000	761,000	803,000	1,038,000
All					
65-69	2,204,036	2,140,000	2,445,000	2,766,000	3,621,000
70-74	2,061,011	1,936,000	2,018,000	2,737,000	2,894,000
75-79	1,457,095	1,664,000	1,590,000	1,895,000	2,190,000
80-84	1,109,015	1,037,000	1,160,000	1,307,000	1,824,000
85+	893,451	993,000	1,091,000	1,212,000	1,598,000

Total	**7,724,608**	**7,770,000**	**8,304,000**	**9,917,000**	**12,127,000**

Source: ONS population estimates for 1995 and GAD 1996-based population projections.

Figure 6.1. Population projections for England



Source: ONS population estimates for 1995 and GAD 1996-based population projections.

6.6. The numbers of elderly people in England (aged 65 and over) are projected to rise by almost 57% between 1995 and 2031. The numbers of very elderly people (aged 85 and over) are projected to rise more rapidly, by around 79%. Almost half the growth in overall numbers is expected to occur in the period 2020 to 2031.

6.7. Long-term care would need to expand by around 61% between 1995 and 2031 to keep pace with the rising numbers of elderly people if no account is taken of other factors. This is in terms of hours of home care, community nurse visits, weeks of residential care etc. The number of elderly home care recipients could be expected to rise by 56%, the number of community nursing care recipients by 61% and the numbers of elderly people in long-stay hospital, nursing home or residential home care by 64%. Overall expenditure would need to rise by 153% between 1995 and 2031 to meet demographic pressures, on the basis of base case inflation assumptions mentioned in the previous chapter.

6.8. Official population projections have tended to underestimate the growth in very elderly people, especially those aged 85 years and over (Shaw, 1994). If the numbers in this age group rose by 1% per year faster than the official projections, the numbers of people aged 85 and over would reach 2,286 thousand rather than 1,598 thousand in 2031, a rise of 156% from 1995. Using official projections for those aged 65 to 84 and this higher projection for those aged 85 and over, the total number of elderly people in England would rise by 66% between 1995 and 2031, as against 57% in the base case. Long-term care would need to expand by 92% rather than 61% to meet this higher demographic pressure. The projected effects of this scenario are shown in table 6.2.

Table 6.2. Results of sensitivity analysis on growth in the numbers of people aged 85 years and over

	% increase 1995-2031	
	85+ grow 1% per year	Base case
People aged 85 and over	156	79
Single people living alone	127	113
Numbers in institutions	101	64
Receiving home help	77	56
Receiving community nursing	82	61
Using private domestic help	86	71
Total NHS expenditure	206	174
Total PSS net expenditure	167	124
Total private expenditure	235	173
Total expenditure	201	153

Source: Model estimates.

6.9. The number of elderly recipients of home care services is projected to rise by 77% rather than by 56% if the numbers of very elderly people grew at this faster rate. Similarly, the number of elderly recipients of community nursing services is projected to rise by 82% rather than by 61% under the scenario involving a faster growth in numbers of very elderly people. The numbers of elderly people in residential, nursing home or hospital care is projected to rise by 101%, as against 64% in the base case. Overall expenditure is projected to rise between 1995 and 2031 by 201% under this scenario, in comparison with 153% under the base scenario. This is intended as an illustration of the sensitivity of projections to future growth rates among very elderly people.

DEPENDENCY

6.10. Dependency is a crucial factor in considering future needs of elderly people for long-term care. Care should be provided in response to assessed needs, and needs are substantially a function of dependency. This raises two key issues: how to define dependency for this purpose; and what assumptions to make about future rates of dependency among elderly people.

Trends in dependency

6.11. There is considerable debate about whether age-specific dependency can be expected to rise or fall. An optimistic view is that there will be a compression of morbidity and that the expansion of life expectancy will be associated with a contraction in the average number of years with disability. A pessimistic view is that that there will be an expansion of morbidity and that the expected continued increase in life expectancy will be associated with an increase in the average number of years with disability.

6.12. Studies of recent trends in health expectancies have tended to show that the extra years of life from rising life expectancy have been years of mild to moderate dependency but not of severe dependency. Estimates for England and Wales are presented and discussed in Bone et al. (1995). Future changes in patterns of dependency are a difficult and controversial topic, on which there appears to be no consensus.

6.13. It will clearly not be satisfactory to make projections of long-term care needs that assume without debate constant age-specific rates of dependency. In view of the uncertainties, sensitivity analysis on future rates of dependency seem essential. The Institute of Actuaries has shown how sensitive longer-term projections are to changes in dependency rates. This means that dependency is a key issue in projecting long-term care for elderly people.

6.14. In principle it is important to examine rates of transition between health or dependency states, and preferably trends in these transition rates, in order to make considered assessments of likely trends in prevalence rates of dependency. Longitudinal data are required in order to make estimates of the probabilities of transition between different health states (and transitions to death) as a function of age and other individual characteristics. The Department of Health's Working Group on Health Expectancy Measures (1998) considered this issue. The Working Group drew attention to the value of longitudinal data for a number of purposes, including projections of long-term care finance.

6.15. In the longer term it would be valuable to develop, with the use of longitudinal data, a model that looked at trends in transition rates between health and dependency states. Such a model would inform the estimates of future age-specific prevalence rates of dependency to be used in making projections of long-term care. In the absence of such analyses, various stylised assumptions have to be made about possible changes in age-specific dependency rates.

Measures of dependency

6.16. Careful consideration needs to be given to appropriate measures of dependency. It is important that whatever measure is used is adequately associated with the probability of receiving long-term care. It is also important that suitable data should be available and that the measures should not be too complex or little used.

6.17. The breakdown has been conducted in terms of ability to perform activities of daily living (ADLs) and instrumental activities of daily living (IADLs). Challis et al. (1995) found that ADLs and IADLs are frequently used in practice by local authorities to assess needs for residential care. ADLs are also typically used as eligibility criteria for long-term care insurance benefits. It would be desirable to take account in addition of cognitive impairment, but data limitations make this problematic.

6.18. Information on the dependency of elderly people in private households in terms of most ADL and IADL limitations is available from the 1994/5 General Household Survey. It covers five of the six usual ADLs (not continence) and a number of IADLs, but it does not include cognitive impairment. The GHS evidence is discussed below.

6.19. The private household population is divided for the purpose of this study into four dependency categories. These are: problems with two or more activities of daily living (ADLs); problems with one ADL; problems with instrumental activities of daily living (IADLs) but not with ADLs; and no problems with ADLs or IADLs. This categorisation is in principle similar to that used in the Brookings/Lewin-VHI long-term care financing model. In practice definitions are not the same.

6.20. Rates of ADL and IADL problems by age and gender are drawn from the 1994/5 General Household Survey, England data. Five ADLs were considered: bathing, dressing, feeding, washing, and getting to and from the toilet. The GHS does not cover continence — the sixth ADL in the list by Katz et al. Those who could not perform a task at all, could perform it only with help or could perform it but with difficulty were taken as having a problem with that ADL.

6.21. The inclusion of those who could perform the task but with difficulty among those deemed to have a limitation means this appears to be a wide definition. It should be noted, however, that the GHS does not mention need for supervision or cueing. People who could perform a task on their own but only if reminded or if someone else was present seem likely to have reported that they could do the task but with difficulty. Exclusion of those who could perform the task but with difficulty would arguably have underestimated the numbers with need for help. It would also have rendered the GHS subsample with ADL problems too small for analysis. It would also have meant that a greater proportion of service recipients would have appeared in the no dependency category.

6.22. Five IADLs were considered: shopping, laundry, vacuuming, cooking a main meal, and handling personal affairs. This is fewer than used in other studies. In particular, ability to use a telephone could not be included, as there is no GHS question on this. Those who reported that they did not perform a task but could do so if they had to are regarded as not having a limitation with that IADL. Only those specifically reporting inability to perform the task are taken as having a limitation.

6.23. It should be noted that the dependency classification used does not involve any consideration of cognitive impairment or of behavioural disturbance. There are no GHS questions on these. The estimated numbers of people with dependency should not, therefore, be taken as a complete estimate of all those requiring long-term care. For this reason, the model does assume that some of those in the no dependency category need care.

GHS information on dependency

6.24. Around 79% of the GHS sample of elderly people in England reported that they were able to undertake on their own all of the following five instrumental activities of daily living (IADLs): shopping, handling personal affairs, vacuuming, cooking a main meal, and washing clothes by hand. It should be noted that many of these people did not actually undertake all these tasks themselves. Those who reported ability to perform all of these five tasks were taken, for the purpose of this analysis, to have no IADL problems. Of the GHS sample, 9% had one IADL problem (usually with shopping), 5% two problems and 6% three or more such problems. These figures exclude 29 respondents who did not answer the relevant questions.

6.25. Almost 18% of the sample reported that they could not bath or shower themselves very or fairly easily, i.e. that they had difficulty, needed help or could not do so at all. Similarly, around 9% could not dress and undress themselves, around 8% could not get in and out of bed alone, around 7% could not get to the toilet alone and around 2% could not feed themselves very or fairly easily.

6.26. Those who reported that they could perform all these five activities of daily living (ADLs) alone and without difficulty were taken, for the purpose of this analysis, to have no ADL problem. Almost 79% had no ADL problem, around 11% had one problem, around 3% had two problems and slightly over 7% had three or more problems. These figures again exclude 29 respondents who did not answer the relevant questions.

6.27. 72% of the sample had no ADL and no IADL problem and were regarded as having no dependency in this study. Almost 7% of the sample had at least one IADL problem but no ADL problem. This group were regarded as having slight dependency. Around 10.5% of the sample had one ADL problem, and of these roughly half had an IADL problem and half did not. This group were regarded as having moderate dependency. Over 3% had two ADL problems and slightly over 7% had three or more ADL problems. Those with two or more ADL problems were regarded as having substantial dependency. These figures exclude 39 respondents who did not answer the relevant questions.

6.28. The proportion with no dependency fell markedly with age, from 84% of those aged 65 to 69, to 35.5% of those aged 85 years and over. It was higher, by age group, for males than females, especially for the very elderly. It was also higher, by age group, for married than for not married people, and for owners than for renters (except in the case of those aged 85 years and over). The proportion with slight dependency rose with age from 3.5% of those aged 65 to 69, to 18% of those aged 85 years and over. It was lower, by age group, for males than females, especially for the very elderly. The proportions with moderate and with substantial dependency also rose markedly with age. Dependency rates by age group and gender are shown in table 6.3 and figure 6.2. Projected numbers of elderly people by dependency are shown in table 6.4 and figure 6.3.

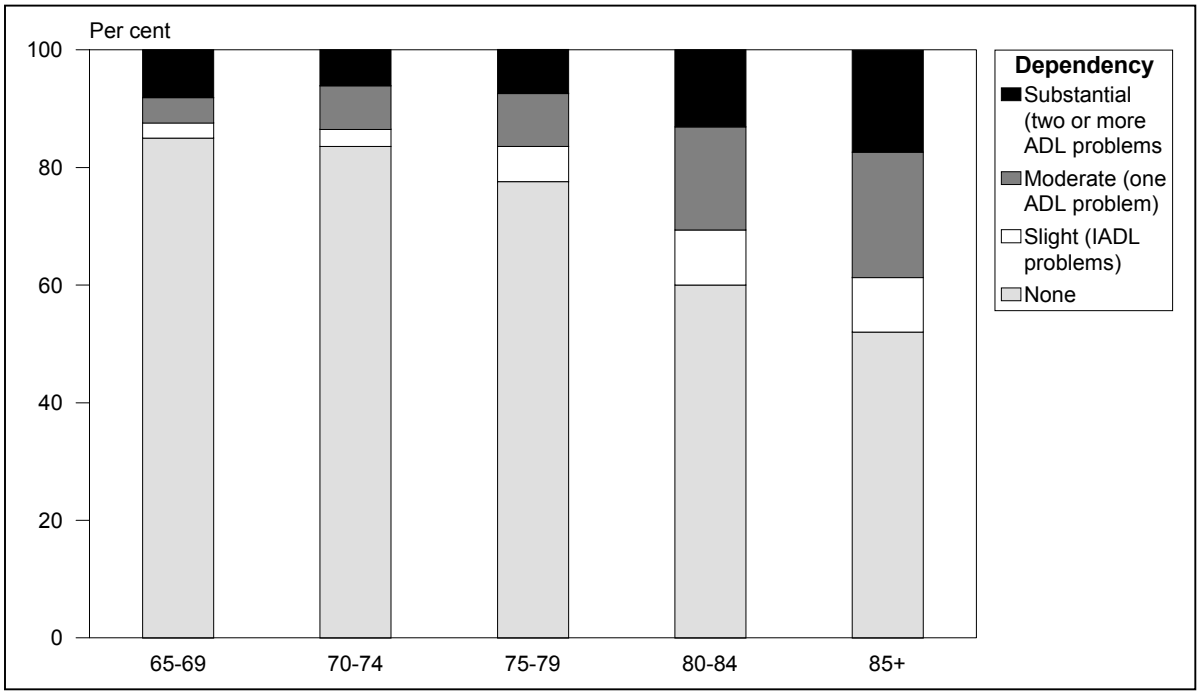
Table 6.3. Dependency rates by age and gender

	None	Slight (IADL problems)	Moderate (one ADL problem)	Substantial (two or more ADL problems)
Males				
65-69	85.0	2.6	4.3	8.1
70-74	83.6	2.9	7.4	6.1
75-79	77.6	6.0	9.0	7.5
80-84	60.0	9.4	17.5	13.1
85+	52.0	9.3	21.3	17.3
Females				
65-69	83.0	4.2	5.1	7.8
70-74	76.6	6.1	9.8	7.5
75-79	63.9	9.3	14.5	12.4
80-84	55.1	10.6	21.1	13.3
85+	29.0	21.6	18.4	31.1

Source: GHS 1994/5, England, elderly people only (3,029 cases).

Figure 6.2. Dependency rates by age and gender

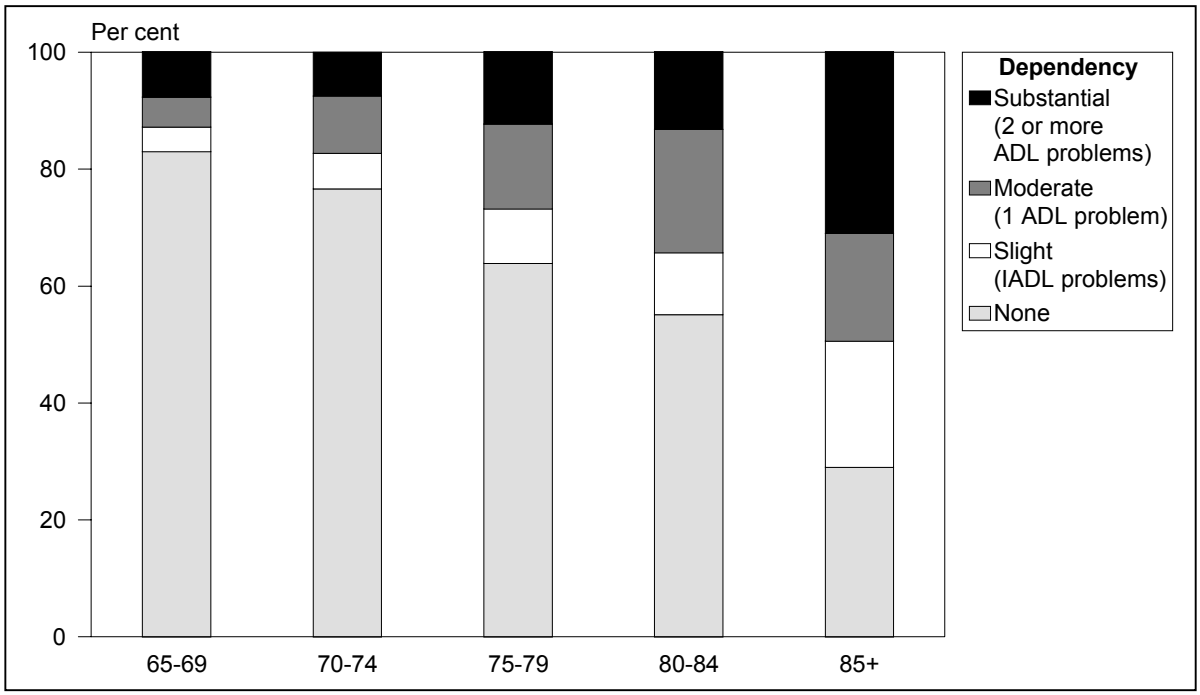
(a) Males



Source: GHS 1994/5, England, elderly people only (3,029 cases).

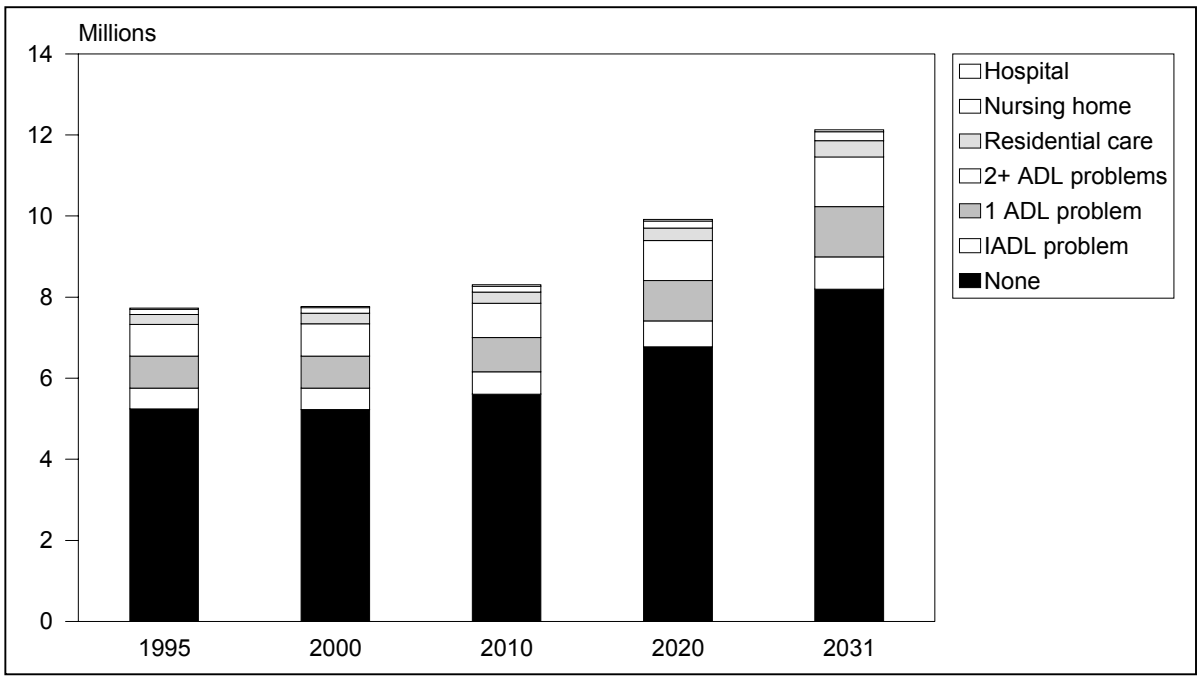
Figure 6.2. Continued

(b) Females



Source: GHS 1994/5, England, elderly people only (3,029 cases).

Figure 6.3. Projected numbers of elderly people by dependency under base case assumption of constant age-specific dependency rates



Source: Model estimates using base case assumptions of no change in age-specific dependency rates.

Table 6.4. Projected numbers of elderly people by dependency under base case assumption of constant age-specific dependency rates

Dependency	1995	2000	2010	2020	2031
None	5,247,520	5,229,932	5,608,850	6,771,609	8,200,690
IADL	510,524	521,814	549,911	641,766	795,627
One ADL	785,760	796,227	842,733	998,973	1,236,594
Two or more ADL	780,582	797,298	847,499	981,764	1,228,091
Residential care	244,840	255,589	273,877	313,718	400,265
Nursing home	133,390	139,803	149,701	171,702	219,255
Hospital	28,695	29,337	31,430	37,468	46,479
Total population	**7,731,311**	**7,770,000**	**8,304,000**	**9,917,000**	**12,127,001**

Source: Model estimates.

6.29. Logistic regression analysis was used to investigate on a multivariate basis the association between dependency and age group, gender, household type and housing tenure. The results of this analysis are set out in an annex to this chapter.

Sensitivity to trends in dependency

6.30. The official 1996-based population projections show that the total elderly population (aged 65 and over) of England is projected to rise from 7.7 million to 12.2 million, or by 57%, between 1995 and 2031. If age-specific rates of institutionalisation remain constant, the number of elderly people in institutional care is projected to rise over the same period from 407 thousand to 666 thousand, a rise of 64%. If additionally age-specific dependency rates remain constant, the number of dependent elderly people, with at least one limitation in activities of daily living or instrumental activities of daily living, is projected to rise from 2,077 thousand to 3,268 thousand, a rise of 57%.

6.31. There is, as discussed above, much debate and little consensus about whether a compression or expansion of morbidity should be expected. The base case assumes no change in age-specific dependency rates. As in the Department of Health projections for the Health Committee, two scenarios were investigated with age-specific dependency rates rising by 1% per year or falling by 1% per year. In each case two variants were considered in which the rise of fall is either limited to those in the community or is extended to the whole population such that institutionalisation rates also rise or fall by 1% per year. These scenarios are intended to illustrate the sensitivity of projections to future age-specific prevalence of dependency. The scenario under which dependency rates rise may be considered rather pessimistic. The projected effect of the different scenarios is shown in table 6.5.

6.32. If age-specific dependency rates among those in the community rose by 1% (not 1% point) per year, the projected number of dependent elderly people would be 4,667 thousand in 2031, a rise of 125%, as against a rise of 57% in the base case. The number of elderly recipients of home care services is projected to rise under this scenario by 97%, as against 61% under the base case. The number of elderly recipients of community nursing services is projected to rise by 97%, as against 56% in the base case. Overall expenditure is projected to rise between 1995 and 2031 by 168% under this scenario, in comparison with 153% under the base scenario.

6.33. If age-specific dependency rates and institutionalisation rates rose by 1% per year, the projected number of elderly people in residential, nursing home or hospital care in 2031 would be 953 thousand, a rise of 134%, as against 64% under the base case. The projected number of dependent elderly people in the community in 2031 would be 4,460 thousand, a rise of 115%, as against a rise of 57% in the base case. The number of elderly recipients of home care services is projected to rise under this scenario by 86%, as against 56% under the base case, and the number of elderly recipients of community nursing by 95%, as against 61% in the base case. Overall expenditure is projected to rise

between 1995 and 2031 by 248% under this scenario, in comparison with 153% under the base case scenario.

Table 6.5. Results of sensitivity analyses on changes in dependency rates

	% increase 1995-2031				
	Dependency and institutionalisation increase by 1% per year	**Dependency increases by 1% per year**	**Dependency decreases by 1% per year**	**Dependency and institutionalisation fall by 1% per year**	**Base case**
No dependency	28	29	75	78	56
People with dependency	115	125	9	13	57
Informal care recipients	114	124	9	12	56
Institutionalised	134	64	64	14	64
Home help recipients	86	97	26	31	56
Community nursing clients	95	106	30	35	61
Using private domestic help	73	81	63	68	71
Total NHS expenditure	270	201	155	104	174
Total PSS net expenditure	209	143	110	63	124
Total private expenditure	276	175	171	98	173
Total expenditure	248	168	142	85	153

Source: Model estimates.

6.34. If age-specific dependency rates among those in the community fell by 1% per year, the projected number of dependent elderly people would be 2,267 thousand in 2031, a rise of 9%, as against a rise of 57% in the base case. The number of elderly recipients of home care services is projected to rise under this scenario by 26%, as against 56% under the base case, and the number of elderly recipients of community nursing services by 30%, as against 61% in the base case. Overall expenditure is projected to rise between 1995 and 2031 by 142% under this scenario, in comparison with 153% under the base scenario.

6.35. If age-specific dependency rates and institutionalisation rates fell by 1% per year, the projected number of elderly people in residential, nursing home or hospital care in 2031 would be 464 thousand, a rise of 14%, as against 64% under the base case, and the projected number of dependent elderly people in the community in 2031 would be 2,341 thousand, a rise of 13%, as against a rise of 57% in the base case. The number of elderly recipients of home care services is projected to rise under this scenario by 31%, as against 61% under the base case, and the number of elderly recipients of community nursing services by 35%, as against 61% in the base case. Overall expenditure is projected to rise between 1995 and 2031 by 85% under this scenario, in comparison with 153% under the base scenario.

Annex to Chapter 6. Association between dependency and other variables

A6.1. Logistic regression analysis was used to investigate on a multivariate basis the association between dependency and age group, gender, household type and housing tenure. The dependent variables were presence/absence of dependency (i.e. one or more IADL problem), presence/absence of at least moderate dependency (i.e. one or more ADL problem), and presence/absence of severe dependency (i.e. two or more ADL problems) among those with at least moderate dependency. The independent variables were age group, gender, housing tenure and household type. They were all treated as categorical variables: the base case in each regression was not married living alone, male, aged 65 to 69 years, in owner-occupied tenure.

A6.2. The analysis of presence of any dependency (i.e. of at least one IADL problem) was statistically significant in terms of model improvement and goodness of fit ($p<0.01$). The percentage of correct predictions was 81% (96% for no dependency and 21% for some dependency). Age group, tenure, gender and household type were all statistically significant ($p<0.01$). Older people, women, people in rented tenure were all more likely to have some dependency. Single people living with others and married people living with partner and others were more likely to have some dependency, but married people living with their partner only were not significantly more likely to have some dependency than single people living alone ($p>0.05$) (and marital status when included instead of household type was not significant).

A6.3. The analysis of presence of moderate or substantial dependency (i.e. of at least one ADL problem) was statistically significant in terms of model improvement and goodness of fit ($p<0.01$). The percentage of correct predictions was 79% (98% for no/slight dependency and 7% for moderate/substantial dependency). Age group ($p<0.01$), gender ($p<0.05$) and tenure ($p<0.01$) were all statistically significant. Older people, women, people in rented tenure were all more likely to have at least moderate dependency (though the difference between those aged 65 to 69 and those aged 70 to 74 was not significant). There was no significant difference by household type ($p>0.05$) (or by marital status when included instead of household type).

A6.4. The analysis of presence of substantial dependency (i.e. of at least two ADL problems) among those with at least moderate dependency (i.e. one ADL problem) was not statistically significant in terms of model improvement or goodness of fit ($p>0.1$). The percentage of correct predictions was only 59% (70% for moderate dependency and 47% for substantial dependency). Age group was significant ($p<0.01$), but gender, tenure and household type were not significant. People aged 70 to 84 years were less likely to have substantial dependency than people aged 65 to 69 or 85 years and over.

7. Marital status and household composition

7.1. The receipt of long-term care services has been shown to be influenced by household type, especially whether or not the elderly person lives alone (Evandrou, 1987). It is, therefore, important to break down the projected non-institutionalised elderly population at least between those living alone, those living with their spouse only, and those living in other types of household.

MARITAL STATUS

7.2. The model first divides the projected population by (*de facto*) marital status. Two categories are used: married or cohabiting and single, separated, divorced or widowed. *De facto* marital status seemed more relevant than legal marital status, as the key issue is the availability of informal care, as discussed in Chapter 8.

7.3. For the private household population data from the 1994/5 GHS are used by age and gender and for the institutionalised population data from the 1991 Census by age and gender. (Since the breakdown is by *de facto* rather than legal marital status, a few people in the GHS sample who were married but living alone were classified as separated.) Data on the proportion married or cohabiting by age and gender are shown in table 7.1, and data on household type by age band in table 7.2.

Table 7.1. Percentage who are married or cohabiting, by age and gender

	Household		Institutional	
Age	Males	Females	Males	Females
65-69	77.0	62.5	16.6	13.6
70-74	75.0	45.8	21.6	22.2
75-79	71.9	30.3	25.6	11.1
80-84	53.8	21.0	25.6	8.4
85+	42.3	10.3	20.0	4.7

Source: Analysis of 1994/5 GHS and 1991 Census.

Table 7.2. Percentages in each household type, by age and gender

Age group	Alone	Single, not alone	Couple, no others	Couple, with others	Total
65-69	24.0	6.8	59.4	10.0	907
70-74	33.6	7.5	53.2	5.7	929
75-74	45.2	8.6	42.2	3.9	533
80-84	53.5	13.0	31.4	2.2	417
85+	65.4	15.1	17.7	1.8	272
All	**38.4**	**9.0**	**46.9**	**5.9**	**3,058**

Source: GHS 1994/5, England elderly only.

7.4. Between 1971 and 1991 the proportion of very elderly (aged 75 and over) men who were married rose markedly, whereas the proportion widowed fell markedly. There were also increases in the proportion who were single (never married) and in the proportion divorced. Among very elderly women, the proportion married and the proportion divorced rose, while the proportion single and the proportion widowed fell over this period (Grundy, 1996).

7.5. These changes in recent years suggest that, as there has been change in the past, it will be reasonable to assume that the near future will also see change. The Government Actuary's Department has prepared 1992-based projections of the population by legal and by de facto marital status. These suggest an increase in the proportion of elderly

people, by age group and gender, expected to be single, divorced or widowed and a decrease in the proportion expected to be married or cohabiting, except for very elderly men. This study has used the trends in proportions expected to be in each group and applied them to the 1996-based population projections. The data used are shown in table 7.3.

Table 7.3. Percentage of the population, by age group and gender, projected to be married or cohabiting

	65 to 69	70 to 74	75 to 79	80 to 84	85 or more
Males					
1995	79.7	76.5	71.8	63.0	46.6
2000	78.7	75.9	71.0	64.3	48.6
2010	75.2	73.6	70.4	64.4	49.3
2020	69.7	69.9	68.2	63.7	49.7
Females					
1995	59.7	47.6	33.7	21.0	10.8
2000	59.6	48.1	34.2	22.0	11.5
2010	57.0	46.9	33.8	21.8	11.2
2020	51.8	43.9	30.7	18.9	9.8

Source: Calculated from a GAD communication.

7.6. The base population for the GAD 1992-based marital status projections is the 1981 Census. The ONS has produced re-based population estimates which incorporate information from the 1991 Census (Morris, 1997). It is expected that the GAD will use them to produce new marital status projections. The GAD marital status projections only go to up to 2020. Since the model runs to 2031, no change has been assumed in the proportion in each marital status from 2020 to 2031.

7.7. Overall, the projections show an increase in the proportion who are *de facto* single. The increase is more marked for the younger groups. For males over 85, there is a small decrease in the proportion who are single. Whether the proportion of *de facto* single increases or not depends on the balance between the increase in the proportion who are divorced, and the decrease in the proportion who are widowed. For the very elderly, the increase in the proportion who are divorced is outweighed by the decrease in the proportion who are widowed.

7.8. The number of single people is expected to increase by 68% using the GAD projected proportions, rather than by 54% on an assumption of unchanged age-specific marital status rates. The numbers living in couples is expected to rise by 45% under the GAD projections, and by 60% assuming no change. Total projected expenditure growth between 1995 and 2031 is 153% when using the GAD proportions and 150% when not. More comparisons between the two approaches are shown in table 7.4.

Table 7.4. Impact on the model projections of using the GAD projections rather than an assumption that the proportions who are *de facto* married or single remain unchanged

	% increase 1995-2031	
	Using GAD projections	**Using 1995 proportions**
Single people living alone	68	54
Single people living with others	68	54
Living in couples	45	60
Institutionalised	64	62
Receiving informal care	56	58
Receiving home help	56	52
Receiving community nursing	61	61
Total expenditure	**153**	**150**

Source: Model estimates.

7.9. Multivariate (logistic regression) analysis showed that marital status is not significantly associated with dependency when age and gender are controlled for. Marital status is thus treated in the model as a function of age and gender but not dependency.

HOUSEHOLD COMPOSITION

7.10. The proportions of very elderly people living alone or just with a spouse have risen considerably between 1971 and 1991 (Grundy, 1996). For men aged 85 and over the proportion living alone rose from 20% to 32%, the proportion living with their wife only rose from 24% to 36%, and the proportion living in other types of households or in institutions fell from 56% to 32%. Similarly for women aged 85 and over the proportion living alone rose from 30% to 49%, the proportion living with their husband only rose from 5% to 6%, and the proportion living in other types of households or in institutions fell from 66% to 45%. Whereas for men the proportion in an institution rose only slightly from 15% to 16%, for women the proportion in an institution rose from 22% to 27% over this period.

7.11. The model divides those in private households by household type: single people are classified as living alone or with others and married/cohabiting people as living with one other person (presumably their partner) or more than one other person. For single people the probability of living alone was found to be significantly associated with dependency but not with age or gender. For married people the probability of living with partner only was found to be significantly associated with age but not with dependency or gender. The proportions of elderly people (by dependency for single people and by age band for married people) assumed in the model to live in different household types are shown in table 7.5. (The PSSRU Residential Care Survey is described in Chapter 10.)

Table 7.5. Household type: Proportion in different types of household (by dependency for single people and by age band for married people)

	Private households				
	Single people			Married people	
Dependency	Alone	With others	Age	Couple	With others
No dep.	82.9	17.2	65-69	85.5	14.5
IADL	69.5	30.5	70-74	90.3	9.7
1 ADL	82.7	17.3	75-79	91.5	8.5
2+ADL	78.7	21.3	80-84	93.6	6.4
			85+	90.6	9.4
	Institutions				
	Single people			Married people	
Age	Alone	With others		Couple	With others
65-69	79.6	20.5		88.9	11.1
70-74	78.7	21.3		90.8	9.3
75-79	78.5	21.5		88.4	11.6
80-84	78.9	21.1		89.1	10.9
85+	79.7	20.4		84.6	15.5

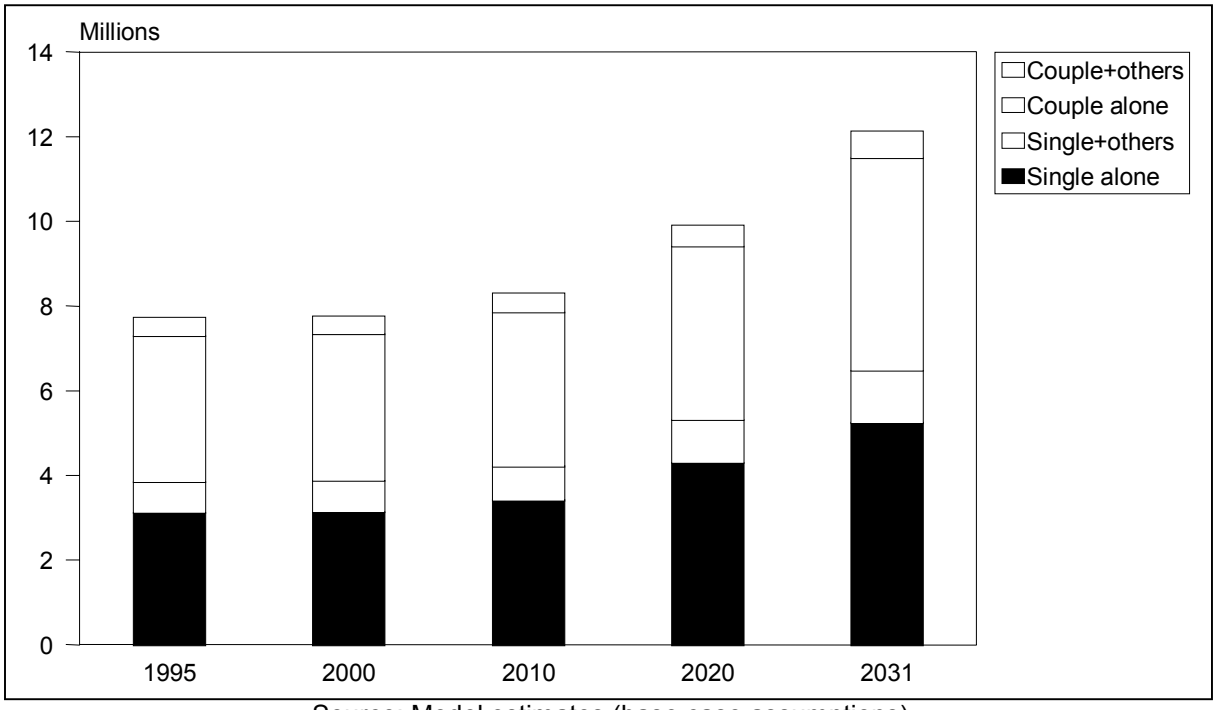
Source: Analysis of 1994/5 GHS and PSSRU Residential Care Survey.

7.12. Around 53% of the GHS sample of elderly people were married or cohabiting and 47% were not, i.e. were single, widowed or divorced and not cohabiting. Of the married group, 88% lived with their partner only, 1% lived alone and 11% lived with their partner and others. Of the non-married group 81% lived alone and 19% with others. Altogether 38% of the sample lived alone, 47% with their partner only, 9% lived with others but not a partner, and 6% lived with their partner and others.

7.13. The Department of the Environment (now Department for the Environment, Transport and the Regions) produced projections for the numbers of households in England to 2016 by type of household (Department of the Environment, 1995). These projections

are based on the GAD marital status projections. Incorporating them in the model made no significant impact on the expenditure projections obtained. The projected elderly population by household type is illustrated in figure 7.1.

Figure 7.1. Projected numbers of elderly people by household type



Source: Model estimates (base case assumptions).

7.14. As mentioned above, the proportion of elderly people living alone arose markedly during the 1970s and 1980s but is now roughly static. It seems possible that divorce among middle-aged people will lead to a further rise in the proportion of elderly people living alone. The possible effect was investigated for illustrative purposes.

7.15. If rates of marriage/cohabitation fell by 1% per year and rates of single people living with others also fell by 1% per year, the projected number of elderly people living alone would rise from 3,120 thousand in 1995 to 6,745 thousand in 2031, a rise of 116%. Under this scenario, the projected number of single people living with others would rise by 45% between 1995 and 2031, and the projected number of married elderly people would rise by only 11% in that period. The number of dependent people receiving informal help with domestic tasks would rise under this scenario from 1,719 thousand in 1995 to 2,568 thousand in 2031, a rise of 56%, as against a rise of 55% under the base case scenario using the GAD marital status projections.

7.16. The number of elderly recipients of home care services is projected to rise between 1995 and 2031 under this scenario by 72%, as against 56% under the base case, and the number of elderly recipients of community nursing services by 65%, as against 61% in the base case. The projected number of elderly people in institutional care is projected to rise by 74% under this scenario, as against 64% in the base case. Overall expenditure is projected to rise between 1995 and 2031 by 167% under this scenario, in comparison with 153% under the base scenario. This is shown in table 7.6.

Table 7.6. Impact of a 1% per year decrease in the proportion who are married or cohabiting, and a 1% decrease in the proportion of single people who live with others

	% increase 1995-2031	
	1% decrease in proportion married and in the proportion of single people living with others	Base case
Single people living alone	116	68
Single people living with others	45	68
Living in couples	11	45
Institutionalised	74	64
Receiving informal care	50	56
Receiving home help	72	56
Receiving community nursing	65	61
Total expenditure	**167**	**153**

Source: Model estimates.

8. Informal care

INTRODUCTION

8.1. Modelling the provision of informal care is a crucial part of the projections. Older people rely far more on informal than on formal care. As part of this study, an analysis was done of sources of support for domestic tasks by elderly people as reported in the 1994/95 General Household Survey. It was found that, of the elderly people who had help with domestic tasks, 80% relied exclusively on informal help (spouse, other household members, relatives outside the household, neighbours and friends), 10% relied on both the formal and informal sectors, and only 10% relied exclusively on the formal sector (National Health Service, personal social services, and paid and voluntary services).

8.2. The extent of informal care is crucial to this study because it is a key factor influencing the extent of public provision. A reduction in informal care would have a major impact on the demand for formal care. There are concerns that the future supply of informal care may be adversely affected by such factors as increases in the divorce rate, reductions in family size and increases in women's labour force participation. There is not universal agreement about the implications of current social trends for the supply of informal care. It is clearly an issue of great importance for the future demand for formal care and one that this study needs to consider.

8.3. It is therefore important to incorporate informal care into the model and to examine possible scenarios involving changes to the supply of informal care. This chapter has three parts. The first part reports on the analysis of the 1994/95 GHS that was undertaken for the project and forms the basis for the model. Part Two reports on the model itself and shows how informal care has been incorporated. Finally, Part Three looks at factors likely to affect the future supply of informal care and reports the results of different scenarios regarding changes to the supply of informal care.

8.4. In spite of the efforts of the authors, the treatment of informal care in the model has remained fairly limited because of data and other problems. This chapter describes how informal care has been incorporated into the model, but also looks at what would have been desirable, had it been possible.

PART ONE. ANALYSIS OF GHS 1994/95 DATA ON INFORMAL CARE

8.5. In Chapter 4, which discussed theoretical issues in modelling long-term demand, it was suggested that it was important to consider both supply and demand factors in relation to receipt of informal care. The consideration of both supply and demand factors is, however, constrained by the practicalities imposed by existing data sets. One of the main problems in developing a good model of the receipt of informal care is to find a data set that includes both supply and demand variables.

8.6. The GHS Informal Carers data offer certain possibilities for analysis. These data, which were used in the London Economics model, include questions about the provision of informal care, collected in 1985, 1990 and 1995. Together with other data collected within the GHS data set, they provide information from a nationally representative sample about informal care, carers and their dependants. However, the amount of information on the cared-for is limited. Information on dependants depended on whether or not they were in the same household as the carer; that is, on whether the dependant was also part of the GHS sample.

8.7. There is, however, another source of data within the GHS data set that includes information on both elderly people and some information on their carers. This is the GHS Elderly data. The GHS for 1980, 1985, 1991/2 and 1994/5 included a section of questions to elderly people about their ability to perform a range of personal care and domestic tasks and about their receipt of health and social services. Those unable to perform tasks without help (but not those unable to perform them at all) were asked who provided the help they needed. The list of responses included informal carers (spouse, or partner, other household member, non-household relative and friends/neighbours) as well as formal services.

8.8. The 1994/5 GHS Elderly sample could be taken as a representative sample of elderly recipients of informal care if it can be assumed that all recipients of informal care were identified by this question. As a considerable proportion of elderly people reported the need for help with domestic tasks, this might not be an implausible assumption.

8.9. This study therefore chose to use the GHS Elderly data rather than the GHS Carers data for the analysis on which to project the amount of informal care provided because this offered the best opportunities for looking at both supply and demand factors.

8.10. The information on informal care in the 1994/95 GHS Elderly data comes from questions about who helped the elderly people in the sample with tasks that they either did not or could not undertake. The analysis of the data for this study focused on three main areas: sources of informal help; the propensity to receive informal care; and access to informal care. The sections below introduce the data on informal care in the GHS Elderly data and summarise the results of the analyses.

Nature of the data

8.11. Questions about help with different tasks were asked in the GHS Elderly data in a rather different way where domestic tasks as opposed to personal care tasks were concerned. On the one hand, respondents who reported that they did not undertake one or more domestic tasks (instrumental activities of daily living or IADLs) were asked who undertook these tasks for them. This was asked of all those who did not undertake one or more tasks, whether or not they could undertake it if necessary. On the other hand, respondents who reported that they could not undertake one or more *personal care* tasks (activities of daily living or ADLs) or who could not walk indoors or outdoors on their own but could do so with help, were asked who provided this help. This was not asked of those who could not undertake the task even with help, nor of those who could undertake it alone but only with great difficulty. This means that the question about help with personal care tasks was asked in a more restricted manner than the question about help with domestic tasks. These limitations need to be borne in mind when analysing the data.

Sources of informal help

8.12. An analysis was undertaken to ascertain who provided help with domestic tasks and with personal care tasks to the elderly people in the sample. The question covered informal carers, privately funded help and formal statutory services. Respondents could mention more than one source of help and could give different sources of help for bathing, for other personal care tasks and for domestic tasks. Full details of the analysis are contained in the Annex to this chapter.

8.13. The analysis of the GHS data for this study confirmed the differences between the sources of help with domestic and with personal care tasks identified in the research literature on informal care (see Chapter 4, para. 4.12). The range of sources of informal support was much greater for domestic tasks than for personal care tasks. On the one hand, much greater reliance was placed on support from within the household where personal care tasks were concerned, than was the case for domestic tasks. Nearly

nine-tenths (87%) of those who gave a source of informal support for personal care tasks mentioned a spouse or relative inside their own household, compared with only about two-thirds (65%) of those who gave a source of support for domestic tasks. On the other hand, where domestic tasks were concerned, there was much greater reliance on support from outside the household. For domestic tasks, 27% of the sample mentioned relatives outside the household and 10% mentioned a friend or neighbour. But for personal care tasks (excluding bathing), only 3% mentioned relatives outside the household and only 1% mentioned a friend or neighbour.

8.14. Further evidence that sources of support for domestic tasks were broader than for personal care tasks was that respondents often mentioned more than one source for domestic tasks but almost always mentioned only one source for personal care tasks. 19% of respondents had more than one source of support for domestic tasks but only 2% had more than one source for personal care tasks, and no respondent seemingly reported more than one source of help with bathing.

Propensity to receive care

8.15. The analysis of the GHS Elderly data also looked at the factors affecting the propensity to receive informal care. This analysis was similar to analyses of the receipt of formal care using the GHS Elderly sample, particularly associated with the work of Maria Evandrou and her colleagues in the 1980s (Evandrou et al., 1986; Evandrou, 1987; Arber et al., 1988; Evandrou and Winter, 1988). This work had explored a number of factors affecting receipt of formal care using, in some cases, logistic regression techniques, made possible by the size of the GHS sample. There has, however, been very little similar work looking at factors affecting the receipt of informal care using the GHS Elderly data. Aspects of this have been explored in some depth, for example Arber and Ginn looked at receipt of informal care by gender (Arber and Ginn, 1991). But most studies looking at the receipt of informal care have been small scale in nature and have not lent themselves to sophisticated data analyses (Wenger, 1984; Qureshi and Walker, 1989; Allen et al., 1992; Wenger, 1992). These studies do, however, suggest that factors such as age, disability, gender, household composition and socio-economic group are associated with receipt of informal care.

8.16. The analysis of receipt of informal care for this study distinguished between those receiving some informal help and those not receiving such help. Informal help included help from a spouse, another member of the household, another relative, a neighbour or a friend. This is a fairly crude measure of receipt of informal support since it does not reflect at all the amount of informal help received. No information on this was recorded in the GHS Elderly data. It should however be remembered that, of those who received informal help, only 11% also relied on formal sources of support. Nearly all the elderly people in the sample who reported receiving informal support were therefore totally reliant on that support.

8.17. 56% of the overall sample reported that they received informal help with domestic tasks. Receipt of informal help with domestic tasks was significantly associated, in a logistic regression, with age group, gender, dependency and household type, but not with housing tenure. Whereas 63% of men received informal help, only 51% of women did so. While less than 40% of single people living alone received informal help with domestic tasks, over 65% of single people living with others and of married people received such help. Around 45% of those without any IADL or ADL problem received informal help, but around 80% of those with an IADL or ADL limitation received informal help. The proportion receiving help rose from just over half of those aged 65 to 69 years to two-thirds of those aged 85 years and over.

8.18. A separate analysis was conducted for those who were dependent, as defined within the study (see Chapter 6, paras 6.16-6.19). Receipt of informal help with domestic tasks among this group was significantly associated, in a logistic regression, with household type and level of dependency, but not with age group, gender or housing

tenure. While 87% of those with an IADL but no ADL limitation received informal help, 77% of those with one ADL problem and 85% of those with two or more ADL problems received such help. While about 70% of single people living alone received informal help with domestic tasks, over 90% of single people living with others and of married people received such help.

8.19. Although there was a clear link between receipt of informal help and dependency, it should also be noted that almost one half (46%) of the GHS sample without any ADL or IADL problem also reported receipt of informal help with domestic tasks. In some cases this may have been because the person required help for reasons not amounting to a limitation with any ADL or IADL task. In most cases it was probably because of the division of labour within the household. The fact that nearly half of those without disabilities (as measured by the study) received informal help is evidence of the extent to which informal help goes to elderly people without disabilities and provides further confirmation of the need to relate demand and supply. (This issue is taken up again in Part Two below, which describes the way informal care is incorporated into the model.)

8.20. A similar analysis of receipt of help with personal care tasks could not be undertaken. This was because of the limitations of the information about informal help with personal care tasks included in the GHS. This was restricted in that questions about sources of help with personal care 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 data on help with personal care tasks was collected was so small that logistic regression analyses could not be conducted.

8.21. The inability to carry out an analysis of the receipt of informal help with personal care tasks is a major limitation in the modelling effort since help with personal care is such an important part of long-term care. Further work needs to be done on this area using other data sets. This is explored further in the conclusions to this chapter. Within the context of the present study, because of the difficulties of looking at informal support with personal care tasks, a rather different kind of analysis was also conducted to explore the amount of informal care. Instead of looking at receipt of informal care as recorded in the GHS data set, this looked at access to informal care.

Access to informal care

8.22. The analysis of access to informal care used the relationships between the tasks that elderly people need to have performed for them and their sources of support with informal care. This showed that access to support for personal care tasks tended to be restricted to help from within the household, whereas help with domestic tasks tended also to include help from relatives, family and friends outside the household.

8.23. It was possible to relate the analysis in terms of tasks to the dependency classification used in this study. The dependency classification is based on the capacity to carry out different types of tasks, distinguishing four levels of dependency depending on whether there are problems with domestic tasks (IADLs) or personal care tasks (ADLs). Thus it distinguishes between those with no dependency; those with a slight dependency who have problems with domestic tasks (IADLs) only; those with a moderate dependency who have one personal care (ADL) problem; and those with a substantial dependency who have at least two personal care (ADL) problems.

8.24. Potential access to support at each level of dependency was identified using the existing research literature. Potential sources of support for people with a slight dependency, who needed help with domestic tasks only, were defined as a spouse, others living in the household or, where people lived alone, family or friends who visited weekly. Potential sources of support for people with a moderate dependency, 85% of whom had problems with bathing, were defined as a spouse, others living in the

household or relatives and friends who visited several times a week. Potential sources of support for people with a substantial dependency were defined as a spouse or others living in the household. In the main, this analysis of "adequate" sources of support by dependency level was based on that used in recent PSSRU studies (Bebbington et al., 1986; Davies et al., 1990).

8.25. Data from the GHS were then used to look at the proportion of people in the different dependency categories with access to potential sources of support. This revealed that 91% of the elderly people in the sample with a slight dependency; 73% of those with a moderate dependency; and 54% of those with a substantial dependency had access to a potential source of informal support. In other words, access to sources of informal support decreased as dependency levels increased. The relevance of this for this study will be examined later in this chapter. The finding that access to informal support decreased with dependency is not necessarily inconsistent with the more usual finding that the more disabled people are, the more informal help they receive. For those with access to informal care, it is very likely that the amount of support increased with dependency, although the GHS data do not allow this to be examined.

Summary of Part One

8.26. The analysis of the 1994/95 GHS carried out for this study suggested two conclusions of importance for modelling informal care. First, it was clear that sources of support for domestic tasks were very different from sources of support for personal care tasks. Since tasks are related to dependency in this study, this suggests that sources of support vary by dependency level and that therefore the supply of care varies by dependency level. When access to informal care was examined, it was found that access to informal care varied with dependency level and that, as dependency increased, access to informal care diminished. Second, the analysis of propensity to receive care suggested that this was significantly associated in logistic regression analysis with a number of factors: age group, gender, dependency and household type. The propensity to receive informal care for those who were dependent was, however, associated only with household type and level of dependency. The probability of receiving care could only be reliably analysed with respect to domestic tasks and no analysis of this type could be carried out with respect to personal care tasks because of the nature of the GHS questions. The implications of these analyses of the GHS for the model are examined in the next Part.

PART TWO. INFORMAL CARE IN THE MODEL

How informal care is incorporated in the model

8.27. The model uses the probability of receiving informal care as the basis for projecting the amount of informal care in the future. This approach has not been used in this country 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. They found that the main variables affecting receipt of informal care were sex, age, educational level and household situation (STG, 1996).

8.28. In the present study, the model incorporates the probability of receiving informal care by dividing elderly people who are dependent and who live in private households into two groups: those receiving informal help with domestic tasks and those not receiving such help. Informal help covers help from a spouse, another member of the person's household, a relative outside the household or a friend or neighbour.

8.29. As already indicated in Part One, the multivariate analyses of the 1994/95 GHS data for England found that the probability of people with dependency receiving informal

care with domestic tasks was associated with household type and dependency but not with age, gender or housing tenure.

8.30. Receipt of informal help with domestic tasks is therefore included in the model as a function of dependency category and household type. The estimated probability of receiving such help by these variables is shown in table 8.1 (below).

Table 8.1. Proportion of elderly people receiving informal help with domestic tasks

Household type	Level of dependency			
	No dependency	IADL problems only	One ADL problem	Two or more ADL problems
Living alone		69.5	67.5	75.7
Single elderly 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

Source: Analysis of 1994/5 GHS.

8.31. People with no dependency are not regarded as receiving informal care for the purposes of the model. As already noted, informal care is often received by people without dependency, as defined for the purposes of this study. In fact, as the analysis of the GHS showed, almost one half (46%) of the GHS sample without any ADL or IADL problem reported receipt of informal help with domestic tasks. In some cases this may be because the person required help for reasons not amounting to a limitation with any ADL or IADL task. In most cases this is probably because of the division of labour within the household. Because people with no dependency are unlikely to receive formal support, their receipt of informal support is also excluded for the purposes of the model.

8.32. The model includes the propensity to receive help with domestic tasks only. As already observed, the GHS also includes some limited information about informal help with personal care tasks. However, this is restricted in that questions about sources of help with personal care 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. This information was not, therefore, used.

8.33. However, those with a high level of dependence, who had difficulties with a number of personal care tasks, were separately identified in the model so that the effects of reducing the supply of informal help with personal care tasks could be examined. Thus, instead of details on the receipt of informal help with personal care, information was used on the proportion of the sample who were unable to perform one or more of four of the five ADL tasks without assistance (or could not perform one or more at all). Bathing was not included for this purpose, as, unlike the feeding, dressing, getting in and out of bed and getting to the toilet, it is not a short or critical interval need (Isaacs and Neville, 1975, 1976). Those unable to perform any of these other four tasks are likely to be at risk of admission to residential care if help is not available for them in their own home.

8.34. The proportion of the GHS sample in this high level of dependence, by age and gender, is shown in table 8.2. The majority of this group receive informal and/or formal care. The separate identification of this group in the model enables the effect of the transfer of part or all of the group to residential care to be investigated. This might be an hypothesised effect of a reduction in informal care supply.

Table 8.2. Proportion of elderly people with very high dependency* by age band and gender

Age band	Males	Females
65-74	2.8	2.9
70-74	2.7	2.5
75-79	2.0	1.8
80-84	3.1	4.3
85+	7.7	9.9

Source: Analysis of 1994/5 GHS.

* "Very high dependency" is defined as inability to perform one or more of four of the five ADL tasks without assistance (or could not perform one or more at all). Bathing is not included for this purpose (see para. 8.33).

Characteristics of informal care in the model

8.35. The model used in the present study treats the receipt of informal care as a function of the elderly person's dependency (as an indicator of need) and household type (as an indicator of the likely availability of informal care). The former may be regarded as a demand variable and the latter as a supply variable. Although dependency is clearly a demand-side variable, household type is more complex and includes aspects of both supply and demand. Evandrou and Winter, for example used household type as a measure of the supply of informal care (Evandrou and Winter, 1988, p.23). The variable does also reflect demand, however, because elderly people may change their household type in response to increases in their disability level (Glaser et al., 1997, pp.5, 16). Nevertheless, because receipt of informal care is seen in the model as a function of these variables, it means that the model allows for variation in both the demand for informal care, by allowing for changes in the numbers who are dependent, and the supply of informal care, by allowing for changes in household composition.

8.36. The model relates supply and demand in another way. The amount of informal care is seen in the model as conditioned by the characteristics of the recipient of informal care. In effect, supply in the model is constrained by demand. Thus, the model includes only informal care that is received by elderly people with a dependency problem. Those without dependency problems are treated as if they were not receiving informal care for the purposes of the model. This takes into account the evidence that much informal care is supplied to elderly people who do not have disabilities and that informal care is often given irrespective of need. Not to take this into account would risk overestimating the amount of informal care.

8.37. The base case of the model assumes that the rates of receipt of informal care are constant. As the numbers of dependent elderly people increase in the future, the amount of informal care also increases. This assumption is varied in the sensitivity analyses, reported in Part Three below, which look at what might happen if the supply of informal care did not increase sufficiently to ensure fixed rates of receipt of informal care.

PART THREE. SENSITIVITY ANALYSIS: FUTURE SUPPLY OF INFORMAL CARE

8.38. This part looks at the supply of informal care. The supply of informal care has not been separately modelled mainly because of the constraints of existing data sources. However, the model does incorporate something about potential changes in the supply of carers because it allows for changes in household composition. As Chapter 7 has indicated, the model incorporates the projections of the Government Actuary's Department of the population by marital status (see paras 7.5 and 7.6). Marital status is important in the supply of informal care since spouses are a major source of informal care. Receipt of informal care in the model is seen partly as a function of house-

hold type, which is crucially affected by marital status. The model does not, however, incorporate anything about other sources of informal care, such as children. The authors acknowledge that the supply of informal care is an area on which further work needs to be done, as the conclusions to this chapter suggest.

The future supply of informal care

8.39. There is much uncertainty about the future supply of informal care. Indeed, the supply of informal care into the 21st century is the central issue when considering informal care in the future. The literature on informal care reflects a widespread concern about the future availability of informal care (for recent reviews, see Allen and Perkins, 1995, and Twigg, 1996).

8.40. A number of reasons have been cited for anticipating a potential decline in informal care supply relative to the growing number of elderly people. These include the following: the changing age structure of the population (Grundy, 1995); rises in divorce rates (Clarke, 1995); a decline in family size (Clarke, 1995); rises in employment rates among married women (Doty, 1986); the changing household composition of elderly people, with fewer elderly people living with their children (Grundy, 1996); the changing care preferences of elderly people (West et al., 1984; Daatland, 1990; Phillipson, 1992); and the nature of kinship obligations, especially in relation to filial responsibilities (Finch, 1989, 1995; Finch and Mason, 1990, 1993).

8.41. There is by no means universal agreement about the implications of current social trends for the supply of informal care. There is evidence, for example, that rising women's employment has not so far led to any reduction in the propensity of women to provide care (Parker, 1990; Joshi, 1995) though at considerable costs in terms of carer stress (Neal et al., 1997). There is also a debate about the extent to which kinship relations are characterised by fixed obligations or by a more fluid sense of commitments (Qureshi and Walker, 1989; Finch and Mason, 1990; Qureshi, 1990).

8.42. Nevertheless, considering all the factors affecting the availability of informal care together, the prospect is likely that the supply of informal care will decline relative to demand. The Department of Health recently funded a review of the social and economic factors affecting the future supply of informal support and care for older people (Allen and Perkins, 1995). This review included scholarly works examining many aspects of the future of family care for older people, including demographic influences, changes in family structure, family obligations and the effects of women's labour market participation. The overall conclusions, after considering all the evidence was as follows:

> On balance we take the view that the evidence suggests a decline in the supply of family care together with an increase in demand for care for older people (Allen and Perkins, 1995, p.232).

Approaches to sensitivity analysis

8.43. It would be useful, for the purposes of this study, to know by how much informal care might decline relative to demand. Allen and Perkins made it clear that they were not "in the business of 'modelling'" (1995, p.232). Those who are in the business of modelling have not necessarily been able to put precise figures on the decline in informal care but have suggested ways of approaching this.

8.44. Nuttall et al. (1994), working for the Institute of Actuaries, posed two scenarios with respect to the future supply of informal care, both of which begin from the starting point that "informal provision is more likely to reduce from its current level than to increase to meet future demand" (Nuttall et al., 1994, p.27). In the first scenario, informal care maintained its share of non-continuous care, but all the increase in continuous care was met by the State or private services. In this scenario, informal care

would increase by 25% but would reduce its share of overall provision from 77% to 66%. In the second scenario, informal care did not increase but remains static, and as a result its share of overall provision fell to 53%. The approach by Nuttall et al. is useful because it suggests ways in which the expected decline in informal care might be translated into different scenarios even if the precise extent of the relative decline in informal care is not known. Their actual figures do need to be treated with caution, however, because they are based on rather contentious methods of estimating the value of informal care.

8.45. Richards et al. (1996), in the London Economics model, do attempt to quantify the future supply of informal care. The model calculates the "propensity to care": the probability that individuals described by a range of criteria are carers at the present time. It then uses current forecasts to build up a picture of the future population and apply the probabilities from the 1990 data to these population estimates to determine the number of carers in the population in the future. They concluded that the number of carers will increase from 7 million in 1995 to 7.6 million in 2031, an increase of 9%, and that the number of hours of informal care will increase by 7%. The increase is partly accounted for by the fact that the elderly are themselves key providers of care and therefore an increase in the elderly population will increase the supply of carers. Nevertheless, the increase is not seen as sufficient to keep up with demand for care and an increase in demand for formal services is envisaged (Richards et al., 1996, p.44). This analysis is useful because it suggests that the number of carers may actually increase in the future but that this increase is unlikely to meet the demands for care of the elderly population. However, some caution needs to be exercised with these figures because they may overestimate the supply of informal care to the disabled elderly population.

Sensitivity analysis

8.46. The existing models have not been able to provide reliable estimates regarding the future supply of informal care, although they do suggest ways in which the issue may be approached. Building on this, the present study has developed three different scenarios to take into account uncertainty about the future supply of informal care by considering the effects of falls in the supply of informal care. In the first, a fall in the supply of informal care with domestic tasks is projected. In the second and third, a fall in the supply of informal help with personal care tasks is projected, using different proxies to measure informal help with personal care tasks.

Scenario 1: a fall in the supply of informal help with domestic tasks

8.47. The first scenario considers the effects of a fall in the supply of informal help with domestic tasks. The consensus in the literature seems to be that the supply of informal care will diminish in the future, though it is not clear by how much. One way of estimating this is by looking at the effects of a fall in the measure of informal care used by the study, that is informal help with domestic tasks. The first scenario therefore suggests a fall of 1% per year in the proportion of elderly people living alone who receive informal help with domestic tasks. Table 8.3 shows the consequences of this scenario for the number of elderly dependent people receiving informal help with domestic tasks and for the number of elderly recipients of different community services.

Table 8.3. Projected numbers of elderly people receiving informal and formal help with a fall in the supply of informal help with domestic tasks, 1995-2031

Numbers of dependent elderly people receiving:	1995	2031	% change	% change under base case
Informal help with domestic tasks	1,719,000	2,356,000	37	56
Receiving home care services*	517,000	848,000	64	56
Receiving community nursing services	444,000	717,000	61	61
Total expenditure	**9,000**	**24,000**	**155**	**153**

Source: Model estimates.

* "Home care" includes help with domestic and personal care tasks to elderly people in their homes

8.48. Under this scenario, between 1995 and 2031 the number of elderly dependent people receiving informal help with domestic tasks would be projected to rise by 37%, as against 56% in the base case. The number of elderly recipients of home care services is projected to rise by 64%, as against 56% under the base case. The number of elderly recipients of community nursing services is projected to rise by 61%, as in the base case. Overall expenditure is projected to rise between 1995 and 2031 by 155% under this scenario, in comparison with 153% under the base scenario.

8.49. The results suggest that a fall of 1% a year in informal help with domestic tasks would not have a very great effect on expenditure on formal services. This may be because those who need help with domestic tasks are less likely than those who need help with personal care tasks to rely on formal services. It is therefore important to look at the effects of changes in the supply of informal help with personal care tasks. This is explored in the next two scenarios, using different proxies for informal help with personal care tasks.

Scenario 2: a fall in the supply of informal help with personal care tasks proxied by a doubling of the number of dependent elderly people receiving formal care

8.50. The supply of informal help with personal care tasks is likely to be more vulnerable in the future than the supply of help with domestic care tasks because there are fewer sources of potential informal support with personal care than with domestic care tasks. The analysis of the 1994/95 GHS reported in Part One above suggested that the range of sources of informal support was much greater for domestic than for personal care tasks (see para. 8.13). A greater proportion of elderly people with domestic care needs than with personal care needs have access to informal support (see paras 8.24-8.25).

8.51. It is difficult to look at the effects of changes in the supply of informal help with personal care tasks directly because of the nature of the GHS data. However, an indirect way of looking at this is by assuming that the supply of informal help with personal care tasks will diminish and that therefore more formal domiciliary help will be needed by people with personal care needs, particularly those who are most likely to depend on informal help with personal care tasks. Those most likely to depend on informal help with personal care tasks are those who live with others, either in a couple or in more complex households. Nearly all the informal help with personal care tasks comes from others living in the same household. The analysis of the 1994/95 GHS showed that nearly 90% of those who gave a source of informal support for personal care tasks mentioned a spouse or relative inside their own household, whereas only about two thirds of those who gave a source of informal help with domestic tasks did so (see para. 8.13). The supply of this form of care has been diminishing in the last decades, especially during the 1970s and 1980s, as fewer elderly people live with their relatives (Grundy, 1996). If these trends continue, then it is reasonable to suppose that the supply of help with personal care tasks will diminish in the future.

8.52. The second scenario explores this by looking at the effects of increasing the number of formal care recipients among the most dependent elderly people (those with two or more ADL problems) who are most likely to depend on informal help with personal care tasks (those who live with others or as a couple). In particular, the scenario looks at what happens if domiciliary services are received by twice as many elderly people with two or more ADL problems who live with others or as a couple. (Only social care is considered in this scenario and community nursing and chiropody are excluded.) The results are summarised in table 8.4.

Table 8.4. Projected numbers of the elderly people receiving formal help, assuming a doubling of the most dependent elderly living with others who receive formal services, 1995-2031

Numbers of elderly people:	1995	2031	% change	% change under base case
Receiving home care services	517,000	896,000	73	56
Receiving meals-on-wheels	206,000	364,000	76	66
Total expenditure	**9,000**	**24,000**	**157**	**153**

Source: Model estimates.

8.53. Under this scenario, between 1995 and 2031, the number of elderly people receiving home care services would rise by 73%, as against 56% in the base case. The numbers receiving meals-on-wheels would rise by 76% as against 66% in the base case. Overall expenditure would rise between 1995 and 2031 by 157% under this scenario, compared with 153% under the base case.

8.54. The effects of doubling the numbers of the most dependent elderly people living with others who receive formal services are not very marked in expenditure terms. This may be because the numbers of dependent elderly people living with others who currently receive services is at present not very great. According to the analysis of the GHS for 1994/95 (reported in Chapter 9) the proportion of those with two or more ADL (personal care) problems living with others who currently receive home care services is only 16%. Therefore, doubling the numbers of elderly people in these categories receiving formal services does not seem to make a tremendous amount of difference to future expenditure.

Scenario 3: a fall in the supply of informal help with personal care tasks proxied by increasing admissions to residential care

8.55. Another way of proxying a fall in informal help with personal care would be to assume that, if there was a reduction in informal help with personal care tasks, then admissions to residential care would need to increase. Past trends suggest that institutional care may have become substituted for family care during the 1980s (Grundy, 1996). Although current policies aim to reverse this trend, this may prove difficult if expectations among elderly people and their relatives about the availability of institutional care remain unchanged or if the supply of informal care with personal care tasks is reduced for other reasons.

8.56. The approach adopted here is to consider the effect if a proportion of the most dependent people in the community were admitted to residential care as a result of a diminished supply of informal care. The scenario looks at the consequences if half of those unable to perform two or more of four ADLs without help were admitted to residential care. The results are summarised in table 8.5.

Table 8.5. Projected numbers of elderly people in institutional care, with half of the most dependent elderly people admitted to residential care, 1995-2031

Numbers of elderly people:	1995	2031	% change	% change under base case
In residential care	407,000	883,000	117	64
Total expenditure	9,000	28,000	195	153

Source: Model estimates.

8.57. Under this scenario, the number of elderly people in institutional care is projected to rise by 117% between 1995 and 2031, as against a rise of 64% under the base case. Overall expenditure is projected to rise by 195% under this scenario in comparison with 153% under the base scenario.

8.58. It is clear that this last scenario, in which more of the most dependent elderly people are admitted to residential care as a result of a fall in the supply of informal help with personal care tasks, is likely to have the greatest impact on expenditure. This is because it involves increases in the most costly form of care: residential care.

CONCLUSIONS

8.59. At the beginning of this chapter, it was suggested that the amount of informal care provided should ideally be modelled as a function of both supply and demand factors. In this study, an attempt has been made to take into account both supply and demand factors.

8.60. Ideally, further work needs to be done on the supply of informal care. The falls in informal care allowed for in the model are essentially guesses as to what might happen. Ideally the supply of informal care needs to be modelled so that better sensitivity analyses can be produced. Any further work on the supply of informal care needs to be aware of the need to relate supply and demand factors so that the dangers of overestimating the supply of informal care are avoided. Such an analysis is difficult within the constraints of existing data sources. Although some work could be done using the Informal Carers data collected in 1995, ideally what is required is the collection of new data, allowing for information on both the carer and cared-for to be collected together.

8.61. There is a second limitation to the modelling of informal care in this study, which again arises from the constraints of existing data sets. This is that the model projects the amount of informal help with *domestic tasks* only. It does not project the amount of help with personal care tasks, because of limitations in the GHS data set. The inability to carry out an analysis of the receipt of informal help with personal care tasks using the GHS data imposes a major limitation on the modelling since help with personal care is such an important part of long-term care. This is another area on which further work needs to be done using other data sets. It is possible that the GHS Informal Carers data or the Family Resources Survey (Department of Social Security, 1997) could be used to analyse informal help with personal care tasks, although neither data set is ideal (see para. 8.6 for limitations on the GHS Carers data for present purposes).

8.62. One consequence of the inability to include informal help with personal care is that the model is likely to overestimate the amount of informal care. This is because, as the analysis of access to informal care in Part One suggested, there is much greater access to help with domestic tasks than to help with personal care tasks. The projections for informal care cannot therefore be used to indicate the amount of help with informal care in general, but are projections for informal help with domestic tasks only.

8.63. In practice, however, the definition of informal care in the model imposes fewer limitations than might be supposed. One of the main purposes of the model is to estimate the amount of *formal* help that will be needed in the future. And one of the main reasons for spending so much time and effort on informal care is because it is known that

receipt of informal care reduces demand for formal support. When modelling *formal* support for non-residential care (see Chapter 9 in this monograph), one of the factors that is incorporated into the model is household type. The association between household type and informal support from within the household is so strong that informal care is sometimes represented by household composition as a variable (for example, by Evandrou and Winter, 1988, p.23).

8.64. The modelling of formal support in the model overall therefore reflects informal care though two variables: household composition and receipt of informal help with domestic tasks. 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, while informal help with domestic tasks reflects in addition help from outside the household. Other models have included two different measures of informal help to capture these different aspects of informal help, for example Bowling et al., who included both household size and social networks (Bowling et al., 1991). Demand for formal services in this study's model overall, therefore, reflects not just receipt of informal help with domestic tasks, but also a measure, in household composition, that probably reflects help with personal care tasks as well. In conclusion, key aspects of informal care are properly represented in the modelling of formal provision in this study.

Annex to Chapter 8. Sources of help with domestic and personal care tasks: Analysis of 1994/95 GHS data

SOURCES OF HELP WITH DOMESTIC TASKS

A8.1. 62% of the overall sample mentioned at least one source of help with domestic tasks. Of these, 81% mentioned one source, 16% two sources, 3% three sources and less than 1% (four people) four sources. These figures include people who received help but also could undertake domestic tasks themselves.

A8.2. Of those reporting a source of help with domestic tasks, 53% mentioned their spouse (44% their spouse only), 12% another household member (8% as sole source of help), 27% a relative outside the household (15% as sole source), 10% a friend or neighbour (4% as sole source), 8% health or social services (3% as sole source), 12% paid help (6% as sole source), and 2% voluntary or other worker. 6% received help from their spouse and another household member or relative outside the household. 3% received help from a relative outside the household and a neighbour or friend. 4% received help from the health and social services and from their spouse, a relative, neighbour and/or friend. 5% received paid help and help from their spouse, a relative, neighbour and/or friend.

A8.3. Sources of help varied markedly by household type. For those receiving help, of single people living alone 58% received help from a relative, 25% from a neighbour or friend, 19% from the health and social services and 26% from a paid helper. Of single people living with others, 92% received help from another household member, but only 11% from a relative outside the household, 4% from a neighbour or friend, 3% from the health and social services and 8% from a paid helper. Of married people living with their spouse only, 91% received help from their spouse, but only 14% from a relative, 3% from a neighbour or friend, 2% from the health and social services and 6% from a paid helper. Of married people living with their spouse and others, 87% received help from their spouse, 38% from another household member, 7% from a relative outside the household, and 3% from a paid helper.

A8.4. An analysis of sources of help with domestic tasks was undertaken for those who were dependent, i.e. who reported that they were unable to undertake one or more of the following five IADLs: shopping, managing personal affairs, vacuuming, cooking a hot meal, laundry. All those with an IADL problem, 21% of the overall sample, received help with domestic tasks. Of these, 35% mentioned their spouse, 17% another household member, 42% a relative outside the household, 15% a friend or neighbour, 17% health or social services, 15% paid help, 1% a voluntary worker and 1% another source of help. The average number of sources of help mentioned was 1.4 per person.

A8.5. A similar analysis was conducted by number of IADL problems from one to five. In general those unable to undertake four or five tasks were, in comparison with those unable to undertake only one or two tasks, more likely to receive help from their spouse, another household member or health and social services, and less likely to receive help from relatives outside the household, a friend or neighbour or a paid helper. An analysis was conducted for those with at least one of the five IADL problems by age, gender, marital status and housing tenure. Younger people were more likely than older people to receive help from their spouse and less likely to receive help from health and social services than older people.

SOURCES OF HELP WITH PERSONAL CARE TASKS

A8.6. All those unable to perform one of the five personal care tasks (ADLs) on their own but able to do so with help mentioned a source of help with domestic tasks. Only 3.1% of the total sample (94 people), however, reported a source of help for ADLs other than bathing, i.e. with getting in and out of bed, getting to the toilet, eating and dressing. This result may be biased downward by the limitation in the circumstances in which the question about help with ADLs was asked. In particular, as mentioned above, those who could undertake the task alone but only with great difficulty were not asked if they ever received any help and, if so, who helped them.

A8.7. Of this small subsample who received help with ADLs other than bathing, 66% mentioned their spouse, 21% another household member, 3% a relative outside the household, 1% a friend or neighbour and 12% health or social services. Only two people mentioned more than one source of help. Over 75% of this group also received help with bathing and virtually all also received help with domestic tasks.

A8.8. A somewhat larger proportion, 7% of the overall sample (215 people), reported a source of help with bathing. Of this larger subsample, 42% mentioned their spouse, 11% another household member, 20% a relative outside the household, 2% a friend or neighbour, 22% health or social services and 1% a paid helper. None seemingly reported more than one source of help with bathing. Almost all those receiving help with bathing also received help with domestic tasks.

A8.9. Analyses of sources of help were conducted by number of ADL limitations and by age, gender, marital status and household tenure for those mentioning a source with any of the five ADLs and for those mentioning a source for any of the four ADLs excluding bathing. These analyses need to be regarded with caution because of the small numbers involved.

9. Non-residential services

INTRODUCTION

9.1. A key aspect of the study is to make projections of the numbers of elderly people receiving non-residential services and projections of future levels of services.

9.2. The study is concerned with demand for formal non-residential services. Supply side factors are considered in the sensitivity analysis which looks at various scenarios around changes to the supply of services.

9.3. This chapter shows how formal non-residential services have been modelled in the study. The chapter has four parts. The first provides some background, looking at approaches to modelling formal non-residential care and at empirical evidence regarding needs-related circumstances affecting utilisation of services. The second part of the chapter reports on the analysis of the use of key community care services using the 1994/95 GHS for England, undertaken for the study. The third part reports on the model itself and shows how the numbers of elderly people receiving non-residential services have been generated by the model. Finally, Part Four looks at changes to the supply of formal non-residential care and reports on the results of different scenarios regarding changes affecting non-residential care in the future.

PART ONE. BACKGROUND

Existing approaches to modelling formal non-residential care

9.4. The two UK models of long-term care demand, developed by the Institute of Actuaries and the London-Economics/IPPR, do not separately model demand for non-residential care. The Institute of Actuaries calculates the total cost of long-term care up to 2031 and then considers the potential roles of different sources of care, defined as the State, private finances and informal provision (Nuttall et al., 1994, pp.22-29). The London-Economics/IPPR model calculates the total amount of care required and the amount of informal care provided up to 2031. Formal care is calculated as the amount of care in excess of that provided by the informal sector (Richards et al., 1996, p.42). The costs of the different elements of formal care, defined as residential and nursing care homes and home care, are then calculated and a figure for the total costs of formal care up to 2031 supplied (p.59).

9.5. In the US, however, the microsimulation model developed at the Brookings Institution does separately model home care utilization (Wiener et al., 1994, p.192). The model simulates the likelihood of using home care services, based on an analysis of the 1982 and 1984 National Long-Term Care Surveys. Separate probabilities of using home care services are developed for two groups, the chronically disabled and the non-disabled who newly become disabled. For the latter, the probability of home care use was found to vary by age, gender and marital status; for the chronically disabled, home care use was found to vary by level of disability and gender (Wiener et al., 1994, pp.208-209).

9.6. The macrosimulation model employed by this study cannot reproduce the methods employed in the Brookings microsimulation model. Nevertheless the Brookings model does suggest a useful approach to the modelling of non-residential care. The approach is based on using the predictors of present use of domiciliary services to model future use of these services.

9.7. This approach depends on the quality of the analysis of the determinants of domiciliary service utilisation. The analysis in the Brookings model does not, however, explicitly take informal care into account. Yet, as has already been suggested in the previous chapter, informal care is a key factor influencing receipt of formal services. The UK models recognise this by explicitly acknowledging the role of informal care, especially the London Economics model which sees the amount of formal care as care in excess of that provided by the informal sector. As Chapter 4 explained, this is not the approach adopted in the present study. Rather, in the present study, the likelihood of using domiciliary services is simulated for future years on the basis of the 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. The evidence regarding utilisation of formal services in the context of needs-related circumstances is reviewed in the section below.

Utilisation of formal services and needs-related circumstances

9.8. A number of studies in this country have looked at the utilisation of formal care services in the context of needs-related circumstances. Excluding small-scale studies, there are three main bodies of research: a series of secondary analyses of the 1980 General Household Survey (Bebbington and Davies, 1983; Evandrou et al., 1986; Evandrou, 1987; Arber et al., 1988; Evandrou and Winter, 1988); a study by Bowling and Grundy which interviewed nearly 1500 elderly people in two very different areas between 1987 and 1989 (Bowling et al., 1991, 1993); and a survey carried out by the PSSRU in 1984/5 of cohorts of new elderly clients of social services departments, which was repeated in 1994/5 (Davies et al., 1990).

9.9. The studies of needs-related circumstances affecting receipt of services have not always looked at informal care directly, but have more often captured the effects of the supply of informal care through variations in household composition. As Evandrou and Winter point out, "the household structure of the elderly person is an indicator of supply of informal care from within the household" (Evandrou and Winter, 1988, p.23). The main relationship between household composition and receipt of services is that elderly persons living alone receive significantly greater levels of domiciliary care than elderly persons in other household types (Evandrou, 1987, p.20).

9.10. The overall conclusions from the studies of needs-related circumstances affecting receipt of services are that the most important factors affecting receipt of formal services are household composition and disability (Bebbington and Davies, 1983, p.321; Evandrou, 1987, p.32; Bowling et al., 1991, p.699, 1993, p.285). What this means is that, using the 1980 GHS data, for example, two-thirds of severely disabled people living alone received the home help service, whereas only a fifth of elderly couples with the same disabilities did so, and elderly people living with younger family members were least likely to receive support (Evandrou, 1987, p.20). There are anomalies in service receipt, such that, for example in the 1984/85 PSSRU study, elderly people with the greatest level of disability were less likely to receive some services than those with lower levels of disability, where the former received more informal support (Davies et al., 1990, pp.54, 58, 61). And, in general, household composition, which captures the effects of informal support, has been found to have greater explanatory power than disability in relation to receipt of social services, though disability has greater explanatory power in relation to health services (Evandrou et al., 1986, p.164; Bowling et al., 1991, p.699; Davies et al., 1990, pp.68-9).

9.11. The effects of household composition and disability have also been found to be compounded by other factors, including age, gender, socio-economic status, social support/contacts and confusion. Thus, Bowling et al. found that age had a significant effect in relation to the use of some services where the very elderly (those aged 85 or over) were concerned (Bowling et al., 1991, p.698). Gender has been found to be important primarily in relation to the carers of elderly people, although the evidence

here is somewhat contradictory (Bebbington and Davies, 1983, p.319; Arber et al., 1988, pp.171-172). Socio-economic factors, including housing tenure, class and income, have all been found to affect receipt of services (Evandrou, 1987, pp.26-27; Evandrou and Winter, 1988, pp.22-24). Measures of social contact, which may sustain informal support from outside the household, have also been found to have an impact on service receipt (Bowling et al., 1991, p.699; Bebbington and Davies, 1983, pp.321-322). Elderly people with dementia have been found to make particularly heavy use of community services (Levin et al., 1989). Patterns of service utilisation have also been found to be affected by a range of more subtle aspects of needs-related circumstances, such as the motivation of the carer, the burdens of caregiving, the nature of the relationship between the carer and the elderly person, or the nature of the disease associated with dependency, while it has also been found that it is often subjective perceptions more than structural and objective factors which have the most direct and often the biggest impacts (Davies et al., 1990).

Conclusions

9.12. This study is approaching the modelling of use of community services in a similar way as the Brookings model, that is by basing projections on an analysis of the factors affecting use of community services in the present. Unlike the Brookings model, however, the present study wants to take into account the effects of receiving informal care. The studies of needs-related circumstances affecting receipt of services confirm the importance of informal care, as measured by household composition, but also confirm the importance of other needs-related circumstances. Evidence from large-scale surveys in this country suggest that it is not just dependency that mediates the effects of informal care but other compounding factors including age, gender, socio-economic status, social contact and mental impairment, as well as more subtle aspects of needs-related circumstances.

PART TWO. USE OF KEY COMMUNITY CARE SERVICES: GHS EVIDENCE

9.13. As part of this study, an analysis of the use of community care services using the 1994/95 GHS sample for England was carried out. The purpose of this was to analyse the predictors of the use of non-residential services for different groups of community-based elderly people.

9.14. The analysis took two forms. First, it looked at the factors affecting the use of services, based on the variables suggested by the earlier work reviewed above. This analysis was essentially looking at "cover" of elderly people by services (the number of recipients per population at risk). Second, an analysis of the "intensity" of service provision (provision per recipient) was also carried out. The distinction between cover and intensity has been developed by Davies since the late 1960s and was well established in the literature by the 1980s (Davies, 1968, 1971a, 1971b; Department of Health and Social Security, 1987; Davies et al., 1990). It seemed important to consider cover and intensity separately so that the effect of varying each independently could be investigated in the model.

9.15. The analysis was carried out for each type of home care service separately. (A brief description of each service is included in the Annex to this chapter.) Some analysis was carried out of packages of care (also summarised in the Annex to this chapter). There is a view that many home care services are interchangeable and that therefore there is no great value in estimating the individual services separately. However, the reason for the emphasis on different services is that the characteristics of elderly people receiving the services was found to vary by the type of service received. Estimating the individual services separately therefore helped to increase the accuracy of the

model's projections (cf Jette et al., 1995, S11, who stress the importance of service-specific analysis). A further reason for considering individual services separately was that different funding and charging arrangements apply to different services.

Nature of the data

9.16. The GHS respondents were asked whether or not they had received each of a number of long-term care services in the preceding month: these were home help, meals-on-wheels, meals in a lunch club, district nurse or health visitor, day centre and private domestic help. They were also asked whether they had received a number of other services in the preceding month or three months: these included local authority social worker or care manager and chiropodist.

9.17. Around 7% of all elderly people in private households reported receipt of home care services, 6% receipt of meals at home or in a club, 6% district nurse or health visitor services, 7% private domestic help and 3% day centre care in the preceding month. The mean number of these five services received was 0.29. This varied from 0.10 for those aged 65 to 69 years, 0.17 for those aged 70 to 74, 0.34 for those aged 75 to 79, 0.55 for those aged 80 to 84, and 0.84 for those aged 85 years and over. Additionally, almost 24% of the total sample reported receipt of chiropody and approximately 2% receipt of local authority social worker or care manager services in the preceding three months. The proportion of elderly people receiving each service is shown by age band and gender in table 9.1, by dependency in table 9.2 and figure 9.1 and by household type in table 9.3.

Table 9.1. Proportion receiving each service by gender and age band

	Home help %	District nurse %	Day centre %	Lunch club %	Meals-on-wheels %	Chiropody %	Private domestic help %
Males							
65-69	2	1	1	1	0	6	3
70-74	2	3	2	1	1	12	3
75-79	4	3	3	3	2	15	8
80-84	10	9	5	5	7	37	11
85+	22	18	6	8	15	49	13
Females							
65-69	3	3	1	2	0	16	4
70-74	5	4	3	2	2	26	5
75-79	9	8	4	5	2	34	13
80-84	16	13	7	9	5	43	11
85+	26	20	5	8	12	43	18

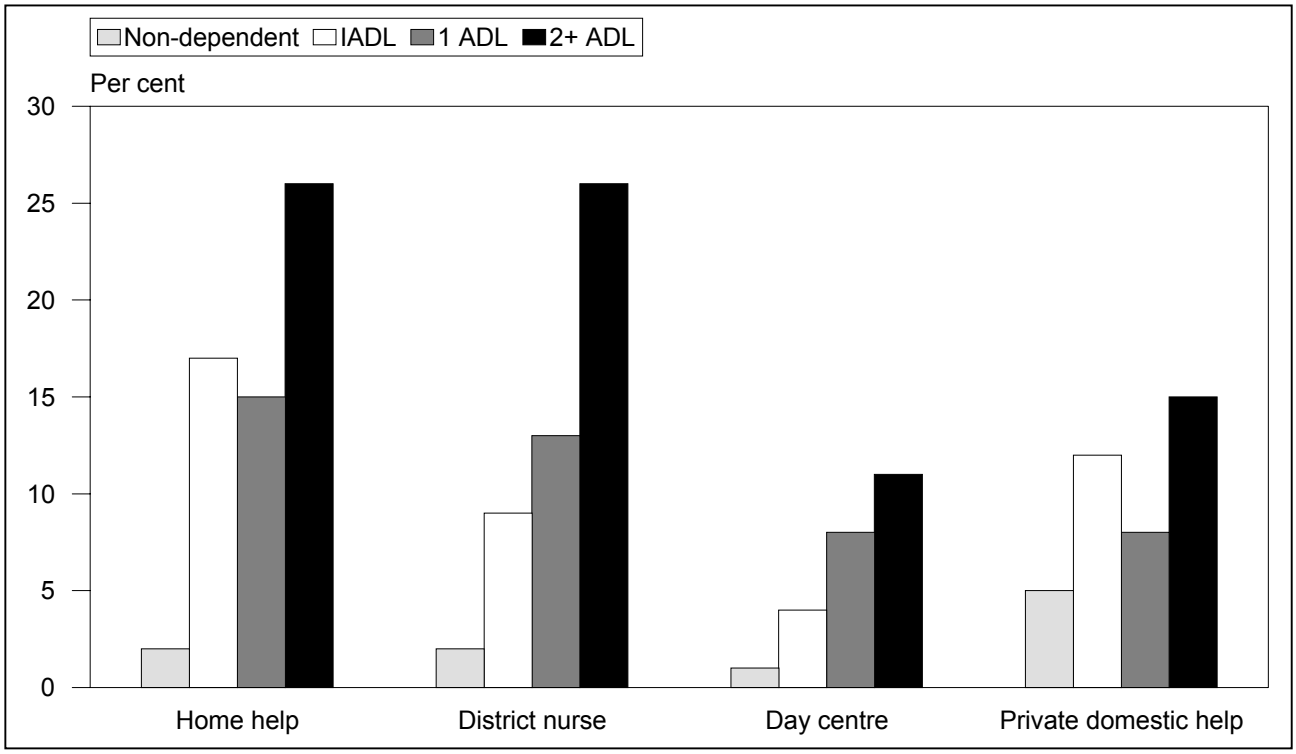
Source: GHS 94/95, England only (3,058 cases).

Table 9.2. Proportion receiving each service by dependency

	Total in the group	Home help %	District nurse %	Day centre %	Lunch club %	Meals-on-wheels %	Chiropody %	Private domestic help %
Non dependent	2,182	2	2	1	2	1	17	5
1 IADL	209	17	9	4	3	6	32	12
ADL	323	15	13	8	8	6	42	8
2+ ADL	319	26	26	11	7	11	45	15

Source: GHS 94/95, population over 65, England only (3,058 cases).

Figure 9.1. Proportions receiving each service by dependency



Source: GHS 94/95, population over 65, England only (3,058 cases).

Table 9.3. Proportion receiving each service by household type

	Total in the group	Home help %	District nurse %	Day centre %	Lunch club %	Meals-on-wheels %	Chiropody %	Private domestic help %
Single alone	1,170	13	10	6	6	6	31	11
Single with others	270	6	6	3	2	2	26	6
Married	1,423	3	3	2	1	1	18	5
Married with others	178	1	3	0	1	0	16	2

Source: GHS 94/95, population over 65, England only (3,041 cases).

Factors affecting receipt of services by elderly people

9.18. The research examined in the previous part suggested that informal care and dependency were major determinants of receipt of formal domiciliary services. Additional compounding variables that have been examined include age, gender, socio-economic status, social contact and mental impairment. Much of the work that has been carried out in this country looking at the effects of these variables has used data collected in the 1980s. However, it is important that projections are based on the most recent data available and therefore the analysis of the 1994/95 GHS was particularly important.

9.19. The analysis of the factors associated with receipt of formal services using the 1994/95 GHS considered the following independent variables: age band, gender, household type, dependency, housing tenure, gross income and receipt of informal care. Informal care was represented by two variables: receipt of informal help with domestic tasks and household composition. The household composition variable captured the effects of the supply of informal care from within the household, while the receipt of informal help with domestic tasks also reflected informal help from outside the household

(see Chapter 8 above). Socio-economic factors were represented by two variables, housing tenure and gross income. Cognitive impairment could not be examined because there is no GHS question on this.[4]

9.20. Multivariate analyses, using logistic regression, were conducted to investigate these factors. With the exception of income, the independent variables were all treated as categorical variables: the base case in each regression was not married, living alone, male, aged 65 to 69 years, with no dependency, in owner-occupied tenure and not in receipt of informal care. The services considered were receipt in the last month of local authority home help, district or other community nursing at home, meals-on-wheels, meals in a lunch club, day centre attendance and private domestic help, and receipt in the last three months of chiropody.

9.21. The analyses showed that gender was not a significant factor in receipt of any of the services considered. They showed that neither usual gross household income nor usual gross individual income (entered separately) was a significant factor except in the case of private domestic help.[5] They also showed that in most cases there was no significant difference in the probability of receipt of services between those aged 65 to 69 and those aged 70 to 74 and little difference between those aged 80 to 84 and those aged over 84. They showed also little difference in the probability of service receipt between single people living with others and married/cohabiting people living with their partner only.

9.22. Separate regression analyses were then run for those with no dependency and those with dependency. As few people without any ADL or IADL problem received services other than chiropody and private domestic help, it seemed helpful to have a simpler model of service receipt for this group. As those with dependency included a higher proportion of service recipients than the full sample, it also seemed helpful for obtaining useful logit regression results to consider them separately. When the two sets of regressions were run, gender and gross income were excluded and the age bands redefined to include only three: 65 to 74, 75 to 79, and 80 or over.

9.23. For those with no dependency, age band and household type were found to be significantly associated with receipt of each service but not housing tenure. An exception was private domestic help, for which age band and housing tenure but not household type were significant. The regression results are set out in table 9.4(a).

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[4] The omission of cognitive impairment from the study is discussed in Chapter 6, para. 6.14. Although cognitive impairment has not been included, an attempt has been made to capture its effects on service receipt. Thus, the model assumes that some of those in the no dependency category need care, since this category could include people with cognitive impairment. The model also projects demand for services, including demand for services from people with cognitive impairment.

[5] Income may not have been significant because housing tenure was also included in the analysis. It may also have lacked statistical significance because of the low income variation among the elderly (cf Bowling et al., 1993, p.284).

Table 9.4. Probability of receiving services: regression results

Summary of results of logistic regressions, where the **dependent variable** is receipt of the service shown at the top of the column.

Explanatory variables:
Age: age 1: 65 to 74; age 2: 75 to 70; age 3: 80 and over
Tenure: renting = 1; owner-occupation = 0
Household type: house 1: living alone; house 2: single living with others; house 3: couple alone; house 4: couple with others
Dependency: depend2: problems with IADLs; depend3: problems with 1 ADL; depend4: problems with 2 or more ADLs
Informal help: receipt of help with domestic tasks = 1; non-receipt = 0

(a) Non-dependent people

	Home care	Nurse	Day centre	Private help	Meals-on-wheels	Lunch club	Chiropody
Constant	-3.8183	-4.1088	-4.3264	-3.1636	-4.8087	-3.8736	-1.5791
Age 1	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2	0.6986	0.9904	0.5113	1.2977	0.1809	0.8222	0.3029
3	1.4903	1.6606	1.1915	1.4189	1.7964	1.4106	1.0634
Tenure				-1.5968			
House 1	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000
2	-0.5050	-1.7720	-1.2343		-0.3355	-0.4332	-0.0409
3	-1.6074	-1.4271	-0.9931		-1.8862	-1.1020	-0.5260
4	-6.6082	-1.0934	-6.0336		-5.6118	-0.5501	-0.5137
Model*	52.9	45.0	18.9	79.6	30.3	35.7	88.2
% Correct predictions	98.0%	98.3%	98.9%	94.5%	99.2%	97.8%	83.1%
Recipients	44/2182	38/2182	25/2182	119/2182	18/2171	47/2171	371/2182

* indicates improvement in log-likelihood over regression with constant term only

(b) Dependent people

	Home care	Nurse	Day centre	Private help	Meals-on-wheels	Lunch club	Chiropody
Constant	-1.4315	-2.8936	-2.9458	-0.9980	-2.6448	-2.0709	-1.1837
Age 1	0.0000	0.0000		0.0000	0.0000		0.0000
2	0.5240	0.3259		0.6074	-0.2037		0.8239
3	1.0005	0.9222		0.6496	1.0815		0.9824
Tenure	0.6547		0.5366	-0.5548			
House 1	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
2	-1.0855		-0.5791	-1.6032	-1.5232	-1.9181	-0.6372
3	-0.9051		-0.7096	-0.8826	-1.6870	-1.5367	-0.2653
4	-2.4918		-6.0356	-2.0516	-6.9721	-7.1319	-5.7370
Depend 2	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000
3	-0.4436	0.4800	0.4953	-0.6964	-0.2557		0.4346
4	0.6232	1.3602	0.8724	0.2828	0.5911		0.6121
Informal help	-0.6700			-0.8409			
Model*	124.9	50.8	28.0	70.3	67.7	31.6	63.4
% Correct predictions	80.2%	83.3%	92.1%	88.2%	92.3%	93.7%	63.6%
Recipients	170/845	142/850	67/844	100/845	65/845	53/845	34/845

* indicates improvement in log-likelihood over regression with constant term only.

9.24. For those with dependency, level of dependency was found to be a significant explanatory factor in the receipt of each service except attendance at a lunch club. Household type was found to be significant for each service except district nursing. Age band was found significant for each service except day care and attendance at a lunch club. Housing tenure was significant for home help, private domestic help, and day centre only. Receipt of informal care with domestic tasks was significant for home help and private domestic help only. The regression results are set out in table 9.4(b).

Intensity of service receipt

9.25. The 1994/5 GHS provides information on intensity of service receipt for most of the non-residential services. Recipients of meals-on-wheels received an average of 3.67 meals per week and recipients of meals in clubs an average of 1.5 meals per week. There was no significant association between number of meals per week and client dependency.

9.26. The average number of hours of home care per week was significantly associated with client dependency. For recipients in the GHS sample, the overall average was around 2.9 hours per week. It was 2 hours for those with no dependency, 3 hours for those with IADL limitations, 2.7 hours for those with one ADL problem and 3.2 hours for those with two or more ADL problems. Where two people in a household received home care, all the hours were assigned to the more dependent person, if they were in different dependency groups, to avoid double-counting.

9.27. The average number of community nurse visits per week was also significantly associated with client dependency. It ranged from less than one visit per week for those with no dependency, to almost twice a week for those with IADL limitations to one and a half times a week for those with one ADL problem and for those with two or more ADL problems.

9.28. The average number of day centre attendances per week was around one. This did not vary significantly with dependency. The average number of visits by private domestic helps was also not significantly associated with dependency (or housing tenure): it was around 1.6 visits per recipient week.

Conclusions

9.29. This study carried out an analysis of the 1994/95 GHS for England in order to analyse the predictors of the use of non-residential services for different groups of community-based elderly people. Separate regression analyses were run for those with no dependency and for those with dependency. The probability of people with no dependency receiving non-residential services was associated with age band and household type, with the exception of private domestic help for which housing tenure rather than household type was significant. The probability of people with dependency receiving non-residential services varied with each service but, taken together, the following variables were significant: level of dependency, household type, age band, housing tenure and receipt of informal help with domestic tasks. Intensity of service receipt for most non-residential services was also analysed.

PART THREE. NON-RESIDENTIAL SERVICES IN THE MODEL

How formal non-residential care is incorporated in the model

9.30. The model uses the propensity to receive formal care as the basis for projecting the amount of formal care in the future. This approach has not been used in this country before, although it is based on a similar approach to that used in the Brookings model in the US. The approach is different from that used by, for example, London Econom-

ics, where formal care is assumed to make up the gap between informal care and total care needed. In the present study, projections of future demand for formal care are based on current patterns of utilisation. Projections were made of both the numbers of elderly recipients of services and the number of hours/visits they received.

Numbers of elderly recipients of services

9.31. In this study, the model incorporates the propensity to receive formal care by dividing elderly people who live in private households into two groups: those with no dependency and those with dependency.

9.32. As already indicated in Part Two, the multivariate analyses of the 1994/95 GHS data for England found that the probability of people with no dependency receiving non-residential services was associated with age band and household type, with the exception of private domestic help for which housing tenure rather than household type was significant. Receipt of non-residential services by people with no dependency is therefore included in the model as a function of age band and household type (housing tenure for private domestic help). The estimated percentages of people with no dependency receiving each service are shown in table 9.5. These are the fitted values from the logistic regression.

Table 9.5. Estimated proportion of non-dependent elderly people receiving service

	Home help	Nurse	Day centre	Private help		Meals	Lunch club	Chiropody
				Owners	Renters			
Age 65-74								
Single	2.2	1.6	1.3	4.1	1.5	0.8	2.1	17.3
Single+	1.3	0.3	0.4	4.1	1.5	0.6	1.4	16.7
Couple	0.4	0.4	0.5	4.1	1.5	0.2	0.6	10.8
Couple+	0.0	0.6	0.0	4.1	1.5	0.0	1.2	11.1
Age 75-79								
Single	4.2	4.2	2.2	13.4	5.4	1.0	4.6	21.9
Single+	2.6	0.8	0.6	13.4	5.4	0.7	3.0	21.2
Couple	0.9	1.1	0.8	13.4	5.4	0.2	1.4	14.1
Couple+	0.0	1.5	0.0	13.4	5.4	0.0	2.7	14.4
Age 80+								
Single	8.9	8.0	4.2	14.9	6.0	4.7	7.7	36.9
Single+	5.6	1.5	1.3	14.9	6.0	3.4	5.1	36.0
Couple	1.9	2.3	1.6	14.9	6.0	0.8	2.4	25.4
Couple+	1.0	2.8	0.0	14.9	6.0	0.0	4.5	25.9

Source: Analysis of 1994/5 GHS.

9.33. The multivariate analyses found that the probability of people with dependency receiving non-residential services varied with each service but, taken together, the following variables were significant: level of dependency, household type, age band, housing tenure and receipt of informal help with domestic tasks. Receipt of non-residential services by people with dependency is therefore included in the model as a function of these variables as they relate to each service. The estimated percentages of people with dependency receiving home care and the percentage receiving community nursing are shown in table 9.6. These are the fitted values from the logistic regression.

Table 9.6. Estimated proportion of dependent elderly people receiving home care and district nursing services

	Home help				District nurse
	No carer/ owner	Carer/ owner	No carer/ renter	Carer/ renter	
With IADL problems					
Age 65-74					
Single	19.3	10.9	31.5	19.1	5.3
Single+	7.5	4.0	13.4	7.4	5.3
Couple	8.8	4.7	15.7	8.7	5.3
Couple+	1.9	1.0	3.7	1.9	5.3
Age 75-79					
Single	28.8	17.1	43.7	28.4	7.1
Single+	12.0	6.5	20.8	11.8	7.1
Couple	14.0	7.7	23.9	13.9	7.1
Couple+	3.2	1.7	6.0	3.2	7.1
Age 80+					
Single	39.4	25.0	55.6	39.0	12.2
Single+	18.0	10.1	29.7	17.8	12.2
Couple	20.8	11.9	33.6	20.6	12.2
Couple+	5.1	2.7	9.4	5.0	12.2
With one ADL problem					
Age 65-74					
Single	13.3	7.3	22.8	13.1	8.2
Single+	4.9	2.6	9.1	4.9	8.2
Couple	5.8	3.1	10.7	5.8	8.2
Couple+	1.3	0.7	2.4	1.2	8.2
Age 75-79					
Single	20.6	11.7	33.3	20.3	11.0
Single+	8.0	4.3	14.4	7.9	11.0
Couple	9.5	5.1	16.8	9.4	11.0
Couple+	2.1	1.1	4.0	2.1	11.0
Age 80+					
Single	29.4	17.6	44.5	29.1	18.4
Single+	12.4	6.7	21.3	12.2	18.4
Couple	14.4	8.0	24.5	14.3	18.4
Couple+	3.3	1.7	6.2	3.3	18.4
With two or more ADL problems					
Age 65-74					
Single	30.8	18.6	46.2	30.5	17.8
Single+	13.1	7.12	22.5	12.9	17.8
Couple	15.3	8.4	25.8	15.1	17.8
Couple+	3.6	1.9	6.6	3.5	17.8
Age 75-79					
Single	43.0	27.8	59.2	42.6	23.0
Single+	20.3	11.5	32.9	20.0	23.0
Couple	23.3	13.5	36.9	23.1	23.0
Couple+	5.9	3.1	10.7	5.8	23.0
Age 80+					
Single	54.8	38.3	70.0	54.4	35.2
Single+	29.0	17.3	44.1	28.7	35.2
Couple	32.9	20.1	48.6	32.6	35.2
Couple+	9.1	4.9	16.2	9.0	35.2

Source: Analysis of 1994/5 GHS.

9.34. The estimated percent of the household population for each sub-group was applied to the estimated numbers in each sub-group to produce an estimated number of recipients of each service by age group, household type etc. These were summed to produce an estimated number of recipients of each service for England for 1995. The figures are shown in table 9.7.

Table 9.7. Estimated numbers of recipients of non-residential services by dependency, England, 1995 (thousands)

	Home help	District nurse	Day centre	Private help	Meals-on-wheels	Lunch club	Chiropody
No dependency	108.6	93.7	61.1	319.3	45.1	116.7	900.0
IADL	91.6	45.0	22.8	65.9	33.4	30.3	164.4
One ADL	115.3	103.3	60.3	60.4	43.0	50.7	333.8
Two+ ADL	219.3	202.8	81.7	121.8	85.8	48.5	351.7
Total	**534.7**	**444.8**	**225.9**	**567.5**	**207.3**	**246.1**	**1,749.9**

Source: Model estimates.

9.35. The estimated proportions of the household population expected to receive each service do not exactly match the GHS data but are close. The slight mismatch is because the use of logistic regression fitted values is a process of estimation. The estimated numbers could be scaled, but it seems more important to compare them with other sources of information.

9.36. The estimated number of elderly home care recipients of approximately 517 thousand is somewhat higher than the Department of Health figure of approximately 450,000 households receiving home care in Autumn 1995 where the oldest person is aged 65 years or over.

9.37. The estimated number of recipients of community nursing services of approximately 444 thousand is far lower than the Department's figure of approximately 1,515 thousand first contacts by district nurses with elderly people in 1994/5. This is probably because some recipients of community nursing services receive care for a limited period after an acute illness rather than ongoing care. Such people would appear in full in the health authority returns which are continuous but would appear only in part in the GHS which asks about receipt in the previous month.

9.38. The estimated number of elderly recipients of meals-on-wheels of approximately 206 thousand is similar to the Department of Health figure of approximately 184 thousand elderly recipients of meals in their own homes in Autumn 1995. The estimated figure for users of lunch clubs of around 246 thousand is, however, much higher than the Department's figure of 70 thousand elderly recipients of meals in luncheon clubs. Possibly respondents to the GHS take a much wider view of what constitutes a lunch club than clubs where meals are subsidised by social services departments.

9.39. The estimated number of elderly users of day centres of approximately 220 thousand is rather higher than the Department's figures of approximately 175 thousand places for elderly people and approximately 140 thousand attendances per week by elderly people in Autumn 1994. The estimated number of elderly recipients of chiropody services of approximately 1,750 thousand is higher than the figure of approximately 1,500 thousand first contacts by NHS chiropodists with elderly people that can be derived from the Department's figures for 1994/5. It seems likely that a proportion of elderly respondents to the GHS use private chiropody services.

9.40. In the projections, the same procedure is applied as for 1995; that is, the estimated percentage of the household population for each sub-group was applied to the estimated numbers in each sub-group to produce an estimated number of recipients of each service by age group, household type etc.

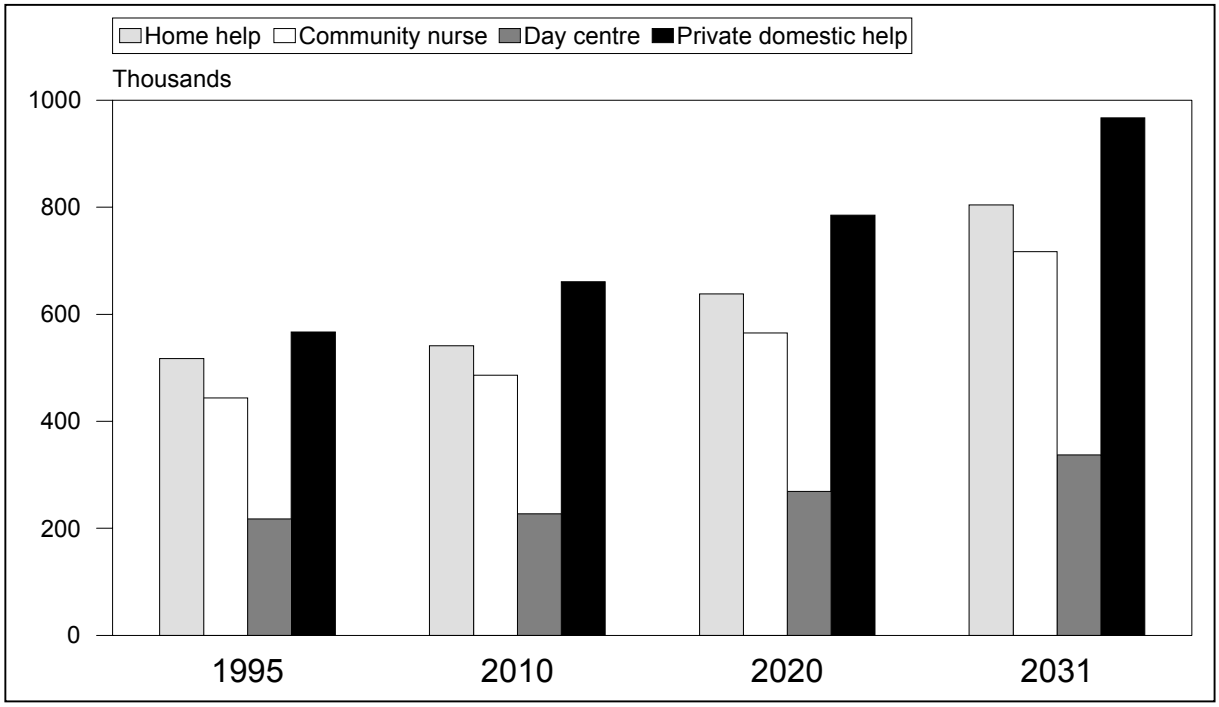
9.41. The results of the model are that the number of elderly recipients of home care services is projected to rise under the base case from 517 thousand in 1995 to 804 thousand in 2031, a rise of 56%. The number of elderly recipients of community nursing services is projected to rise from 444 thousand in 1995 to 717 thousand in 2031, a rise of 61%. The projected numbers of recipients of each service are shown in table 9.8 and figure 9.2.

Table 9.8. Projected numbers of recipients of each service, 1995-2031 (thousands)

	1995	2000	2010	2020	2031
Home help	517	518	541	638	804
Community nurse	444	454	486	565	717
Day centre	218	217	227	269	337
Private domestic help	567	600	661	785	967
Meals-on-wheels	206	209	226	265	340
Luncheon club	245	249	267	321	399
Chiropody	1,749	1,777	1,899	2,252	2,804

Source: Model estimates.

Figure 9.2. Projected numbers of recipients of each service, 1995-2031



Source: Model estimates.

Number of hours/visits received

9.42. The number of hours/visits received etc. are estimated primarily using the 1994/95 GHS information on intensity of service receipt, described in Part Two above. Where possible, these data have been compared with other data and adjusted where necessary.

9.43. The analysis of the 1994/95 GHS provided figures for the average number of hours of home care per week and showed that this was significantly associated with client dependency. For recipients in the GHS sample, the overall average was around 2.9 hours per week. Department of Health data, however, show an average of 4.1 hours per recipient week in 1994 and 4.7 hours per recipient week in 1995. The GHS figures were, therefore, increased by a factor of 1.5.

9.44. The GHS analysis showed that recipients of meals-on-wheels received an average of 3.7 meals per week and recipients of meals in clubs an average of 1.5 meals per week. This corresponds well with Department of Health data, which shows an average of around 3.5 meals per week for recipients of meals in their own homes and around 1.8 meals per week for recipients of meals in luncheon clubs. GHS data for the average number of community nurse visits per week and the average number of day centre attendances per week were utilised in the estimates.

9.45. The GHS does not provide data on the frequency of visits by or to a chiropodist. Department of Health data show that that in the course of 1994 the total number of contacts was around 3.5 times higher than the number of first contacts. Some clients may, however, receive chiropody services for a limited period. It is assumed that recipients of chiropody services receive treatment once every five weeks.

9.46. In the model, the average intensity of service receipt, varied by dependency where appropriate, was applied to the numbers of service recipients to produce estimates of the total number of hours, number of visits etc. The results of the model are that the number of home care hours is projected to rise under the base case by 55% between 1995 and 2031. The number of visits by community nurses is projected to rise by 61% over the same period.

Characteristics of formal non-residential care in the model

9.47. The model is demand-led. The base case holds constant the rates of receipt of formal non-residential care by age band, dependency, household type, housing tenure, and receipt of informal help with domestic tasks. Therefore, as the numbers of elderly people increase in the future, the amount of formal non-residential care will also increase. This assumption is varied in the sensitivity analyses, reported in Part Four below.

PART FOUR. SENSITIVITY ANALYSIS

Future supply of formal non-residential care

9.48. Essentially, the base case is demand-led. Yet, it is clear that receipt of services is affected by the supply of services. This is of particular importance because the changing community care policy context during the 1990s has introduced changes to the supply of services that are intended to affect service utilisation. The effects of changes to the supply of care are incorporated in the model through the sensitivity analyses which allow for changes in the availability of formal care.

The supply of services to elderly people and to carers

9.49. Receipt of formal services is not just affected by demand-side but also by supply-side factors. During the 1980s increasing attention was paid by researchers in this country and elsewhere to the impact that the availability of services has on patterns of receipt. This was most clearly demonstrated in the work of Evandrou and Winter (1988) who incorporated supply side variables in their model of receipt of services. It was also acknowledged by Bowling et al. who argued that administrative, resource and organisational factors could affect the utilisation of services (Bowling et al., 1991, p.699, 1993, p.284). Elsewhere, research by Daatland in Norway suggested that, as public services increased in availability, so their rate of uptake by elderly people increased (Daatland, 1990). Increases in the provision of services, both in the UK and in the US, however, have crucially affected the balance between cover and intensity, with increases in cover often achieved only by reductions in intensity of provision (Davies, 1990, pp.23 et seq.).

9.50. In Britain, the overall supply of publicly-funded care is a function of policy decisions at central and local level about priorities for public expenditure. The impact of policy decisions on service receipt by the elderly was analysed by Davies et al. (1990) who looked at the prerequisites for achieving the goals of the 1989 White Paper, *Caring for People*. Poor targeting of services to elderly people in most need, anomalies in allocations and consumption, and low intensity of provision, indicating the inadequate matching of resources to needs, together with low marginal productivities during the

1980s, were linked to the service delivery system and the need for better case management skills in social services.

9.51. The impact of the supply of services for patterns of receipt has been particularly clear with respect to carers. Twigg et al., using evidence from the 1980s, argued that service providers in this country regarded carers essentially as a free resource and directed services away from situations in which carers were available. This approach to carers was not, however, the only one possible and was neither efficient, in that it failed to support carers who might otherwise continue to provide care, nor equitable, in that it placed too heavy a burden on some individuals in a way that called for public intervention and support (Twigg, 1989, 1992; Twigg et al., 1990; Twigg and Atkin, 1994).

Changing policy context

9.52. The supply of formal care has recently undergone considerable change with the introduction of the community care reforms and the NHS & Community Care Act 1990 which came into effect between April 1991 and April 1993. The aims of the reforms were to make large changes to the way in which services were delivered in ways that were intended to affect patterns of service receipt.

9.53. As Chapter 2 indicated, the reforms aimed to make three key changes to the organisation of services: to move services away from institutional towards community services; to shift services from being supply-led to needs-led; and to give recognition to the needs of carers.

9.54. The impact of the community care changes is not yet clear. It is currently being evaluated for the Department of Health by a major PSSRU study, ECCEP (Evaluating Community Care for Elderly People) and the evaluation is still in progress.

9.55. What is clear, however, is that the 1994/95 GHS may not be a good indicator of future patterns of service receipt. The 1994/95 GHS is historical data in that many of the sample interviewed for the GHS may have been users of services before the community care changes were introduced and the data will therefore to some extent reflect past patterns of service delivery and receipt.

9.56. It was therefore important to incorporate anticipated changes into the model. The aim in doing so was not to predict the effects of the community care changes as such, since the effects are not yet known. Rather the aim has been to take the intentions of the reforms as reflecting some dominant concerns of social policy and explore some scenarios suggested by them.

9.57. This has been done via sensitivity analysis using a number of scenarios. The potential changes introduced by the reforms have suggested a number of scenarios for the modelling. Four scenarios were explored. The first looked at the effects of reducing institutionalisation and providing non-residential services instead. The second and third explored the effects of providing more needs-led services by projecting increased levels of services to different groups of dependent elderly people in the community. The fourth looked at the effects of increasing services to carers. These four scenarios are explored below.

Sensitivity analysis

Scenario 1: from institutional to community services

9.58. The first scenario involves a fall of 1% per year in institutionalisation rates, with those who would have been in a residential care home, nursing home or hospital now receiving non-residential services at the rates estimated for the most dependent elderly people living alone in the community. The numbers of elderly people in institutional

care, receiving home care services and receiving community nursing services in 1995 and 2031 under this scenario are shown in the table 9.9.

Table 9.9. Projected numbers of elderly people receiving different types of service under different scenarios, 1995-2031

	1995	2031	% change
Scenario 1: a fall of 1% per year in institutionalisation rates			
Institutional care	407,000	464,000	14
Receiving home care services	517,000	892,000	73
Receiving community nursing services	444,000	780,000	76
Total expenditure	9,400	19,000	100
Scenario 2: an increase of 1% per year in rates of receipt of each non-residential service among the most dependent elderly people			
Receiving home care services	517,000	943,000	82
Receiving community nursing services	444,000	856,000	93
Total expenditure	9,400	25,000	163
Scenario 3: an increase of 1% per year in rates of receipt of each non-residential service among those with personal care needs			
Receiving home care services	517,000	1,026,000	98
Receiving community nursing services	444,000	819,000	84
Total expenditure	9,400	25,000	166
Scenario 4: elderly people with a substantial dependency who live with others receive the same package of care as those living alone			
Receiving home care services	517,000	908,000	76
Receiving community nursing services	444,000	717,000	61
Total expenditure	9,400	24,000	158

Source: Model estimates.

9.59. Under this scenario, between 1995 and 2031, the number of elderly people in institutional care is projected to rise by 14%, as against 64% under the base case. The number of elderly recipients of home care services is projected to rise by 73%, as against 56% under the base case, while the number of elderly recipients of community nursing services is projected to rise by 76%, as against 61% in the base case. Overall expenditure is projected to rise by 100% in comparison with 153% under the base case. However, this result should be taken with caution, since it is very likely that the "new" people receiving formal services in the community would have higher levels of dependency than the actual most dependent elderly people in the community, even those living alone. In addition, some of these people may also be entitled to social security benefits, which are not accounted for in the model.

Scenario 2: increasing services to the most dependent elderly people

9.60. The second scenario involves an increase of 1% per year in the rates of receipt of each non-residential service (except chiropody) among the most dependent elderly people in the community. Table 9.9 shows the numbers of elderly people receiving home care services and community nursing services in 1995 and 2031 under this scenario.

9.61. Under this scenario, between 1995 and 2031, the number of elderly recipients of home care services is projected to rise by 82%, as against 56% under the base case. The number of elderly recipients of community nursing services is projected to rise by 93%, as against 61% in the base case. Overall expenditure is projected to rise by 163%, in comparison with 153% under the base case.

Scenario 3: increasing services to other dependent elderly people

9.62. The third example assumes that the rate of receipt of each non-residential service (except for chiropody) grows 1% per year among those in dependency groups 2 and 3 (those with problems with domestic tasks or with one personal care task). Table 9.9

shows the numbers of elderly people receiving home care services and community nursing services in 1995 and 2031 under this scenario.

9.63. In this case, the number of recipients of home help would grow by 98%, compared to the base case rise of 56%. The number of recipients of community nursing would rise by 84%, against the rise of 61% under the base case. Overall expenditure would grow by 166%, as opposed to 153% with the base case.

Scenario 4: increasing services to carers

9.64. The final scenario explores the implications of increasing the supply of support to carers. It assumes that services will be more "carer-blind" in the future (cf Twigg and Atkin, 1994, p.150). There is evidence from the ECCEP study at the PSSRU that there have been important changes since the community care reforms to the supply of support for carers. The scenario looks at the effects if more support is given 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; Twigg, 1996). The scenario therefore looks at the implications of increasing domiciliary services to elderly people with substantial dependency needs (those with two or more ADL problems or problems with personal care tasks) who share a household with others. The latter includes single elderly people living with others, married elderly people living with others and married elderly people living as a couple. 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 involves giving to elderly people with a substantial dependency who live with others the same packages of non-residential services (except chiropody) as received by those living alone. The results of this scenario are shown in the table 9.9.

9.65. Under this scenario, between 1995 and 2031, the number of elderly recipients of home care services is projected to rise by 76%, as against 56% under the base case. The number of elderly recipients of community nursing services is projected to rise by 61%, exactly the same as in the base case. The reason that the scenario makes no difference in respect to community nursing services may be because community nursing services are currently more likely to provide services on the basis of dependency than home care services (Davies et al., 1990, pp.68-69; Bowling et al., 1991, p.699). Because of the rise in the numbers receiving home care services, overall expenditure is projected to rise by 158%, in comparison with 153% under the base case.

Annex to Chapter 9.

DESCRIPTION OF MAIN NON-RESIDENTIAL SERVICES

Home care services

A9.1. Home care services include help with both domestic and personal care tasks provided for elderly people in their own homes by local authority social services departments. The services were redesignated as home care services during the 1980s from their previous title of "home help" services, by which title they are still sometimes known.

Community nursing services

A9.2. Community nursing services for elderly people are mainly provided by district nurses as part of the National Health Service and include skilled nursing input, advice and help with medical conditions, and help with bathing and other forms of personal care.

Meals-on-wheels

A9.3. The meals-on-wheels service provides elderly people with hot meals or meals which can be heated up in their own homes. The service may be provided directly by local authorities or indirectly by voluntary agencies funded by local authorities.

Day centres

A9.4. Day centres funded by social services departments may be provided directly or by the voluntary or for-profit sectors. They provide lunch and social activities and may also offer support services such as baths, hairdressing, and chiropody.

Lunch clubs

A9.5. Lunch clubs provide meals subsidised by social services departments but, as paragraph 9.38 suggests, they may also include other types of provision.

Chiropody

A9.6. Chiropody services are provided by the National Health Service but elderly people may also use private chiropodists.

Private domestic help

A9.7. Private domestic help refers to help purchased by elderly people from their own resources.

ANALYSIS OF PACKAGES OF CARE USING 1994/95 GHS SAMPLE

A9.8. To investigate the receipt of packages of care, receipt of each service was cross-tabulated with receipt of each other service. Full results are at table 9.10. A substantial proportion of those receiving other services received chiropody; that is, about 50% of home care recipients, 50% of meals recipients, over 50% of recipients of district nurs-

ing, over 40% of day care recipients, and over 40% of users of private domestic help. This is not surprising since a considerable proportion of the total sample received chiropody.

A9.9. A significant proportion of those receiving other services also received home care, that is, over 40% of recipients of meals, nearly 40% of district nursing recipients, and around 35% of day care recipients, but only 15% of chiropody clients and under 10% of users of paid domestic help. A marked proportion of those receiving other services also received meals, that is, around 35% of home care recipients, 25% of district nursing recipients, and around 35% of day care recipients, but only few chiropody clients and few users of paid domestic help. Receipt of services other than chiropody, home care and meals were less correlated with each other.

Table 9.10. Receipt of one service by receipt of other services: percentage of those receiving row service also receiving column service

	Home help %	Nurse %	Day centre %	Meals-on-wheels %	Lunch club %	Private domestic help %	Chiropody %
Home help		32	15	25	13	9	51
Community nurse	38		11	14	12	18	53
Day centre	34	21		13	24	8	43
Meals-on-wheels	62	29	14		9	12	51
Lunch club	27	22	23	8		14	48
Private help	9	15	4	5	6		42
Chiropody	15	13	6	6	7	13	

Source: Analysis of 1994/5 GHS data for England.

10. Residential, nursing home and hospital care

10.1. Institutional care continues to account for a substantial proportion of expenditure on long-term care for elderly people. This implies that projections of long-term care demand and finance can be expected to be sensitive to future utilisation of residential care and future costs per resident week. This chapter considers use of long-stay hospital, nursing home and residential home care. Costs are discussed in Chapter 11.

10.2. The need for long-stay residential care may be related to a number of factors including age, dependency, living alone, and economic circumstances. The Brookings Institution model considers the probability that an individual will enter a nursing home separately for disabled people and for non-disabled people who newly become disabled (Wiener et al., 1994). For the former group, the probability is treated as a function of age, marital status, dependency and whether or not the person had a previous admission. For the latter group it is treated as a function of age, marital status, gender, and whether or not the person had a previous admission. This is on the basis of analyses of data from the US National Long-Term Care Surveys for 1982 and 1984 and the National Nursing Home Survey of 1985.

10.3. As discussed further below, the model in this study treats the probability of institutional care as a function of age, gender, and whether or not the person lived alone prior to admission. It is not treated as a direct function of dependency, but rather institutionalisation is treated as if it were an additional dependency category. This seemed necessary as data on dependency were not available in a single data set covering those in private households and those in institutions.

PSSRU SURVEYS OF RESIDENTIAL CARE

10.4. Over the last 15 years the PSSRU has conducted a number of surveys of residential care and nursing homes and their residents. In 1981 the Unit conducted a survey of around 14,000 residents of around 450 local authority and independent residential care homes in 12 local authorities in England and Wales (Darton, 1986a, 1986b). In 1986 the Unit conducted, in collaboration with the Centre for Health Economics at the University of York, a survey of over 10,000 residents of 855 private and voluntary registered residential care and nursing homes in 17 local authorities in Great Britain (Darton et al., 1989). This survey included younger people with learning disabilities, mental illness and physical disabilities as well as elderly people. Both surveys were commissioned by the former Department of Health and Social Security.

10.5. More recently the PSSRU has conducted two related surveys of residential care commissioned by the Department of Health. Information was collected in winter 1995/6 on around 2,500 local authority funded admissions of elderly people to residential or nursing home care in 18 English local authorities. The main aim of this survey was to provide information to assist the estimation of a new personal social services Standard Spending Assessment (SSA) formula for the distribution of monies for residential care for elderly people between local authorities in England (Bebbington et al., 1996). The sample of publicly funded admissions is being followed up longitudinally to obtain information on completed lengths of stay and on changes in dependency.

10.6. A cross-sectional survey of homes and their residents was conducted in autumn 1996 (Netten et al., 1997). The sample consisted of almost 12,000 elderly residents in over 600 residential care and nursing homes in 21 English local authorities. The survey covered local authority homes, registered residential homes, registered nursing homes and dual-registered homes for elderly people. Information was collected on the homes, including their fees, staffing, and wages, and on the residents, including their

age, gender, source of admission, source of finance, physical disability, and cognitive ability.

DATA AND METHODS USED

10.7. A combination of local authority and health service data and data from the recent PSSRU surveys are used in the model to separate the institutionalised elderly population from the population in private households. Three forms of institutions are considered: residential care homes, nursing homes and hospitals. For each type of institution estimates are incorporated of the numbers of residents by age group and gender. These are shown in table 10.1.

Table 10.1. Numbers in institutional care, by age and gender

	Residential care home		Nursing home		Hospital (NHS)	
	Males	Females	Males	Females	Males	Females
65-69	3,725	2,795	1,940	3,535	2,170	2,335
70-74	10,990	10,430	6,840	6,270	2,435	2,955
75-79	8,905	20,525	7,305	14,125	2,270	3,785
80-84	13,885	40,750	9,995	18,645	2,095	4,370
85+	26,930	105,905	15,815	48,920	1,460	4,820

Sources: Residential Accommodation Statistics, Körner Statistics, Hospital Episode Statistics, PSSRU Residential Care Survey.

10.8. For residential care homes, Department of Health data, based on Residential Accommodation returns from local authorities, show that there were 244,860 elderly residents on 31 March 1996 (Department of Health, 1996c). Around 11% were aged 65 to 74 years, 34% aged 75 to 84 years and 54% were aged 85 years and over. The total was further broken down into five age bands and by gender using data from the PSSRU's sample survey of residents of residential care homes in autumn 1996.

10.9. For nursing homes, Department of Health data, based on Körner returns from health authorities, show that there were 133,387 elderly residents on 31 March 1996. Around 14% were aged 65 to 74 years, 38% aged 75 to 84 years and 49% were aged 85 years and over. The total was again further broken down into five age bands and by gender using data from the PSSRU's sample survey of residents of nursing homes in autumn 1996.

10.10. For hospital care, use is made of data from the NHS Hospital Episode Statistics (HES) for 1994/5 on the numbers of unfinished episodes, as at 31 March 1995, involving elderly patients. More specifically the numbers of unfinished episodes lasting over 55 days is selected. These total 28,701. By way of comparison, the 1991 Census shows around 31,500 elderly non-staff residents of hospitals of all types (including private hospitals). The HES data provides a breakdown by age group and gender.

10.11. Elderly people living alone are at greater risk of admission to institutional care than those living with others. This was one of the findings of the PSSRU analysis for SSA purposes of data from the General Household Survey and from the 1995/6 PSSRU survey of publicly funded admissions (Bebbington et al., 1996). It therefore seemed most important to ensure that the model treated the probability of entering residential care as a function, not only of age and gender, but also of whether or not the elderly person lived alone.

10.12. The PSSRU admissions survey and cross-sectional survey both provide some information on the source of admission of residents. The former survey found that 62% of those admitted to local authority funded residential care from a private household had lived alone prior to admission. It also found that 61% of those admitted from another residential care or nursing home and 65% of those admitted from a hospital had lived alone prior to admission to the first home or hospital. This suggests that those

admitted from a hospital or other home were no more or less likely to have lived alone prior to admission than those admitted from a private household. It should be noted, however, that information on whether or not the person lived alone was not collected in the case of those who had been in hospital or another care home for more than eight weeks.

10.13. The cross-sectional survey found that 37% of residents were admitted from a single person household (including sheltered housing), 16% from a multi-occupancy household, 14% from another residential care or nursing home and 31% from a hospital (and 1% from none of these). This survey did not attempt to ask about the source of admission prior to any earlier hospital spell or spell in another care home. On the assumption that those admitted from a hospital or another home did not differ, in terms of prior household type, from those admitted directly from a private household, these figures suggest that around 70% of elderly residents lived alone prior to admission to institutional care.

10.14. Information was analysed in respect of those in the cross-sectional survey who had been admitted to their current home directly from a private household. The proportion of residents estimated to have lived alone prior to admission was estimated separately for each type of home (residential and nursing home) for each age group by gender. For males, there was no clear relationship between age and source of admission. Around 45% of males in residential care homes and 65% of males in nursing homes had lived alone prior to admission. For females, a higher proportion had lived alone — 67% of those in residential care homes and 76% of those in nursing homes — and the proportion rose with age. The figures used in the model are shown in table 10.2. In the absence of similar information on elderly long-stay hospital residents, the nursing home breakdown by household type prior to admission was also used as a proxy for hospital residents.

Table 10.2. Percentage of residents who lived alone prior to admission

	Residential care homes	Nursing homes
Males		
All ages	65	45
Females		
65-69	58	20
70-74	64	50
75-79	69	59
80-84	76	61
85+	79	73

Source: PSSRU Cross-sectional Survey of Residential Care, 1996.

10.15. These estimates were applied to the numbers of residents in each type of home by age group and gender, to provide estimates of the numbers of residents by household type prior to admission for each age group and gender. As the model breaks down the estimated total 1995 elderly population by household type, it was then possible to estimate the proportion of elderly people in each type of institutional care by household type, age and gender. The estimated percentages are in table 10.3. This enables institutionalisation to be modelled as a function of age, gender and household type.

Table 10.3. Percentage of elderly people in institutional care by age, gender and household type before admission

(a) previously living alone

	Residential care homes		Nursing homes		Hospitals	
Age	Males	Females	Males	Females	Males	Females
65-69	1.0	0.5	0.4	0.2	0.4	0.1
70-74	2.1	1.5	1.0	0.7	0.5	0.3
75-79	3.8	2.6	1.7	1.5	0.7	0.4
80-84	5.7	7.0	2.4	2.9	0.6	0.6
85+	11.6	18.6	5.8	7.7	0.6	0.7

(b) previously not living alone

	Residential care homes		Nursing homes		Hospitals	
Age	Males	Females	Males	Females	Males	Females
65-69	0.2	0.3	0.2	0.4	0.2	0.3
70-74	0.4	0.6	0.4	0.6	0.2	0.2
75-79	0.8	1.7	0.8	1.6	0.3	0.4
80-84	1.9	3.8	1.8	3.6	0.5	0.7
85+	5.3	13.2	6.0	7.6	0.7	0.7

Source: derived from information in tables 10.1 and 10.2 and from model estimates of the elderly population by age, gender and household type.

10.16. Institutionalisation is a function of dependency as well as household type. The model, however, treats institutionalisation as if it was a further set of dependency groups. This seemed necessary as data on dependency were not available in a single data set covering those in private households and those in institutions. The model effectively breaks down the population by age and gender into seven groups: no dependency, IADL problems, one ADL problem, two or more ADL problems, residential care, nursing home care, hospital care. The PSSRU cross-sectional survey found that most residents had substantial dependency. 35% had severe cognitive impairment and 45% moderate cognitive impairment. 16% had moderate dependence, 18% severe dependence and 21% total dependence on the Barthel Index of ADLs. This suggests that few residents would fall into the milder dependency categories.

10.17. The base case in the model assumes that the proportion of elderly people by age group, gender, and household type (prior to admission) in each type of institution remains constant. Changes in the projected age mix, gender mix, or mix of household types alter the proportion of the overall elderly population projected to be receiving institutional care. A change in the projected dependency composition of the elderly population — that is, in age-specific dependency rates — does not have any effect on the proportion projected to receive residential care. This means that, if a scenario is investigated that assumes a rise (or fall) in age-specific dependency rates, the scenario needs to incorporate a separate assumption about whether age-specific institutionalisation rates are similarly assumed to rise (or fall). This was considered in Chapter 6.

PROJECTIONS

10.18. The total elderly population (aged 65 and over) of England is projected to rise from 7.7 million to 12.1 million, or by 57%, between 1995 and 2031. The numbers of elderly people in institutional care are projected to rise over the same period from 407 thousand to 666 thousand, a rise of 64%, as shown in table 10.4. The numbers of dependent elderly people living at home, with at least one limitation in activities of daily living or instrumental activities of daily living, are projected to rise from 2,077 thousand to 3,260 thousand, a rise of 57%. These are on the base case assumption of unchanged age-gender specific dependency and institutionalisation rates.

Table 10.4. Projected numbers of elderly people in institutional care by age band, gender and type of institution

	1995	2000	2010	2020	2031
Residential care homes					
Male					
65-69	4,150	4,203	5,225	6,712	8,879
70-74	7,675	7,291	8,469	12,291	13,421
75-79	9,160	10,913	11,353	15,314	16,772
80-85	12,785	12,174	15,096	18,812	25,503
85+	18,570	21,954	26,741	34,134	45,297
Female					
65-69	4,400	4,211	4,866	5,627	7,237
70-74	11,715	10,687	10,935	15,089	15,633
75-79	19,385	21,622	19,628	23,159	26,635
80-85	42,735	38,954	41,253	45,157	62,671
85+	114,265	123,581	130,311	137,424	178,216
Nursing homes					
Male					
65-69	2,490	2,497	3,005	3,681	4,889
70-74	5,365	5,137	5,766	8,161	8,860
75-79	6,060	7,187	7,422	9,525	10,763
80-85	7,885	7,628	9,381	11,207	15,785
85+	13,400	16,065	19,562	24,116	33,206
Female					
65-69	3,330	3,159	3,542	3,909	5,003
70-74	7,400	6,771	6,881	9,304	9,665
75-79	13,505	15,053	13,651	16,056	18,365
80-85	22,620	20,725	21,906	23,930	32,786
85+	51,335	55,580	58,585	61,814	79,935
Hospital (NHS)					
Male					
65-69	2,170	2,176	2,619	3,208	4,261
70-74	2,435	2,332	2,617	3,704	4,021
75-79	2,270	2,692	2,780	3,568	4,032
80-85	2,095	2,027	2,493	2,978	4,194
85+	1,460	1,750	2,131	2,628	3,618
Female					
65-69	2,335	2,215	2,484	2,741	3,508
70-74	2,955	2,704	2,748	3,715	3,859
75-79	3,785	4,219	3,826	4,500	5,147
80-85	4,370	4,004	4,232	4,623	6,334
85+	4,820	5,219	5,501	5,804	7,505

Source: Model estimates.

11. Costs of care and sources of funding

11.1. The outputs of the second part of the model are, as discussed in Chapters 9 and 10, projected numbers of weeks of residential care, hours of home care, day care sessions etc. The third part of the model costs these projected quantities of care to produce expenditure projections and then breaks down the projected expenditure by source of funding. The concern of the model is with projections of the real total costs of *formal* long-term care services for elderly people, covering the costs to the health services, social services and users of services. This chapter discusses information on the unit costs of care. It then discusses the difficult issue of rises over time in the real unit costs of care. Finally it also discusses the breakdown of costs between sources of finance.

UNIT COSTS OF CARE

11.2. Data on the unit costs of services at 1995/6 prices were taken, where available, from Netten and Dennett's *Unit Costs of Community Care 1996*. This publication, which has been produced annually in recent years, provides the best available estimates for the unit costs of a wide range of community care services. The estimated costs represent, as far as possible, full opportunity costs including the opportunity cost of capital, overheads and travel.

11.3. An hour's local authority home care is costed at £8.50, based on the figure of £8 per hour with client, plus travel. Meals-on-wheels are costed at £2.90 each. In the absence of information, the same cost is assumed for meals in a luncheon club. Day care is costed at £28 per attendance. A visit by a community nurse is costed at £17, based on the figure of £32 per hour with client, plus travel, with an assumption of on average half an hour with the client for each visit. Chiropody is costed at £10 per treatment, based on figures of £8 per clinic visit and £15 per domiciliary visit (including travel) and an assumption that around 25% of contacts are domiciliary visits.

11.4. Residential care is costed at £275 per resident week. This is on the basis of the figures of £242 per week in an independent home and £380 per week in a local authority home. Department of Health figures show that over 75% of elderly residents are in independent homes. Nursing home care is costed at £337 per resident week and hospital care at £800 per resident week. The costs of additional services, such as GP services to residents in homes, are not included in these figures.

ESTIMATED TOTAL COSTS OF CARE

11.5. These unit costs are multiplied by the estimated weeks, hours, sessions of care to produce a base-line assumed total cost of long-term care for elderly people in England for 1995. For institutional care, the estimates are £1,200 million for long-stay hospital care, £2,345 million for nursing home care and £3,510 million for residential care. These figures broadly correspond in total to around 85% (an England proportion) of the UK expenditure figures shown by Laing & Buisson for these services, but the balance between residential and nursing home expenditure is somewhat different. Laing & Buisson show £1,230 million for NHS long-stay geriatric and elderly mentally ill hospital care, £3,300 million for private and voluntary nursing home care, and £3,730 million for independent and local authority residential care for the UK for April 1996 (Laing & Buisson, 1997).

11.6. For non-residential social services, the model base estimates are £880 million for home care services, £320 million for day care services and £170 million for meals (£115 mil-

lion for meals-on-wheels and £55 million for meals in clubs). The estimate for home care is in line with the Department of Health's figure for gross expenditure on home care, while the estimates for day care and meals are rather higher than the Department of Health's figures for total social services gross expenditure on these services. As discussed below, a possible explanation could be that the day care data in the GHS include some hospital day care. The estimated total of £1,370 million non-residential social services gross expenditure is not much higher than the Department of Health figure of £1,310 million for all non-residential social services for elderly people.

11.7. For community health services, the model base estimates are £570 million for community nursing and £180 million for chiropody. The estimate for community nursing would be in line with the Department of Health's figure if around 65% of general patient community health care services related to community nursing for elderly people. The estimate for chiropody is rather higher than the Department of Health's figure for NHS chiropody, but, as discussed below, the GHS data include private as well as NHS chiropody. It should be noted that the model does not include other community health services for elderly people.

11.8. The model's estimate of £180 million for private domestic help should be treated with caution. In particular, it is not clear how far the GHS information on private domestic help represents help for long-term care needs and how much general help not related to needs arising from disability.

11.9. The concern of the model is with the costs of formal care, and no attempt is made to put a value on informal care. Informal care is incorporated in the model by looking at the effects of receipt of informal care on demand for formal services (see Chapter 8). This approach to informal care distinguishes the model from others that have attempted to put a value either on informal care (Nuttall et al., 1994; Richards et al., 1996) or on the opportunity costs of informal care (Richards et al., 1996). The attempt to put a value on informal care is a complex issue, which is not pursued in this study. (The Annex to this chapter outlines some of the issues raised by attempting to cost informal care.)

REAL RISES IN UNIT COSTS OF CARE

11.10. A key factor in projecting expenditure for future years is the assumption made about real rises in the unit costs of care. The Department of Health projections for the House of Commons Health Committee showed how sensitive projections are to the assumed rate of real inflation in care costs (House of Commons Health Committee, 1996b).

11.11. There are a number of reasons why unit costs of care can be expected to rise in real terms. The key factor for services that are highly labour-intensive is real rises in wages. On this basis, the Institute of Actuaries and London Economics both assumed as a base case that the unit costs of care will rise in line with aggregate gross domestic product. Other factors include increased quality of care and increased client dependency. These factors are probably more relevant for residential care, where they would raise the average cost of a resident week, than for non-residential care, where they would be more likely to raise the number of hours of care than the hourly cost of care. A countervailing factor would be increased efficiency. The issue here is how far technical efficiency, i.e. the input-output ratio, can be expected to rise. It could be argued that increases in cost-effectiveness, in terms of the input to outcomes for client welfare ratio, are more likely.

11.12. It is assumed as a base case that the costs of social care services will rise by 1% per year in real terms. This is line with the Department of Health (House of Commons Health Committee, 1996b) assumption, which is based on the finding that the personal social services pay and prices index has on average risen by around 1% per year in real terms since 1979. It is assumed as a base case that the costs of health services will

rise by 1.5% per year in real terms. This is greater than the Department of Health assumption but is based on the finding that the hospital and community health services pay and prices index rose by around 1.5% in real terms since 1979.

11.13. This model confirms the findings of the Institute of Actuaries and Department of Health studies that projections of future expenditure on long-term care are highly sensitive to the assumptions about real rises in the unit costs of care. If these costs are assumed to rise by 1 percentage point more than in the base case (that is 2% for social care and 2.5% per year for health care) total expenditure is projected to rise from 1995 to 2031 by 260% rather than 153%. If these costs are assumed to rise by 1 percentage point less than in the base case (that is, social care costs would be constant in real terms and health care costs would rise at 0.5% per year), total expenditure is expected to rise from 1995 to 2031 by only 77%.

COSTS OF CARE BY SOURCE OF FINANCE

11.14. This section considers the balance of funding between the health service, the personal social services, and users and their families. The latter includes payments made by users from social security benefits such as the state pension and attendance allowance. The model concentrates on projecting health and social services expenditure.

11.15. There are four main sources of finance for residential and nursing home care. The social services fund the majority of publicly financed residents of residential care and nursing homes. This funding is subject to a means test as well as an assessment of care needs. The social security system funds through higher levels of income support publicly financed residents of independent homes who were admitted before 1 April 1993. This funding is subject to means test. A significant minority of residents fund their own care from their assets and income (including income from state pensions and disability benefits). Finally, the NHS, as well as funding hospital care, funds a small proportion of elderly nursing home residents. There is no means test for NHS care and no client contributions.

11.16. There are three main sources of finance for non-residential care. The NHS funds community nursing, hospital day care, chiropody and therapy services. The social services fund home care, day care, meals, social work support, occupational therapy, and aids and adaptations. Local authorities have a power to charge for home care, day care and meals. Elderly people can also purchase home nursing, home care, chiropody and other non-residential services privately.

NHS expenditure

11.17. All hospital inpatient care and all community nursing care are assumed to be funded by the NHS. In addition, two-thirds of chiropody expenditure, one-third of day care expenditure and 7% of nursing home expenditure is assumed to be NHS funded. Total estimated NHS expenditure on long-term care for elderly people in 1995/6 is estimated at around £2,160 million on this basis.

11.18. The General Household Survey does not distinguish between NHS and private chiropody. An assumption that one-third is private is made on the basis that this broadly equates estimated NHS expenditure on chiropody in 1995/6 with the Department of Health's figure. The GHS does not explicitly ask about day hospital care, but a possible explanation for the high level of day care utilisation reported in the GHS is that respondents may not have distinguished between day hospital care and other forms of day care. An assumption that one-third of reported day care is NHS funded broadly matches estimated NHS expenditure on day care for elderly people with the Department of Health's figure for non-psychiatric day hospital care. For nursing home care, the Laing & Buisson *Care of Elderly People* market survey for 1996 reports that 7% of elderly nursing home residents are NHS funded (Laing & Buisson, 1996).

Social services gross and net expenditure

11.19. All local authority home help care, two thirds of day care attendances, all meals-on-wheels, one half of lunches in luncheon clubs, 71% of residential care client weeks and 66% of nursing home weeks are assumed to funded by local authority social services gross expenditure (that is subject to income from user charges). This is on the basis of the post-April 1993 system of finance for residential care and nursing home care. The numbers of residents who are entitled to higher rates of income support under the preserved rights system, on the basis of admission before 1 April 1993, is declining. The model, therefore, operates entirely under the new financing system.

11.20. The Laing & Buisson market survey for 1996 reports that 29% of residential care home residents and 27% of nursing home residents are privately financed. The PSSRU cross-sectional survey of 1996 similarly found that around 29% of residential care home residents and 26% of nursing home residents were privately funded. These proportions are likely to rise, as discussed in the next chapter.

11.21. A possible explanation for the high level of luncheon club attendances reported in the GHS is that respondents may have included luncheon clubs not funded by local authorities. An assumption that one half of reported luncheon club attendances are wholly privately funded brings estimated social services gross expenditure on luncheon clubs for elderly people closer to the Department of Health's figure.

11.22. Rates of recovery of gross social services expenditures in user charges are taken from Department of Health data, which are compiled from local authority revenue outturn (RO3) forms. Data for 1994/5 show 7.2% recovery rate of gross expenditure on home help services, 7.6% for day care, 44% for meals-on-wheels, and 34% for meals in luncheon clubs. For local authority arranged residential care, the data show rates of recovery of 35% for residential care gross expenditure and 29% for nursing home gross expenditure. On this basis PSS net expenditure on elderly people in 1995/6 is estimated at £3,815 million. This is higher than the Department of Health figure of £3,251 for 1995/6 (Department of Health, 1998). This is mainly because the model operates entirely under the new funding system, without any residents with preserved rights to higher levels of income support.

PRIVATE EXPENDITURE

11.23. All private domestic help, one-third of chiropody treatments, one half of all luncheon club attendances, 29% of residential care client weeks and 27% of nursing home client weeks are assumed to be privately funded. Estimated income from charges for social services are added to the total for privately funded care. This gives an estimated total for private expenditure of almost £3,380 million. This figure should be treated with caution as it is not clear that the model covers all privately funded care for elderly people.

TOTAL EXPENDITURE

11.24. Estimated expenditure for 1995 (in 1995/6 prices) on each service by source of funding is shown in table 11.1. The estimated figures for the non-residential NHS services are broadly consistent with Department of Health figures, on the assumption that elderly people receive around 65% of district nursing services. Some of the assumptions about sources of finance have been made to ensure this. The estimated figures for social services non-residential care are similar to but slightly lower than Department of Health figures, after one-third of the day care estimate is assigned to NHS day hospital care.

Table 11.1. Expenditure by service and source of funding in 1995 (£ million at 1995/6 prices)

	NHS	PSS gross	PSS net	Private	Total
Home care		882	818	63	882
Community nurse	569				569
Day care	106	213	197	16	319
Private domestic				178	178
Meals-on-wheels		115	64	50	115
Lunch club		28	18	37	56
Chiropody	122			61	183
Residential care homes		2,494	1,621	1,891	3,512
Nursing homes	164	1,547	1,099	1,082	2,344
Long-stay hospital	1,197				1,197
Total	**2,159**	**5,278**	**3,817**	**3,378**	**9,355**

Source: Model estimates based on a range of sources discussed in this chapter.

11.25. The estimated figures for hospital, residential care home and nursing home gross expenditures are in total broadly in line with Laing & Buisson data (on the basis that England comprises roughly 85% of the UK), but the balance between residential and nursing home care is different. A comparison with Department of Health data on residential care expenditure is not possible. This is because the Department of Health data reflect the preserved rights scheme for residents admitted before April 1993, while the model operates entirely under the new post-April 1993 funding system.

PROJECTIONS

11.26 Projections of future expenditure on long-term care for elderly people, under base case and alternative assumptions, are discussed more fully in Chapter 13. A brief summary is shown in table 11.2 and illustrated in figure 11.1. The estimates are in 1995/6 prices but assume 1% per year real rises in the unit costs of social care and 1.5% real rises in the costs of health care. They show that NHS expenditures are projected to rise by 174% between 1995 and 2031, PSS net expenditures by 124% and private expenditures by 173%. If GDP was assumed to rise by 2.25% per year, it would rise by 123% between 1995 and 2031. These projections are on the basis of official population projections, unchanged age-specific rates of dependency and unchanged probability of receiving each type of care by age, gender, dependency, household type and housing tenure. The proportion of residents of homes who are privately funded is assumed to rise on the basis discussed in the next chapter.

Table 11.2. Expenditure projections under base case assumptions

(a) Amounts in £ million at 1995/6 prices

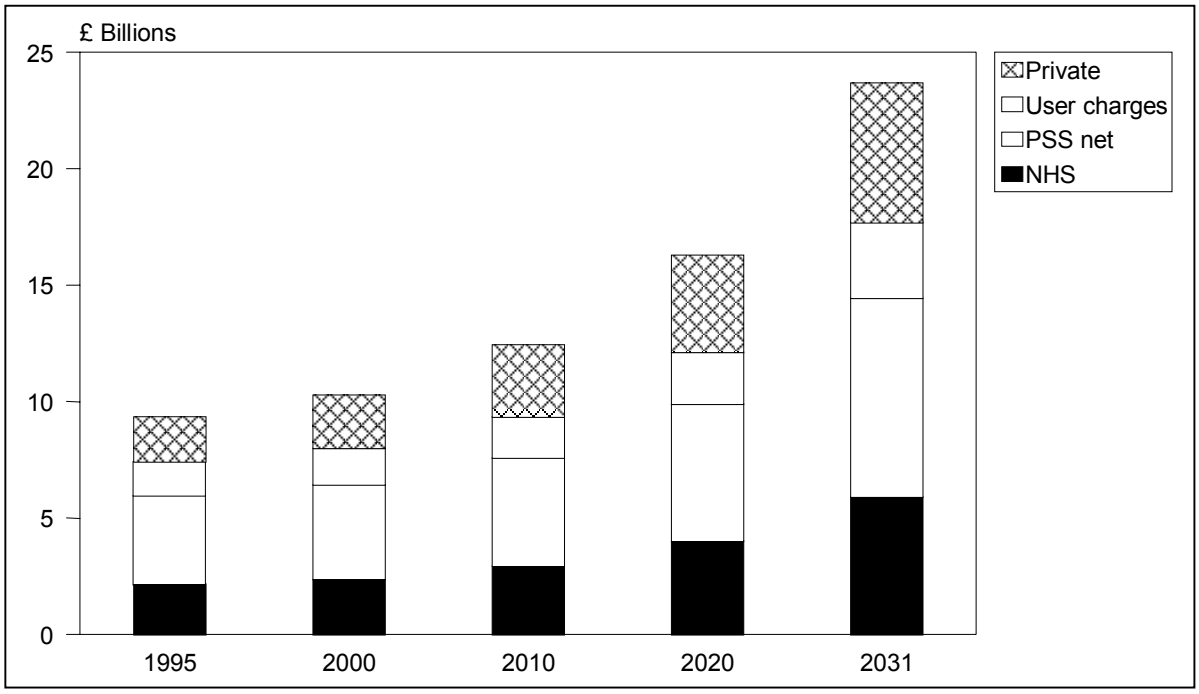
	1995	2000	2010	2020	2031
NHS	2,159	2,376	2,942	4,017	5,910
PSS gross	5,278	5,634	6,425	8,106	11,790
PSS net	3,817	4,072	4,649	5,879	8,542
Total public	5,976	6,448	7,591	9,896	14,452
User charges	1,461	1,562	1,766	2,227	3,248
Private	1,918	2,279	3,068	4,156	5,968
Total private	3,379	3,841	4,834	6,383	9,216
Total	**9,355**	**10,290**	**12,424**	**16,279**	**23,668**

(b) Percentage breakdown between sources of funding

	1995	2000	2010	2020	2031
NHS	23.1	23.1	23.7	24.7	25.0
PSS net	40.8	39.6	37.1	36.1	36.1
Total public	63.9	62.7	61.1	60.8	61.1
User charges	15.6	15.2	14.2	13.7	13.7
Private	20.5	22.1	24.7	25.5	25.2
Total private	36.1	37.3	38.9	39.2	38.9
Total	100.0	100.0	100.0	100.0	100.0

Source: Model estimates.

Figure 11.1. Projected expenditure by funding source: base case



Source: Model estimates (billions of pounds).

Annex to Chapter 11. Issues in costing informal care

A11.1. A number of models have attempted to put a value on informal care. Thus, the Institute of Actuaries, in its calculation of the value of long-term care, calculated the number of hours of care needed by disabled adults both at the time and in the future. They then valued care, both formal and informal, at £7 an hour, this figure being derived from information as to local authority hourly costs for basic formal care. They calculated the total value of long-term care (Nuttall et al., 1994). The London Economics model also provided estimates of the future costs of the informal sector and estimates of the opportunity costs to society of informal care (Richards et al., 1996).

A11.2. Concerns have been expressed at these attempts to put a value informal care. The House of Commons Health Committee in its Report on Long-Term Care expressed considerable reservations about the attempts to value informal care, describing these as "unverifiable" and "probably inflated" (House of Commons Health Committee, 1996a, para. 121). In relation to the Institute of Actuaries, the Committee felt that "the lack of firm basis for the assumptions made as to the future costs and extent of informal care means that the estimates of the overall future financial cost of long-term care to the nation, like all such estimates, contains a very considerable element of guesswork" (ibid, para. 105). The Committee expressed reservations about the valuation of informal care at £7 per hour which they argued "may be too high and is certainly not a figure on which reliance can be placed" (ibid, para. 107).

A11.3. The problem with valuing informal care at the same rate as formal care is that it assumes an equivalence between informal and formal care. Yet the nature of relationships in the two sectors are very different (Abrams, 1978; Litwak, 1985). One implication of this may be that an hour of informal care may not be the equivalent of an hour of formal care. Indeed, the nature of informal care is such that an hour of informal care given by one carer may not be equivalent to an hour of informal care given by another. The essence of informal care is precisely that it is informal, unregulated either by the labour market or by the criteria used in the public sector. Equivalence of hours therefore cannot be guaranteed.

A11.4. There is some evidence to support the non-equivalence of informal and formal hours of care from research into the issue of the substitution of formal for informal care in the US. Reference has already been made in this report to the extensive literature on the substitution issue in the US (see Chapter 4). What is particularly interesting in the present context is evidence about the rate at which substitution of formal for informal care occurs. In one study where this was investigated, the research found that an hour of informal care was not replaced by an hour of formal care. As the researchers put it, "not every informal care hour was replaced by formal services" (Tennstedt et al., 1996, p.87). One reason for this, it was suggested, might be that "hours of informal care and hours of formal service are not time-equivalent" (ibid). As the researchers went on to suggest: "The use of formal services such as housekeeping might require fewer number of hours due to the relative efficiency of the professional performing the service as compared to the informal care-giver. Or perhaps the time reported by informal caregivers for a task such as housekeeping includes time spent socializing with the care recipient as well" (ibid, pp.87-88).

A11.5. Further evidence for the non-equivalence of hours of informal and formal care comes from a recent study of community care in England and France (Davies et al., 1998b). This study looked at substitution while holding outputs constant. It showed the substitution effects of informal care (number of hours of informal help with meals) and formal care (number of hours of help with housework provided by agencies) control-

ling for the probability of admissions into institutions. The fact that hours from each sector did not dominate the equations supports the idea that there is not a simple substitutive relationship between inputs from the informal and formal care sectors (ibid, pp.120-123).

A11.6. The implication of this is that, if formal and informal hours of care are not equivalent, then it does not make sense to value informal care at the same rate as formal care. However, it is not clear at what value informal care should be rated. In these circumstances, the PSSRU study adopted an approach that avoided putting a value on informal care.

12. Assets, housing tenure, income and sources of funding

12.1. This chapter considers the assets, housing tenure and income of elderly people. It discusses the effect that changes in the economic circumstances of elderly people might have on demand for long-term care and more especially on the sources of funding.

12.2. Rising incomes and wealth of elderly people can be expected to affect their demand for long-term care services and their ability to pay for them. The absence of detailed information on the incomes and wealth of recipients of long-term care services and the absence of information on the income elasticity of demand for such services has limited the extent to which the changing income and wealth of elderly people could be modelled.

ASSETS AND HOUSING TENURE

12.3. The Family Resources Survey (FRS) for 1995/6 (Department of Social Security, 1997) provides some information on the assets held by elderly people. 34% of single pensioner and 20% of pensioner couple benefit units reported no savings, in comparison with 37% of all benefit units. 15% of single pensioner and 31% of pensioner couple benefit units reported savings of £20,000 or more, in comparison with 12% of all benefit units. These figures suggest that around one quarter of elderly people have savings of £20,000 or more and that elderly people are generally wealthier in terms of savings than younger people.

12.4. Future cohorts of elderly people may be wealthier than the 1995/6 FRS cohort. This would enable them to meet a greater proportion of the costs of means-tested social care. There are, however, no reliable projections of the future overall assets of elderly people. The role of financial assets has not been explored.

12.5. A significant proportion of elderly people have housing wealth. The General Household Survey for 1994/5 shows that around 66% of people aged 65 and over in private households live in owner-occupier tenure. This would be equivalent to 63% of all elderly people. Not all these elderly people are themselves the owners. In some cases their spouse may be the owner and in a few cases a child, sibling or other relative with whom the elderly person lives may be the owner. The proportions of elderly people, by age band and household type, in owner-occupier tenure are shown in table 12.1.

Table 12.1. Percentage levels of owner-occupation by age band and household type, 1995

	Single		Married	
	Alone	With others	Alone	With others
65-69	49.3	61.3	80.6	81.0
70-74	56.7	64.3	73.0	75.5
75-79	55.9	76.1	68.0	81.0
80-84	49.1	84.9	74.6	88.9
85+	51.4	80.0	70.0	100.0

Source: GHS, 1994/95, England elderly data.

12.6. The proportion of elderly people in owner-occupier tenure is expected to rise. This is because the proportion of middle-aged people who are owner-occupiers is higher than that of elderly people. The Anchor Housing Trust (Forrest et al., 1996) has made projections of owner-occupation among elderly people to 2010. Its estimates seem to imply that the proportion of elderly people in owner-occupier tenure will rise to roughly 75% in 2010.

12.7. The model includes a simple breakdown by housing tenure, between those living in owner-occupied tenure and those living in rented accommodation. Tenure was included partly because it is a simple proxy for socio-economic circumstances. The other reason for its inclusion is the association with source of finance. Elderly people in owner-occupier tenure are less likely to receive local authority home care and more likely to use private domestic care than tenants. Elderly owner-occupiers living alone are much more likely to fund their residential care than elderly tenants.

12.8. The model incorporates current projected rates of owner-occupation by age band and household type. Housing tenure was found in multivariate analysis to be significantly associated with household type and dependency but not age or gender. Tenure rates were, however, estimated from the 1994/5 GHS England data by age band and household type. It seemed unsatisfactory to assume that future changes in dependency would lead to changes in patterns of housing tenure.

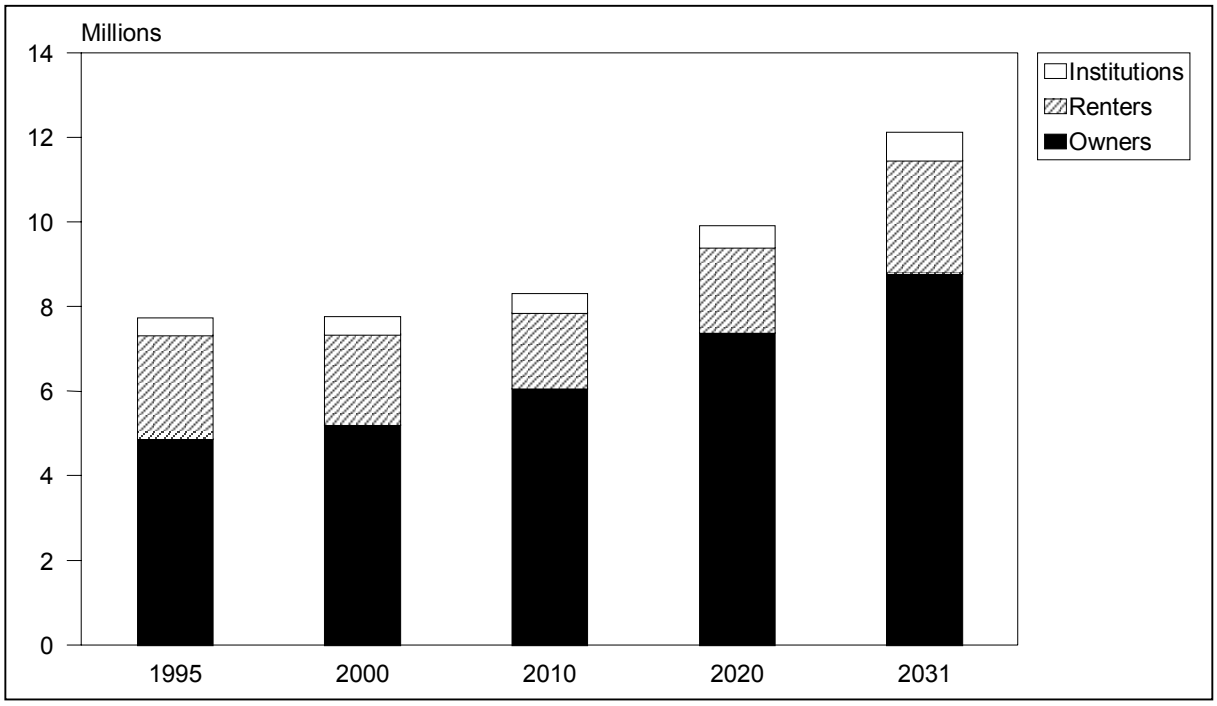
12.9. Projected rates of owner-occupation for 2010 were derived from the Anchor Housing Trust projections. These rates were then also applied for 2020 and 2031. They are shown, by age band and household type, in table 12.2. The projected elderly population by housing tenure is illustrated in figure 12.1.

Table 12.2. Percentage levels of projected owner-occupation by age and household type, 2010 onward

	Single		Married	
	Alone	With others	Alone	With others
65-69	56.1	77.7	89.7	100.0
70-74	68.8	78.2	82.5	91.8
75-79	72.3	83.7	77.7	89.1
80-84	59.8	78.0	92.7	81.7
85+	66.8	76.8	84.9	96.0

Source: Derived from Anchor Housing Trust projections.

Figure 12.1. Projected number of elderly people by housing tenure



Source: Model estimates (base case assumptions).

12.10. The anticipated rise in owner-occupation among elderly people living alone can be expected to lead to a higher proportion of residents in residential care and nursing homes with assets too high to qualify for public funding through social services. The proportion of elderly people living alone who are owner-occupiers is assumed to rise from 48% in 1995 to 59% in 2010 and then remain constant at 59%. The initial figure for 1995 is derived from the GHS for 1994/5. The upward trend is derived from the Anchor Housing Trust projections.

12.11. It is further assumed that the ratio of privately funded to social services funded residents of residential care and nursing homes will rise in line with the ratio of owners living alone to the rest of the elderly household population. This seems an appropriate assumption on the basis that under the means test owner-occupiers living alone who enter residential care are generally privately funded while all tenants and owner-occupiers living with others are generally publicly funded. On this basis the proportion of residents of residential care homes who are privately funded would rise from 29% in 1995, to 35% in 2010, and 37% in 2020 and 2031. Similarly, the proportion of nursing home residents who are privately funded would rise from 27% in 1995 to 33% in 2010, 35% in 2020 and 34% in 2031.

12.12. If housing tenure rates, by age and household type, remained unchanged, social services' net expenditure is projected to rise by 142% and private expenditure by 155% between 1995 and 2031. On the basis of rising owner-occupation accompanied by rising private funding of residential care, social services net expenditure is projected to rise by 124% and private expenditure by 173% over the same period. This is shown in table 12.3.

Table 12.3. Projected expenditure under base case and under unchanged age-specific tenure rates

	% increase 1995-2031	
	Using 1995 housing tenure rates	Base case
Living in owner-occupier tenure	54	80
Receiving home help	60	56
Receiving community nursing	62	61
Using private domestic help	59	71
Total NHS expenditure	174	174
Total PSS net expenditure	142	124
Total private expenditure	155	173
Total expenditure	154	153

Source: Model estimates.

INCOMES

12.13. Projections of pensioner incomes from the Department of Social Security PENSIM model (Curry, 1996) show the real incomes of single pensioners rising by 57% and of pensioner couples by 66% between 1994 and 2025. PENSIM also forecasts that the gap between pensioners with the highest and lowest incomes will increase significantly between 1994 and 2025. For single pensioners the mean income of the bottom quintile is projected to increase by 13% and that of the top quintile by 100%. For pensioner couples the mean income of the bottom quintile is projected to increase by 27% and that of the top quintile by 63%.

12.14. Rising real incomes of pensioners might lead to higher rates of recovery of gross social services expenditure through user charges. It is not clear, however, how much faster pensioner incomes will rise than the costs of care, and the incomes of poorer pensioners might rise less than care costs. If rates of recovery rise by 1% per year, for example, net social services expenditure is projected to rise by 120% from 1995 to 2031 as

against base case projections of 124%. It seems doubtful, however, that recovery rates could rise so much without policy changes.

12.15. New charging mechanisms would change the rates of recovery for formal non-residential services. Some possible scenarios have been tested on a sample of social services users in the General Household Survey for 1994/5. For example, under a mechanism by which recipients would pay the full cost of formal non-residential services up to 10% of their income, net social services expenditure would increase by 110% between 1995 and 2030 as against 124% under the base case. If this was modified to exempt income support recipients from charges, net social services expenditures would grow by 117%.

13. Illustrative projections: sensitivity analysis

13.1. This chapter sets out some projections obtained using the long-term care financing model developed for this study and described in earlier chapters. It looks at the sensitivity of the base projections of overall expenditure to a range of alternative scenarios. The purpose is to illustrate the potential uses of the model for making projections rather than to reach conclusions on any "correct" scenario.

13.2. The scenarios considered concern future numbers of very elderly people, future age-specific dependency rates, future rates of living alone, future levels of informal care, future levels of formal services, and real rises in the costs of long-term care. Consideration is also given to the sensitivity of the base projections on the balance between funding sources to future proportions of elderly people funding their residential care privately and to future recovery rates of gross social services expenditure through user charges.

BASE CASE

13.3. The alternative scenarios are presented by comparison with a base case. This base case makes the following assumptions relating to the estimated numbers of recipients of community care services and costs:

Base case assumptions

1. Population numbers will change in line with official 1996 based population projections
2. Age/gender specific rates of institutionalisation and dependency will remain unchanged
3. Age/gender specific marital status rates change according to the Government Actuary's Department marital status projections
4. Age/household type specific housing tenure rates change broadly in line with the Anchor Housing Trust projections
5. Dependency/household type rates of receiving informal help with domestic tasks remain unchanged
6. Rates of receiving formal community care services remain an unchanged function of age, dependency, household type, housing tenure and receipt of informal care
7. Dependency specific quantities of formal services per recipient week (eg home care hours per week) remain constant
8. Real unit costs of social care will rise by 1% per year and of health care by 1.5% per year
9. The ratio of privately funded residents of care homes to publicly funded residents will rise in line with the ratio of elderly owner-occupiers living alone to the rest of the elderly household population
10. The rate of recovery of gross costs of social care in user charges will remain constant
11. The division of funding responsibilities between agencies will not be changed

13.4. Table 13.1 shows the impact of the incorporation of different assumptions on the results obtained from the model. It starts with the expenditure projections obtained when the only change over time comes from the pressures from changing numbers of elderly people by age and gender (on the basis of the 1996-based GAD population projections). This is referred to as the demography-led scenario. Each row in the table incorporates a fur-

ther assumption to this scenario, and the base case described above is reached in row 4. The inflation assumption has the biggest impact on projected expenditure, whereas the impact of introducing marital status projections is relatively small. The bottom row of the table compares the projected long-term care expenditure with economic growth expected if GDP grows at 2.25% per year.

Table 13.1. Percentage increase in expenditure over period 1995 to 2031, under varying assumptions

	NHS	PSS net	Private	Total
Demography led-scenario	60	61%	62%	61%
Adding assumption 3 on marital status trends	62	63%	63%	63%
Adding assumptions 4 and 9 on housing tenure	61	48%	79%	62%
Adding assumption 8 on care cost inflation to reach base case scenario	174	124%	173%	153%
Economic growth of 2.25% p.a.		123		

13.5. Table 13.2 shows the projections obtained using the base case assumptions. The model projects that, between 1995 and 2031, the number of elderly people in institutions will grow by 64%, whereas the number of dependent elderly living at home and receiving informal care will rise by 56%. The number of recipients of home care is expected to increase by 56%, and the number of elderly people using private domestic help by 61%. Total expenditure is expected to increase by 153%, to around £23,650 million. Of this, 25% would be NHS expenditure, 36% net social services expenditure, and 39% private expenditure by service users.

Table 13.2. Projections under the base case scenario

	Number in 1995 (thousands)	Number in 2031 (thousands)	% increase 1995-2031
Numbers of people aged 65+	7,731	12,127	57
Numbers of people aged 85+	893	1,598	79
Numbers with dependency in households	2,077	3,260	57
Numbers living alone	3,120	5,248	68
Numbers living in owner-occupier tenure	4,876	8,781	80
Numbers in institutions	407	666	64
Total receiving informal care	1,719	2,685	56
Total receiving home care	517	804	56
Total recipients of community nursing	444	717	61
Total visiting day centres	218	337	54
Total using private domestic help	567	967	71
Total receiving meals-on-wheels	206	339	65
Total going to luncheon clubs	246	399	62
Total receiving chiropody	1,750	2,804	60
Total in residential care homes	245	400	64
Total in nursing homes	133	219	64
Total in hospitals	29	46	62
NHS expenditure (millions)	2,159	5,910	174
PSS gross expenditure (millions)	5,278	11,790	123
PSS net expenditure (millions)	3,817	8,542	124
Private expenditure (millions)	3,379	9,216	173
Total expenditure (millions)	9,355	23,668	153

13.6. Table 13.3 shows the projections obtained with a demography-led scenario, which assumes that the only change will be in the numbers of elderly people. This scenario is useful in order to illustrate the degree to which demographic pressures alone will affect future demand and expenditure. It is assumed for this purpose that care costs remain constant in real terms.

Table 13.3. Projections under the demography-led scenario

	Number in 1995 (thousands)	Number in 2031 (thousands)	% increase 1995-2031	*Base case scenario % increase 1995-2031*
Numbers of people aged 65+	7,731	12,127	57	*57*
Numbers of people aged 85+	893	1,598	79	*79*
Numbers with dependency in households	2,077	3,268	57	*57*
Numbers living alone	3,120	4,798	54	*68*
Numbers living in owner-occupier tenure	4,876	7,658	57	*80*
Numbers in institutions	407	658	62	*64*
Total receiving informal care	1,719	2,709	58	*56*
Total receiving home care	517	822	59	*56*
Total receiving community nursing	444	713	61	*61*
Total using day centres	218	343	57	*54*
Total using private domestic help	567	901	59	*71*
Total receiving meals-on-wheels	206	331	61	*65*
Total going to luncheon clubs	246	386	57	*62*
Total receiving chiropody	1,750	2,775	59	*60*
Total in residential homes	245	395	61	*64*
Total in nursing homes	133	218	63	*64*
Total in hospitals	29	46	59	*62*
NHS expenditure (millions)	2,159	3,447	60	*174*
PSS gross expenditure (millions)	5,278	8,509	61	*123*
PSS net expenditure (millions)	3,817	6,148	61	*124*
Private expenditure (millions)	3,379	5,459	62	*173*
Total expenditure (millions)	9,355	15,054	64	*153*

SENSITIVITY ANALYSES

13.7. There are infinite possibilities for changes in each data input and parameter used in the model. A number of likely scenarios have been tried for each of the key assumptions in the model, in order to show the impact that different scenarios can have on the results.

POPULATION PROJECTIONS

13.8. As discussed in Chapter 6, the GAD population projections have tended to underestimate the growth in the numbers of very elderly people, especially those aged 85 years and over. The numbers in this age band are projected to rise from 893 thousand in 1995 to 1,598 thousand in 2031, a rise of 79%. If the numbers rose by 1% per year faster than the official projections, the numbers of people aged 85 and over would reach 2,286 thousand in 2031, a rise of 156% from 1995. Using official projections for those aged 65 to 84 and this higher projection for those aged 85 and over, the total number of elderly people in England would rise by 66% between 1995 and 2031, as against 57% in the base case. The projected impact of this is shown in table 13.4.

Table 13.4. Impact on the model's projections of assuming that the number of people who are aged 85 or over will rise 1% per year faster than projected by GAD

	% increase 1995-2031	
	85+ grow 1% per year	Base case
People aged 85 and over	156	79
Single people living alone	127	113
Numbers in institutions	101	64
Receiving home help	77	56
Receiving community nursing	82	61
Using private domestic help	86	71
Total NHS expenditure	206	174
Total PSS net expenditure	167	124
Total private expenditure	235	173
Total expenditure	201	153

DEPENDENCY

13.9. There is much debate and little consensus about whether a compression or expansion of morbidity should be expected. As discussed in Chapter 6, the base case of the model assumes no change in age-specific dependency rates. As in the Department of Health projections for the Health Committee, two scenarios are investigated with age-specific dependency rates rising by 1% per year or falling by 1% per year. In each case two variants are considered, in which the rise or fall is either limited to those in the community or is extended to the whole population such that institutionalisation rates also rise or fall by 1% per year.

13.10. If age-specific dependency rates among those in the community rose by 1% (not 1 percentage point) per year, the projected number of dependent elderly people would be 4,670 thousand in 2031, a rise of 125%, as against a rise of 57% in the base case. The impact of using this assumption in the model is illustrated in table 13.5, first column.

13.11. If age-specific dependency rates among those in the community fell by 1% per year, the projected number of dependent elderly people would be 2,267 thousand in 2031, a rise of 9%, as against a rise of 57% in the base case. Table 13.5, second column, shows the predicted impact on service utilisation and costs of this assumption.

Table 13.5. Changes in age-specific dependency rates

			% increase 1995-2031
	Dependency increases by 1% per year	Dependency decreases by 1% per year	Base case
People with no dependency	29	75	56
People with dependency	125	9	57
Informal care recipients	124	9	56
Receiving home help	97	26	56
Receiving community nursing	106	30	61
Using private domestic help	81	63	71
Total NHS expenditure	201	155	174
Total PSS net expenditure	143	110	124
Total private expenditure	175	171	173
Total expenditure	168	142	153

13.12. If age-specific dependency rates and institutionalisation rates rose by 1% per year, the projected number of elderly people in residential, nursing home or hospital care in 2031 would be 953 thousand, a rise of 134%, as against 64% under the base case. The projected number of dependent elderly people in the community in 2031 would be 4,460 thousand,

a rise of 115%, as against a rise of 57% in the base case. Table 13.6, first column, illustrates the projected impact of this assumption.

13.13. If age-specific dependency rates and institutionalisation rates fell by 1% per year, the projected number of elderly people in residential, nursing home or hospital care in 2031 would be 464 thousand, a rise of 14%, as against 64% under the base case. The projected number of dependent elderly people in the community in 2031 would be 2,341 thousand, a rise of 13%, as against a rise of 57% in the base case. Table 13.6, second column, illustrates the projected impact of this assumption.

Table 13.6. Changes in age-specific dependency and institutionalisation rates

	% increase 1995-2031		
	Dependency and institutionalisation increase 1% per year	**Dependency and institutionalisation decrease 1% per year**	**Base case**
No dependency in the community	28	78	56
People with dependency	115	13	57
Informal care recipients	114	12	56
Institutionalised	134	14	64
Receiving home help	86	31	56
Receiving community nursing	95	35	61
Using private domestic help	73	68	71
Total NHS expenditure	270	104	174
Total PSS net expenditure	209	63	124
Total private expenditure	276	98	173
Total expenditure	248	85	153

MARITAL STATUS AND HOUSEHOLD TYPE

13.14. The model uses as a base case assumption trends in marital status from the GAD marital status projections, as explained in Chapter 7. With this assumption, the number of elderly people living as a couple is projected to rise from 3,877 in 1995 to 5,649 in 2031, and the number of elderly people living alone is expected to rise from 3,120 in 1995 to 5,248 in 2031. Table 13.7 shows the results obtained if unchanged marital status rates by age and gender are used, instead of using the GAD projected trends. The number of elderly people in couples would rise to 6,200 under this scenario (more than under the base case) and the number of elderly people living alone in 2031 would rise to 4,797 (less than under the base case).

Table 13.7. Unchanged age-specific marital status rates

	% increase 1995-2031	
	Using 1995 rates	Base case (using trends from GAD projections)
Single people living alone	54	68
Single people living with others	54	68
Living in couples	60	45
Institutionalised	62	64
Receiving informal care	58	56
Receiving home help	52	56
Receiving community nursing	61	61
Total NHS expenditure	170	174
Total PSS net expenditure	128	124
Total private expenditure	162	173
Total expenditure	150	153

13.15. The next scenario examines faster decreases in age-specific rates of being (*de facto*) married than projected by GAD. Table 13.8 first column shows the impact on the results of the model of a decrease of 1% per year in the proportion who are married or cohabiting. The number of elderly people who are *de facto* married in 2031 would be 4,318 under this scenario, and the number of elderly people living alone would rise to 6,336 by 2031. Overall expenditure is projected to rise between 1995 and 2031 by 163% under this scenario in comparison with 153% under the base scenario.

Table 13.8. Changes in the proportion who are married or cohabiting

			% increase 1995-2031
	1% decrease in proportion married	1% increase in single living alone	Base case
Single people living alone	103	79	68
Single people living with others	101	22	68
Living in couples	11	45	45
Institutionalised	71	66	64
Receiving informal care	52	54	56
Receiving home help	66	60	56
Receiving community nursing	64	62	61
Total NHS expenditure	183	175	174
Total PSS net expenditure	116	122	124
Total private expenditure	204	183	173
Total expenditure	163	156	153

13.16. The next scenario, illustrated in table 13.8 second column, shows the impact of a decrease in the proportion of single people who live with others of 1% per year. Under this scenario the number of elderly people living alone would rise from 3,120 in 1995 to 5,585 in 2031, a rise of 79%, compared to a rise of 68% under the base case. Overall expenditure would rise by 156% under this scenario, compared to 153% under the base case.

HOUSING TENURE

13.17. As discussed in Chapter 12, the model uses as a base case the assumption that housing tenure rates change, up to the year 2011, broadly in line with Anchor Housing Trust projections. Two alternative scenarios are discussed here: an assumption that owner-occupation rates by age group and household type remain unchanged, and an increase in owner-occupation rates of 0.5% per year.

13.18. Table 13.9 shows the results obtained from the model if housing tenure rates by age band and household type remained constant, instead of changing in line with the Anchor Trust projections. Because, as discussed in Chapter 12, the ratio of privately funded to publicly funded residents of care homes is assumed to increase in line with the ratio of elderly people who are owner-occupiers living alone to the rest of the elderly household population, this scenario has an important impact on the distribution of expenditure between private and net social services expenditure.

Table 13.9. Housing tenure rates scenarios

		% increase 1995-2031	
	Using 1995 housing tenure rates	Owner-occupation rates increase by 0.5% per year	Base case
Living in owner-occupier tenure	54	84	80
Receiving home help	60	56	56
Receiving community nursing	62	61	61
Using private domestic help	59	71	71
Total NHS expenditure	174	174	174
Total PSS net expenditure	142	126	124
Total private expenditure	155	171	173
Total expenditure	154	153	153

13.19. If owner-occupation rates, by age group and household type, rose by 0.5 per year per year until 2031, the projected number of elderly people in owner-occupied tenure would rise from 4,876 thousand in 1995 to 8,974 thousand in 2031, a rise of 84%, and the projected number in rented tenure would increase by 2%. There would be minimal impact on projected total expenditure in 2031. There would be a shift toward private expenditure, which is discussed in Chapter 12.

INFORMAL CARE

13.20. As discussed in Chapter 8, there is uncertainty about future levels of informal care. A possible scenario is a decrease by 1% per year in the proportion of those who live alone who receive informal help with domestic tasks. Under this scenario the number who receive informal help would increase from 1,719 thousand in 1995 to 2,356 in 2031, an increase of 37%, compared to 56% under the base case. In 2031, 848 thousand elderly people would be recipients of home help, compared to 804 thousand under the base case. Overall expenditure would rise by 155%, compared to 153%. This is set out in table 13.10.

Table 13.10. Decrease by 1% in the proportion living alone who receive informal help with domestic tasks

	% increase 1995-2031	
	Decrease of 1% in proportion living alone who receive informal help	Base case
Informal care recipients	37	56
Receiving home help	64	56
Receiving community nursing	61	61
Using private domestic help	79	71
Total NHS expenditure	174	174
Total PSS net expenditure	127	124
Total private expenditure	174	173
Total expenditure	155	153

RECEIPT OF FORMAL SERVICES

13.21. A wide range of changes in the allocation of formal care services could be investigated. Two scenarios are presented as examples. The first involves an increase of 1% per year in the rates of receipt of each non-residential service (except chiropody) among the most dependent elderly people in the community. Under this scenario, the number of elderly recipients of home care services is projected to rise from 517 thousand in 1995 to 943 thousand in 2031, a rise of 82%, as against 56% under the base case. The number of elderly recipients of community nursing services is projected to rise from 444 thousand in 1995 to 820 thousand in 2031, a rise of 85%, as against 61% in the base case. Overall expenditure is projected to rise between 1995 and 2031 by 162% under this scenario, in comparison with 153% under the base case. This is shown in table 13.11.

Table 13.11. Increase of 1% in the proportion of most dependent who receive formal non-residential services

	% increase 1995-2031	
	Increase of 1% in proportion of the most dependent receiving formal services	Base case
Receiving home help	82	56
Receiving community nursing	85	61
Using day centres	77	54
Using private domestic help	84	71
Total NHS expenditure	187	174
Total PSS net expenditure	136	124
Total private expenditure	175	173
Total expenditure	162	153

13.22. The second example is to assume that the rate of receipt of each non-residential service (except for chiropody) grows by 1% per year among those with lesser dependency, i.e. those with IADL problems only or with one ADL problem. In this case, the number of recipients of home help would grow from 517 thousand in 1995 to 935 thousand in 2031, a rise of 98%, compared to the base case rise of 56%. The number of recipients of community nursing would rise from 444 thousand in 1995 to 819 thousand in 2031. This represents a rise of 84%, against the rise of 61% under the base case. Overall expenditure would grow by 166%, as opposed to 153% with the base case. This is shown in table 13.12.

Table 13.12. Increase of 1% per year in the proportion of those in dependency groups 2 and 3 who receive formal non-residential services

	% increase 1995-2031	
	Increase of 1% per year in proportion receiving formal services among dependency groups 2 and 3	Base case
Receiving home help	98	56
Receiving community nursing	84	61
Using day centres	96	54
Using private domestic help	98	71
Total NHS expenditure	187	174
Total PSS net expenditure	138	124
Total private expenditure	178	173
Total expenditure	166	153

PRIVATE FUNDING AND RECOVERY RATES

13.23. The base case assumes that the ratio of privately funded to publicly funded residents of care homes rises in line with the ratio of elderly owner-occupiers living alone to the rest of the elderly household population. As discussed above, the proportion of elderly people living in owner-occupier tenure is assumed to rise broadly in line with the Anchor Housing Trust housing tenure projections. If it is assumed that the proportion who are privately funded will remain constant over time, net social services expenditure is projected to rise by 144% and private expenditure by 150%, as against 124% and 173% respectively under the base case. This is shown in table 13.13, first column.

Table 13.13. Changes in the proportion privately financed

	% increase 1995-2031		
	Proportion privately financed does not change over time	Proportion privately financed increases by 1% per year	Base case
Total NHS expenditure	174	174	174
Total PSS gross expenditure	145	111	123
Total PSS net expenditure	144	112	124
Total private expenditure	150	186	173
Total expenditure	153	153	153

13.24. The anticipated rise in owner-occupation among elderly people can be expected to lead to a higher proportion of residents in residential care and nursing homes with assets too high to qualify for public funding through social services. If the proportion of residents paying for their own residential care from private sources rose by 1% per year, around 42% of residential care homes and around 38% of nursing home residents would be privately funded in 2031. Under this scenario, net social services expenditure is projected to rise by 112% from 1995 to 2031 and private expenditure by 186%, as against base case projections of 124% and 173% respectively. This is shown in table 13.13, second column.

13.25. Rising real incomes of pensioners might lead to higher rates of recovery of gross social services expenditure through user charges. It is not clear, however, how much faster pensioner incomes will rise than the costs of care, and the incomes of poorer pensioners might rise less than care costs. If rates of recovery of the gross costs of non-residential social care rise by 1% per year, for example, net social services expenditure is projected to rise by 120% from 1995 to 2031 and private expenditure by 177%, as against base case projections of 124% and 173% respectively. This is shown in table 13.14.

Table 13.14. Rates of recovery of non-residential care costs through charges increase by 1% per year

	% increase 1995-2031	
	Rates of recovery increase by 1% per year	Base case
Total NHS expenditure	174	174
Total PSS gross expenditure	123	123
Total PSS net expenditure	120	124
Total private expenditure	177	173
Total expenditure	153	153

13.26. As discussed in Chapter 12, new charging mechanisms would change the rates of recovery for formal non-residential social services. Some possible scenarios have been tested on a sample of social services users in the 1994/5 GHS. For example, under a mechanism by which recipients would pay the full cost of formal non-residential services up to 10% of their income (see table 13.15), net social services expenditure would increase 110% and private expenditure would rise by 189% (against 124% and 173% under the base

case). Modifying this mechanism so that income support recipients were exempted from payment, net social services expenditures would grow by 117% and private expenditure would rise by 181%.

Table 13.15. Changes in charging mechanisms

	% increase 1995-2031		
	Users pay up to 10% of income	Users pay up to 10% of income, income support exempted	Base case
Total NHS expenditure	174	174	174
Total PSS gross expenditure	123	123	123
Total PSS net expenditure	110	117	124
Total private expenditure	189	181	173
Total expenditure	153	153	153

REAL RISES IN UNIT COSTS OF CARE

13.27. This model confirms the findings of the Institute of Actuaries and Department of Health studies that projections of future expenditure on long-term care are highly sensitive to the assumptions about real rises in the unit costs of care. Table 13.16 (first column) shows the cost projections obtained in the model if care costs remained constant in real terms. Under that scenario, total expenditure would rise, between 1995 and 2031, by 62%, compared to 153% under the base case.

Table 13.16. Changes in real care costs

	% increase 1995-2031			
	No real care cost inflation	Unit costs rise 1% less than in base case	Unit costs rise 1% more than in base case	Base case
Total NHS expenditure	61	92	290	174
Total PSS gross expenditure	48	56	218	123
Total PSS net expenditure	48	57	219	124
Total private expenditure	79	91	289	173
Total expenditure	62	77	260	153

13.28. If these costs are assumed to rise by 1 percentage point less than in the base case (that is, social care costs are constant in real terms and health care costs rise at 0.5% per year), total expenditure is projected to rise from 1995 to 2031 by only 77% rather than 153% (see table 13.16, second column). If these costs are assumed to rise by 1 percentage point more than in the base case (that is, 2% for social care and 2.5% per year for health care), total expenditure is expected to rise from 1995 to 2031 by 260% (see table 13.16, third column).

14. Conclusions

14.1. This chapter draws together the themes of earlier chapters and suggests some directions for further work. It is not a conclusion in the conventional sense: no definitive conclusion can be reached about the level of funding required to provide long-term care for elderly people over the next three to four decades. It is a conclusion in so far as it brings together what has been found in this study and what would be valuable for future studies.

EXPECTATIONS

14.2. Earlier chapters have discussed a range of pressures on demand for long-term care. These have included changes in the numbers of elderly people, possible changes in their dependency, and possible changes in their household circumstances. They have also included changes in the costs of care and possible changes in the distribution of costs between sources of funding. The current patterns of care have been assumed as a base.

14.3. A study of demographic, social and economic pressures requires a clear starting position. It does seem sensible to start from the present levels and patterns of care. It needs to be recognised, however, that elderly people, or society in general, may not be content in the future with 1990s care. Expectations about quantity and quality of care may rise. Rising expectations may even put greater pressures on demand for long-term care than demographic changes.

14.4. The base for the projections in this report is itself an assumption. There seems little alternative as any other base would also be an assumption. It is, however, important to recognise that the study is rooted in the present patterns of care. The user can enter alternative patterns of care in the model. This report relates to the current pattern except where changes are specifically investigated.

14.5. Rising expectations could take a number of forms. There may be an expectation of continuing improvements in material standards in residential care homes and nursing homes. This would put upward pressure on the weekly costs of residential care. The resultant change in relative costs of residential and non-residential care would then further influence the balance between these two types of care.

14.6. There may be a shift in preferences between different forms of care. Elderly people and their families may increasingly prefer assisted living, sheltered or very sheltered housing, or developing forms of shelter-with-care to traditional residential care. There may also be changing views about the role of day and home care services. Such shifts in patterns of demand would be expected to have implications for patterns of expenditure.

INFORMAL CARE

14.7. Informal care has been discussed extensively in this report, especially in Chapter 8. Views and expectations about the role of informal care may change over the coming decades. It has not been possible to reach any conclusion about whether informal care supply is likely to keep pace with rising needs. It may not be realistic even to speculate in much detail on this. Much will depend on attitudes, values and expectations of dependent elderly people and their families. How these will evolve is uncertain.

14.8. If informal care supply fails to keep up with rising needs, there could be significant consequences for demand for formal long-term care services. Quantification would be difficult. It is not always clear when formal care could be a substitute for informal care and when it could not. It is important to note that most of the projections in this study do not assume any significant substitution of formal for informal care.

DEPENDENCY

14.9. The debate about the compression or expansion of morbidity has been discussed in Chapter 6. In the absence of a consensus view about future trends in morbidity, sensitivity analyses have been conducted. The future demand for long-term care was found in this study, as in others, to be highly sensitive to trends in age-specific dependency rates.

14.10. Information on the incidence of dependency and on transitions between dependency states would be valuable. The collection of such information requires longitudinal data, which are not currently available at national level. Prevalence data reflect past trends in incidence, while incidence data reflect current incidence. Analyses of incidence data could, therefore, assist in projecting future prevalence rates. The Working Group on Health Expectancy Measures (1998) has made recommendations concerning the importance of longitudinal data on health state.

ECONOMIC FACTORS

14.11. This study has found that projections of long-term care expenditure are highly sensitive to assumptions about future real rises in the unit costs of care. As there is no clear correct assumption, sensitivity analyses seem essential. It is most important to appreciate that this issue of real rises in the costs of an hour's home care, or a week's residential care, is likely to be a key factor in influencing the rate at which expenditures need to rise to enable services to keep pace with demographic and other pressures.

14.12. Elderly people may in the future be more able to contribute to the costs of their care through rising housing equity and rising real incomes. The study has considered the potential effect of rising owner-occupation on the proportion of elderly people paying for residential care privately. It has not been possible to examine the potential impact of rising real incomes and rising real assets. This would require detailed projections of the assets and incomes of elderly people. It would be necessary to consider whether they would rise as fast or faster than the real costs of care.

14.13. Rising incomes of elderly people could be accompanied by rising inequality in their incomes. It would, therefore, be valuable to examine the distributional implications of changes in the patterns of funding of long-term care. It would be difficult to pursue this with a cell-based model: a microsimulation model might be more appropriate. The potential value of a microsimulation model was discussed in the annex to Chapter 3.

AFFORDABILITY

14.14. A key question for long-term care finance is whether or not current patterns of care could, if unchanged, be afforded in the future. This depends clearly not only on growth in long-term care expenditures but also on growth in the economy as a whole. It seems reasonable to assume that economic growth will probably lie in the range 2% to 2.5% per year. The question then is whether or not long-term care expenditures for elderly people are likely to need to rise more rapidly to keep pace with pressures.

14.15. Earlier chapters have highlighted the sensitivity of projections to a range of factors. These include in particular growth in the very elderly population, any changes in age-specific dependency rates, and real rises in the unit costs of care. If the official population projections prove accurate, age-specific dependency rates do not rise, real costs of social care rise by no more than 1% per year, a rising proportion of elderly people fund their residential care privately from housing assets, and patterns of care remain broadly unchanged, pressures on net social services expenditure would not seem unaffordable. For, on these assumptions, net social services expenditure need rise no faster than gross domestic product (GDP) and the proportion of output devoted to social care need not rise.

14.16. The pressures on health services seem likely to be somewhat greater. First, rising housing wealth of elderly people is not relevant, as there is no means test. Second, and more importantly, the real costs of health care have risen more rapidly than the real costs of social care in recent years, and may continue to do so. If the official population projections prove accurate, age-specific dependency rates do not rise, real costs of health care rise by no more than 1.5% per year, and patterns of care remain broadly unchanged, pressures on health services expenditure would also not seem clearly unaffordable though they would be higher than pressures on social care expenditure. Health services expenditure on long-term care would need, on these assumptions, to rise slightly faster than GDP and the proportion of output devoted to health care would need to rise.

DIRECTIONS FOR FURTHER ANALYSES

14.17. The tentative conclusions in the preceding paragraphs are subject to a wide range of assumptions. Moreover, the conclusions have been shown to be sensitive to these assumptions, especially those concerning trends in dependency and in real unit costs of care. It would be helpful if further analyses could reduce the degree of uncertainty but that seems most unlikely. It would be more realistic to consider ways in which the model could be used to help inform policy and planning and to examine in that context what further developments would be valuable.

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