Ageing and Society, **17**, 1997, 3–19.

Limiting Long-Term Illness and Household Structure among People Aged 45 and over, Great Britain 1991

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ABSTRACT

The aim of the study reported here was to investigate the relationship between health and household composition among older people. The 1 per cent and 2 per cent SARs (Samples of Anonymised Records) drawn from 1991 British Census data were used to examine the frequency of a limiting long-term illness among older people according to different types of living arrangements. These data include the population in institutions and our results show that previous studies based only on the private household population have underestimated the prevalence of illness among older people. Long-term illness rates vary across family and household types, with higher frequencies found for those individuals not living in families (either alone or with others) or in lone parent families, compared with those living as part of a couple. Importantly, our results show a previously unreported clustering of long-term illness in households. Those over 45 suffering from a limiting long-term illness were more likely than those without such an illness, to live in households including others with long-term illness. These results indicate that health should be considered from a household, rather than just an individual, perspective. Our findings support those who have argued that families including an older ill member need more help from formal services. However, it is unlikely that this can be achieved solely by redeploying services from those living alone as long-term illness rates were also high in this group.

KEY WORDS – older people, households, health, Great Britain.

Introduction

Studies of the living arrangements of older people have chiefly concerned cultural, economic and demographic influences on house-

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hold composition (Bartiaux 1991; Beland and G.R.I.S. 1987; Michael *et al.* 1980; Mutchler 1990; Solinge and Esveldt 1991). In particular, researchers have attempted to understand the relative importance of these factors in accounting for both changes over time, such as the increase in solitary living observed in most western populations, and differences between countries, regions and ethnic and socio-economic groups in the living arrangements of older people. More recently the relationship between health status and household composition has been the focus of attention. This relationship is important, and its study complicated, for several reasons. The first of these is related to selection effects; as individuals get older and ill they may move in with relatives or friends. Secondly, particular household or family types[1] may promote good or poor health. Finally, it is an important public policy issue to know what proportion of older people in poor health have access to support from within the household, what proportion are more likely to be dependent on formal services (*e.g.* those who live alone) and how policy can affect these proportions. These three facets are not, however, mutually exclusive as several factors may operate in conjunction to influence the composition of households including older people.

Household Type and Health Status

Much of the literature on the relationship between household structure among older people and health is based on cross-sectional, localised studies with small sample sizes, mostly in the U.S. (Birkel and Jones 1989; Chappell 1991; Fillenbaum and Wallman 1984; Gerstel and Gallagher 1993; Iliffe *et al.* 1992; Magaziner *et al.* 1988; Reschovsky and Newman 1990; Stoller 1985; Stoller 1990). Even those studies that use national surveys (Arber *et al.* 1988; Cafferata 1987; Crimmins and Ingegneri 1990; Dale *et al.* 1987; Hatch 1991; Prohaska *et al.* 1993; Soldo *et al.* 1990; Wolf and Soldo 1988) or longitudinal data (Angel *et al.* 1992; Belgrave and Bradsher 1994; Börsch-Supan 1990; Speare *et al.* 1991; Spitze *et al.* 1992; Stinner *et al.* 1990; Worobey and Angel 1984) to examine this relationship, are affected by certain limitations. The analysis of household change as a consequence of illness, is often restricted to a certain group of individuals, such as non-married older people (Angel *et al.* 1992; Soldo *et al.* 1984; Soldo *et al.* 1990; Wolf and Soldo 1988; Worobey and Angel 1984). Health measures vary widely between studies, ranging from subjective self-ratings of an illness or health condition (Belgrave and Bradsher 1994) to indexes reflecting partial or full assessments of difficulties with everyday activities (Angel

et al. 1992; Arber *et al*. 1988; Cafferata 1987; Crimmins and Ingegneri 1990; Dale *et al*. 1987; Prohaska *et al*. 1993; Soldo *et al*. 1990; Spitze *et al*. 1992; Stinner *et al*. 1990; Wolf and Soldo 1988; Worobey and Angel 1984) and/or more detailed measures of physical and mental disabilities (Soldo *et al*. 1990; Speare *et al*. 1991). Although the characteristics of providers of support have been extensively researched, few studies have specifically analysed household composition. When specific living arrangements are examined, the variable used to measure household composition has ranged from simple dichotomous variables, such as living alone/not alone; to more detailed indicators of household structure based on a wider range of family and household living arrangements (Arber *et al*. 1988; Dale *et al*. 1987; Fillenbaum and Wallman 1984; Soldo *et al*. 1984; Soldo *et al*. 1990; Speare *et al*. 1991; Spitze *et al*. 1992).

Bearing in mind these restrictions, there is evidence to indicate that health is associated with living arrangements and that increases in disability among older people lead to changes in their living arrangements (Angel *et al*. 1992; Börsch-Supan 1990; Choi 1991; Crimmins and Ingegneri 1990; Soldo *et al*. 1984; Soldo *et al*. 1990; Speare *et al*. 1991; Spitze *et al*. 1992; Stinner *et al*. 1990; Wolf and Soldo 1988; Worobey and Angel 1984). Arber *et al*. (1988), for example, carried out a detailed analysis of household structure by the older household member's level of disability using the British 1980 General Household Survey (GHS). This study showed that the proportion of older people who were very severely or severely disabled was much higher among those living with an adult woman, living with a younger married couple or an older individual other than a spouse, than it was for those living as a couple. Angel *et al*. (1992), Spitze *et al*. (1992) and Worobey and Angel (1984) using the U.S. Longitudinal Study of Aging and its follow-ups, showed that those non-married individuals who experienced a decline in functional capacity between 1984–1986 and 1986–1988, were more likely to be living with others than living alone, even when various socio-economic and demographic variables were controlled for. Stinner *et al*. (1990) found that men with two or more disabling conditions were more than 2.5 times as likely to be living with (an) adult relative(s) as men with no disabling conditions, even when other variables were controlled for (*i.e*. race, age, marital status and income). Börsch-Supan's (1990) analysis of the U.S. Panel Study of Income Dynamics, based on longitudinal data between 1968 and 1984, examined the events that precipitated changes in living arrangements among older people. Moving in with others appeared to be a response to the sudden onset of a disability.

Household Type and Mortality

Studies of mortality differentials also suggest an association between health and household type. Welin *et al.* (1985), in a large prospective study of middle-aged and older men, found an inverse relationship between household size and mortality. In contrast, Magaziner *et al.* (1988), in their analysis of a small sample of women in Northeast Baltimore U.S.A., found that those who lived with people other than their spouse had the poorest health, while those who lived alone were in the best health. They reasoned that while living alone may promote good health and living with others may promote poor health, it was more probable that their results reflected selection processes whereby those who live with others choose their living arrangements because of their health problems. In their analysis, once those who chose their living arrangements based on their disabilities were removed, household structure demonstrated no association with mortality. Thus, they concluded that health influences living arrangements rather than vice versa.

Analyses based on the OPCS Longitudinal Study, which includes individual census records and linked death registration data, showed regional and socio-economic variations in the household composition of older people and in their transitions to institutions (Grundy 1987; Harrop and Grundy 1991). Older people in 'independent' households (alone or with a spouse) in 1971 but in 'supported' households (with relatives) in 1981, were found to have higher mortality in 1981–85 than those remaining in independent households, suggesting that this type of transition was health related. The highest mortality was observed in those who had made a transition from any type of private household in 1971 to an institution in 1981 (Grundy 1993; Grundy 1992).

Direct effects of household type on health have attracted less attention, although there is some evidence that living alone is associated with dietary inadequacy (Davis *et al.* 1990). Several studies have suggested that the health of carers of disabled older people, such as dementia sufferers, may be affected (Gilleard *et al.* 1984). This raises the question of whether the presence of an older ill person may have negative health consequences for other household members, but this issue has not been investigated systematically.

Household type and use of formal services

A large share of research on the relationship between health and household composition among older people has focused on the

implications of the choice of living arrangements for the provision of care (Arber *et al.* 1988; Arber and Gilbert 1989; Cafferata 1987; Chappell 1991; Evandrou 1990; Iliffe *et al.* 1992). Arber *et al.* (1988) and Arber and Gilbert (1989), using the 1980 GHS, found that the allocation of formal care (in terms of the provision of statutory services) was influenced more by household composition than the gender of either the older person or the carer. Thus, they observed that older people who lived alone were five times more likely to receive home help support than those who are married. Consequently, the living arrangements of older ill people have important implications for the allocation of public resources, as they affect the likelihood of receiving both formal and informal care. In the study reported here we have used a large, national data set to investigate these issues.

Data and Methods

The 1991 British Census included a question on limiting long-term illness, the first health-related question in a Census since 1911 (Charlton *et al.* 1994), and for the first time in Britain a 'public use' sample of individual level data was made available from the Census returns. These Samples of Anonymised Records (SARs) have been used here to examine the link between health status and household structure among the older population.

The SARs comprise two sets of data extracted from the 1991 British Census. The first data set is a 2 per cent sample of individuals in households and communal establishments. The second file is a 1 per cent sample of households and all of the individuals in each of these households; this sample was selected so that it did not overlap with the 2 per cent sample. In order to maintain confidentiality this second file is not as detailed as the first in terms of a few variables, such as geographic area. Surveys like the General Household Survey are based on a much smaller sample size. The SARs (1 per cent and 2 per cent) are 20 and 40 times larger respectively and permit detailed analyses of the population by single years of age and of smaller groups such as those aged 85 and over. Moreover, the SARs include the institutionalised population, an often omitted but important group for studies of the health status of older people.

Because the main interest is in the joint health of all household members, the main data source used here is the 1 per cent SAR. The base population for private households is present and absent residents, visitors being excluded. Because the role of the institutional sector is

important for older people, we also use the 2 per cent SAR which includes those individuals enumerated in non-private establishments where 'some form of communal catering is provided' (OPCS 1992: 12). This broad definition covers a wide range of institutions such as medical and care establishments, detention, defence and education establishments, hotels, boarding houses, hostels, common lodging houses, and other categories of non-private households (persons sleeping rough, campers, and those on civilian ships, boats and barges) (OPC 1992: 12–13). Our analysis excludes visitors in communal establishments (such as short-stay patients in hospital), but includes both resident staff and non-staff.

The household composition variables used in this study, family type and relationship to head of household, were derived from the question on relationship to 'head of household' on the Census form: the 'head of household' is defined as the first person entered in the form who should be over 16 and usually resident at the address of enumeration, and the relationship of each household member to this person is coded.

The family classification used here is the same as that used in Murphy and Grundy (1994) containing the following categories: individual(s) who are not part of a co-resident family unit and who are either living alone or with others; couple without co-resident never-married child(ren); lone parent with never-married child(ren); and a couple with never-married child(ren). The relationship to the head of household variable has been recorded into three categories; head or partner; parent (or parent-in-law); and other related or unrelated household members.

The health status data came from responses to the Census question which asked 'Does the person have any long-term illness, health problem or handicap which limits his/her daily activities or the work he/she can do?' The prevalence of long-standing illness reported in the Census was lower in most age groups than that reported in the GHS, which has included a similar question since its inception, but higher in very old age groups. These differences probably reflect minor variations in question wording and the fact that the notes with the Census question specifically instructed that problems due to old age be included.

Unless indicated otherwise, only differences that are statistically significant at the 5 per cent level have been commented on.

Results

Table 1 shows long-term illness rates for residents in private households and communal establishments, obtained from the 2 per cent SAR. These results and equivalent ones from the 1 per cent SAR, are very similar to figures based on the 100 per cent coverage of the 1991 Census given by Charlton *et al.* (1994). The table demonstrates the importance of including the institutionalised population in estimates of the frequency of illness in the population, especially for the older age groups. Long-term illness rates are much higher for the over 85 age group when the population in communal establishments is included. Surveys like the GHS, based only on private households, underestimate the prevalence of illness among older people.

Rates of limiting long-term illness were significantly higher among men than women in the 55–64 and 65–74 age groups, a difference apparent in Figure 1, which shows the overall pattern of long-term illness by age and gender for the private household population. It appears that men may become more aware of their health limitations in these age groups, as many retire from work because of health-related difficulties. Responses to the Census question on economic position/employment status reflect the fact that upon reaching retirement men choose to classify themselves as being 'retired' rather than as 'permanently sick': thus, while 12.6 per cent of men aged 55–59 and 19.2 per cent of men aged 60–64 declare their economic activity status as permanently sick, this figure rapidly drops to 6 per cent among the 65–69 age group, and this may influence the response to the limiting long-standing illness question. There is not a similar retirement effect for women, presumably because fewer women are in full-time work. After the age of 75, illness rates are significantly higher for women than men.

Among residents in non-private households, also shown in Figure 1, the prevalence of limiting long-term illness increases sharply for both sexes around the age of 20. This may be because most children in communal establishments are in children's homes or are boarders at school, whereas adults are more likely to be in institutions for health-related reasons. The prevalence of a long-standing illness is significantly higher among women than men in the institutional population in the 45–54 and 75–84 age groups. Because the rates of limiting long-standing illness are so much higher among older people, they form the focus of the rest of this paper.

One way people may attempt to cope with illness is by changing their living arrangements and, as shown in Table 2, the frequency of a

TABLE 1. *Adults aged 45 and over: % with a limiting long-term illness by residence, age and sex, 1991, Britain*

		45–54	55–64	65–74	75–84	85+	45+	n
Private households	Males	11.7	26.1	34.6	44.3	57.4	25.9	183,029
	Females	12.0	20.9	30.9	46.7	63.5	26.7	216,143
Institutions	Males	65.6	76.0	84.8	90.7	94.6	84.9	3,006
	Females	78.4	82.7	89.6	93.9	94.7	93.0	7,228
Total	Males	12.1	26.5	35.3	46.3	63.2	26.8	186,249
	Females	12.2	21.1	31.7	50.0	72.1	28.8	223,582
n	Males	62,598	54,423	43,286	21,914	4,028		
	Females	62,825	57,187	53,543	37,640	12,387		

Note: The percentages for institutions includes only non-staff residents. The total percentages includes all residents of private households and institutions (including staff).
Source: 2% SAR.

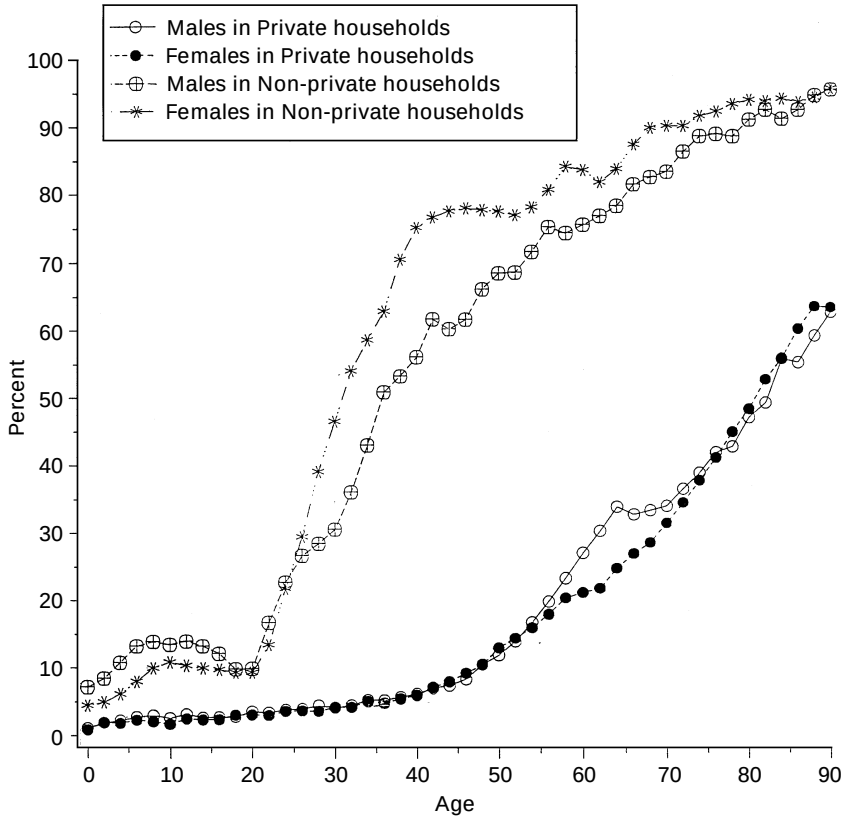

Figure 1. Limiting long-term illness: sex and residential status, GB 1991.
Source: 1991 2% individual SAR. Non-private household data have been smoothed.

https://doi.org/10.1017/S0144686X96006277 Published online by Cambridge University Press

TABLE 2. *Adults aged 45 and over: % with a limiting long-term illness by family type, age and sex, 1991, Britain*

		45–54	55–64	65–74	75–84	85+	45+	n
Not in family								
Living alone	Males	21.7	35.2	37.9	47.9	55.4	37.0	12,509
	Females	23.8	25.7	32.6	46.5	61.9	38.5	29,777
Living with others	Males	21.0	35.0	35.8	44.8	63.0	34.0	3,936
	Females	23.4	25.1	31.3	52.1	67.0	39.5	6,346
Couple, no children	Males	12.4	25.4	33.8	41.4	55.2	28.7	43,663
	Females	12.7	19.8	30.0	45.3	58.0	24.2	42,431
Lone parent	Males	18.4	28.5	38.5	44.0	63.2	27.2	2,698
	Females	16.7	22.9	32.4	52.2	73.6	28.0	7,432
Couple with children	Males	9.6	22.2	32.1	38.6	60.5	15.4	28,680
	Females	8.1	17.7	26.2	46.7	—	11.9	22,217

Note: — indicates results not given because n is less than 15.
Source: 1% SAR.

long-term illness varies by family type. Among older women long-term illness rates are higher for those individuals not living in families but with others or in lone parent families,[2] than for those living as part of a couple.[3] Those living alone have intermediate rates of long-term illness. The pattern is less clear for men, given the small number in these categories for the older age groups, and the consequently large standard errors.

By examining the relationship of the ill person to the household head one can determine the position of the sick individual in the household (Table 3). Long-term illness rates among both men and women were higher for household members who were not themselves the head or partner of the head of household. In almost all age groups, women and men who were parents (or parents-in-law) of the head of household had the highest frequencies of a limiting long-standing illness. Among both men and women the frequency of illness among those related in other ways or unrelated to the head of the household – a group which would include people living with siblings, parents, other relatives or friends – was also higher than that of heads or spouses of heads in the oldest age group shown. However, the number of cases for men, in particular, is small (n = 28) and the standard error consequently large (SE = .07).

Another way of elucidating patterns of long-term illness within households is by examining the overall numbers of ill co-resident household members. Figures 2 and 3 present the mean number of other household members who are ill or not ill, excluding the individual who is the basis of analysis (one person households are therefore excluded). It can be seen that the mean number of older male household members

TABLE 3. *Adults aged 45 and over: % with a limiting long-term illness by relationship to head of household, age and sex, 1991, Britain*

		45–54	55–64	65–74	75–84	85+	45+	n
Head or partner	Males	11.6	25.7	34.4	43.0	55.4	25.5	87,488
	Females	11.5	20.7	30.8	46.4	62.0	26.1	102,983
Parent or parent-in-law	Males	23.3	45.5	38.5	53.7	68.6	47.5	835
	Females	19.8	29.5	38.8	59.3	72.9	51.0	2,483
Other	Males	22.7	33.1	35.2	41.0	70.0	29.5	3,163
	Females	22.2	23.0	28.7	49.6	64.2	31.0	2,737

Note: 'Other' includes children, kin and non-kin relationships.
Source: 1% SAR.

with a long term illness remains relatively stable (around 0.05) across the age groups. However, the mean number of younger (in the rest of this paper, this will include those of equal age) male household members with a long-term illness increases steadily with age, rising from under 0.10 for those aged 45 to about 0.50 at the oldest ages. By contrast, the mean number of older female household members with a long-term illness increases with age until the late 60s, when it begins to decline. As for men, the average number of younger female household members with a long-term illness also increases with age, rising from around 0.07 at age 45 to approximately 0.30 for the oldest age groups. While there are more older and ill female household members than older males, there are few younger and ill female household members than males.

Figure 3 illustrates the mean number of not ill members of the household, co-resident with the reference individual. The mean number of younger and not ill household members for both sexes declines until the age of 80, after which the mean increases more sharply for women than for men. The mean number of older and not ill males and females also declines with age although the decrease is once again larger for women than for men. For men over 75, about one-third of younger household members have a long-standing illness; for women the figure is about one-quarter: in addition, half of the older people in their households are also ill. Consequently, the extent to which the fullest measure of assistance can be given is severely constrained.

In assessing the likely demand for and supply of assistance, the status of each individual needs to be considered in relation to those of the other members of the household. Table 4, therefore, breaks down the data of Figures 2 and 3 by the health status of the reference individual. This table demonstrates that households in which someone over 45 suffers from a long-standing illness have a higher mean number of other

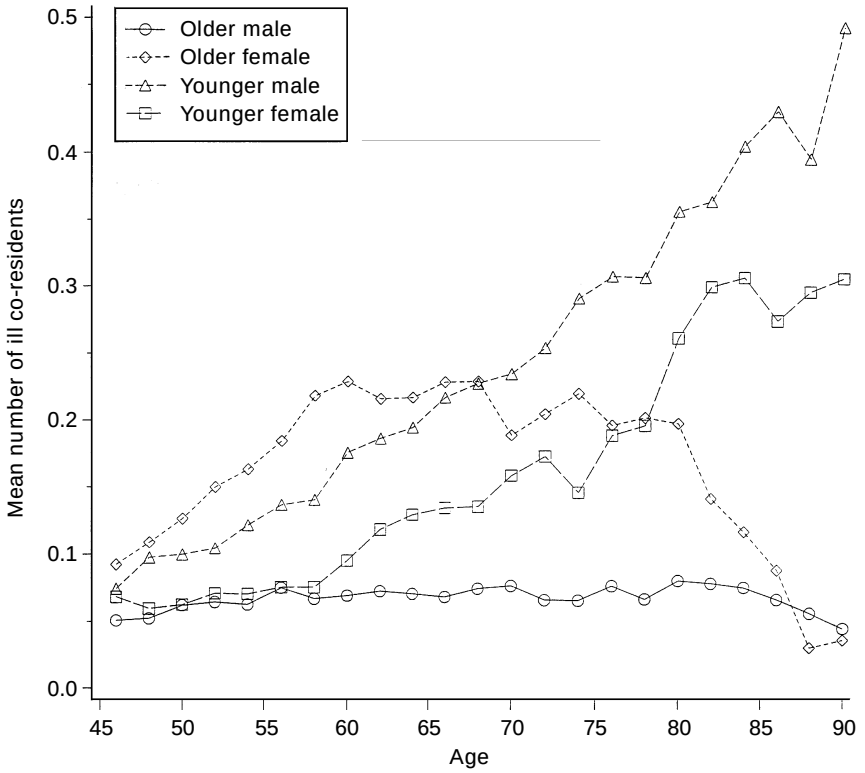

Figure 2. Mean number of co-residents with limiting long-term illness, GB 1991.
Source: 1991 1% Household SAR.

ill household members than those households where a corresponding person over 45 does not have a long-term illness. It establishes, moreover, that these differences are very large. For men aged 45 and over who have a limiting long-term illness, the mean number of older and ill household members (ranging from 0.06 and 0.15) is two or three times higher than for men in the same age groups who do not have a long-term illness (where the means range between 0.03 and 0.05) (Table 4). Furthermore, for men who have a long-term illness the mean number of younger ill household members rises steadily from 0.31 for ages 45 to 54, to 0.58 for ages 85 and over. In contrast, the mean number of ill younger household members for men who are not themselves ill is three to four times lower, ranging from only 0.07 for those aged 45 to 54 to 0.22 for those 85 and over. Similarly, the presence of an ill woman in the household increases the likelihood of there being other ill household members by a factor of two or three

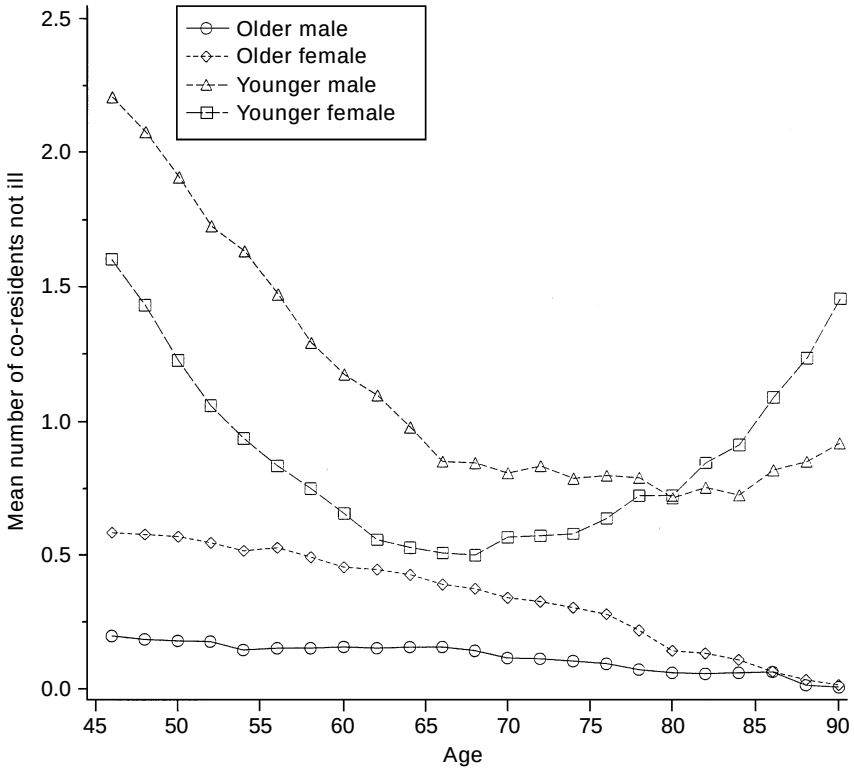

Figure 3. Mean number of co-residents with no limiting long-term illness, GB 1991. *Source*: 1991 1% Household SAR.

(Table 4). For women over 45 suffering from a limiting long-term illness the mean number of older and ill other household members ranges between 0.07 and 0.41 in contrast to women in the same age groups who do not have a long-term illness, where the range is between 0.03 and 0.16. For women who have a limiting long-term illness the mean number of younger household members who are ill increases with age from 0.19 to 0.40, whereas for women who are not ill the corresponding increase in means is smaller, rising from 0.05 to 0.16.

These findings point to the existence of a clustering of illness in selected households. This is reflected in the fact that for men and women over the age of 45 who have a limiting long-term illness, the proportions of older and ill household members, and younger and ill household members, relative to the number of co-resident persons in the household is respectively three and around four times higher than for men and women who are not themselves ill (Table 5).

https://doi.org/10.1017/S0144686X96006277 Published online by Cambridge University Press

TABLE 4. *Adults aged 45 or over in households of two or more residents: mean number of ill and well household members by sex, age and health of reference individual, 1991, Britain*

Reference individual: Age		45–54		55–64		65–74		75–84		85+		45+	
Sex	Health	ill	well	ill	well	ill	well	ill	well	ill	well	ill	well
Males													
Household members who are:													
older and ill		.15	.05	.12	.05	.14	.04	.13	.05	.06	.03	.13	.05
older and well		.16	.18	.12	.16	.06	.16	.03	.11	.01	.04	.09	.16
younger and ill		.31	.07	.33	.10	.45	.12	.54	.16	.58	.22	.41	.10
younger and well		1.59	2.02	1.05	1.30	.63	.97	.55	.88	.69	1.01	.91	1.50
Females													
Household members who are:													
older and ill		.31	.10	.41	.16	.39	.13	.26	.10	.07	.03	.34	.13
older and well		.36	.59	.27	.52	.16	.44	.09	.31	.02	.07	.20	.52
younger and ill		.19	.05	.19	.07	.27	.09	.36	.12	.40	.16	.26	.07
younger and well		1.00	1.36	.63	.70	.44	.58	.68	.77	1.10	1.26	.68	.97

Note: 'well' refers to people with no limiting long-term illness; 'younger' refers to co-residents who are younger or the same age.
Source: 1% SAR.

TABLE 5. *Adults aged 45 or over in households of two or more residents: ratios of ill and well household members to number of co-residents by sex and health of reference individual, 1991, Britain*

Reference individual: Sex	Males		Females	
Health	ill	well	ill	well
Ratio of older and ill household members to number of co-residents	.11	.03	.29	.10
Ratio of younger and ill household members to number of co-residents	.32	.07	.20	.05

Note: 'well' refers to people with no limiting long-term illness; 'younger' refers to co-residents who are younger or the same age.
Source: 1% SAR.

It should be stressed that these substantial excess numbers of other ill people in households where an individual is ill are not because ill people tend to live in larger households. The overall number of co-resident younger and older people, and total household members (results not shown), are very similar in both cases. In 15 of the 20 groups shown in Table 4, the average numbers of younger and older people differ between ill and non-ill people by less than 10 per cent. The result is, of course, that on average not only do ill people live with more ill people than fit ones, they also live with fewer fit people, tending to reinforce

their relative disadvantage in terms of access to care within the household.

Discussion

Although previous studies have examined the relationship between health and living arrangements, few have been able to analyse the great diversity of household and family types at older, including very old, ages. Many of the data sets which have been used in past research are limited in their ability to identify different types of family arrangements, a result of the low frequency of some of these living arrangements within the general population (*e.g.* lone parent families among the older age groups). The SARs, drawn from Census data, enable a more detailed and systematic analysis of the frequency of illness by various household and family types among older age groups. In addition, the inclusion of the institutionalised population provides a more accurate picture of the prevalence of limiting long-term illness among older people.

The higher prevalence of a long-term illness among older people not living in a family, but living with others, supports previous research on the relationship between health and household structure. Similarly, the high long-term illness frequencies among parents or parents-in-law of the head of household suggest the importance of health as an influence on living arrangements. Older people may respond to illness by forming more complex household types which may be better suited to cope with the greater financial, emotional and time demands of providing care. However, this type of response is not always possible or desired and our results also show high long-term illness rates among older people living alone.

A long-standing dilemma for policy makers and service providers is the relative priority given to families which include an older disabled member, and to older disabled people living alone. Although the importance of providing help to the former has often been emphasised, studies suggest that they are accorded much lower priority than the latter. Our results show just how important it is that the needs of the former group should not be neglected. One of the most interesting findings of our analysis is that those who are suffering from a limiting long-term illness are much more likely to live in households where others are also ill. This clustering of illness within households has not, to our knowledge, been previously discussed in the literature, but has important policy implications. Assessments of need for services, for

example, should perhaps consider not just the health status of individual older people, but also the health status of their co-residents. As those living alone also report high rates of long-term illness, it is unclear whether providing more to those living with relatives can be achieved simply through redeployment of existing resources.

Acknowledgements

The research reported here is supported by the ESRC as part of its Population and Household Change programme, Grant Reference Number L31523018. This work is based on the SARs provided through the Census Microdata Unit of the University of Manchester with the support of the ESRC/JISC/DENI. Reproduced with the permission of the controller of Her Majesty's Stationery Office. Crown Copyright.

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NOTES

1 A household refers to a co-resident group with some shared living space or housekeeping and a family encompasses co-resident nuclear families.
2 Among men over 70 with a long-term illness in a lone parent family 84 per cent are the heads of households (first person on the form), the remainder being the parent or parent-in-law of the head of household. For women over 70 with a limiting long-term illness in a lone parent family, 77 per cent are the heads of households with the remainder being the parent or parent-in-law.
3 Although the limiting long-term illness rate seems high for men over 85 in a couple with children, the figure is based on a small number of cases (n = 26) with a consequently large standard error (S.E. = .08).

Article accepted 28 January 1996