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Household transitions and subsequent mortality among older people in England and Wales: Trends over three decades

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What this paper adds

What is already known

There have been major changes both in the living arrangements of older people and in long-term care policy and provision in England and Wales, and many other European countries. Changes in the availability of co-resident family care for older people has implications for demand for formally provided care, conversely long term care policies are an important potential influence on the residential choices of disabled older people.

What this study adds

In England and Wales risks of moving to an institution in 1991-2001 were lower, and subsequent excess mortality of those making such a move, higher than in earlier decades. This suggests that policy reforms introduced in the 1990s led to a reduction in the use of institutional care and greater targeting of this resource on the most frail. Chances of living with relatives also show a downward trend suggesting other influences driving increased residential independence of older people. Differences in the mortality of older people living with relatives and those living in institutions indicates that the health status of these populations is not equivalent.

Abstract

Background

The past thirty years have seen major changes in the living arrangements of older people and in long-term care policy in England and Wales. Co-resident family care and institutional care can be alternatives for seriously disabled older people, so changes in the availability of either may affect demands for the other.

Aims

To analyse changes in older people's living arrangements in three successive decades in England and Wales and compare the subsequent mortality of older people living with relatives; those living alone or with a spouse; and those living in institutions.

Methods

Cross sequential analysis of household circumstances at the beginning and end of three decades using multinomial logistic regression of data from the Office for National Statistics Longitudinal Study. Poisson regression analysis of subsequent mortality.

Results

Risks of moving to an institution 1991-2001 relative to living alone or in a couple were lower than in 1981-1991 for women and men and for women also lower in comparison to living with relatives. Chances of living with relatives rather than alone or in a couple showed a downward trend over time. Institutional residents had higher mortality than those living alone/in a couple or those with relatives. This excess was greater in 2001-05 than in previous periods, even so 26% of male and 36% of female institutional residents in 2001 survived three years.

Conclusion

Policy changes are important influences on use of institutional care. The health status of older people living with relatives and those in institutions is not equivalent.

Introduction

Over the past three decades living alone or just with a spouse has become increasingly prevalent and living with relatives increasingly unusual for older people in most of Europe and North America. [1-3] Possible explanations encompass positive developments including higher incomes, better health, and improvements in housing, assistive technology, transport and communications. Such changes may have enabled more older people to meet preferences for residential independence and made it easier to provide extra-household help to those who cannot manage unaided. [4-6] Other interpretations have emphasised constraints, including possible declines in family support. [7,8] The proportion of older people with a spouse or child alive has increased in recent decades in England and Wales and other European countries because of historic changes in family formation patterns and mortality declines leading to later ages at widowhood. [9-11] However, the ability or willingness of younger generations to provide care, including co-resident care, for disabled older relatives (and older people's care preferences), may have fallen as a result of social changes including increases in the proportions of women working full time and greater individualism. [12-14] As family care is so important for older people with disabilities, any change in the availability of such support has implications for the demand for formally provided services, including institutional care. [15] Conversely, changes in the supply of formal care have implications for potential family supporters and long-term care policies are an important potential influence on residential choices and constraints among older people with disabilities. [16,17]

Long-term care policy and provision in England and Wales¹

Long-term care provision for older people in England and Wales still bears the hallmark of the post World War II legislation which established the modern British welfare state. This included a requirement for local authorities to provide residential care and an empowerment to financially support residents in homes provided in the private (for profit) and voluntary (not-for-profit) sectors. Long-term hospital care became the responsibility of the National Health Service (NHS) and was free of charge, although local authority accommodation was from its inception means tested. Subsequent legislation incrementally extended and changed the relative responsibilities of the NHS and local authorities for providing other long-term care services, such as home help, meals, and day care. [18, 19]

The past three decades have seen significant changes in both organisation and availability of long-term care services. After a period of expansion in the immediate post war decades, in the later 1970s and 1980s financial constraints meant that the provision of local authority paid-for residential and domiciliary long-term care services failed to

¹ There are a number of differences in long-term care policies in the constituent countries of the UK (England & Wales, Scotland, Northern Ireland) which are not discussed here.

keep pace with increases in the size of the older old population. [20, 21] Long-term hospital provision reduced substantially from the 1980s (in part associated with reductions in lengths of stay) with further large reductions more recently. [22, 23] Secondly, administrative changes in regulations on payment of supplements to those on low incomes introduced in 1980 made 'board and lodging' payments available to low income older people entering private and voluntary residential or nursing homes resulting *in a huge expansion in provision and a ten-fold increase in (Central) Government expenditure on these supplements during the 1980s*. [24] This increased provision was associated with changes in the balance between institutional care and co-residence with relatives. Research using data from the Office for National Statistics Longitudinal Study (ONS LS) showed that, after controlling for age, marital status and housing tenure, the risk of transition from a private household to an institution was some 33-52% higher in 1981-91 than in 1971-81 while rates of transition to live with relatives declined. [25] Subsequently, attempts to rein back escalating costs and re-emphasise community care led to the introduction of the NHS and Community Care Act in 1990 (fully implemented in 1993). This returned to local authorities responsibility for arranging and funding (on a means tested basis) long-term care in residential and nursing homes. This legislation introduced a requirement for an assessment of older people moving into residential or nursing home care (apart from self-funders) and the targeting of home care resources on those most at risk of such a move. These policies appear to have had some effect in that admission rates levelled off during the 1990s [22, 23] and domiciliary services have become focussed on a smaller proportion of older people who receive larger amounts of support. [26] It is not known whether these changes have influenced rates of co-residence with relatives. There is also a lack of national information on whether the requirement for medical assessment prior to institutional admission led to a change in the health status of older people entering institutional care and their subsequent mortality.

Aims

The aims of this study were to identify possible effects of the NHS and Community Care Act and subsequent reforms firstly by analysing changes in the proportions of older people living with relatives and moving to institutional care in three successive decades in England and Wales, and secondly by comparing the subsequent mortality of older people living with relatives; those living 'independently'; and those living in institutions.

Data and Methods

I employ a cross sequential design to examine the household circumstances of older people at the beginning and end of three successive decades (1971-81, 1981-91 and 1991-2001) and contrast three end-of-decade living arrangements -residence in an institution; co-residence with relatives; and living alone or just with a spouse-, using multinomial logistic regression. Poisson regression was used to model differentials in mortality for each decade- specific sample during the subsequent five years (**the precise follow-up period was 4.5 years, this was chosen because of slight variations in the dates of the 1981, 1991 and 2001 Censuses which would have meant variable lengths of follow-up if end of the calendar year five years post census had been chosen as the end point**).

Data are drawn from the ONS LS, a record linkage study of approximately 1% of the population England and Wales. The sample was initially drawn from the 1971 Census and now includes information from subsequent censuses and from vital registration. The LS is a multi-cohort moving sample; members are lost through emigration and death and recruited through immigration and birth. The data set thus remains representative and may be used for cross sectional and cross sequential, as well as longitudinal, analyses. Strengths of the data include large sample size, low non-response and attrition bias (as census coverage is good and rates of linkage high); and inclusion of the institutional population. [27] Information from the census records of people in LS members' households is also available, although records for co-residents are not linked over time.

The sample for each decade comprised people aged 65 and over at the start of the decade who were still alive and in the sample ten years later. **Those in the analysis sample for later decades thus include survivors from preceding decades together with those attaining the age of 65 in the interim and new recruits to the study.** Initial modelling was undertaken separately for each decade but results reported here are for the pooled sample with decade as a co-variate. All analyses were undertaken for men and women separately, **because of well established gender differences in living arrangements and mortality**, and exclude very small proportions with missing information on relevant variables. People who at the start of each decade were resident in institutions were also excluded (as the intention was to analyse variations in moves to institutions) as were visitors (such as acute hospital inpatients) at the address of enumeration at start or end of decade.

Measures

Private (non-institutional) households in the census, and so in the LS, are defined as individuals or groups of co-residents who share a dwelling and have common housekeeping. People living in establishments where meals and services are communally provided (including those in schemes in which individual cooking facilities are available to fewer than half the residents) are identified as living in institutions. [27] For those in private households two classifications of household/family type were derived referring respectively to living arrangements at the start and end of each decade. These have been described in detail elsewhere [28] and use the census definition of a family which counts configurations of parents and never-married children (of any age) as part of the same family but not other combinations of relatives (such as widows living with married children).

Start of decade living arrangements were grouped into four categories comprising: people living alone, ('Solitary'); people living with a spouse (or partner) only, ('Couple alone'); those in any other type of family, very largely comprising people living with a spouse and children or lone parents living with a never-married child, ('Family'); people living with relatives or friends not classified as being part of the same family or, less usually, in two family households ('Complex household').

The 'family' and 'complex household' groups were distinguished in the start-of-decade household classification because in the younger elderly population the former often includes people providing support to co-residents (e.g. 65 year old married men with

children still at home), whereas the latter configuration is more likely to arise because of parental needs (e.g. 85 year old widows who have moved to live with a married daughter). However, the proportions in the ‘family’ category by the end of each decade (when sample members were aged 75 and over) were very small, so they were combined with the complex household group in the end of decade classification. Those living alone or just with a spouse at end of decade were also grouped together but are effectively distinguished in the analysis through inclusion of marital status as a co-variate. The third end of decade group comprised those living in an institution.

Other covariates were age in single years and housing tenure (distinguishing home owners from others) at start of the relevant decade and marital status at end of decade. Housing tenure was included as an indicator of socio-economic status and has been shown in previous studies to be associated with household changes, including moves to institutions. [28] There may also be a more direct relationship between housing wealth and entry to institutional care as means testing procedures mean that home owners (and their heirs) have particular disincentives to enter state funded residential care. [29] Marital status is an important indicator of availability of potential care from a spouse and also of likelihood of availability of a child (as in the cohorts considered few never-married people have children). End-of-decade indicators for marital status were chosen as being closer temporally to end-of-decade living arrangements and also to avoid problems with collinearity between initial household type and marital status. Finally, a dummy variable indicating decade of observation was derived.

Results

Table 1 shows the distribution of the three samples by variables used in the analysis. The ageing of the England and Wales population is reflected in larger sample sizes for the later decades and slight increases in mean age. The progressively lower proportion of never-married women in each of the three samples is a result of cohort differences in marriage; as would be expected, a much higher proportion of men than women were married. Changes in housing tenure patterns over time, including the consequences of the 1980 ‘right to buy’ legislation which enabled public sector tenants to buy their homes at discounted prices, are evident in the large increase in the proportion of home owners. The distribution of the three samples by household type at the start and end of the relevant decade is shown in Table 2. The proportions living alone at the start of each decade were much higher for women than men and increased in successive decades, in the case of women from 34% in 1971 to 40% in 1991. The proportions living alone or in a couple only household at the end of each decade also increased, for example from 76% for men in 1981 to 83% in 2001. The proportions living with relatives declined and the proportions in institutions first rose and then fell.

Table 3 presents results from fitting multinomial regression models presented as relative risk ratios (and 95% confidence intervals) for three end of decade contrasts: living in an institution rather than alone or with a spouse; living with relatives (family/complex) rather than alone or in a couple; and living in an institution rather than with relatives. Living in an institution, rather than alone or in a couple, was positively associated with

older age, living in the family or complex household types at start of decade, being a tenant at start of decade and with being unmarried, particularly never-married, at end of decade. Living in a family/complex household at end of decade rather than alone or in a couple was positively – and very strongly- associated with being in one of these types of living arrangement at the start of the decade, with older age and with being unmarried (although this association was not as great as in the institution versus solitary/couple contrast), and negatively associated with being a tenant. The third contrast, between living in an institution versus with relatives, showed positive associations with older age, being a tenant and being unmarried and strong negative associations with initially living in a complex or family household and, to a lesser extent, with initially living with a spouse.

Relative to 1981-91, risk ratios of being in an institution at the end of the period, rather than in the alone/couple category group, were lower in 1991-2001 and in 1971-81 for both women and men. In 1991-2001 the risk of being in an institution rather than living with relatives was also significantly lower than in 1981-91 for women; **among men this risk ratio was also lower in 1991-2001 than in 1981-91 but the difference was not statistically significant, possibly because of reduced statistical power in the smaller samples of men.** For both men and women risks of being in an institution rather than living with relatives were nevertheless significantly higher for 1991-2001 than for 1971-81. Finally risks of being in a family/complex household rather than solitary/couple show a downward trend over time for women being significantly higher 1971-81 than 1981-91 but lower in 1991-2001. Among men the ratio for the last decade was lower than for 1981-91, but the difference was not statistically significant.

Mortality by end of decade living arrangement

Figure 1a and b show the survival of men and women for the four and a half years following each of the 1981, 1991 and 2001 Censuses by living arrangement at that point. In all periods those living alone or in a couple had the highest survival and those in institutions the lowest. However, whereas the survival of men and women living alone/in a couple or with relatives tended to improve over successive periods, the median survival of those in institutions in 2001 was about six months less than median survival of the 1991 institutional population

Results from fully adjusted Poisson regression models of mortality for the 4.5 years following each decade of interest are shown in Table 4. Information on co-variables comes from the same time points as shown in earlier tables so, for example, mortality 2001-05 is shown in relation to housing tenure in 1991; marital status in 2001, and household type in both 1991 and 2001.

Residence in an institution at end of decade was associated with elevated mortality risks in the subsequent 4.5 years; this excess mortality was greatest in the most recent period. Thus the IRR 2001-05 for residents in an institution in 2001 was 2.85 (95% C.I. 2.68-3.03) for women and 2.80 (2.53-3.09) for men; comparable estimates for 1991-95 were 1.97 (1.86-2.09) for women and 2.19 (1.98-2.29) for men; the extent of excess mortality risk in 1981-85 was lower still. Women living with relatives had higher mortality than the reference category of those living alone or in a couple, but the excess risk was much less marked than for those in institutions and risk ratios were lower, for men and women, than

for institutional residents. Household type at start of each relevant decade had no association with mortality 10-15 years later. Analysis of models including interaction terms (not shown) did, however, indicate raised mortality risks for men and women changing from living in a couple in 1991 to an institution in 2001; (men: 1.31, 1.06-1.61 $p < 0.05$; women 1.1.6, 1.02-1.32 $p < 0.05$); and for women moving from living in the other family category to living in an a institution 1991-2001 (1.43, 1.09-1.88 $p < 0.01$) and men changing from living in a couple to living in an institution 1981-91 (1.31, 1.04-1.67 $p < 0.05$).

Results also show higher mortality for widowed and divorced compared with married men in 1981-85 and for both widowed and divorced men and women in 2001-05 and a positive association between older age and mortality, which was greater in the 2000-05 period than earlier. There were no significant associations between being never-married and mortality once household type at two time points was controlled for, as shown in the table. In 2001-05 the mortality of men who had been tenants in 1991 was 25% higher than that of 1991 owner occupiers; among women this excess was 20%. Mortality 1991-5 was also raised for men who had been tenants in 1981.

Discussion

For men and women risks of moving to an institution 1991-2001 relative to chances of living alone or in a couple were lower than in 1981-1991. For women risks of moving to an institution rather than living with relatives were also significantly lower 1991-2001 than in 1981-91, although for both men and women they were higher than in 1971-81. Chances of living with relatives rather than alone or with a spouse were lower in 1991-2001 than 1971-81 or, for women, in 1981-91. Excess mortality of the institutional population was greatest in 2001-05. Among women, those living with relatives also had raised mortality risks, but these were considerably less than the risks for those in institutions suggesting that these populations are not equivalent in terms of health status. Housing tenure was more strongly associated with mortality risk in 2001-05 than in earlier periods probably because tenants by then comprised a smaller and relatively more disadvantaged group. It is not clear why age was more strongly associated with mortality in 2001-05 than in previous periods **but investigation using data from the whole England and Wales population showed a similar increase in the strength of the association between age and mortality, a change which merits further analysis.**

These results are based on a large nationally representative data set that is minimally affected by non response and attrition and allows comparisons over three decades. However the long intervals between census data capture points makes it impossible to pinpoint dates of household transitions; we do not know, for example, whether changes in household type between 1991 and 2001 pre or post dated implementation of the NHS Community Care Act, although given the high mortality of residents in institutions it is unlikely that many of those in institutional care in 2001 had been there for more than seven years. The lack of detailed information on health, family support from outside the household or use of services presents a further limitation, particularly in this design as the analysis was restricted to variables included in all the censuses of interest. Studies including more detailed information have been able to identify factors predictive of entry to institutions more precisely and in particular have identified the importance of

conditions such as dementia and the preventive role of extra-household support from relatives and formal services. [30-33] However, in many cases these more detailed findings have been restricted to local populations and do not allow consideration of changes over time [30, 31] and as yet we lack data sets which combine detail with size and availability of data for different time periods.

The findings suggest that policy changes influence the residential choices of older people and that more specifically, the NHS and Community Care Act and other reforms in the 1990s led to a reduction in institutional admission **and that those who were admitted had a poorer health status overall than people entering institutional care in previous decades.** Among women the balance between institutional and co-resident family care also shifted slightly towards the latter in the 1991-2001 decade (although not back to the 1971-81 level), but also towards living alone (or with a spouse). **The targeting of community services on those deemed most at risk of institutional admission, which included increases in hours of help provided for this group, [26] may have enabled more people to remain in the community for longer, even if living alone or just with a spouse.** Overall chances of living with relatives were lower in 1991-2001 than in previous decades suggesting other influences driving a continued trend towards increased residential independence among older people. International comparisons would improve our ability to identify these differing drivers, and perhaps identify more clearly the effects of policy. Finally, despite the high mortality of residents in institutions, it is noteworthy that 36% of women and 26% of men in institutional care in 2001 were still alive three years later, a finding relevant to both families and service providers planning financing of care.

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Table 1. Distribution of 1971-81, 1981-91 and 1991-2001 samples by socio-demographic characteristics.

	1971-81		1981-91		1991-2001	
	Men	Women	Men	Women	Men	Women
Mean age ¹ (SD)	69.5 (4.1)	70.6 (4.7)	70.0 (4.3)	71.2 (5.0)	70.0 (4.4)	71.2 (5.0)
Owner occupier ¹ (%)	58.4	52.7	61.3	56.0	72.6	65.8
Tenant ¹ (%)	41.6	47.7	38.7	44.0	27.4	34.2
Married ² (%)	61.2	20.2	63.8	23.8	63.6	25.9
Never-married ² (%)	6.1	13.0	5.4	10.1	5.5	7.0
Wid./div ² (%)	32.7	66.8	30.8	66.2	30.9	67.1
N	8,482	17,259	10,971	20,978	13,587	23,107

¹ At start of decade; ² at end of decade.

Source: Analysis of ONS Longitudinal Study data.

Table 2. Distribution by household type at start and end of decade, men and women aged 65 and over at start of decade, 1971-81; 1981-91 and 1991-2001.

<i>Household type at start of decade</i>	<i>Household type at end of decade</i>				
	Solitary/ couple alone	Other family /complex	Institution	N	%
MEN					
1971-81					
Solitary	81.7	10.3	8.0	887	10.5
Couple alone	90.8	6.5	2.7	5,175	61.0
Family	47.7	50.8	1.6	1,590	18.7
Complex	28.0	63.9	8.1	829	9.8
All	75.7	20.8	3.6		
N	6,416	1,763	302	8,481	
1981-91					
Solitary	82.8	7.1	10.1	1,386	12.7
Couple alone	92.4	4.0	3.6	7,163	65.5
Family	50.3	47.4	2.3	1,664	15.2
Complex	37.2	50.8	12.0	726	6.6
All	81.1	14.1	4.8		
N	8,871	1,544	524	10,939	
1991-2001					
Solitary	85.28	4.3	10.4	1,895	14.0
Couple alone	92.86	3.8	3.3	9,116	67.3
Family	48.68	49.3	2.1	1,888	13.9
Complex	39.44	52.9	7.7	639	4.7
All	83.1	12.5	4.3		
N	11,252	1,698	588	13,538	
WOMEN					
1971-81					
Solitary	81.8	8.3	9.9	5,899	34.2
Couple alone	86.8	8.5	4.7	6,081	35.3
Family	27.8	69.2	3.0	2,295	13.3
Complex	27.8	63.9	8.2	2,974	17.2
All	67.1	26.08	6.9		
N	11,566	4,499	1,184	17,249	
1981-91					
Solitary	79.7	5.6	14.7	8,117	38.8
Couple alone	88.2	4.8	7.0	8,182	39.1
Family	32.0	62.9	5.0	2,345	11.2
Complex	34.4	53.3	12.4	2,280	10.9
All	72.7	16.9	10.3		
N	15,218	3,542	2,164	20,924	
1991-2001					
Solitary	81.5	4.9	13.6	9,237	39.9
Couple alone	89.6	4.4	6.0	9,937	42.9
Family	31.5	63.7	4.8	2,317	10.0
Complex	33.1	55.1	11.8	1,674	7.2
All	76.5	14.2	9.3		
N	17,723	3,285	2,157	23,165	

Source: Analysis of ONS Longitudinal Study data.

Table 3. Results from multinomial regression models of transitions between household types 1971-81; 1981-91 and 1991-2001, men and women aged 65 and over at start of decade.

	<i>Household type at end of decade</i>					
	Institution vs. solitary/couple alone		Family/complex vs. solitary/couple alone		Institution vs. Family/complex	
	RRR	95% C.I	RRR	95% C.I	RRR	95% C.I
MEN						
Age	1.16***	1.15-1.17	1.05***	1.04-1.06	1.10***	1.09-1.12
<i>Household type</i> ¹						
Solitary (Ref.)	1.00		1.00		1.00	
Couple alone	0.94	0.81-1.10	1.18*	1.02-1.37	0.80*	0.66-0.98
Family	1.47***	1.15-1.87	27.02***	23.20-31.46	0.05***	0.04-0.07
Complex	3.72***	3.04-4.55	26.24***	22.37-30.77	0.14***	0.11-0.18
<i>Housing tenure</i> ¹						
Owner occupier	1.00		1.00		1.00	
Tenant	1.44***	1.27-1.60	0.88**	0.81-0.95	1.63***	1.43-1.85
<i>Marital status</i> ²						
Married (Ref.)	1.00		1.00		1.00	
Never-married	5.86***	4.64-7.41	2.32***	1.96-2.74	2.53***	1.95-3.27
Wid./divorced	4.75***	4.11-5.49	2.74***	2.51-2.99	1.73***	1.48-2.04
<i>Period</i>						
1971-81	0.71**	0.68-0.92	1.38***	1.26-1.52	0.57***	0.49-0.68
1981-91 (Ref.)	1.00		1.00		1.00	
1991-2001	0.84**	0.74-0.96	0.94	0.86-1.03	0.90	0.78-1.04
N	32,915		32,915		32,915	
WOMEN						
Age	1.18***	1.17-1.19	1.06***	1.05-1.07	1.12***	1.11-1.12
<i>Household type</i> ¹						
Solitary (Ref.)	1.00		1.00		1.00	
Couple alone	1.07	0.99-1.15	1.34***	1.24-1.46	0.79***	0.71-0.88
Family	1.96***	1.71-2.25	42.30***	38.94-45.94	0.05***	0.04-0.05
Complex	2.49***	2.25-2.75	25.88***	23.91-28.01	0.10***	0.09-0.11
<i>Housing tenure</i> ¹						
Owner occupier (Ref.)	1.00		1.00		1.00	
Tenant	1.20***	1.13-1.27	0.85***	0.80-0.89	1.41***	1.31-1.52
<i>Marital status</i> ²						
Married (Ref.)	1.00		1.00		1.00	
Never-married	4.58***	3.94-5.32	2.28***	2.01-2.53	2.03***	1.71-2.42
Wid./divorced	3.29***	2.91-3.71	2.59***	2.39-2.80	1.27***	1.11-1.46
<i>Period</i>						
1971-81	0.75***	0.70-0.82	1.48***	1.39-1.58	0.51***	0.47-0.56
1981-91 (Ref.)	1.00		1.00		1.00	
1991-2001	0.78***	0.73-0.84	0.90**	0.84-0.96	0.87**	0.80-0.95
N	61,237					

¹ At start of decade; ² at end of decade.

Source: Analysis of ONS Longitudinal Study data. * p<0.05; ** p<0.01; ***p<0.001

Table 4. Results from Poisson regression analysis of mortality by household type at start and end of relevant decade, 1981-85; 1991-95 and 2001-05, men and women aged 65 and over at start of decade.

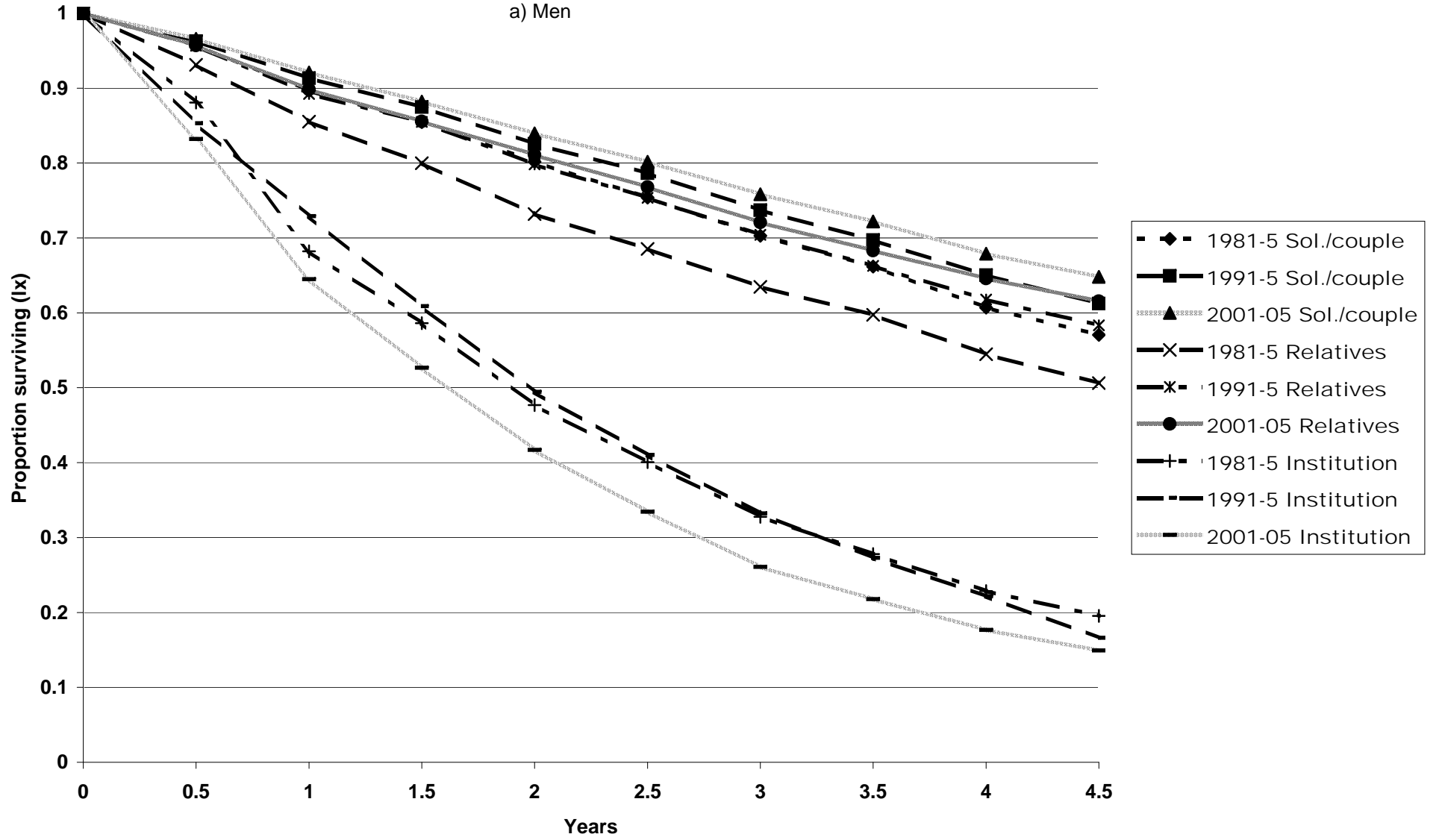
	1981-85		1991-95		2001-05	
<i>MEN</i>	IRR	95% C.I.	IRR	95% C.I.	IRR	95% C.I.
Age	1.04***	1.04-1.05	1.03***	1.03-1.04	1.08***	1.08-1.09
Owner occupier (Ref.)	1.00		1.00		1.00	
Tenant	1.04	0.99-1.10	1.08**	1.03-1.14	1.25***	1.18-1.33
Household type at start of decade						
Solitary (Ref.)	1.00		1.00		1.00	
Couple alone	1.04	0.94-1.15	1.02	0.93-1.11	0.98	0.90-1.08
Family	1.04	0.92-1.17	0.97	0.87-1.09	1.00	0.88-1.13
Complex	1.02	0.90-1.16	0.98	0.86-1.10	0.94	0.81-1.09
Household type at end of decade						
Solitary/couple (Ref.)	1.00		1.00		1.00	
Family/complex	1.08	0.99-1.17	1.07	0.98-1.16	1.10	1.00-1.21
Institution	1.91***	1.68-2.18	2.19***	1.98-2.29	2.80***	2.53-3.09
Marital status						
Married (Ref.)	1.00		1.00		1.00	
Single	1.04	0.91-1.19	1.00	0.88-1.15	1.11	0.96-1.28
Widowed/divorced	1.10**	1.03-1.18	1.02	0.96-1.08	1.11*	1.03-1.18
Number of deaths	1162		1230		1204	
<i>WOMEN</i>						
Age	1.04***	1.04-1.04	1.04***	1.04-1.04	1.09***	1.09-1.09
Owner occupier (Ref.)	1.00		1.00		1.00	
Tenant	1.04	1.00-1.08	1.04	1.00-1.08	1.20***	1.15-1.26
Household type at start of decade						
Solitary (Ref.)	1.00		1.00		1.00	
Couple alone	0.99	0.93-1.04	0.97	0.93-1.02	1.03	0.97-1.10
Family	0.93	0.87-1.01	0.96	0.89-1.04	0.99	0.90-1.08
Complex	0.98	0.91-1.05	1.01	0.95-1.09	1.03	0.94-1.13
Household type at end of decade						
Solitary/couple (Ref.)	1.00		1.00		1.00	
Family/complex	1.15***	1.08-1.22	1.10**	1.04-1.17	1.25***	1.15-1.35
Institution	1.85***	1.72-1.99	1.97***	1.86-2.09	2.85***	2.68-3.03
Marital status						
Married (Ref.)	1.00		1.00		1.00	
Single	0.98	0.90-1.07	0.97	0.89-1.05	1.04	0.93-1.16
Widowed/divorced	0.99	0.93-1.05	1.02	0.97-1.08	1.08*	1.00-1.15
Number of deaths	1596		1705		1641	

Source: Analysis of ONS Longitudinal Study data.

* p<0.05; ** p<0.01; ***p<0.001

Figure 1. Survival (proportion surviving) by living arrangement at census, 1981-5, 1991-5 and 2001-05.

a) Men



b) Women

