Socio-demographic influences on survival in institutional care: a comparison of
Belgium and England & Wales

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Introduction

In this paper we use census and linked mortality data for a 1% sample of the population of England and Wales and the whole population of Belgium to examine variations in the subsequent survival of older people resident in various forms of institutional care in 2001. The main research question addressed is whether socio-demographic factors known to be associated with greater risks of entry to institutional care are also associated with subsequent longer survival (implying a different health threshold for admission) and whether this patter in similar in the two countries considered.

Background

In European countries most long-term care for older people with disabilities is provided by family members, sometimes working in partnership with state or privately funded home care services, in the community. However, care in a residential setting is an important component of long-term care for older people with serious disabilities, particularly for those lacking family resources. Institutional care is a costly resource and it is important that funders and providers of residential and nursing home facilities and related services and products have robust data enabling them to plan appropriate levels of provision. This requires information on both rates of admission and durations of stay, as these jointly determine the overall size of the population in institutional settings, as well as on variations by socio-demographic characteristics. Although an individual's length of stay in residential or nursing home care will depend on his or her particular health status and circumstances, people making long term financial plans for themselves or their families may also wish to know about average durations of stay. Finally, analyses of differentials in survival in institutional settings may provide insights into socio-demographic variations in thresholds for admission and comparative studies may provide further information on the influence of both macro level and individual factors, and their interaction.

Previous studies have shown a strong association between disability, especially cognitive impairment, and institutional admission or residence. A national survey conducted in England in 2000, for example, showed that 75% of those in care homes were severely disabled (Bajekal, 2000). A more detailed 2003 survey of residents in UK residential and nursing homes managed by the largest not-for –profit provider found that half of all residents had dementia, stroke or other neurodegenerative disease (Bowman et al, 2004). Family or social reasons were identified among reasons for admission for 9% of nursing home and 20% of residential home residents, but fewer than 10% of residents had no identifiable clinical condition leading to admission. However, not all seriously disabled elderly people enter institutional care and some studies suggest that there is a

still a small minority of who are not seriously disabled. In short, although serious disability is the major driver of institutional admission, other factors, such as availability of social and socio-economic resources, are also relevant.

There are several reasons why socio-economic and socio-demographic factors might be associated with admission rates including the well-established association between socio-economic status and disability. Additionally those with greater socio-economic resources are better placed to pay for additional home care and home adaptations which may enable them to postpone or avoid institutional admission. Demographic factors, especially marital status, are very important as it is well established that most extra- institutional care for older people with disabilities is provided by close relatives. Previous studies in England & Wales have shown that housing tenure, marital status and household composition, and among women, parity are all associated with diferntitials in entry to institutional care (Grundy 1992; Grundy and Glaser 1997; Grundy and Jitlal, 2007).

Aims and hypothesis
The present study has the following aims:

1. To analyse survival durations for older people resident in communal establishments at the 2001 Census (length of follow up to 2009 for England & Wales; to 2006 for Belgium)
2. To analyse variations in survival by factors associated both with mortality and with risk of admission to institutional care
3. To test the hypothesis that socio-demographic factors associated with a greater risk of admission to institutional care (such as being never-married) will be associated with longer survival due to a lower poor health threshold for entry to care.
4. To compare patterns and differentials in the two countries and identify any differences possibly related to aspects of the macro context.

Data and Methods
Nationally representative survey data on the population in communal establishments are generally sparse as this group are often omitted from surveys and are relatively few in number (although in many Northern and Western European countries they constitute a sizeable proportion of the oldest old). Longitudinal survey data, needed to provide information on subsequent mortality, are even more problematic as large samples are needed to include sufficient numbers in these groups and even in studies which are designed to 'follow' people subsequent to admission to institutional care loss to follow up may be a serious problem as this type of transition is often associated with dissolution of the original household. Census based record linkage systems and population registers generally lack the detailed information on specific medical conditions and socio-demographic circumstances available in some survey based sources, but nevertheless have important advantages for studying this population group. In particular they cover the whole population or have large sample sizes and much better capture of subsequent mortality. In this paper we use data from the whole population of Belgium and from a 1% sample of the population of England & Wales. The Belgium data come from the continuous population register linked to census data for 2001 and 1991. The study populations considered here are people who in 2001 were aged 65 and over and then resident in various institutional settings who had been present in the 1991 Census; small numbers of immigrants since 1991 are therefore excluded. . These

amounted to 84,083 people in the Belgium population of whom 50,496 died within 4 years and 4,004 (3,950 with complete information on variables used in the analysis) in the 1% E&W sample of whom 3,658 (3,610) died before end of follow-up on 31.12.2009.

Measures

In England & Wales institutional, or communal, establishments were defined in the 2001 Census as those providing managed residential accommodation with 'managed' meaning full or part-time supervision (Office for National Statistics 2004). Institutional residence was defined similarly in the Belgium Census. We exclude temporary residents of establishments, such as acute care hospital inpatients.
2001 variables drawn from the Census included demographic information, namely sex, age (in single years) and marital status (never-married; married; widowed; divorced/separated/). In Belgium we also distinguished those widowed in the previous five years from those with longer durations of widowhood. Information on self-rated health (good, fair, or poor) was also available from this Census for both countries, although in Belgium this was missing for some of the population. We also distinguished between types of establishment type (nursing home; residential home; other). 'Other' includes all other types of collective households, such as psychiatric institutions and prisons; in Belgium those in convents and monasteries were excluded (those groups are included in England & Wales but are very small). Information from the 1991 Census was included to provide some data on socio-economic status. For both countries information on housing tenure (home owner versus tenant) was available; in Belgium data on educational level (any qualification versus none) was also collected in the census (in England & Wales the 1991 Census collected information on higher level educational qualifications which and only a very small proportion of older people had and addressed these questions only to those then aged 75 and younger). Date of death in both sources was available from linked vital registration data.

Analysis

We firstly present some descriptive information about the study populations and then analyse differentials in survival showing Kaplan-Meir survival plots and results from Cox proportional hazards models of survival.

Results
Table 1 shows the distribution of the England & Wales and Belgian populations in communal establishments in 2001 by gender, marital status, self rated health and the housing tenure they had occupied in 1991. In comparison with England & Wales, a much higher proportion of the Belgian population were in establishments classed as nursing rather than residential homes; however this may represent a different use of terminology rather than any real difference in type of care offered. Distributions by self-rated health aslk9o varied by country, only comparison is difficult as a third of the Belgian sample had missing data for this variable; it is likely that this group were in poor health. Distributions by gender, marital status, and 1991 housing tenure were similar, as was the distribution by age group (not shown).

Figures 1 a –e show Kaplan-Meier survival estimates for both populations by the main socio-demographic variables considered. Comparisons are complicated by the different lengths of

follow-up considered here but in both populations survival post 2001 was strongly differentiated by age group and men had lower survival than women, particularly in Belgium. In both populations those in residential homes had better survival than nursing home residents, this differential was sharper in Belgium where the proportion in residential homes was longer (and the two types of home may be more sharply delineated than in England & Wales). Differentials by self-rated health show no differences between the 'good' and 'fairly good' categories in England & Wales, although in Belgium the 'good' group had better survival than those reporting their health to be 'fair'. The large proportion of the Belgium population with missing self-rated health had the poorest survival. Variations by marital status show survival advantages for never-married and women in Belgium and never-married in England & Wales. However, among women in England & Wales survival was slightly better for divorced women than the never-married. In both populations long term residents of institutions, already in a collective household in 1991, tended to have the highest survival probability. This group may include people whose reasons for residence in a collective establishment were less strongly related to health, they also represent by definition a survivor population as by 2001 they had already been in an institution for at least ten years.

Table 2 shows results from the Cox proportional hazards modelling of mortality. In this analysis we also included a variable indicating educational status for the Belgium population. This measure, taken from the 2001 Census or the 1991 Census if missing in 2001, distinguished those who completed their education before and after the age of 14. Unfortunately similar information is not available for England & Wales. Results show that in both countries older age and being male were significantly associated with raised hazard of dying, although in Belgium the effect of being male seemed stronger. In both populations ratios for unmarried or formerly married groups were raised compared to the reference never-married group; were lower for those in 'other' types of communal household and for those in residential, rather than nursing, homes and for those already in an institution in 1991. However, the mortality of former tenants was not significantly different from that of former owner occupiers. In Belgium lower education was associated with higher mortality. In both Belgium and England & Wales those reporting poor health in 2001 had higher mortality than the reference category of people reporting good health, although ratios were relatively higher in Belgium than in England & Wales and in Belgium those reporting fair health, and those with missing information, also had raised hazard ratios.

Discussion

Overall this comparative analysis shows strong similarities between Belgium and England & Wales in terms of the characteristics of the older population resident in various types of institutional care in 2001 and their subsequent survival. In both cases older age and being male were associated with lower survival, as in the general population. However differentials by marital status in the institutional population are reversed from those normally seen in general or community populations, thus in this study people who were married in 2001 had lower survival than the never-married. This is consistent with the hypothesis that older people with a spouse have a higher disability threshold for entry to residential or nursing home care. The lower survival of the formerly married compared with the never-married suggests that availability of children may also be relevant. Previous research has shown that in England & Wales and other UK countries, tenants have higher risks of admission to institutional care than owner occupiers. This might also suggest some differential in health threshold effects (although actual differences in disability are also likely to be important). If so we might expect that former tenants in communal establishments in 2001

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would have had lower mortality than former owner occupiers. However we found no evidence for this and in Belgium low mortality was associated with raised mortality. Further work will clarify whether in Belgium, as in England and Wales, there are socio-economic variations in admissions to institutional care. In both countries of those aged 80-84 in 2001, about half of men survived for another two years and about half of women survived for three subsequent years. This information for personal as well as policy planning and indicates the importance of paying attention to the quality of life of those in institutional care, as well as those outside it. Given that in some European countries the proportion of older old in this form of living arrangement is quite high, it is also important that they are included in analysis and projections of mortality.

Table 1. Distribution of the population in communal establishments in 2001; England & Wales and Belgium.

	England & Wales		Belgium	
	%	N	%	N
TOTAL SAMPLE	**100**	**4,004**	**100**	**84,083**
GENDER				
Men	24.8	991	20.9	17,538
Women	75.3	3,013	79.1	66,545
MARITAL STATUS				
Never-married	17.5	699	18.0	15,121
Married	10.6	423	7.2	6,054
Divorced/separated	3.4	135	4.8	4,016
Widowed	68.6	2,747	70.0	58,892
For longer than 5 years			58.8	49,479
Within the last 5 years			11.2	9,413
SELF RATED HEALTH				
Good	21.3	844	13.3	11,144
Fair	36.4	1,439	30.9	25,985
Poor	42.2	1,667	22.1	18,613
Missing			33.7	28,341
ESTABLISHMENT TYPE				
Nursing home	36.8	1,473	60.4	50,751
Residential home	54.3	2,175	33.3	28,020
Other type of establishment	8.9	356	6.3	5,312
HOUSING TENURE IN 1991				
Owner-occupier	44.6	1,785	49.1	41,294
Tenant	33.5	1,341	40.1	33,695
Communal establishment	10.1	403	10,8	9,094
Missing	11.9	475		

Figure 1: Survival of the E&W institutional population 2001-2009 and Belgium institutional population 2002-2006 by sex and 2001 socio-demographic characteristics.
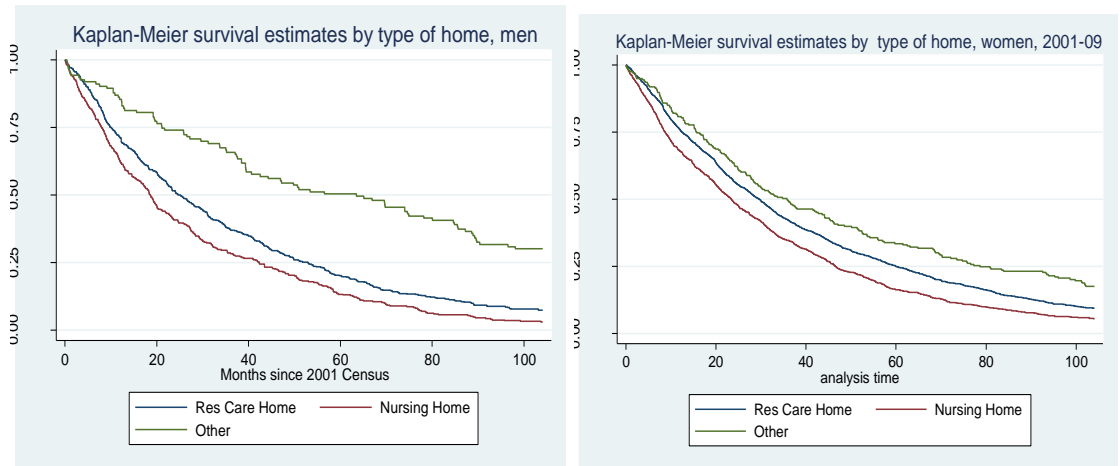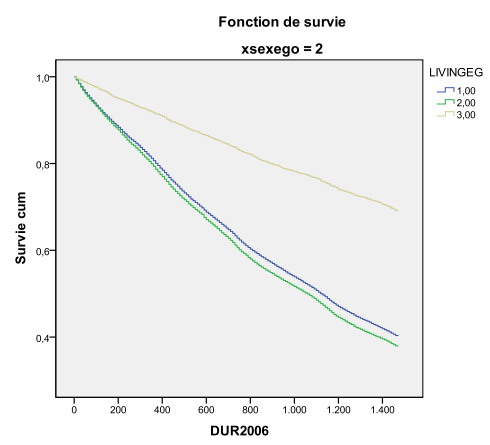
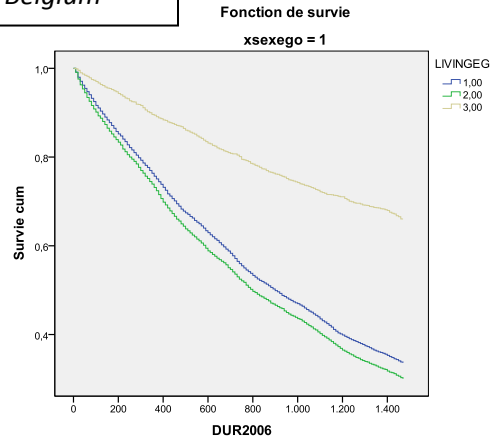**1a) Survival by age group**
England & Wales
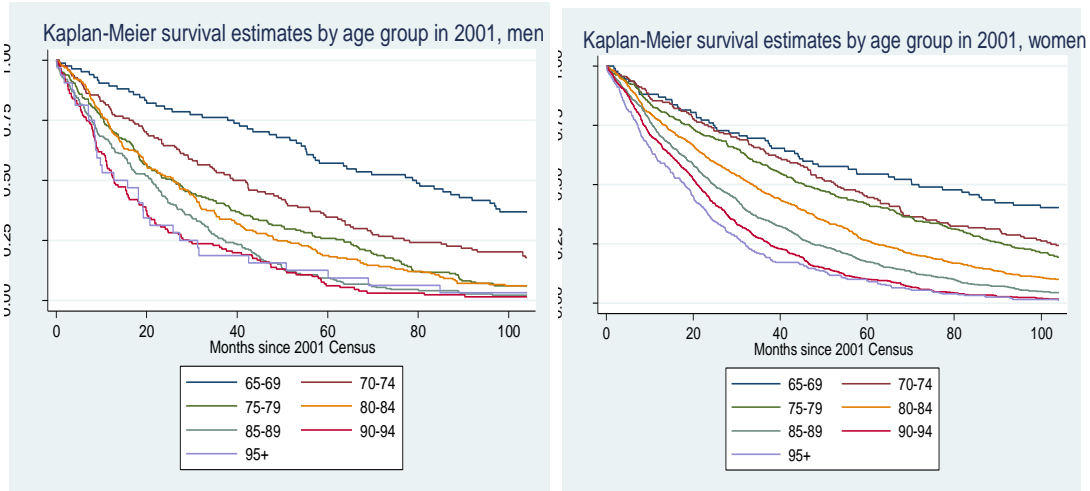
Belgium
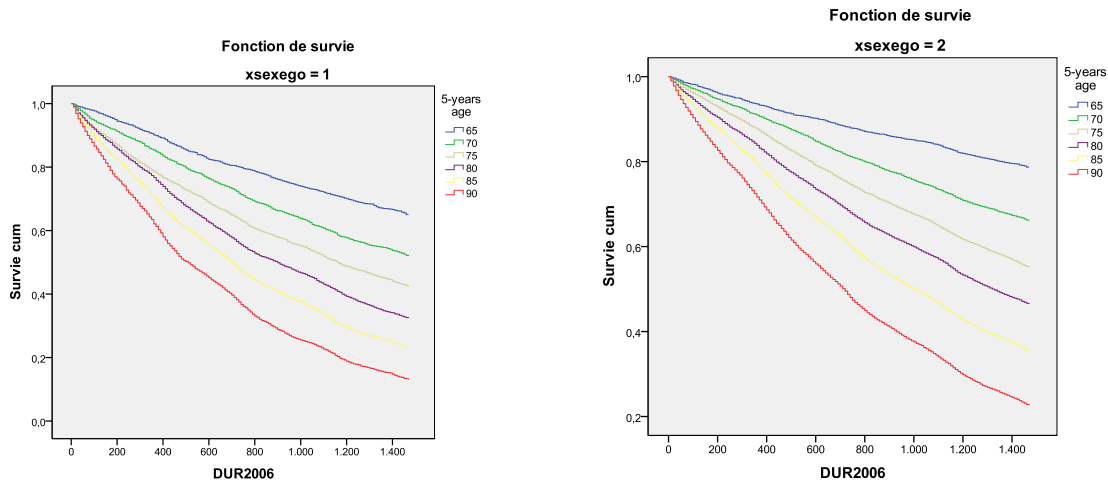
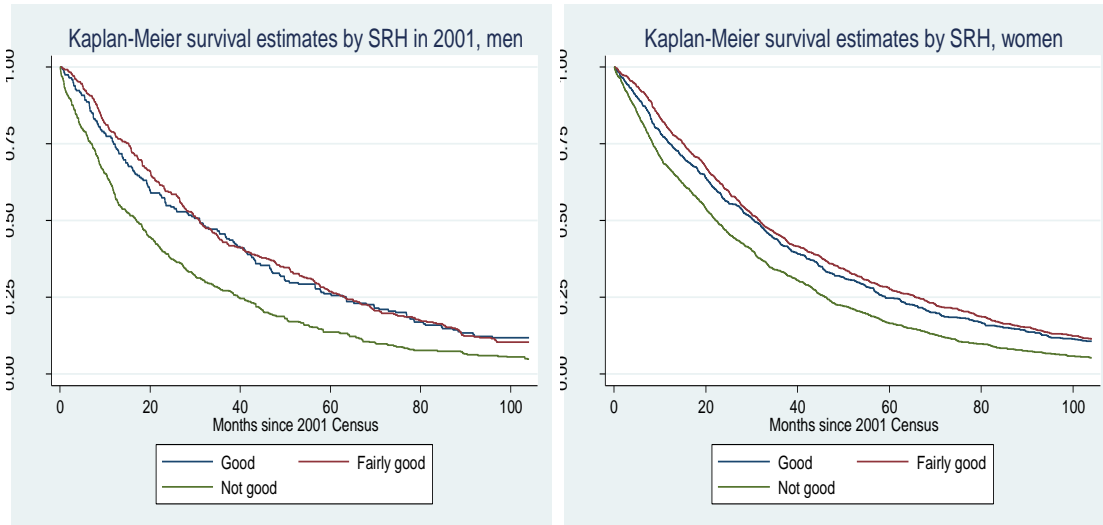# Figure 1 b: Survival by type of home
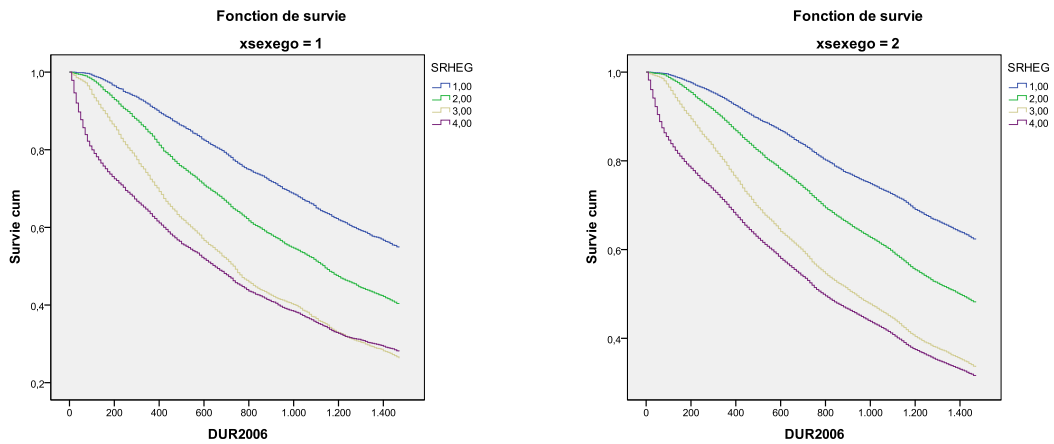
England & Wales

1 = Residential care
2 = Nursing Home
3 = Other

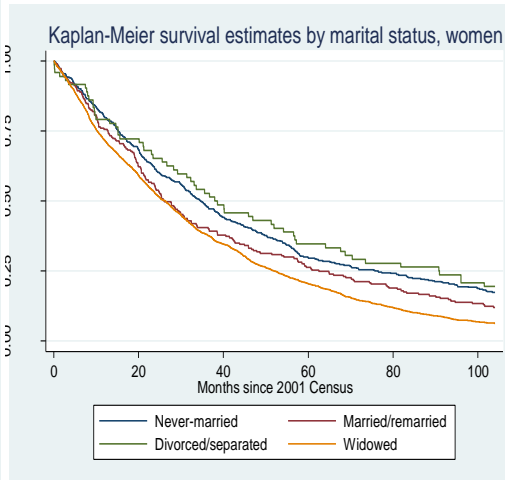# Figure 1c: Survival by self-rated health
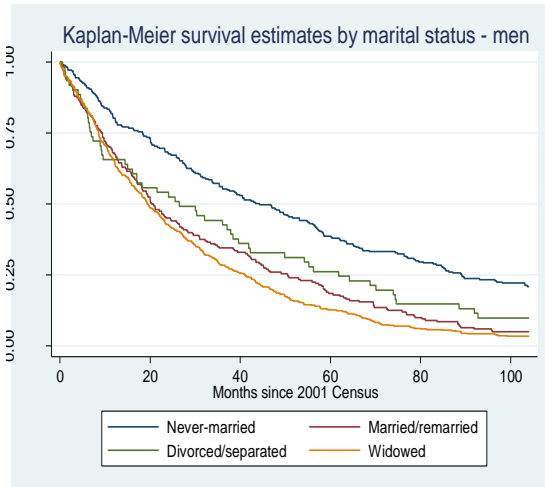
England & Wales
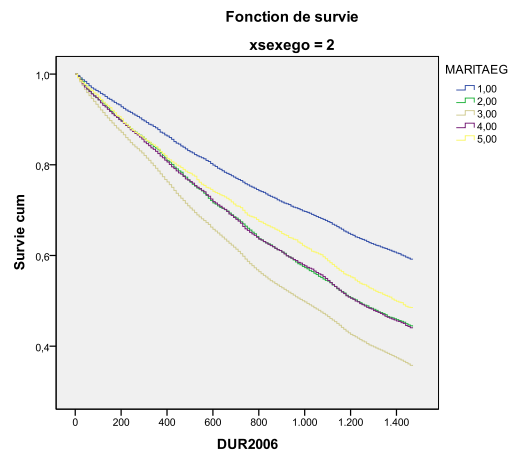

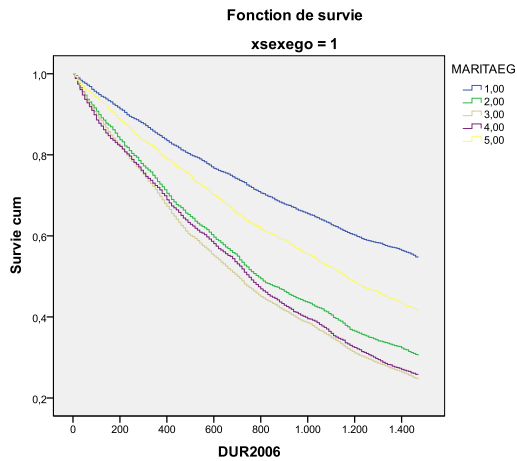*Belgium*

1 = Good
2 = Fair
3 = Bad
4 = Missing

1d. Survival by marital status in 2001
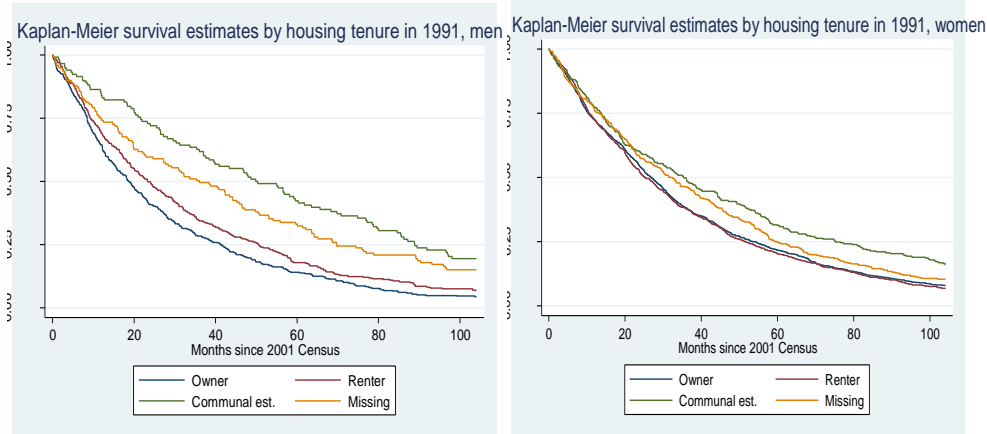*England & Wales*

Belgium

1 = Single
2 = Married
3 = Old widow
4 = Recent widow
5 = Divorced or separated

1.e Survival by housing tenure in 1991

England & Wales

Kaplan-Meier survival estimates by housing tenure in 1991, men

Kaplan-Meier survival estimates by housing tenure in 1991, women

Belgium

Fonction de survie

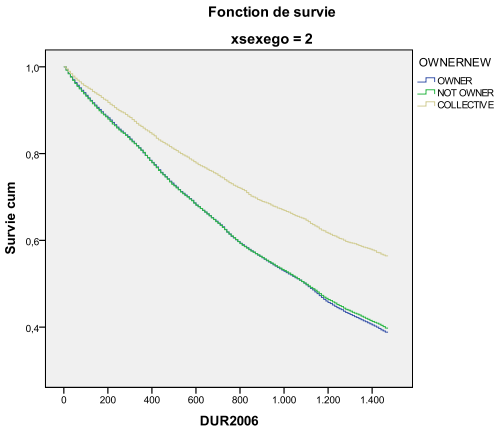xsexego = 1
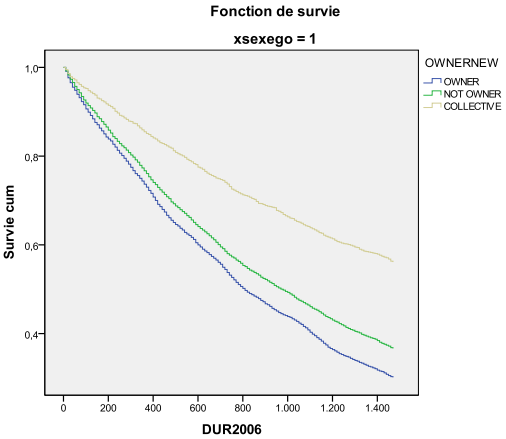
Fonction de survie

xsexego = 2

Table 2. Hazard ratios from Cox proportional hazards models of survival post 2001 among residents of communal establishments in England & Wales and Belgium in 2001

Covariates (2001)		ENGLAND & WALES 2001-2009	BELGIUM 2002-2006
Age (single years)		1.053***	1.054***
Sex (ref. men)	Women	0.710***	0.633***
Marital status (ref.single)	Married	1.325***	1.304***
	Div./sep.	1.289*	1.233***
	Widowed (old /recent in Belgium)	1.247***	1.283*** 1.243***
Self rated health (ref.good)	Fair	0.954	1.444***
	Poor	1.344***	2.121***
	Missing	n.a.	2.415***
Estab. Type (ref. Nursing home)	Residential home	0.842***	0.922***
	Other	0.634***	0.635***
1991 tenure (ref. Owner occupier)	Tenant	1.025	1.005
	Collective.	0.866*	0.898***
	Missing	0.868**	n.a.
Education (ref. high)	Low	n.a.	1.086***

Bajekal M. *Health Survey for England 2000: Characteristics of Care Homes and their Resident*s. London: The Stationery Office, 2002.

Bowman C, Whistler J, Ellerby M. A national census of care home residents. *Age and Ageing* 2004; 33:561-6.

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