Changes in living arrangement of the elderly population: data from population register

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1. Introduction

One of the most important symptomatic factors of wellbeing in old age is the existence of a network of relatives, support and care around the subject (Gierved, Tilburg, Lecchini,1995). Most of these significant relationships concern co-residence, although the enlarged network sometimes integrates, or even substitutes, these primary relationships. Often the need for care becomes urgent and continuous due to an illness or an event which the subjective physical, psychological and economic resources cannot cope with. In this case the existence of some form of network proves to be a precious resource to which the social and sanitary services can give support. On the other hand, where these links do not exist it is more difficult to keep the subject in his or her normal life context: a transfer from a domestic environment to a community environment is necessary, which in Italy's case almost invariably means to a home for the elderly.

In the elderly stages of life many events concerning the relational context of the person occur: to a greater extent these concern losses (death of parents, partner, siblings, or friends) and the social network therefore tends to weaken. Links that in the past were highly significant can grow weak (due to exit of children from family, to illnesses that prevent contact). However, there is no shortage of cases in which new relationships are created (with sons or daughters-in-law, grandchildren, nephews and nieces), even out with the circle of relatives: new friends met in community environments with whom common interests are found; institutional or private caregivers (helpers, nurses, physiotherapists), especially when health and autonomy are declining.

Limiting the field of observation to the circle of relationships which come into play in the ambit of family co-residence, it is possible to observe the profound changes that affect the structures of the families of the elderly as they grow older.

On the threshold of old age, the *Indagine Multiscopo sulle Famiglie 1998*[1] (Multipurpose Survey) estimates that between the ages of 65 and 69, about 59% of women and 85% of men live with their spouse and sometimes with children as well. Between the ages of 75 and 79 only 33% of females and 80% of males are in the same household condition: if this behaviour observed among contemporaries in 1998 were a cohort behaviour, between the starting data and data ten years on, profound existential upsets would have occurred during the life of those men and, to an even greater extent, of those women, still alive among their contemporaries. The substantial coherence of these cross-sectional data with the real behaviour of the cohorts can be exemplified by the observation, in successive surveys, of the same generations at later ages.

If we take the five generations born between 1919 and 1923 as an example, they appear in the Multipurpose Surveys of 1988, 1993 and 1998 respectively between the ages of 65 and 69, 70 and 74, and 75 and 79. In these cohorts 56% of women and 89% of men between the ages of 65 and 69 live with their

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[1] The presented data come from the processing of standard files supplied by ISTAT (the National Statistical Institute) concerning the surveys for 1988, 1993 and 1998 carried out in the field of different cycles of the Multipurpose Survey on Family. Data from the same Survey were used by Tomassini, Wolf (2000).

partner (and in part with children as well); while, as was seen, only 33% of women but 80% of men continue to live in the same condition of union (but less and less with children) ten years later, ten years older[2] (Figure 1).

The percentages of individuals in a condition of solitude is rather different: 7% of males live alone at the beginning of old age while about 13% do so 10 years later; 27% of women are already alone at the age of 65-69, and 43% are alone ten years later (Figure 2).

Figure 1 - *Percentage of the elderly who live in union (with or without children). Italy, 1919-23 cohorts*
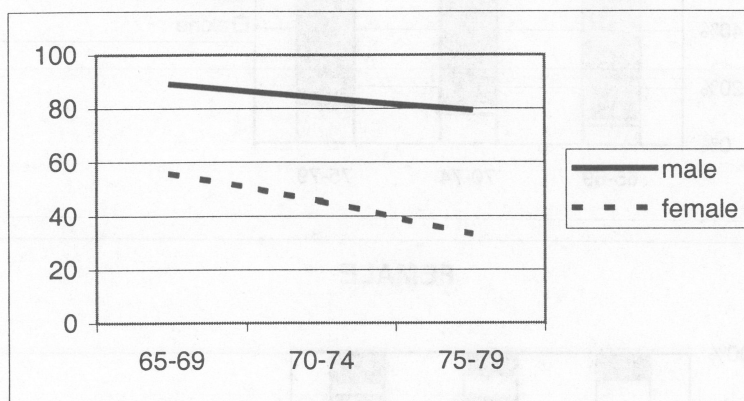
Source: ISTAT, *Indagine Multiscopo sulle Famiglie* 1988, 1993, 1998

Figure 2 - *Percentage of the elderly who live alone. Italy, 1919-23 cohorts*
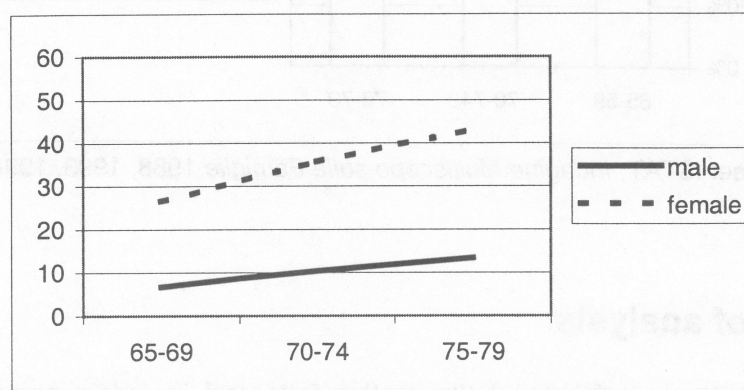
Source: ISTAT, *Indagine Multiscopo sulle Famiglie* 1988, 1993, 1998

Let us consider two other typical family forms for the elderly; belonging to a single parent family (in the great majority of cases as a parent or – very occasionally – as a son), and being in a household in which other members are present (whether they be in a family unit or not). If we also distinguish between

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[2] A broader analysis of the living arrangement of successive cohorts of elderly people taken from data supplied by the Multipurpose Survey is presented in Clerici, Mazzuco, Ongaro (2001).

couples with children and without, we can see how over time the composition relative to household forms for the elderly has evolved (Figure 3).

Figure 3 - *Percentage distribution of the elderly population by sex, age class and household form. Italy, 1919-23 cohorts*
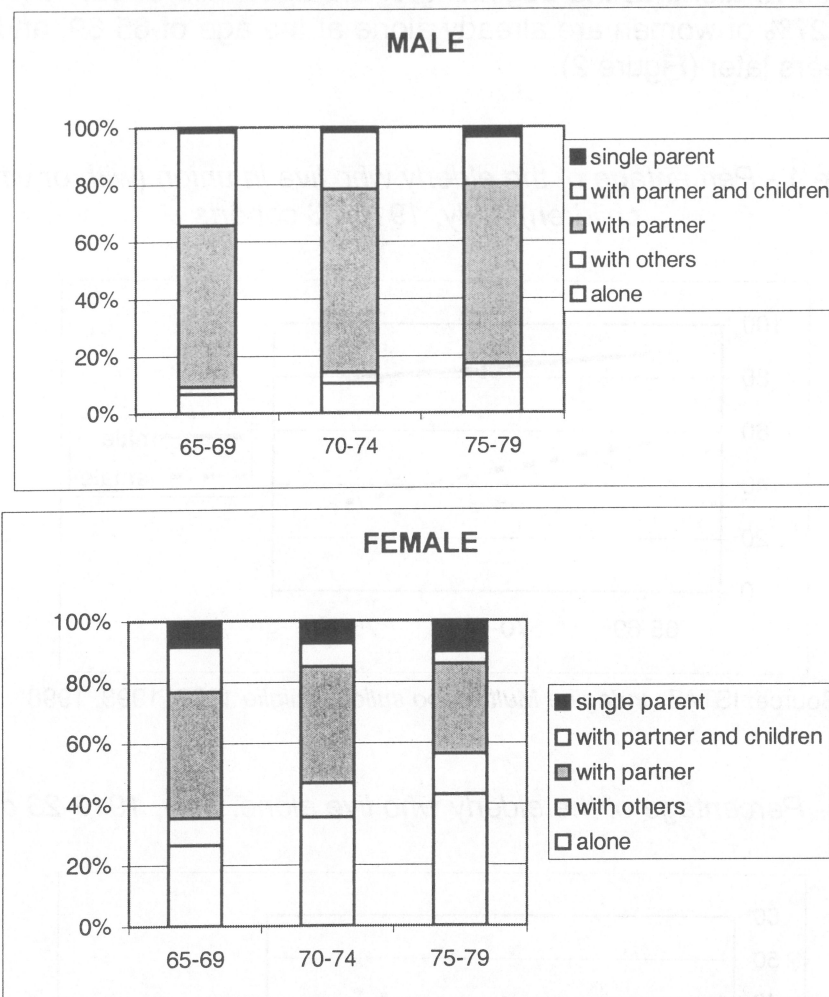

Source: ISTAT, *Indagine Multiscopo sulle Famiglie* 1988, 1993, 1998

2. Strategy of analysis

In order to better understand the paths followed in living arrangements at elderly ages, we tried to study them in an experimental way, using data supplied by the computerised population register (in Italy called *Anagrafe*), obtained thanks to the collaboration of the *Servizio Ecografico* of the City of Vicenza.

The initial project, to follow the subjects over the later stages of their life, proved to be unfeasible therefore the study was limited to the changes in living arrangement of all individuals over 65 (sometimes over 50), grouped into five-year classes, observed on two dates (31.12.1998 and 31.12.1999): a year later, a year older. Figure 4 shows how the information, used in the analyses that followed, was grouped.

Figure 4 - *Representation on the Lexis diagram of the form of the analysed event*
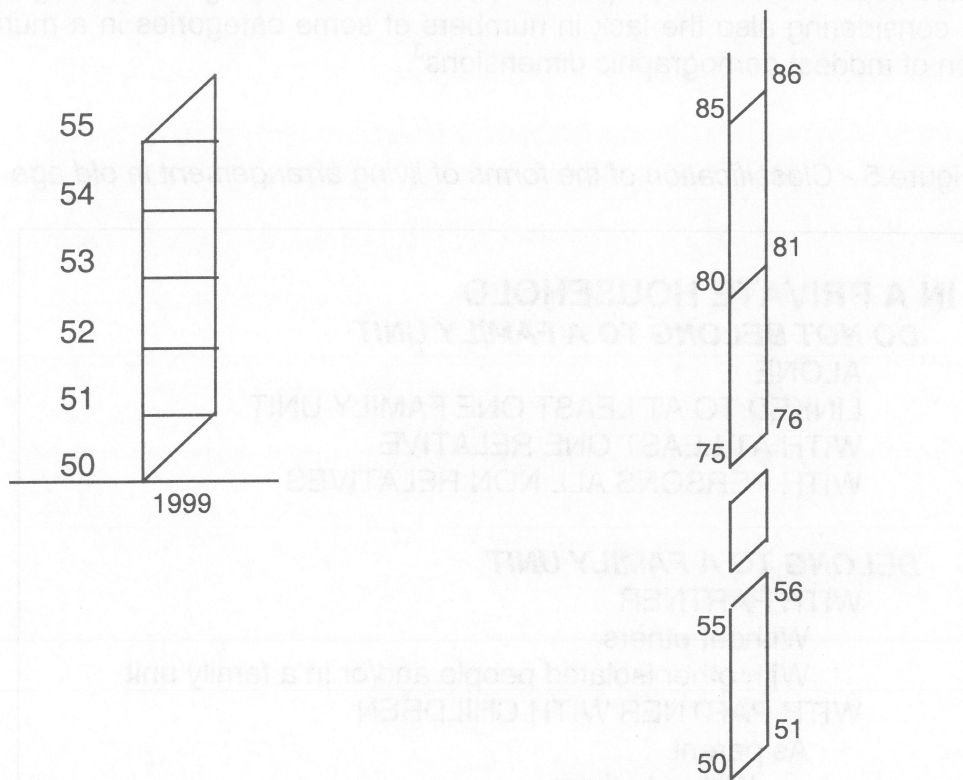
The work started with the construction of a classification of subjects capable of representing both those placed in a private household and those living in a institutional household; if within a household it was necessary to distinguish between insertion into a personal family unit or joining someone else's family, or insertion into a household with no family units (alone or in presence of others). In an early version the typology also considered roles within the family units (in particular the role of parent or son in single parent families) (Figure 5).
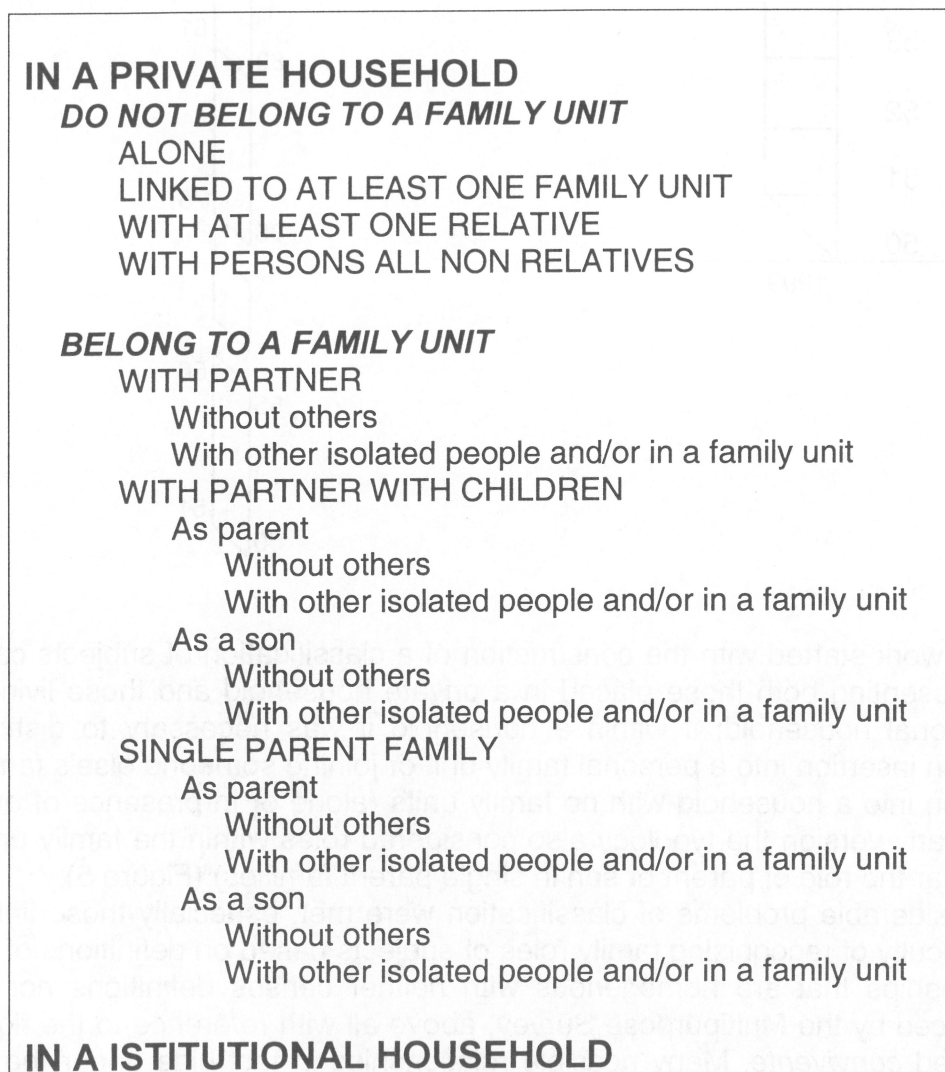
Considerable problems of classification were met, especially those linked to the difficulty of recognising family roles of subjects based on definitions of family relationships that are homogenous with neither census definitions nor those introduced by the Multipurpose Survey, above all with reference to the figure of so called *convivente*. Many possible relationships in fact hide under the same label:

- placement in institutional household
- living together as in marriage with householder
- living together as in marriage with another component of the household
- relative of person living together as in marriage with householder
- relative of person living together as in marriage with another component
- other person living together

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The cases in doubt were however resolved with checks for compatibility between the presumed relationship and other known characteristics (in particular sex and age).

In the following analysis the classification of the living arrangement is presented in an even more simplified form, aimed at making the reading of data easier, considering also the lack in numbers of some categories in a municipal situation of modest demographic dimensions[3].

Figure 5 - *Classification of the forms of living arrangement in old age*

IN A PRIVATE HOUSEHOLD
    DO NOT BELONG TO A FAMILY UNIT
        ALONE
        LINKED TO AT LEAST ONE FAMILY UNIT
        WITH AT LEAST ONE RELATIVE
        WITH PERSONS ALL NON RELATIVES

    BELONG TO A FAMILY UNIT
        WITH PARTNER
            Without others
            With other isolated people and/or in a family unit
        WITH PARTNER WITH CHILDREN
            As parent
                Without others
                With other isolated people and/or in a family unit
            As a son
                Without others
                With other isolated people and/or in a family unit
        SINGLE PARENT FAMILY
            As parent
                Without others
                With other isolated people and/or in a family unit
            As a son
                Without others
                With other isolated people and/or in a family unit

IN A ISTITUTIONAL HOUSEHOLD

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[3] On 1.1.1999 there were 109,026 individuals registered as residents and of these 21,779 elderly people (individuals 65 and over), of which 13,700 females.

3. Elderly population and living arrangement in Vicenza

Below can be found tables describing the composition by sex, age class and articulation in the various forms of living arrangement of the population aged 65 and over, resident in Vicenza at the beginning of 1999.

The elderly population of Vicenza has analogous characteristics to those of the entire Italian elderly population, with a more marked ageing (Table 1). This to some extent affects the frequency with which the various household forms occur: a greater presence of people living alone and in single parent families, and fewer forms of elderly people joining other relatives in a family unit (Table 2).

Table 1 - *Distribution of the elderly population resident in Vicenza on 31.12.1998 by sex and age class. Comparison with the resident population in a private household (excluding permanent members of institutional households), in Italy, according to the Multipurpose Survey 1998.*

| | WOMEN | | | MEN | | |
| | | in a private household | | | in a private household | |
age class	Vicenza total	Vicenza	Italy	Vicenza total	Vicenza	Italy
65-69	26,0	27,2	30,7	33,7	34,2	35,7
70-74	25,6	26,7	27,3	27,8	27,8	29,5
75-79	21,7	22,2	20,0	20,9	20,9	20,3
80-84	12,2	11,7	22,1	9,8	9,6	14,4
85 and over	14,5	12,2		7,9	7,4	
total	100,0	100	100,0	100,0	100	100,0
N.	13700	12583	5858426	8079	7808	4079094

Table 2 - *Form of living arrangement of the elderly population resident in Vicenza on 31.12.1998 by sex. Comparison with the resident population in a household (excluding permanent members of institutional household), in Italy, according to the Multipurpose Survey 1998.*

| | WOMEN | | | MEN | | |
| | | in a private household | | | in a private household | |
	Vicenza total	Vicenza	Italy	Vicenza total	Vicenza	Italy
alone	39,8	43,3	36,9	12,6	13,0	12,4
linked to one family unit	5,1	9,6	13,8	1,3	3,1	4,7
with others	3,8			1,7		
with partner	24,7	26,9	31,3	53,1	55,0	56,4
with partner and children	7,5	8,2	8,7	24,5	25,4	23,3
single parent	11,0	12,0	9,2	3,5	3,6	3,1
in institutional household	8,2	-	-	3,4	-	-
Total	100,0	100,0	100,0	100,0	100,0	100,0
N.	13700	12583	5858426	8079	7808	4079094

The Vicenza situation does not therefore seem too distant from the situation of the elderly Italian population as a whole. Which paths does the development of this situation tend to follow? The study of the transitions between forms of living arrangement can help to distinguish the elements of the change.

To reach this objective the population of Vicenza was conjointly classed by age class and form of living arrangement on 31.12.1998 and on 31.12.1999 using a record linkage of the two yearly data sets. We obtain many transition matrices of living arrangement with various levels of detail: by sex; by sex and age class (Casagrande, 2000).

The change can firstly be evaluated at an overall level, taking into consideration only the distinction between sexes.

We must firstly distinguish between the "stayers" and "movers" in the matrix of transition that classifies the subjects in two different instants: the first are positioned along the principal diagonal (and represented as n_{ij} for i=j), the others above and below the diagonal (Figure 6).

Figure 6 - *Transition matrix*

Time 0	Time 1		
	TYPE 1 . . . TYPE j . . .		
TYPE 1	n_{11} . . . n_{1j} . . .		$n_{1\bullet}$
.	. .		.
.	. .		.
TYPE i	n_{i1} . . . n_{ij} . . .		$n_{i\bullet}$
.	. .		.
.	. .		.
	$n_{\bullet 1}$ . . . $n_{\bullet j}$ . . .		n

The variation index (Hout, 1994), i.e. a first global measure of the propensity to change type of household, is obtainable from the relationship:

$$\text{Variation index} = 1 - \left(\sum \frac{n_{ij}}{n} \right), \quad \text{for i=j}$$

that when applied to the elderly population of Vicenza distinguished by sex (Table 3) provides the following values:

Variation index (males) = $1 - 0,898 = 0,102$
Variation index (females) = $1 - 0,902 = 0,098$

It can be seen that the propensity to change, in general, is very similar between the two sexes although slightly higher for males: most residents maintained the same household condition in the year taken into consideration;

10% underwent a change. Since the transitions include those towards death, we can obtain a measure of the change "in life". This reduces by almost 50% the overall propensity to change of males, who thus show up to be less mobile in life transitions.

$$\text{Variation index in life (males)} = 1 - 0{,}948 = 0{,}052$$
$$\text{Variation index in life (females)} = 1 - 0{,}937 = 0{,}063$$

By constructing transition matrices and then variation indices in life as well as for sex and age class, we note how the "mobility" varies according to sex: it progressively grows from the age of 70 among women, while among men it tends to be very contained from the age of 70 and then slightly increases again after 85 (Figure 7).

Figure 7 - *Variation indices in life by sex and age class*
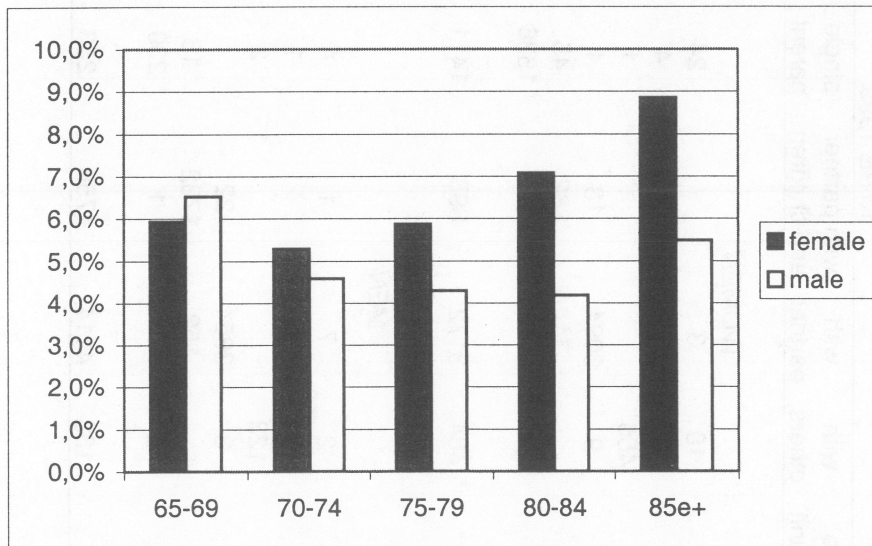
The propensity to remain in the same form of living arrangement varies therefore as age and sex vary, but it is also different for the different categories. There are more stable and more mobile forms. The category with the highest levels of stability is "alone" for females and "with partner without others" for males. The category "with partner, with children and others" presents opposing trends for the two sexes. For males the propensity towards stability grows as age increases, for females it decreases. Women, given their greater longevity, are obliged to undergo existential changes with greater frequency due to the loss of the husband.

Thus, among the various forms of living arrangement, some see an increase in the relative consistency in the age groups as they get older (above all "alone", "linked to a family unit" and "resident in institutional household"), others, on the other hand, tend to disappear ("with partner and children", "single parent family as a son"). We can analyse the course of the probability of a move from various categories towards those more greatly absorbent, calculating the line percentages in the outflow matrices for sex and five-year

Table 3 - Transition matrix of living arrangement of the population aged 65 and over resident in Vicenza between 31.12 1998 and 31.12.1999, by sex

TYPE 1998	TYPE 1999									
	alone	linked to a family unit	with others	with partner	with partner and children	single parent	institutional household	emigrant	death	Total
WOMEN										
alone	5085	22	10	3		24	44	73	187	5448
linked to a family unit	15	599	8	1	2	4	6	17	44	696
with others	31	2	455			1	3	5	19	516
with partner	183	10	9	3094	13	1	6	14	58	3388
with partner and children	5	1		74	882	45		3	14	1024
single parent	78	8	2		1	1336	10	11	65	1511
in institutional household							904	82	131	1117
Total	5397	642	484	3172	898	1411	973	205	518	13700
MEN										
alone	906	1	2	7	1	4	7	18	72	1018
linked to a family unit	1	88	3	1		1		1	11	106
with others	7		123			2	1	1	6	140
with partner	69		3	3954	22		11	20	209	4288
with partner and children	1			152	1732	16	3	7	66	1977
single parent	21	4	2		1	230	1	5	15	279
in institutional household							226	4	41	271
Total	1005	93	133	4114	1756	253	249	56	420	8079

age classes. Analogously we could observe the tendency of the exit rate from the categories that expel more greatly towards other categories, drawing the column percentages from the inflow matrices. In the descriptions of the graphs and in the comments that follow it is suggested that the change in living arrangement is uniquely a result of the effect of age, i.e. that in a fictitious cohort of people of 50 and over we would have the transitions observed on the periods of cohorts observed in 1999[4].

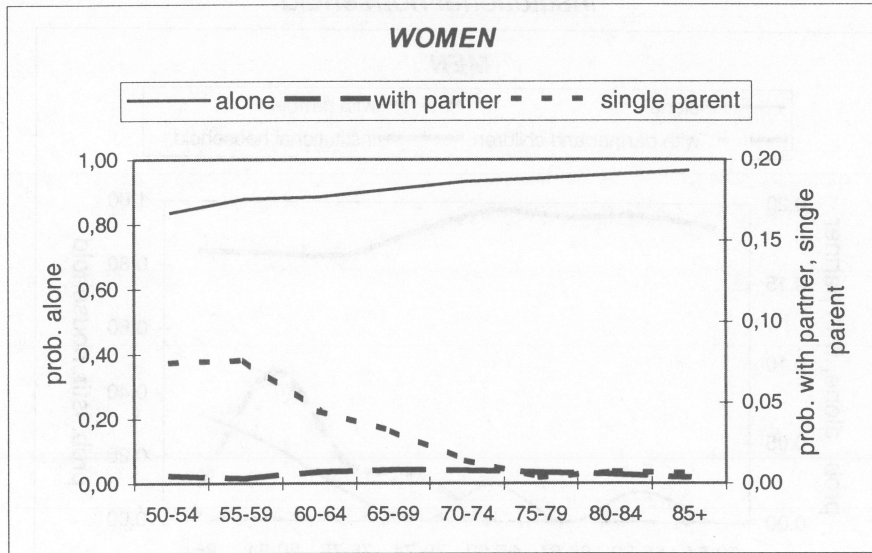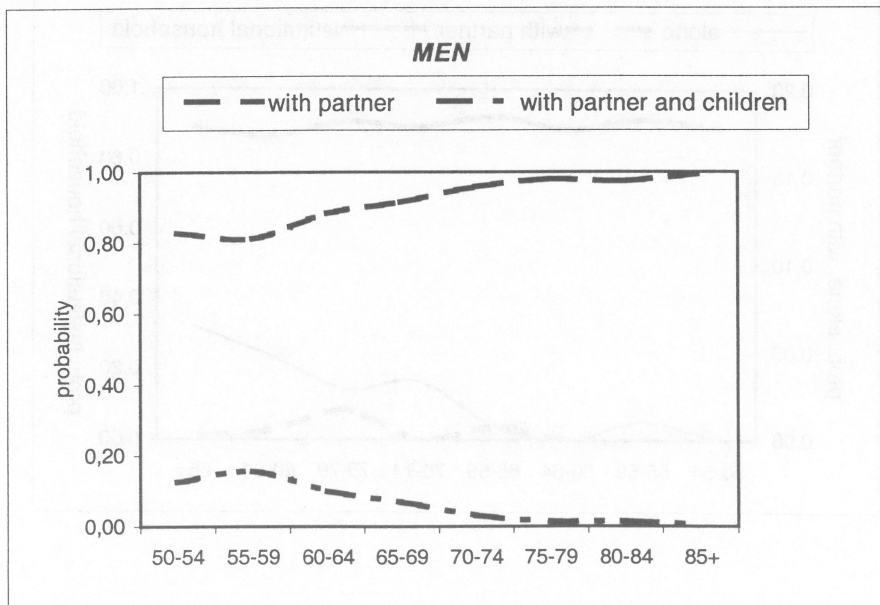Figure 8 - *Probability of changing from the various categories to "alone"*

Figure 9 - *Probability of changing to "with partner without others"*

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[4] The breaking up of the effects of age, period and cohort on the variations in the household typology, carried out in Clerici, Mazzuco, Ongaro (2001), makes this hypothesis plausible, given that the effects of age have proved to be completely predominant.

The move from the domestic condition to institutional residence affects males and females who are "alone" with relatively greater probability. There are also cases of males who pass directly from a condition of union to cohabitation, without passing through a phase of solitude: they experience this change at a higher average age than women who endure widowhood in earlier phases of their life course (Figure 10).

Figure 10 - *Probability of changing from the following categories to "institutional household"*
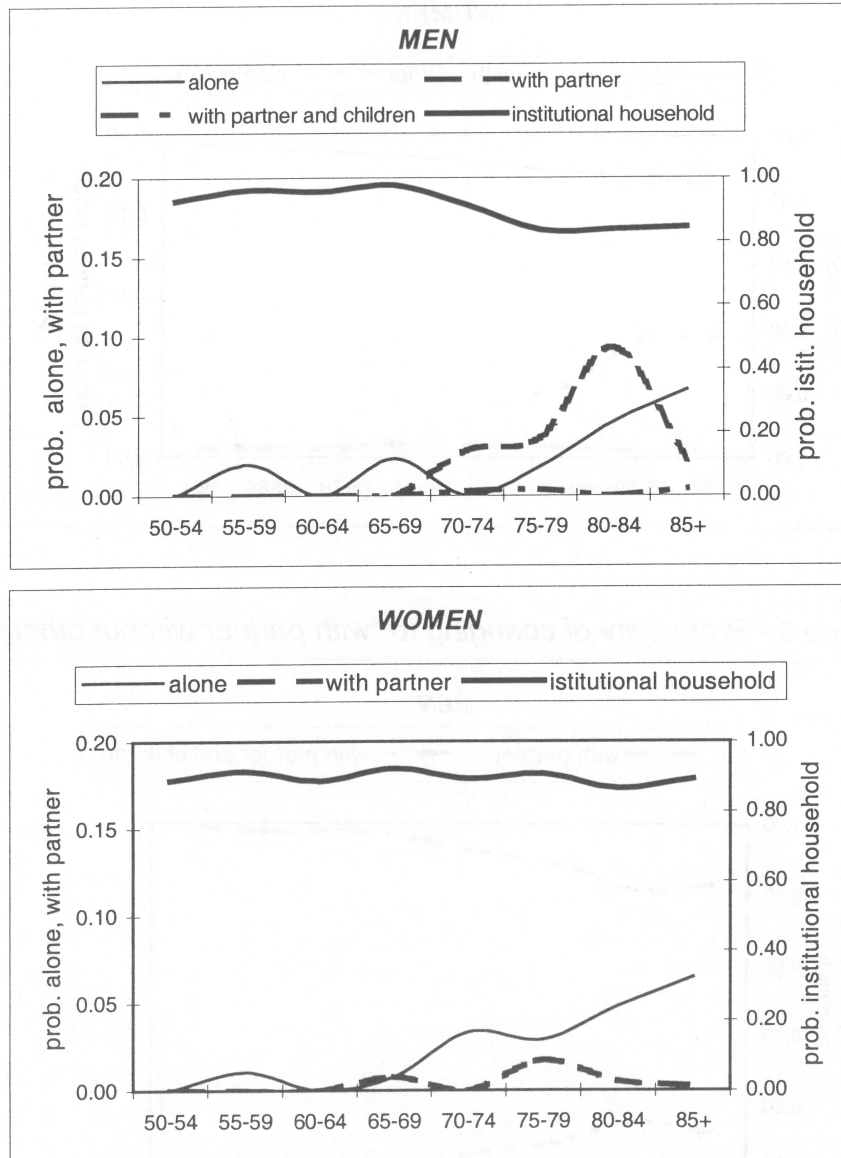
4. Differential mortality

The analysis of the outflow tables also highlighted the existence of different levels in the probabilities of death, as well as for sex and age, also for residential conditions at the time of death. In order to study the theme of differential mortality in greater depth, Life Tables[5] were constructed for form of living arrangement and for other important characteristics taken from information contained in the city archive, in particular marital status and level of education (Baldan, 2000).

The marital status gives information about the existence of past unions, at least the "official" ones, which for the cohorts we are considering is however the absolute majority, and which therefore help us understand the life history that precedes the event of death.

The level of education[6] is a proxy variable in as much that it sticks to the social level, as well as the cultural level of the subject; it synthesises lifestyles that are more or less at risk, but also availability of economic and cultural resources (Micheli, 1999). We are dealing with resources that can be linked to the ability to foresee and then face, with adequate strategies, the onset of possible pathologies.

Table 4 shows, for a synthetic comparison, the values of life expectancy at 65 and 75 years of age for the different subgroups of the elderly population.

In order to evaluate the reliability of the results obtained from the municipal records, the provincial values obtained from the ISTAT Life Tables for 1995 are shown (ISTAT, 2000). The higher level of survival registered in the city of Vicenza can be put down, as well as to the time interval (about 4 years) that separates the two measurements, to a reasonable higher survival in an urban context. We can in fact expect greater availability of personal resources, as well as accessibility to services in the city, compared to the rest of the province; but we must presume that this will no longer be true for future generations given the progressive decline in quality of life in urban areas.

The division into subgroups can, of course, create a problem of low numbers for some of the groups; nevertheless the results appear to be coherent and in line with results from other works on differential mortality (Cogliani, Demaria, Codum, Bena, 1994). The tables used are based on mortality rates that are later transformed into probability and fitted to cover the incomplete series.

The factors used in the differential analysis show effects that are not always uniform for the two sexes. As the education level of women increases, survival increases (with maximum values of another 24 years expected in average for the most educated women at 65 years of age and another 16 years for those at 75), while among males the trend is not so clear. The presence of the partner

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[5] These are abridged period life tables based on specific mortality rates by sex, five years age class and some individual or family characteristics as observed in 1999. The specific mortality rates are then transformed into five-year death probabilities by the Reed and Merrel formula.

[6] The "low" level of education includes subjects who have completed primary school; "medium" level includes middle school; "high" includes those who have completed secondary school or university. The quality of this variable in the Register Population may be sometimes low; but we think that it is not the case of the elderly population. For older people, in fact, there are no update problems.

is associated, for both sexes, to high values of life expectancy, but women who are alone do not suffer in terms of survival due to their condition, which in most cases is not chosen but due to widowhood. On the other hand placement into a community environment is always linked to the lowest levels of life expectancy, and this is justified by the fact that most of the elderly population in a community are placed in a nursing home with serious health problems. As concerns marital status, the elderly with marital break-ups during their life have a much reduced life expectancy (especially males), while single men are among the longest living males.

Table 4 - *Life expectancy at 65 and 75 years of age by sex and marital status, education level, living arrangement of the population resident in Vicenza. 1999*

	MALE		FEMALE	
	e_{65}	e_{75}	e_{65}	e_{75}
living arrangement				
alone	15,6	9,9	22,0	14,3
linked to at least one family unit	10,7 *	7,0 *	20,2	13,8
with others	15,7 *	9,4 *	19,8	11,7
with partner and children	16,3	9,0	21,2	12,9
with partner	16,9	10,3	21,6	13,4
monogenitore come genitore	15,3	12,0	19,9	12,3
in institutional household	11,5	6,4	16,7	9,7
marital status				
bachelor/spinstrer	17,4	10,0	20,3	12,6
married	16,8	9,9	22,5	14,4
divorced	9,6 *	4,6 *	17,1 *	11,1 *
widowed	13,6	8,9	20,7	13,1
education level				
low	14,9	8,5	20,4	12,7
medium	19,5	12,0	22,3 *	14,8 *
high	18,8	12,2	24,3 *	16,0 *
Total City	16,4	9,8	21,3	13,1
Total Province, 1995	15,7	9,8	20,2	12,3

* Less than twenty cases.

5. Conclusions

The Italian Population Register is a seldom used source despite being very rich in information. Its greatest limit is the lack of centralization, but also the heterogeneity of the coding and recording systems. Other limits, linked to the quality of the data, have already been discussed in previous papers (Clerici, 1994; Clerici, 1996).

This new analysis aims at showing the strength of this source in the sphere of the study of transitions in the elderly stages of life: between household forms or between household and institutions, as well as the final transition to death, with much information about individual and domestic characteristics.

The low number of events that we can observe depends on the dimension of the reference population, but the same problem arises using the only sample data that allows a similar approach for Italy, i.e. the European Family Panel.

An important result in the study of the living arrangement of the elderly population is the evidence of phases of stability and phases of sudden changes. For men and women we observe various courses and different intensity of the transitions: for women the most common form is to live alone, while for men it is to live with a partner; the oldest women have the highest variation indices, while men show less variability in variation indices, which are a little higher at the beginning of old age.

Mortality seems to differ greatly according to living context and lifestyle. The household resources (*in primis* the partnership) are for men efficient antidotes against death, while for women loneliness is linked to greater life expectancy.

References

BALDAN T. (2000), *Mortalità degli anziani per condizioni familiari e sociali a Vicenza da fonte anagrafica,* diploma dissertation, tutor R. Clerici, Facoltà di Scienze Statistiche, Università degli Studi di Padova.

CASAGRANDE F. (2000), *Propensione al cambiamento della condizione familiare nella fase anziana della vita*, diploma dissertation, tutor R. Clerici, Facoltà di Scienze Statistiche, Università degli Studi di Padova.

CLERICI R. (1994), "Lo sfruttamento di un archivio anagrafico automatizzato: una coorte di matrimoni nel primo decennio di vita" in (a cura di) L. CIUCCI e F. RACIOPPI, *Studi di popolazione. Nuovi approcci per la descrizione e l'interpretazione*, Dipartimento di Scienze Demografiche, Università degli studi di Roma "La Sapienza", Roma, pp. 317-339.

CLERICI R. (1996), "Le famiglie e la città: le scelte residenziali delle famiglie dei coniugati nel 1982", in G.A.MICHELI, R.CLERICI (a cura di), *Morfologia e mobilità urbana*, Franco Angeli, Milano, pp. 17-113.

CLERICI R., MAZZUCO S., ONGARO F. (2001), *Household living arrangements in later life: the role of kinship*, presented at the Meeting "Socio-demographic factors and future of welfare state in Italy", Frascati 16-17 march.

COGLIANI F., DEMARIA M., CODUM E., BENA A. (1994), Mortalità per stato civile e ambiente familiare nello studio longitudinale torinese (1971-1991), in CIUCCI L., RACIOPPI F. (editors), *Studi di popolazione. Nuovi approcci per la descrizione e l'interpretazione*, Dipartimento di Scienze Demografiche, Università degli Studi "La Sapienza", Roma, pp. 629-657.

GIERVED J., TILBURG T., LECCHINI L. (1995), *Socio-economic resources, living arrangements, and the social networks as determinants of well-being among older adults*, paper presented at the EAPS Conference, Milano.

HOUT M. (1994), *Mobility Tables*, SAGE University Paper, 31, London.

ISTAT (s.d.), *Indagine Statistica Multiscopo sulle Famiglie, Secondo Ciclo, Anno 1988. File Standard*, Roma.

ISTAT (s.d.), *Indagine Multiscopo sulle Famiglie, Aspetti della vita quotidiana, Anno 1993. File Standard*, Roma.

ISTAT (s.d.), *Indagine Multiscopo sulle Famiglie. Famiglia, soggetti sociali e condizioni dell'infanzia, Anno 1998. File Standard*, Roma.

ISTAT (2000), Tavole provinciali di mortalità, Anno 1995, *Informazioni*, 12.

MICHELI G.A. (1999), *Vulnerabilità della popolazione anziana come stato e come disposizione*, final meeting of the Progetto Strategico C.N.R. "Indicatori e misure per la politica economica e sociale" Sottoprogetto "Anziani e politiche sociali", Unità Operativa Milano-Università Cattolica, Roma.

TOMASSINI C., WOLF D.A. (2000), Stability and change in the living arrangements of older Italian women: 1990-1995, *Genus*, LVI, 1-2.