HEALTH CONDITIONS AMONG THE ELDERLY POPULATION IN ITALY: GENDER DIFFERENCES

Paper submitted by Italy[1]

Summary

Older people constitute a very dis-homogeneous group with features, needs and expectations in continue evolution. We used data from the 1999 face to face Italian Health Interview Survey to analyse the gender differences in health conditions, considering different aspects such as: health objective determinants (morbidity, disability, etc.), self-perceived health status, life styles (smoking, leisure, etc.), culture background and other social-demographic features.

Although women live longer than men, they tend to experience more disabling diseases such as osteoporosis, arthritis, etc. They are more likely to suffer from chronic co-morbidity too, probably associated with older age. Considering multidimensional phenomenon we used a multivariate approach (a multidimensional and clustering analysis) too, that shows a strong difference between "young-old" and "old-old" groups.

[1] Lidia Gargiulo, Laura Iannucci, ISTAT.

Introduction

It is widely known that demographers, sociologists and anthropologists, politicians and economists are paying increasingly closer attention to the aging process in populations of developing countries and to the issues concerning the implications involved in the future possibility of growing medical-care needs arising from the declining health of the elderly.

But one of the main effects associated to the progressively longer average life span is the possible change in the gender distribution of the population. In fact, women tend to live longer than men. The life expectancy in most developed countries is over 80 for women and about 75 for men, with a male-female differential ranging from 5 to 8 years (in Italy it is approximately 7 years). As a result, most of the "old-old" are essentially women and although it is possible to foresee the possibility of a partial recovery in the future in terms of the average age among men, it is estimated that there will nevertheless remain a substantial difference.

Before carrying out the analysis on elderly health gender differences, in order to avoid excessive simplification, it seems essential to point out how complex and different the world of old people truly is.

At this point in time, in most developed societies two major categories of the elderly can be distinguished: the "old-old" who are over the age of 75 and the "young-old" aged 65-74. Until just a few decades ago, they were grouped together as "old people", taken as a single category solely because of their demographic connotation and irrevocably linked with the idea of illness and decreased independence.

On the other hand, we cannot ignore that this universe is highly articulated and constantly changing, not only quantitatively but above all in terms of quality, and it is essential to avoid underestimating the substantial differentiation existing among these different individuals – on a cultural, social and territorial level, in terms of former employment and, last but not least, in relation to any illnesses they have experienced.

The rapid transformations of developed modern societies necessarily involve this universe as well, changing the characteristics, needs and expectations of this sub-population: the elderly of the near future will be quite different from today's elderly population. In general, the demand for a better quality of life for this population group has increased and become more articulated.

It is already evident that there has been an increase in the request for intervention in the social field (for example, in terms of the opportunity to use their free time), in addition to the health-social field in more limited terms (for example, the use of home-care services). We are already seeing the promotion of a series of interventions to oppose social isolation, which is not always due exclusively to the loss of self-sufficiency (courses for elderly population are one example, but in the near future the Internet phenomenon could represent yet another challenge for the elderly as well). In addition, the marketing of fitness for this age group is also being developed and in general, the free-time industry is considering it more and more inviting to increase their activities in this type of market.

Thus, an analysis of the state of health of the elderly cannot separate this issue from a consideration of the multiple other aspects related to quality of life. In particular, it is indispensable to consider not only an objective evaluation of the state of health, understood as the presence of pathologies, but also and above all the subjective perception of one's own health. Bearing in mind the pioneering definition put out by the World Health Organization ("Health is a condition of complete physical, mental and social wellbeing and does not consist only of the absence of disease" - WHO, 1948), the indicator of the subjective perception of health represents the sum of several factors – medical, psychological or social, as the case may be – and 'feeling well' does not necessarily imply the absence of any disorders or diseases but can assume a good coexistence with one's own illness.

Thus, considering our multifaceted universe, in addition to a descriptive analysis that is capable of grasping these individual aspects in relation to gender, it seemed proper to follow a multidimensional approach that could summarize the multiplicity of the aspects of the phenomenon we are considering, identifying the possible joint relations and the gender-related discriminants in the state of health of the elderly.

1. Gender perspective in elderly people health

One of the first indicators frequently used to analyze health conditions in a population is mortality rate. The specific mortality ratios by sex point to the female advantage in all age groups. Part of this advantage about the longer life span with respect to males is biological: not only is the probability of survival higher among females in infancy but, women present a biological advantage in adulthood as well, at least until menopause, since hormonal factors afford them greater protection from the risk of cardiovascular pathologies, which continue to be the leading cause of death.

In addition to biological factors, which cannot be modified as yet, there are other risk factors that affect the male-female differential and they are connected with different lifestyles (smoking, alcohol consumption, etc.) as well as with the different roles and responsibilities assumed by the two genders in society over the past century. In fact, historically women did not always live longer than men. In Europe, for example, this difference arose with economic and social development, which led to significant progress in reducing the risk of death among women in relation to childbirth. At the same time, the start of the industrialization process led to an increase in the causes of work-related deaths that, considering the division of roles in the work environment, mainly involved men.

In the face of a greater life expectancy, at least in developed countries, elderly women nevertheless do not enjoy better health than their peers. On the contrary, there emerges a female disadvantage if we examine other indicators of health: multiple chronicity, disability, etc. The female aging process would appear to be more characterized by an accentuated co-morbidity referable to chronic-degenerative pathologies that are less life-threatening but more debilitating and that gradually lead to more or less serious forms of disability. Instead, among males the rates of multiple chronicity and disability seem to be lower.

The impact that the various forms of disability have on the quality of life is by no means negligible and this is what leads to the need to analyze the level of health among the aged, using indicators on the quality of survival. The concise indicators that have also been proposed on an international level, such as the ones for life expectancy in good health and with no disabilities, make it possible to consider both

the number of years left to live and their quality. While confirming the female advantage concerning lower mortality rates in absolute terms, these indicators also show that women are the ones who spend a greater part of their lives in poor health. Indeed, with aging there is also a higher risk of more severe forms of disability, such as confinement (to a bed or chair), and the disability-free life expectancy at the age of 75 is 6.6 years for men and 6.9 for women, despite the fact that the latter have a longer life expectancy than men.

1.1 Chronic illnesses

In developed countries, there has been a changeover from a health situation with a high mortality rate and the spread of acute and infective pathologies to one characterized by low mortality and an increase in the chronic-degenerative pathological forms that strike the elderly above all. Once they have set in, these pathologies permanently influence the physical and psychological wellbeing of the aged, gradually restricting their independence and leading to the need for care and assistance.

In Italy, among the elderly (people aged 65 and over) with at least one chronic disease[2], there is a higher number of women than men (84.3% as opposed to 79.1%) and this is observed even at the same age level. With the advancement of age, there is also an increase in comorbidity, meaning the accumulation of several chronic illnesses in the same person. Once again, there is a female slant to the comorbidity rate: elderly women with at least two chronic illnesses account for 70.3%, as opposed to 62.0% among the opposite sex (see Table 1).

Table 1. People aged 65 and over by number of chronic diseases, sex, and age group
        (column percentages)

N° of chronic deseases	AGE GROUP								TOTAL	
	65-69		70-74		75-79		80+			
	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males
No diseases	19.1	25.0	16.1	21.1	15.2	18.6	11.5	15.0	15.7	20.9
Only one disease	16.3	19.9	14.0	16.4	13.1	15.8	12.1	14.1	14.0	17.1
Two diseases or more	64.6	55.1	69.9	62.5	71.8	65.6	76.4	70.9	70.3	62.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: ISTAT, Health conditions and recourse to health services 1999-2000 – provisional data

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[2] The prevalence estimate comes from the survey "Health conditions and recourse to health services 1999-2000". The interviewed fills a self-administrated questionnaire, where there is a question about the presence of chronic diseases or conditions and if they are diagnosed by a physician (over 90% on average are diagnosed). There is a list of twenty-eight chronic illnesses: allergic illnesses, diabetes, cataracts, hypertension, myocardial infarction, angina pectoris, other heart diseases, thrombosis-embolism-cerebral hemorrhage, varicose veins and varicocele, hemorrhoids, chronic bronchitis-emphysema-respiratory insufficiency, arthrosis-arthritis, backache and sciatica, osteoporosis, abdominal hernia, gastric or duodenal ulcers, liver or gall stones, cirrhosis of the liver, chronic hepatitis, kidney stones, prostate hypertrophy, cancer, headaches or migraines, Parkinson's disease-Alzheimer's disease-epilepsy-memory loss, other nervous disorders (depression-anorexia-bulimia, etc.).

The types of chronic illnesses among the elderly are not the same for both genders. Biological and behavioral factors (smoking, nutrition, exercise, etc.) underlie the difference in the prevalence of chronic illnesses in the male and female population. An analysis of the picture of the individual pathologies reveals that among elderly women (see Table 2) there is a higher prevalence of arthrosis (58.8% vs. 43%), backache and sciatica (17.4% vs. 13.2%), osteoporosis (26.1% vs. 4.2%), varicose veins and varicocele (21.3% vs. 8.2%), thyroid disease (6.4% vs. 2.2%), liver and gall stones (7.8% vs. 4.8%), recurrent headaches or migraines (13.9% vs. 7.5%), and nervous disorders such as depression, anorexia and bulimia (10.1% vs. 5.2%); among elderly men, there is a higher prevalence of myocardial infarction (5.6% vs. 3.1%), chronic bronchitis, respiratory insufficiency (19% vs. 11.3%), bronchial asthma (8.4% vs. 5.7%), abdominal hernia (8.8% vs. 4.3%), and gastric or duodenal ulcer (8.9% vs. 6.4%).

Table 2. People aged 65 and over reporting chronic conditions by disease, sex and age group
    (quotients per hundred)

CHRONIC DISEASES										
SEX	FEMALES					MALES				
AGE GROUP	65-	70-74	75-	80 and	Tot	65-	70-	75-79	80 and	Tot
Allergic diseases	8,2	9,6	7,7	5,3	7,8	7	7,4	7,3	5,2	6,9
Diabetes	10,3	15,1	12,6	13,5	12,	10	11,8	12,6	10,8	11,
Cataract	7,5	16,2	19,1	30,4	17,	6,6	10,5	18,4	23,8	13
Hypertension	31,8	39,1	42,1	40,8	38,	29,5	33	33	27,7	31
Miocardium infarct	1,9	2,9	3,4	4,3	3,1	5,2	5,7	7,2	4,1	5,6
Angina pectoris	2,2	2,9	4,6	4,6	3,5	3,7	3,7	3,9	3,7	3,7
Other heart diseases	9,1	11,8	16	19,7	13,	8,9	10,1	12,8	13,6	10,
Thrombosis,Embolism,Cerebra	1,6	2	3,1	5,8	3	2,8	3,7	4,3	5,6	3,8
Varicose veins, varicocele	20	22,3	22,6	20,5	21,	7,3	9,7	7,9	8	8,2
Haemorrhoids	9,4	8,2	11,1	9,9	9,6	8,1	9	7,1	8,2	8,2
Chronic	8,2	10,9	11,4	15,5	11,	14,7	18,9	20,4	26,5	19
Bronchial asthma	4,2	5,5	6,8	6,6	5,7	6,9	7,4	9	12,4	8,4
Skin complaints (psoriasis,	2,8	4,2	3	4,4	3,6	4,8	4,7	4	6,1	4,8
Underactive/overactive thyroid	7,5	7,2	6,1	4,3	6,4	2,4	2,1	2	2,1	2,2
Arthrosis, Arthritis	53,7	58,5	61,6	62,8	58,	38,2	43,7	44,1	50,4	43
Lumbarsciatica	16,1	17,8	19,2	16,7	17,	13,5	12,7	13,4	13,1	13,
Osteoporos1s	21,3	26,1	27,7	30,6	26,	2,6	3,3	5,3	7,6	4,2
Abdominal hernia	3,1	3,7	4,3	6,3	4,3	6	7,5	10,7	14,7	8,8
Gastric or duodenal ulcer	5,8	6,3	7,1	6,6	6,4	8	8,3	9,8	10,4	8,9
Lithiasis of liver and bile ducts	8,4	7,7	7,9	7	7,8	4,6	5,1	4,2	5,6	4,8
Hepatic Cirrhosis	0,6	0,6	0,8	0,3	0,6	1	1,6	1	0,3	1,1
Chronic hepatitis (excluding	2,4	0,9	2,4	1,3	1,8	1,8	2,2	0,8	0,7	1,5
Renal lithiasis	3,2	2,4	2,4	2,6	2,7	4,1	3,4	4	2,8	3,7
Prostate gland hypertrophy	0	0	0	0	0	11	18	19,8	21,2	16,
Tumours (including	3,2	2,2	2,3	2,6	2,6	2,4	3	3,5	3,1	2,9
Cephalea or recurring migraine	14,1	15	13,5	12,9	13,	6,9	6,6	9,2	7,7	7,5
Parkinson's disease,Alzheimer's	1,6	2,9	4,1	10,7	4,6	1,5	3,4	4,4	10,5	4,1
Other nervous disorders	8,6	10,6	10,7	10,7	10,	3,3	5,6	6,9	6,2	5,2
Ather	5,8	6,1	6,1	7,6	6,4	6,1	6	6,5	8,5	6,5

Source: ISTAT, Health conditions and recourse to health services 1999-2000 – provisional data

In short, this difference in typology of diseases highlights a discriminating aspect between genders in terms of health: women are struck more often than men – and earlier – with less life-threatening but more incapacitating types of illnesses.

In fact, while pathologies of the osteomuscular system have a lower mortality rate than other pathologies, in effect they involve a longer and more disabling course. The joint pain and stiffness caused by arthrosis and the increased bone fragility caused by osteoporosis significantly affect the normal everyday activities of the elderly, progressively limiting their independence (for example, it is well known that femoral fractures represent one of the leading problems in industrialized countries).

In this light, it becomes clear that in analyzing the health conditions of a given population, it is essential to examine not only the causes of death (see Table 3) but also to investigate all the chronic-degenerative pathologies that, over the years, lead to a loss of independence.

Table 3. Standardized mortality rates by sex and main causes of death
            – Year 1996 (*per 1.000 inhabitants*)

CHAPTER CAUSES OF DEATH (ICD9 CHAPTER) ICD9		ITALY		
		M	F	MF
001-139	Infectious diseases	0,05	0,04	0,04
140-239	Neoplasms	2,99	2,04	2,50
240-279	Endocrine diseases	0,38	0,42	0,40
280-289	Diseases of the blood	0,03	0,04	0,03
290-319	Mental disorders	0,11	0,12	0,11
320-389	*Diseases of the nervous system*	0,17	0,19	0,18
390-459	Diseases of the circulatory system	3,45	3,73	3,60
460-519	Diseases of the respiratory system	0,61	0,36	0,49
520-579	Diseases of the digestive system	0,45	0,37	0,41
580-629	Diseases of the genitourinary syst.	0,12	0,10	0,11
630-676	Complications of pregnancy	-	0,00	0,00
680-709	Diseases of the skin	0,01	0,01	0,01
710-739	Diseases of the musculoskeletal system	0,02	0,05	0,03
740-759	Congenital malformations	0,03	0,03	0,03
760-779	Certain condit. in the perinatal period	0,04	0,03	0,03
780-799	Symptoms ill-defined causes	0,11	0,12	0,12
800-999	External causes	0,56	0,34	0,45
TOTAL		**9,12**	**7,99**	**8,55**

Source: ISTAT, Sistema sanitario e salute della popolazione - 2000

2.2 *Disability*

The phenomenon of disability associated above all with aging populations in developed countries has been the subject of debate and often dire predictions.

In 1980, the World Health Organization (WHO) promoted a common instrument, adopted by various countries, to investigate disability, which is defined as "the decrease or loss of functional capacities and

activities as a result of impairment"[3]. Disability also involves the loss or limitation of the level of individual autonomy in carrying out certain fundamental functions in everyday life (Activities of Daily Living), such as moving about, washing oneself, dressing, eating and communicating. More specifically, it is measured through a battery of 17 questions that make it possible to ascertain the individual level of autonomy and to reconstruct the various facets of the phenomenon: confinement (to bed, a chair, the home), difficulty of movement (walking, going up and down stairs, bending over to pick things up from the floor), difficulty in daily functions (going to bed, getting out of bed, sitting down and standing up from a seated position, getting dressed and undressed, bathing or showering, washing one's hands and face, eating, chewing), difficulty in communicating (hearing, seeing, speaking).

The elderly presenting a serious disability in at least one of the four dimensions considered above represent 19.6% of the population: 23.5% of elderly women and 14.1% of elderly men. (Table 4).

Table 4. People aged 65 years and over with at least one type of disability by sex and age group. (*quotients per hundred.*)

AGE GROUP	SEX		
	Females	Males	Total
65-69	8,3	5,6	7,1
70-74	14,0	9,5	12,1
75-79	24,1	15,7	20,7
80+	51,8	38,5	47,6
Totale	23,.5	14,1	19,6

Source: ISTAT, Health conditions and recourse to health services 1999-2000 – provisional data

Severe disability is an event that is manifested above all in those over eighty, among whom the share of people with a disability rises to 51.8% among women and 47.4% among men.

The prevalence of women is manifested in all forms of disability, even at an equivalent age level, with very significant gap with respect to men in cases of individual confinement (10.8% as opposed to 6%), which represents the most severe form of disability in absolute terms. With regard to difficulties in everyday life, again women are at a disadvantage (15.3% vs. 9.2%), as is the case with difficulty of movement (15.2% vs. 8.6%). With respect to communication difficulties, only after the age of 80 is there a higher prevalence among women (Table 5).

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[3] Impairment is understood as "any mental or physical disturbance in bodily functions". It is characterized by anatomic, psychological or physiological loss or abnormality (in terms of a given tissue, organ, functional system or individual bodily function).

Table 5. People disabled aged 65 years and over by type of disability, sex, and age group.
    (q*uotients per hundred)*

AGE GROUP	TYPE OF DISABILITIES			
	Motory difficulties	Sight,hearing and speach difficulties	Confined	ADL Disabilities
		FEMALES		
65-69	5,1	1,2	3,1	4,2
70-74	8,5	2,4	5,2	6,5
75-79	15,2	3,3	9,3	14,5
80+	34,7	12,4	27,9	39,0
Total	15,2	4,6	10,8	15,3
		MALES		
65-69	3,7	1,1	1,9	3.0
70-74	6,1	2	3,5	5,1
75-79	9,5	3,9	5,7	10,1
80+	22,9	10,5	20,2	28,9
Total	8,6	3,4	6	9,2

Source: ISTAT, Health conditions and recourse to health services 1999-2000 – provisional data

In 83.1% of cases (83.5% of women vs. 81.9% of men), severe disability is associated with two or more chronic illnesses (Table 6).

Table 6. People disabled aged 65 years and over by number of deseases, sex, and age group
    (*column percentages*)

N° of chronic diseases	AGE GROUP						Total
	65-74		75 and over		TOTAL		
	Females	Males	Females	Males	Females	Males	
None disease	7,7	8,8	7,2	7,9	7,4	8,2	7,6
Only one disease	9,2	7,6	9,0	11,0	9,1	9,9	9,3
Two diseases and over	83,1	83,6	83,7	81,1	83,5	81,9	83,1
Total	100	100	100	100	100	100	100

Source: ISTAT, Health conditions and recourse to health services 1999-2000 – provisional data

Considering that the family structure of old people assumes an important role as regards to health too – see Aureli-Baldazzi – it is suitable to point to disabled people' s family structures. Generally disabled people's family structures are the typical ones of the elderly age: living alone or couples without children, even if the disability involves an increase of lone parents. In other words a disabled person is more accepted in an other household than a person without disability because of his greater need of assistance**.**

The main feature which has to be underlined in this analysis is the gender difference in disabled people's family structure. While most part of disabled men over 75 still live in couple (53.6% in couple without children), the disabled women more frequently live alone their disability; they are more widow because of the double effect of both greater longevity and age span between the two partners (women are younger). Often that's the woman of the old couple which help the disabled partner (see Freguja-Sabbadini), while the disabled woman lives in a greater condition of solitude.

Tav 7. People aged 65 years and over by sex, disabilty, family structure and age group
    (column percentages)

FAMILY STRUCTURE	Males		Females	
	65-74	75 and over	65-74	75 and over
Other families	5,8	7,0	5,2	8,4
Couples with children	29,8	11,7	12,0	1,9
Couples without children	49,2	53,6	36,7	13,4
No family member	2,5	8,6	6,0	17,7
Lone parent	2,4	3,4	9,2	9,2
Living alone	10,3	15,6	30,9	49,3
Total	100,0	100,0	100,0	100,0

Source: ISTAT, Health conditions and recourse to health services 1999-2000 – provisional data

1.3 *Health perceived status*

The evaluation of one's own health status is a complex indicator that is not always directly linked with the actual presence of a pathology, serious or otherwise, since self-perception of one's state of health (physical and psychological) is also affected by other factors, such as cultural, social and territorial ones. Therefore, feeling well does not necessarily imply the absence of a possible disorder or illness.

In the overall elderly population, it is evident that the perception of one's state of health becomes increasingly negative as we go from the younger age ranges to the older ones (Table 8). At an equivalent age, women have a more negative perception of their state of health: for example, once they are past the age of eighty, 10.8% of women state that they feel well or very well, as opposed to 18.3% of men.

Table 8. People aged 65 years and over by perceived health status, sex and age group

| PERCEIVED HEALTH STATUS | SEX | | | | | | | | | | TOTAL |
| | Females | | | | | Males | | | | | |
	65-69	70-74	75-79	80 and over	Total	65-69	70-74	75-79	80 and over	Total	
Missing value	2.4	0.9	2.9	0.8	1.8	2.1	0.8	1.3	1.3	1.4	1.6
Very bad	3.5	3.4	5.0	11.0	5.6	2.5	2.5	3.6	10.2	4.0	5.0
Bad	12.7	22.5	22.2	26.6	20.5	12.7	12.4	17.9	19.5	14.9	18.4
Fair	59.5	56.8	55.0	50.7	55.7	56.1	61.3	62.7	50.7	58.2	56.7
Good	20.3	15.0	13.7	9.8	15.0	23.7	20.5	12.8	17.6	19.3	16.7
Very good	1.7	1.2	1.3	1.0	1.4	2.8	2.5	1.8	0.7	2.1	1.7

Source: ISTAT, Health conditions and recourse to health services 1999-2000 – provisional data

The presence of multiple chronicity or disability has a significant impact on the perception of one's health. In these groups, it is more likely to encounter significant percentages of people who state that they are ill or very ill. In fact, among the elderly overall, this mode accounts for 23.3% (26.1% for women, 18.9% for men), while in those with multiple chronic illnesses this reaches 30.4% (32.9% for women as opposed to 26.4%) and among the disabled it rises as high as 61.5% (60.6% as opposed to 63.7%) (table 9).

Table 9. People aged 65 years and over by perceived health status, number of chronic disease, sex and age group *(column percentages)*

| Perceived health | AGE | | | | | | Total |
| | 65-74 | | 75 and over | | Total | | |
	Females	Males	Females	Males	Females	Males	
	0 chronic disease						
Missing value	4.9	4.1	7.1	2.4	5.8	3.5	4.7
Bad or very bad	4.9	5.2	16.8	9.9	9.6	6.6	8.2
Fair	51.6	44.0	46.1	56.8	49.4	47.9	48.7
Good or very good	38.6	46.7	30.0	30.9	35.2	41.9	38.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	one chronic disease						
Missing value	0.1	0.4	0.7	2.3	0.4	1.0	0.7
Bad or very bad	7.7	7.0	16.0	13.6	11.1	9.2	10.2
Fair	56.6	57.2	57.9	63.1	57.1	59.1	58.1
Good or very good	35.6	35.4	25.3	21.0	31.4	30.6	31.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	Two chronic diseases and over						
Missing value	0.7	0.5	0.7	0.4	0.7	0.4	0.6
Bad or very bad	27.4	21.7	38.7	33.2	32.9	26.4	30.4
Fair	61.3	65.1	53.8	55.7	57.7	61.2	59.0
Good or very good	10.5	12.8	6.8	10.7	8.7	11.9	9.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: ISTAT, Health conditions and recourse to health services 1999-2000 – provisional data

However, the number of multichronic elderly people who consider their state of health to be fair is not negligible and in fact, it represents 57.7% of women and 61.2% of men. This probably means a healthy coexistence with one's own state of health: it is indeed possible not to consider one's health in totally negative light, despite the presence of a chronic illness.

It is well known that the perception of one's state of health is strongly affected by the level of education, former professional activity, available financial resources and family setting in which the elderly person lives. In order to keep sight of all the relationships underlying the complexity of both the objective and subjective analysis of one's state of health, a multidimensional approach was deemed appropriate.

2. Health gender differences through clustering

2.1 Multiple corrispondence analysis

Following the exploratory perspective of the French school of *Analyse des données*, using the multiple correspondence analysis (MCA) we proceeded to simplify and summarize the set of information on the health of the aged in relation to both the objective aspect, understood as the presence and treatment of chronic illnesses and disabilities, and the subjective one, understood as the perception of one's own state of health. The data that was processed was gathered during the multi-scope investigation on "Health and recourse to health services 1999-2000", conducted in September and December 1999.

In the application, as active variables we considered the ones that most identify the objective condition of health in reference to the elderly person (type and number of severe chronic pathologies[4], the presence of severe disability[5], visits to general practitioners or specialists, the reason for the visit, the use of drugs, diagnostic examinations), certain health-care behaviors (weight control, diet, smoking) and the subjective perception of health. In addition, gender and age, subdivided into four classes (65-69, 70-74, 75-80, 80 and over), were also included in the active component of the analysis.

Based on the analysis that was performed, the first three axes explain 19.82% of the total inertia (using Benzecri's formula the total inertia increases to the 75,6%).
The first discriminating dimension of the phenomenon proved to be the *state of health of the elderly* (64,3% of inertia explained by the first axis). In fact, as shown in Fig. 1, this made it possible to delimit the "area of good health" characterized by modes denoting good physical condition, both objectively (no chronic illnesses) and subjectively (feeling well), in relation to the more composite area of "poor health", characterized instead by a series of modes that reveal aspects and behaviors attributable to a poor state of health (the presence of several chronic illnesses, the presence of disability, recourse to medical visits due to illness, the need to undergo diagnostic examinations, the negative perception of one's physical conditions).

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[4] Among the 28 chronic diseases surveyed the following are considered in the analysis: diabetes, myocardial infarction, angina pectoris, other heart diseases, thrombosis-embolism-cerebral hemorrhage, bronchitis-emphysema-respiratory insufficiency, asthma, arthrosis, osteoporosis, cirrhosis, cancer, Parkinson's disease-Alzheimer's disease-epilepsy-memory loss.
[5] A person is considered severely disabled when he or she is confined or presents serious difficulties in at least one of the following: movement, daily functions, communication.

The second axis (7,5%) identifies the *demographic dimension of health* (Fig. 1). Here, the "young-old" are in contrast with the "old-old". In particular, it can be noted that there is a natural association between the age of the senior citizen and his or her state of health: as the years go by, there is an inevitable decline in physical condition toward disability, going through various chronic pathologies. Since women are more long-lived than men, it is more likely that they will arrive at a condition of great physical discomfort characterized by full or partial loss of independence in their basic daily activities. Several epidemiological studies have shown that osteoarthrosis is the leading cause of disability among the elderly, involving the articulation of the hip, knee and spinal column, and limiting activities in everyday life as well as the ability to walk. Moreover, osteoporosis is particularly debilitating and it is often the cause of most fractures among the elderly.

The onset of chronicity fuels behaviors that are more attentive to fighting the illness by relying on visits to doctors and diagnostic exams, behaviors that instead are not encountered in the "old-old", even if disabled.

Figure 1 – Factor Plan 1, 2
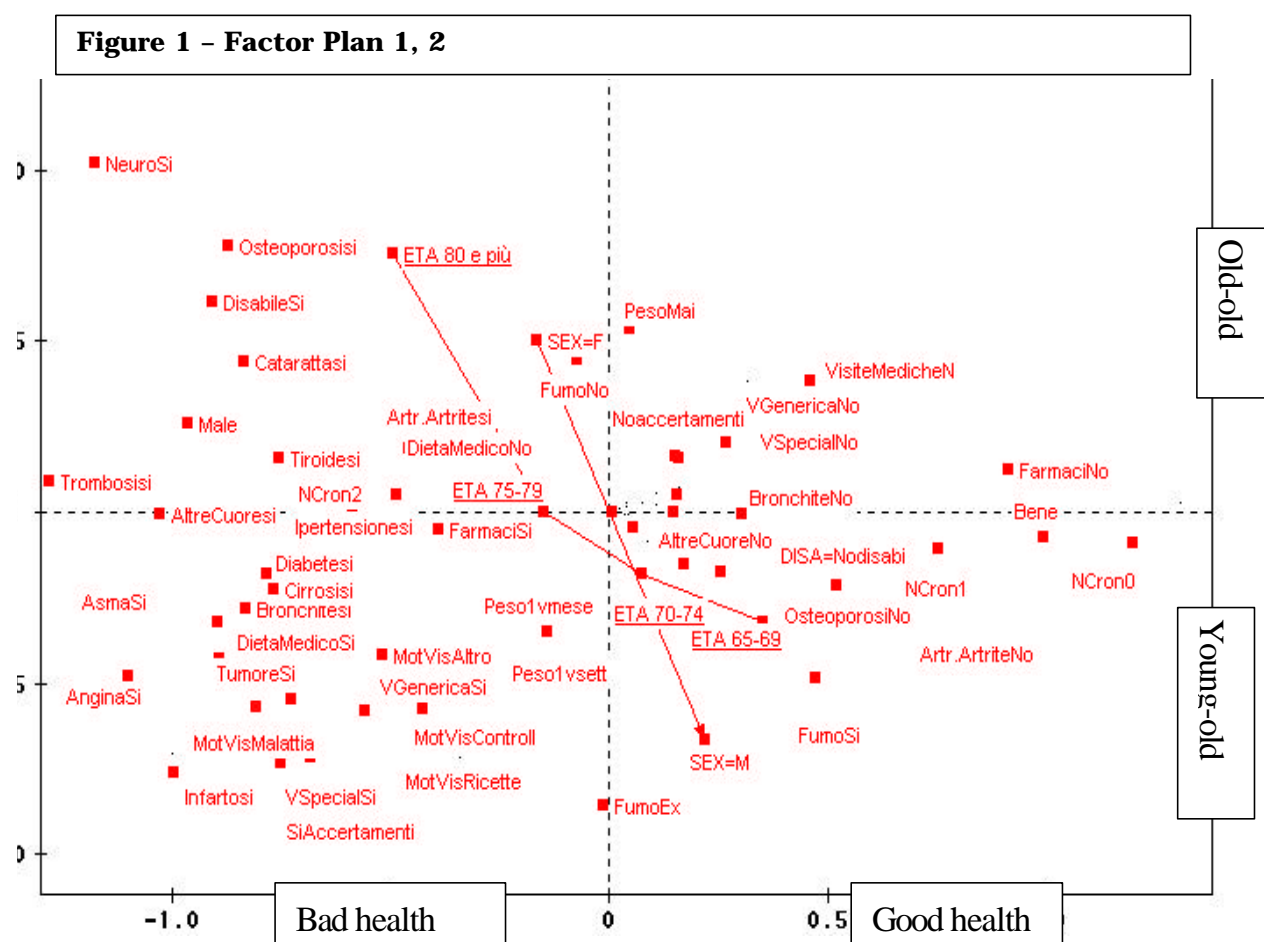
The third axis (3,8%) represents *the gender-related health dimension* (Fig. 2). A contrast is noted between pathologies of the osteomuscular system (osteoporosis) which, for biological motives, mainly strike women after menopause, and pathologies tied to the circulatory system (infarction) and the

respiratory system (bronchitis), which are prevalent in men. The latter pathologies appear to be associated with a present or past lifestyle of the senior citizen that was not as health-oriented as that of their peers, above all with regard to smoking. In fact, well-established scientific evidence has demonstrated the relationship between habitual tobacco consumption and health. Smoking can be considered responsible for 90% of the deaths caused by lung cancer, two-thirds of the deaths due to chronic bronchopneumopathy and one-fourth of the deaths caused by cardiovascular disease (see PSN).

Figure 2 –Factor Plan 2-3
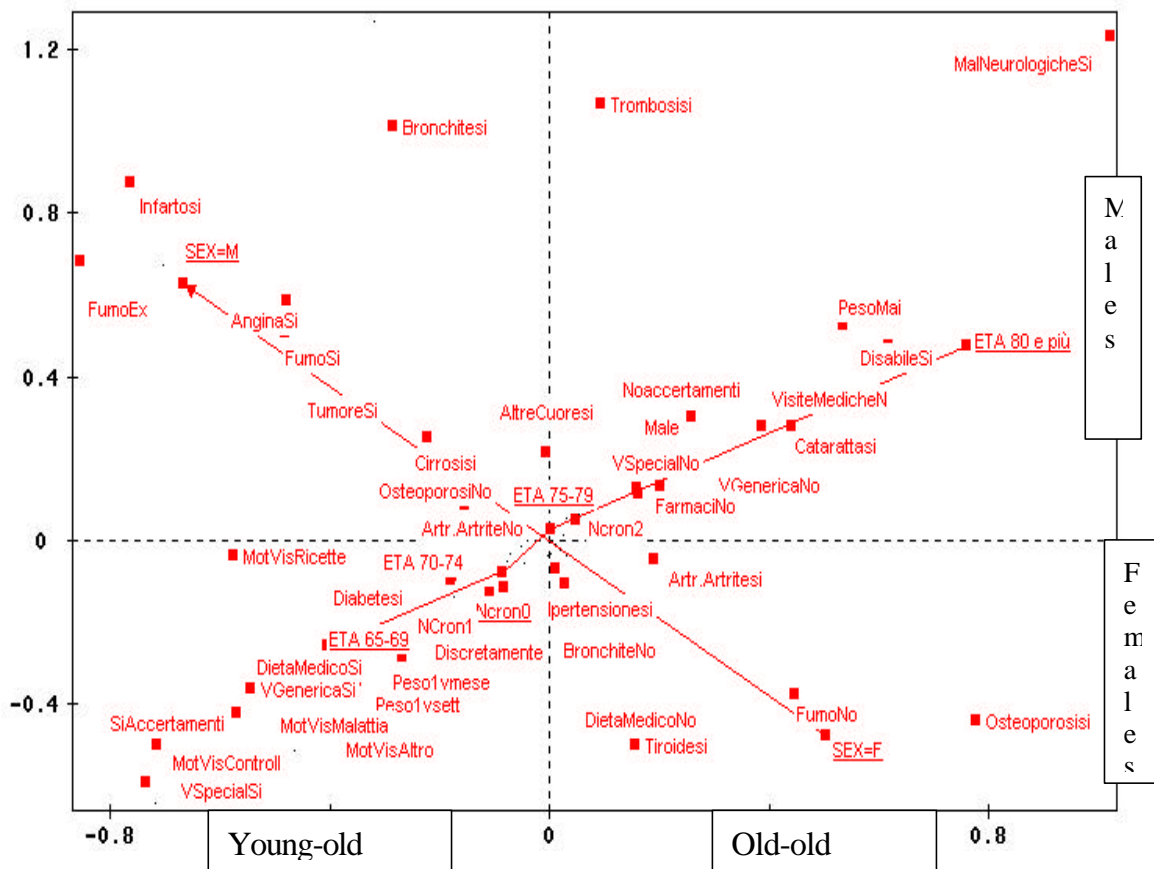
2.2 *Cluster analysis*

Among the nine clusters [6]that were identified, there emerge groups that are clearly distinguished in relation to gender, and they will thus be referred to as female groups and male groups, respectively, and groups in which there are no notable gender-related characteristics.

A - The female groups

The **second cluster** is the most numerous group (comprising 24.1% of the whole old population) and it is represented by women between 70 and 79 years of age (about 55%) who perceive their state of health as fair (76%). They declared that they had not had medical consultations or diagnostic examinations within the past four weeks, although they did present several chronic pathologies (arthritis/arthrosis, hypertension, etc.) at a stage that was not disabling yet and simply involved slight difficulty of movement. They are basically elderly persons who coexist well with their status of being old and they do not face any particular socioeconomic hardships: 68% considered their financial resources to be adequate and their social relations seem to be substantial. In fact, about half of this group spends time with friends and many of them see their close relations (siblings) on a regular basis.

The **seventh cluster** represents 10.6% of our cohort and 97.7% is composed of women. Most are in their seventies (57% aged 70-79) and multichronic (99.6%), with pathologies tied to the female aging process. In fact, they suffer from arthritis/arthrosis (86.9%), hypertension (51.3%) and osteoporosis (43.7%), treating these illnesses by taking medication (89.6%), consulting a physician (57.8% consult a general practitioner and 55.4% go to specialists) or undergoing diagnostic examinations (39.5%). In spite of this, 63% of these cases consider their state of health to be fair, while 34% consider themselves to be in poor health. Their social lives focus above all on their loved ones: about 72.2% of them see their children often and their friends less frequently (34.8% see their friends from time to time). About 46% of the seventy-year-olds belonging to this group are already widowed and 37% live alone.

The **eighth cluster** comprises 9.4% of the elderly population: 76% are women and about 71% are over 80 years old. The group is characterized by various types of disability (92%): difficulty in daily activities (77%) and difficulty of movement (70%), and more than half present the most severe form of disability and are confined (to bed, to a chair or at home). In any event, this disability is associated with serious forms of chronic comorbidity (92.3% of the elderly in this group are multichronic). In addition to osteoporosis (35.4%), arthritis/arthrosis (72%) and hypertension (43%), 33.3% of this group presents diseases of the nervous system (Parkinson's disease, Alzheimer's disease, memory loss). They treat their very poor state of health (78% declare that they are ill or very ill) by resorting above all to drugs (92.2% of them took drugs during the two days prior to the interview). In part, they live as an aggregate member of their children's families (16.3% as opposed to 6% of all old people), while some live alone (38.1% as opposed to 26.2% of all the elderly).

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[6] Cluster analysis is a mulvariate technique used to cluster the observations or the variables, such that objects in a given cluster tend to be similar to each other in some sense, and objects in different clusters tend to be dissimilar. Several clustering methods can be used. We used mixed clustering alghoritm (implemented on SPAD package).

B - The male groups

The **first cluster** covers about 19% and it is characterized by young-old: about half are aged 65-69 and they are prevalently males (54%). Most of them declare that they feel well or very well, without any chronic pathologies or with one at the most, but not a serious one. About 65% are still part of a couple and they have an active social life, not only because of their good or moderate conditions but also because they have adequate financial resources at their disposal. In fact, to a much larger extent than the rest of the elderly, who lead a rather retiring lifestyle, this group presents more people who spend their free time in cultural activities such as going to concerts, visiting museums, etc. Since they do not have any severe chronic pathologies, they do not take medication nor do they resort to medical visits in the short term. They practice sports to stay in shape and also attend athletic events.

This is essentially the senior citizen group that does not present any health problems or problems due to social isolation, since they are more involved than the other groups in social relations with friends and relatives.

The **fourth cluster** is a small group comprising 5.5%, and 52% are men. This group is characterized by chronic comorbidity (98.4% of cases) and the more typical male pathologies prevail in particular, such as infarction (58.1%), angina pectoris (57.7%), chronic bronchitis (29.8% as opposed to 15.8% for all the elderly) and other heart diseases (25.8% as opposed to 12.7% of the others).

The **fifth cluster** constitutes 10.3 % of the elderly, and 63.8% are men. They present few or no chronic pathologies and in fact they do not have a pessimistic perception of their state of health (61% declare that they are in fair condition and 21.5% state they are in good health). They differ above all from the first group in terms of their behavior concerning health care and prevention: 40.9% of the cases have stopped smoking (as opposed to 26.9% among all the elderly), and more than half rely on medical visits (general practitioners and specialists). In 46.7% of cases, they are still part of a couple as "empty nests", and they state that their financial resources are adequate (68.5%).

The **ninth cluster** represents 7.5% of the cohort and it is the group in which males predominate (78%). It is characterized by multichronic men (99.6%) whose pathologies are mainly associated with the "smoking" risk factor. The smokers number 22.4% while 51.6% are ex-smokers, and they present typical respiratory illnesses, i.e. bronchitis (85.3%) and asthma (59.9%). Nevertheless, they perceive their state of health as fair (66.1%), although 28% declare they are ill or very ill. Drugs are taken by 80.2%. Their financial conditions do not seem satisfactory as compared to the other groups and most of them live with a spouse or companion without children (51%).

C - Non-differentiated groups with regard to gender

The third cluster represents 7.9%. It is characterized above all by multichronic elderly persons (93.2%), most of whom are diabetic (77%) and are affected with associated pathologies (hypertension, cataracts, etc.). Therefore, they follow a diet prescribed by their physicians (73.2%) and check their weight more often than the others.

The sixth cluster constitutes 5.9%. It is a residual group of multichronic subjects (78.4%), and about half of them suffer from hypertension. They are elderly people who treat themselves with drugs (88.2%) and during the last four weeks they went to their general practitioners (89.9%) above all to

renew prescriptions (81.72%). The presence of any pathologies does not restrict their circle of friends and 51.5% see their friends often.

Conclusions

The analysis highlights the substantial heterogeneity of the "elderly" universe, which is also reflected on health, where age differentiation becomes increasingly more important – particularly between the "young-old" and the "old-old". Therefore, in the descriptive analysis the main health aspects of the elderly, such as the presence of chronic illnesses or also of disability, and the general self-evaluation indicator of one's own state of health are analyzed in relation to gender to show any differences there may be, but considering the phenomenon at an equivalent age.

With respect to the objective of this study, which was oriented toward grasping gender differences, the difficult summary permitted through a multidimensional approach has made it possible to distinguish three dimensions underlying the phenomenon. The first factor summaries the main aspects of health listed above (presence and type of chronicity, disability, self-perception of the state of health), while the other two factors explain the phenomenon, one in terms of age and the other in terms of gender. The classification procedure shows the complexity and heterogeneity of the "elderly" universe, which is also characterized by a difference in numbers between the male and female contingents that becomes even more accentuated as the years advance. The analysis thus permits a better characterization (also with respect to gender) when finer divisions are used, identifying nine groups of elderly persons: some are more typically female while others have more male-oriented characteristics (although the gender difference diminishes numerically), and still others are not characterized according to gender but identify types of elderly persons with specific chronic pathologies. This technique made it possible to compare the different characteristic groups through a simultaneous analysis of health conditions, several risk factors and aspects related to the relationship of the elderly.

While also acknowledging the difficulty involved in a offering a validating summary of the phenomenon, which risks simplifying the analysis that was conducted, what emerges first of all is the dual nature of the phenomenon: the young-old (both males and females) in a fair or even good health status, who lead rather active lives also in terms of social relations, and the old-old who present a greater differentiation and articulation within their group. However, what best connotes the gender difference in health condition of the elderly (particularly the old-old) is the different quality of life that characterizes the world of women. They become multichronic earlier than their peers, coexisting for a longer time with the increasingly debilitating effects of these pathologies (particularly osteomuscular ones). Last but not least, they experience greater isolation due both to widowhood and to the greater risk of confinement as a result of progressive physical decline.

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