

# **The perception of health: relevance and dimensions**

*La Percezione Della Salute: Pertinenza e Dimensioni*

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## **Riassunto**

La valutazione soggettiva delle condizioni di salute espressa dai più anziani nella popolazione italiana (dati ECHP 1995-2001) è fortemente associata al rischio di morte: tra le diverse variabili considerate nello studio (condizioni oggettive di salute e variabili demografiche e sociali), la salute percepita rappresenta il più forte predittore della mortalità anche controllando tutte le altre covariate. Il concetto di salute percepita include numerose dimensioni e informazioni che l'individuo considera nel valutare il proprio stato di salute complessivo. Da una analisi dei dati dell'indagine Istat sulla salute del 1999-2000 è emersa la forte associazione con le condizioni oggettive di salute tanto da individuare tre distinte sottopopolazioni all'interno delle quali, man mano che le condizioni oggettive si fanno più precarie, l'influenza dei fattori demografici e socio-economici si fa meno importante nella determinazione dello stato di salute dichiarato.

**Key words:** Perceived health, Survival, Elderly

## **1. Introduction**

Health plays a central role in people's perceptions of the risks they are exposed to. At an elderly age in particular, health represents a fundamental dimension in a person's sense of well being around which the whole satisfaction/dissatisfaction system revolves. At the same time quality of life (whether tied or not to health) influences the perception and the evaluation that the individual has of his or her state of health. As a matter of fact, people perceive their state of health from within very complex conceptual frames where one's actual state of health (presence of acute and chronic illness, disability, symptoms and debilitating conditions and/or painful conditions) interacts with numerous other factors of well-being. Within this complex system of relations where the perception of health is at the same time cause and effect of many other well-being dimensions, the usefulness of the indicator based on a complete evaluation of the state of health as predictor of survival has been widely demonstrated. These indicators have

been mainly noted in advanced years, when health becomes frail and individuals frequently face multiple health problems. Perceived health in such cases thus becomes a good predictor of one's actual state of health and of the risk of mortality.

Many studies have also explored the numerous dimensions where to the person is influenced when he or she evaluates his/her health individuating several characteristics. Such characteristics of the individual and the context in which he or she lives exercise and influence a person's perception of health. Furthermore, it has been demonstrated that the relations that link such evaluations to other well-being dimensions are not uniform within the population and that, to the contrary, change depending on a person's actual state of health.

The aim of our work is to contend that the subjective evaluation of one's own health is a good indicator of the actual state of health and is strongly linked to the risk of mortality. Moreover, we present the main results of a study aimed at identifying the various dimensions that the individual integrates when evaluating his/her health: his actual health (both as presence/absence of specific diseases and functional health); his well-being (including his satisfaction for different life dimensions), his health behaviour (healthy vs. non healthy life style). At the same time, the role of some socio-economic and demographic covariates is evaluated. Some evidence indicates that these elements and their relative importance change over the life span of a person and between gender and their influence on perceived health depends on the objective health status.

## **2. Perceived health and mortality: the relevance of the self-evaluation**

### **2.1 Converging results on the relevance of perceived health**

A wide consensus is emerging about the crucial role played by perceived health as a predictor of mortality, particularly in older age groups. Many studies carried out in different countries and using different data (epidemiological or population surveys) converge on the result that self-rated health is a significant independent predictor of survival, even after controlling for socio-demographic covariates and physical health status (Krause and Jay, 1994; McCallum et al., 1994; for a in-depth discussion of the main results, see Idler, 1992), and even when answers are given by family informed respondents (proxy evaluations) (Lawrence and Assmann, 1997). Persons who rate their health as 'poor' have a higher risk of dying compared with people who feel 'good' or 'very good.' These studies also found some evidence for a 'dose response' association (Rakowsky et al., 1991), namely the effect becomes stronger as the rating becomes worse.

Despite this general agreement, the mechanism, both physical and psychological, underlying the relationship between subjective health and mortality is still unknown and many hypothesis are facing each other. These vary from a causal oriented relation from badly perceived health to mortality, assuming that a negative self-evaluation of health could stimulate a psycho-neuro-immunologic response thus leaving the person more susceptible to diseases, to the possibility that a bad perception could produce negative effects on lifestyles; to an inverse causal chain that recognises, especially in the elderly, the capability of correctly evaluating their own health status by integrating different aspects of health in ways inaccessible to any external observer (presence of specific diseases, but also of pre-clinical changes in body function; presence of multiple

conditions) (Idler, 1992). Moreover, the relevance of perceived health could be increased due to the fact that dimensions other than current health status are called into play when assessing health: family history (Idler and Kasl, 1991), the dynamic of health status, that is, improvements or deterioration over time (Idler et al., 1997), or the presence or absence of personal resources (external, such as family, kinship or social networks; or internal, such as a positive or negative personal attitudes to health) (Wolinsky et al., 1992).

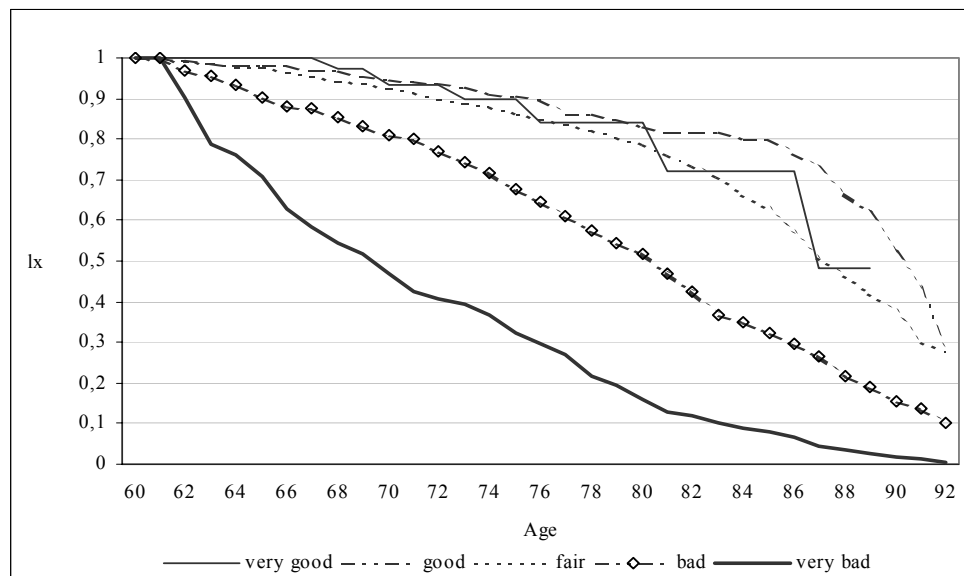
## 2.2 Coherent results are found in Italy

Based on data collected in successive waves (1995-2001) by the European Community Household Panel (ECHP), a recent study (Egidi and Spizzichino, 2006) has demonstrated that the relationship between self-perceived health and mortality is strong in Italy too. The ECHP is a harmonized, cross-national longitudinal survey, focused on household income and living conditions but collecting also demographic, socio-economic and health information. It was promoted and coordinated by the Statistical Office of the European Community (Eurostat) and carried out by the National Statistical Institutes of 15 European countries, then in Italy by Istat. Concerning perceived health, the question used in the ECHP is that suggested by the WHO 'How is your health in general?' with the following possible answer: 'very good', 'good', 'fair', 'bad', 'very bad'.

Figure 1 shows Kaplan-Meier's survival curves by perceived health status of a hypothetical cohort which displays throughout its life the mean survival probabilities by health status of the period (1995-2001).

There is a similitude among survival curves for those who rated their health as 'very good', 'good' and 'fair', with some inversions of the expected order between people reporting a 'very good' and 'good' health status, and a global disadvantage of the first compared with the second (figure 1) that shows what has already been highlighted in previous studies (Mc Callum et al., 1994). Concerning those who rate their health as 'bad' or 'very bad', a higher extra-mortality risk is evident compared with those who state they feel 'very good' or 'good': the probability of dying between 60 and 69 years, for example, is equal to 65 per thousand among people rating their health as very good and goes to 532 per thousand among those who rate their health as very bad, and differentials tend to be lower with ageing (the ratio between the probability of death of people declaring very bad and very good health is 8 between 60 and 69 year, becomes 6,5 between 70 and 79, and 2 between 80 and 89 years).

**Figure 1:** *Kaplan-Meier survival function by perceived health. ECHP 1995-2001*



Source: Egidi, Spizzichino 2006

To study the relationship between perceived health and mortality, controlling for the impact of covariates like objective health and socio-demographic dimensions, a multiple logistic model was used. In this model, the dependent variable is mortality, with two alternatives: 'alive' (0) and 'dead' (1), then odds ratios ( $\exp(b)$  in table 1) greater than 1 imply a higher probability of dying in the interval year between one wave and the next. The most important demographic and social variables (age, gender, marital status, education, residence) were taken into account, to adjust the impact of objective health (disability, chronic condition, acute physical or mental illness) on perceived health.

A significant influence on mortality is played by gender and age (the latter assumed as a continuous variable). All other variables being equal, men have a higher risk of dying than women ( $\exp(B)=2.2$ ) and by ageing a year induces a 10% increased risk. The other structural variables have no significant influence. The only one that is significantly associated with mortality is the condition of never married (of the variable marital status), that is associated with a 77% extra-risk compared to married people. This is due to two possible mechanisms. First there could be a protective effect: marriage can be protective in reducing the risk of mortality, through a reduction in stress and stress-related illness and through general and familial social integration (Kobrin and Hendershot, 1977) or thanks to the adoption of healthier lifestyles of married people compared to singles. Secondly, there could be a selective effect: marriage selects healthier people and leaves among the singles higher proportion of persons with serious health problems. Persons in poor health, and those with chronic conditions or dangerous/unhealthy lifestyles, may find it more difficult to attract a spouse than healthy individuals (Carter and Glinck, 1976).

Among the various health dimensions, perceived health is the strongest predictor of mortality, even after controlling for other covariates. All other conditions being equal, those who perceived their health as 'very bad' are 5 times (odds ratio 5.2) more likely to die than those who declared being in 'good and very good' health. The extra-risk of

dying of those who perceived their health as 'bad' is 3 times higher, while persons who declared their health to be 'fair' have a 66% disadvantage (table 1).

Among other health related variables, only acute illness shows an independent influence on the risk of dying. Acute physical illness causes an extra risk of 87%, acute mental illness causes an extra risk of 46%. After controlling for demographic covariates and perceived health, the influence of chronic morbidity and disability is no longer significant. Regarding chronic morbidity, this could be due to the indefiniteness of the question asked in the ECHP. Moreover, particularly for older people, to suffer from only one chronic disease could be compatible with a good health status and low mortality risks, with health conditions worsening as the number of chronic diseases or conditions increases. Regarding disability, this is probably due to the fact that the relationship between disability and perceived health is very strong, then the latter variable absorbs all the information coming from disability (Wolinsky and Johnson, 1992).

To assess the predictive value of the logistic model, the ROC curve<sup>1</sup> has been built. This curve gives an estimation of how the model predicts the dependent variable (in this case mortality) taking into account that the two alternatives of the dependent variable (alive and dead) have highly different probability to be realized. The indicator based on the ROC curve gives the proportion of persons rightly predicted quite well: comparing the persons really dead with those predicted by the model as dead and the persons who really survived with those predicted as survived, the correspondence is high (the value of the area under the curve is equal to 0.82) and the appropriateness of the model can be considered as good.

All these results demonstrate the high relevance of perceived health. As seen before, the explanations of its relevance range from a direct influence of perceived health on mortality to an actual capability of individuals to correctly assess their own health. In this latter hypothesis, it is also possible that, in the developed world and particularly where, such as in Italy, universal health care ensures frequent and systematic contact between the system and the patient - especially the elderly patient - the individual is in a privileged position to observe and assess his/her health status thanks to information obtained from the health operators and his or her own body (Egidi and Spizzichino, 2006). These results suggest that an individual's health cannot be judged only on the basis of objective indicators of specific diseases or pathologies, an important role is also played by the individual's own perception of health. Thus when an elderly person declares him or herself to be in 'bad' or 'very bad' health then he or she is expressing a meaningful evaluation, strongly linked to his or her actual state of health, and integrating various relevant health dimensions.

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<sup>1</sup> The Receiver Operating Characteristic (ROC) curve is a diagnostic tool for assessing the ability of a logistic model to discriminate between events and non-events. If the model discriminates perfectly, the ROC curve passes through the point (0,1) and the area below the curve is one. If the model has no discriminating ability, the curve is a line from (0,0) to (1,1). Each point on the ROC curve provides the sensitivity and specificity measures associated with a cut point in the probability scale which allows classification of each observation as either a predicted event or a predicted non-event.

**Table 1:** Multiple logistic regression models of 1995-2001 mortality risk over 60 years of age. Odds ratios, significance and confidence intervals. Italy.

| Variable (reference value)                      | Exp(B) Sig | 95% CI      |
|-------------------------------------------------|------------|-------------|
| <b>Sex (Female)</b>                             |            |             |
| Male                                            | 2.165 ***  | 1.809-2.591 |
| <b>Age (1 more year)</b>                        | 1.096 ***  | 1.084-1.108 |
| <b>Perceived health</b><br>(Good and very good) |            |             |
| Fair                                            | 1.656 ***  | 1.209-2.267 |
| Bad                                             | 3.136 ***  | 2.225-4.420 |
| Very bad                                        | 5.237 ***  | 3.518-7.796 |
| <b>Disability (No)</b>                          |            |             |
| Yes to some extent                              | 0.949      | 0.544-1.657 |
| Yes severely                                    | 1.430      | 0.821-2.490 |
| <b>Chronic (No)</b>                             |            |             |
| Yes                                             | 0.896      | 0.525-1.529 |
| <b>Physical (No)</b>                            |            |             |
| Yes                                             | 1.866 ***  | 1.496-2.328 |
| <b>Mental (No)</b>                              |            |             |
| Yes                                             | 1.460 **   | 1.019-2.090 |
| <b>Marital status (Married)</b>                 |            |             |
| Separated/divorced                              | 1.129      | 0.491-2.598 |
| Widowed                                         | 1.156      | 0.943-1.418 |
| Never married                                   | 1.770 ***  | 1.306-2.400 |
| <b>Education<sup>(1)</sup> (High)</b>           |            |             |
| Medium                                          | 1.044      | 0.588-1.854 |
| Low                                             | 0.980      | 0.591-1.625 |
| <b>Geographic region (North)</b>                |            |             |
| Center                                          | 1.099      | 0.882-1.369 |
| South                                           | 1.047      | 0.871-1.257 |

Source: Egidi, Spizzichino 2006

\*\*\* p<0.01; \*\* p<0.05; \* p<0.10

(1) The question asked in ECHP is: 'Highest level of general or higher education completed'. We labelled the answer 'recognised third level education' as High, 'second stage of secondary level education' as Medium, 'less than second stage of secondary education' as Low.

### 3. Dimensions of perceptions of health: between objective health and well-being

#### 3.1 A strong link between objective and subjective health

The concept of perceived health is quite complex: there are many dimensions and information (concerning both the present and the past) that the individual takes into

account and values in an integrated approach when he or she answers questions about his/her own global health status.

The strongest association has been found for physical, functional and mental health, but other factors also have an impact on perceived health: socio-demographic, life-style and behavioural factors (Bjorner et al., 1996). Studies on the socio-economic discrepancies influencing perceptions of health have a particular relevance. They have always pointed out the discomfort of those occupying the most disadvantaged social positions independently of the considered socio-economic indicator (Vannoni et al., 1999; Costa et al., 2004; Kunst et al., 2004).

A recent study (Salvatore and Spizzichino, 2007) has attempted to highlight the main factors that determine perceptions of health in Italy, utilizing the data of the health survey carried out by Istat in 1999-2000. The survey is based on a wide sample of 52 thousand and 3 hundred families, with a total of around 140 thousand individuals, and provides a rich amount of information to investigate the several dimensions of the population's state of health: objective health, referred to the presence of one or more diseases (acute or chronic) and of disability; subjective health (or perceived health), measured through the same question used in ECHP and suggested by WHO; moreover, the SF-12 scale, a shortened version of the MOS SF-36, aimed at assessing the various dimensions of health related to well-being, is also used in the Italian survey.

The study refers to the 'poor' perceived health ('bad' and 'very bad') and takes into account numerous potential determining factors: an individual's personal characteristics (age, sex, marital status, body mass index), the objective health (disability and chronic illnesses), some socio-economic variables (level of education, socio-professional class<sup>2</sup>, family's assessment of its own economic resources, tenure and conditions of dwelling), as well as the geographical living area and domain (residential zone)<sup>3</sup>, as indirect indicators of 'macro' factors which may influence perceptions of a person's state of health. As is obvious, the transversal nature of the survey impedes the understanding of the associations as cause-effect relationships. Furthermore, for certain variables, such as family's assessment of economic resources, it is not possible to assume that the assessment proceeded the perception. We cannot exclude that certain needs may arise as a consequence of bad health which make economic resources inadequate, producing dissatisfaction.

One of the objectives of the study was to verify if the reference population could be considered homogeneous in respect to the relationship between perceived health and considered variables or rather, if groups of individuals exist for which the determinants

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<sup>2</sup> The "socio professional class" variable was determined from the "professional condition" and "professional position" variables included in the survey. Workers, those in search of work and those who have left the workplace have been classified according to their position in their profession following the Schizzerotto classification (1993):

1. Bourgeoisie (manager, entrepreneur, independant professionnel);
2. White-collar middle class (office worker);
3. Petty bourgeoisie (own account worker, member of cooperative, cooperator);
4. Working class (workman, junior clerk, work at home).
5. Housewife (so considered independently from whether they worked in the past)
6. Unable to work;
7. Other condition.

<sup>3</sup> The ISTAT classification of the municipalities is as follows: major urban areas municipalities; municipalities of the hinterland; municipalities with 2000 inhabitants or less; those with 2001-10.000 inhabitants; those with 10001-50.000 inhabitants; those with 50.001 inhabitants or more.

of perceived health are different or exercise an influence more or less strong in respect to other groups.

For this end the data has been analyzed by taking a segmentation approach which does not foresee any homogeneity within the units. On the contrary it aims, through a progressive division of the initial sample of people, to identify groups that are more and more homogenous in themselves and more heterogeneous between them in respect to the perception of health (Fabbris, 1997). The segmentation approach<sup>4</sup> has led to the refusal of the homogeneity hypothesis and has identified three sub populations (sub trees of the segmentation analysis), distinguished on the basis of the presence/absence of disability and/or chronic illnesses<sup>5</sup>: the non disabled and non multi-chronically ill (the 'healthy'), the non disabled and multi-chronic ill persons (the 'multi-chronic') and the disabled. The people who belong to these sub populations show clearly different health conditions. On average, only 5.1% of the 'healthy' feel bad or very bad; such a quota rises to 23.1% in the presence of multi-chronicity and overtakes 60% amongst the disabled. Moreover, within the three sub populations, certain variables (often diverse in the different populations) show groups of individuals (subdivision of the knots) characterized by a diverse perception of health. Within the sub population of the 'healthy', for instance, the proportion of those perceiving themselves in 'poor' health, is between a minimum of 1.2% of the group formed by those with better education (at least a 2-3 year degree), the younger (45-55 years) and those satisfied with their economic resources, to a maximum of 16.4% of the group of those with the lowest education and not satisfied.

Amongst the 'the multi-chronic', the same proportion varies between around 10% for the best educated (in this case at least secondary school diploma), the youngest (45-59 years of age) and economically satisfied, and increases to more than 45% for those who live on the Islands and are dissatisfied with their economic situation.

Also amongst the disabled the differences are strong and the proportion of individuals who perceive themselves in 'poor' health varies from 46% for those who are not multi-chronic and who are satisfied with their economic conditions, to 90% for those who are multi-chronic, outside the work market and economically dissatisfied.

### 3.2 Diverse dimensions of perceived health depending on objective health

The separate analysis of the three sub populations highlights the different system of relationships between perceived health and covariates. In table 2, the results of the logistic regression for the three sub populations and for the whole population are given. As for the latter all the considered variables show, in a highly significant way, a link to the perceived bad state of health while the separated analysis of the three sub

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<sup>4</sup> Amongst the several segmentation procedures, the algorithm CHAID-*Chi-squared Automatic Interaction Detection*- (Kass, 1980) was utilized. Such algorithm gave more stable results and more easily comprehensible ones. Utilising the Chi-squared test, for each predictor, CHAID unifies those modalities assessed as homogeneous from a statistical point of view with reference to the response variable and it maintains separate all the other modalities considered heterogeneous. After this, CHAID selects the best predictor in order to form the first branch of the decisional tree. In such a way, the heterogeneity between the knots and the homogeneity within the knots in respect to the variable response is maximized. Such a process is repeated until the complete expansion of the tree or, in any case, until some stop rules take place (a maximum level of 6 is the stop rule of the tree development used in Salvatore and Spizzichino's study).

<sup>5</sup> The multi-chronicity, defined as the presence of 3 or more chronic disease, is considered

populations points out a highly complex system of relationships where the variables are connected to the 'poor' perceived health with different modalities and different intensity depending on the actual state of health.

Starting from the demographical variables, the influence of age decreases going from the 'healthy' population to the population with objective health problems. Amongst the first, people belonging to the 65-74 years of age group and the above 75 group show a risk of perceiving 'poor' health respectively 1.7 and 2.3 times the risk of those between 45 and 64 years of age. Risks diminish appreciably in the sub populations of the 'multi-chronic persons' and the disabled. At the same time, also the ageing effect is low among the multi-chronic and disappears among the disabled. In the first the OR of the 65-74 and 75 years of age and above, still in respect to the 45-64 years of age, is respectively 1.3 and 1.4; in the second, the OR is 1.4 for both age groups, 65-74 and 75 and above.

As far as gender is concerned, the female disadvantage that emerges from the analysis of the whole population is significant in not one of the three sub populations.

A person's marital status is significantly associated to perceived health only amongst the disabled for whom a disadvantage for those married appears. It could be explained either as the result of a possible selection effect brought about by institutionalization. This could be with a minor presence of the more gravely disabled amongst those who are not living with a partner with the effect of a higher inclination to entering a nursing home or as a higher tendency to self indulgence on the part of those with partners.

The geographical variables point out, in all three sub populations, a significant disadvantage for those living in the southern regions: respectively for the 'healthy,' the 'multi-chronic' and the disabled the risk of perceiving bad health for those who live in the 'South and Islands', when all the other variables are the same, is respectively 1.4, 1.5 and 1.5 times the risk of those who live in the North. As for the non disabled (whether chronically ill or not) the disadvantage of those coming from the central regions is also significant.

Only amongst the 'multi-chronic', does place of settlement influence the perception of health: in particular, when the other conditions are the same. Those who live in city centres show a risk of perceiving bad conditions of health 1.4 times that of those who live around large urban areas.

As far as socio-economic variables are concerned, the level of education plays a significant role within the 'healthy' population. It points to the strong discomfort of those with lower education levels and, most of all, those who do not have any education degree. Those with only primary school certificates and those without any certificate of education perceive 'poor' health respectively 1.7 and 2.1 times those with more than primary school certificate. The variable holds its high significance amongst the 'multi-chronic', showing strong gaps, even though less strong when compared to those that come out within the healthy population, amongst the more educated and the less. Those with only primary school certificates and those without, show a higher risk in perceiving negatively their health respectively 1.4 and 1.8 times the risk of those with more than a primary school certificate. The variable loses significance amongst the disabled.

Equally, the variable relative to housing conditions, that holds a significant role amongst the non disabled (chronically ill or not), loses significance amongst the disabled.

**Table 2:** Poor perceived health (bad and very bad) after 45 years of age. Multiple logistic regression models applied to different sub-populations. Odds ratios and significance. Italy, 1999/2000

| VARIABLES                                       | Without disability, without chronic diseases |       | Without disability, with chronic diseases |       | With disability |       | Total population |       |
|-------------------------------------------------|----------------------------------------------|-------|-------------------------------------------|-------|-----------------|-------|------------------|-------|
|                                                 | Exp(B)                                       | Sign. | Exp(B)                                    | Sign. | Exp(B)          | Sign. | Exp(B)           | Sign. |
| <b>Age (45-64)</b>                              |                                              | ***   |                                           | ***   |                 | *     |                  | ***   |
| 65-74                                           | 1.69                                         | ***   | 1.25                                      | **    | 1.40            | *     | 1.50             | ***   |
| 75 or more                                      | 2.33                                         | ***   | 1.42                                      | ***   | 1.41            | *     | 1.68             | ***   |
| <b>Sex (Male)</b>                               | n.s.                                         |       | n.s.                                      |       | n.s.            |       |                  | *     |
| Female                                          |                                              |       |                                           |       |                 |       | 1.12             | *     |
| <b>Marital status (Married)</b>                 | n.s.                                         |       | n.s.                                      |       |                 | ***   |                  | ***   |
| Never married                                   |                                              |       |                                           |       | 0.65            | **    | 0.85             |       |
| Separated/Divorced                              |                                              |       |                                           |       | 0.52            | *     | 0.91             |       |
| Widowed                                         |                                              |       |                                           |       | 0.62            | ***   | 0.73             | ***   |
| <b>Geographic region (North)</b>                |                                              | ***   |                                           | ***   |                 | ***   |                  | ***   |
| Center                                          | 1.46                                         | ***   | 1.45                                      | *     | 1.20            |       | 1.41             | ***   |
| South and Islands                               | 1.44                                         | ***   | 1.52                                      | ***   | 1.46            | ***   | 1.49             | ***   |
| <b>Tipology of municipality (Hinterland)</b>    | n.s.                                         |       |                                           | ***   | n.s.            |       |                  | ***   |
| Up to 2000 inhabitants                          |                                              |       | 0.92                                      |       |                 |       | 0.87             |       |
| 2001-10.000 inhabitants                         |                                              |       | 0.87                                      |       |                 |       | 0.86             |       |
| 10.001-50.000 inhabitants                       |                                              |       | 0.95                                      |       |                 |       | 1.00             |       |
| 50.001 and more inhabitants                     |                                              |       | 1.16                                      |       |                 |       | 1.16             |       |
| Metropolitan center                             |                                              |       | 1.41                                      | ***   |                 |       | 1.25             | **    |
| <b>Education (More than primary school)</b>     |                                              | ***   |                                           | ***   | n.s.            |       |                  | ***   |
| Primary school                                  | 1.67                                         | ***   | 1.39                                      | *     |                 |       | 1.43             | ***   |
| Less than primary school                        | 2.09                                         | ***   | 1.82                                      | ***   |                 |       | 1.68             | ***   |
| <b>Socio-professional class (Bourgeoisie)</b>   |                                              | ***   |                                           | ***   |                 | *     |                  | ***   |
| White-collar middle class                       | 0.80                                         |       | 1.13                                      |       | 1.11            |       | 1.04             |       |
| Petty bourgeoisie                               | 1.08                                         |       | 1.17                                      |       | 1.04            |       | 1.12             |       |
| Working class                                   | 1.09                                         |       | 1.45                                      | *     | 1.20            |       | 1.30             | *     |
| Housewife                                       | 1.03                                         |       | 1.46                                      | *     | 1.02            |       | 1.24             |       |
| Unable to work                                  | 4.59                                         | ***   | 3.56                                      | ***   | 2.04            | *     | 3.17             | ***   |
| Other condition                                 | 1.11                                         |       | 1.69                                      | *     | 1.51            |       | 1.55             | **    |
| <b>Self perceived economic condition (Good)</b> |                                              | ***   |                                           | ***   |                 | ***   |                  | ***   |
| Bad                                             | 2.15                                         | ***   | 1.79                                      | ***   | 1.58            | ***   | 1.86             | ***   |
| <b>House condition (Good)</b>                   |                                              | *     |                                           | ***   | n.s.            |       |                  | ***   |
| Bad                                             | 1.34                                         | *     | 1.60                                      | ***   |                 |       | 1.45             | ***   |
| <b>B.M.I. (Normal weight)</b>                   |                                              | **    |                                           | *     |                 | **    |                  | ***   |
| Underweight                                     | 1.79                                         | *     | 1.33                                      |       | 1.71            | **    | 1.69             | ***   |
| Some excess weight                              | 0.86                                         |       | 0.97                                      |       | 0.78            | **    | 0.90             | *     |
| Overweight                                      | 1.28                                         | *     | 1.21                                      | *     | 0.85            |       | 1.13             |       |
| <b>Chronic condition (No)</b>                   |                                              |       |                                           |       |                 | ***   |                  | ***   |
| Yes                                             |                                              |       |                                           |       | 2.08            | ***   | 3.89             | ***   |
| <b>Disability (No)</b>                          |                                              |       |                                           |       |                 |       |                  | ***   |
| Yes                                             |                                              |       |                                           |       |                 |       | 8.41             | ***   |

\*\*\* p< 0.001 \*\* p<0.01 \* p<0.05

Source: Salvatore, Spizzichino, 2007

Amongst the socio-economic variables, only the socio-professional class and the assessment of economic resources, highly significant in both the non disabled sub populations, hold their significance also amongst the disabled. In all three sub populations the discomfort of those unable to work and, in general, the gap between that part of the workforce and those outside the workforce, is evident. Within the healthy population the risk of perceiving bad health for a person not able to work is 4.6 times that of a person from the bourgeoisie class. Such a gap decreases with a worsening in objective health conditions, being the OR equal to 3.6 and 2 respectively for the 'multi-chronic' and for the disabled. Within the firsts the discomfort of the working class and of the other classes not part of the work force, such as people 'in other conditions' and housewives that present a respectively 1.4, 1.7 and 1.5 times the risk of that of the bourgeoisie, is evident. The assessment of the economic resources holds its strong significance in all three groups. Nonetheless, also as for such a variable the gap between the risk of perceiving 'poor' health of the economically dissatisfied and satisfied is higher in the absence of objective health conditions. Amongst the 'healthy' such risk for those declaring scarce or insufficient economic resources is 2.2 times the risk of those economically satisfied. Such a relationship is reduced amongst the 'multi-chronic' (1.8) and the disabled (1.6). The only variable that is not significant both in the total population and in all three sub populations refers to a person's relationship to their dwelling (tenant/owner).

The study shows a strong tie between perceived health and objective health conditions. It is such a strong relationship that it influences not only perceived health but also the system of relationships between it and the other variables. In general, the demographic, socio-economic and territorial differentiations, where significant, are far higher in the absence of objective health problems. Furthermore, when one suffers from real health problems, and especially from disability, such determining factors do not significantly influence the perception (such is the case for instance of education and housing conditions in the presence of disability), whilst the remaining variables, even though holding their significance, act with a minor strength on the reckoning of the declared state of health.

#### **4. Conclusions**

The evidence by now strongly favors the position that the personal evaluation of ones health expressed by the elderly is a good estimate of the individual's objective health. It also strongly contends that from the several variables that can be gathered from population surveys, perceived health is the best indicator of elderly mortality. Also in these surveys that manage to make a comparison between the ability to predict the objective health status of the variables arising from interviews and those noticed by medical personnel directly on the interviewed during the health examination surveys, the personal evaluation done by the individuals is confirmed as being the best indicator of mortality (Idler and Benyamini, 1997). Such results have at least two important consequences. Both with a high operative impact. The first one allows us to give a higher value to a person's state of health deducted from the surveys based on the interviews. Taking into consideration the much lower costs of such surveys compared to the more complex health examination surveys, the possibility of deriving from them high quality estimates of objective health is without a doubt an important step ahead.

The second effect is to underline the increasing ability of the individual, often finding themselves in the position of integrating information coming from several sources, to make a self evaluation. In respect to health, the principle information available (also thanks to more frequent contact with general practitioners, especially amongst the elderly) and the integration of several elements make the individual a 'privileged witness' whose assessment deserves to be taken into account by medical operators. In fact, only the individual is able to integrate information related to past and present, individual history and family history, to the perception of the evolution of an illness, to the symptoms impeding the normal daily routine and to numerous other elements (not necessarily all real) that influence their state of health.

Even the studies trying to individuate the variables that contribute to the forming of the individual evaluation have shown a strong influence of the objective health on the subjective evaluation. As for Italy, such an influence is so strong as to highlight three distinct populations. Each one is characterized by its own system of relations between perceived health and determining factors. The more the objective health becomes precarious, the less important socio-economic factors become in the perception of health. Furthermore, amongst the disabled, socio-economic factors lose absolutely their significance. In the same way classic differentiations determined by demographic characteristics, such as aging effects, also decrease in importance or disappear.

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