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Healthy life, social interaction and disability

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Abstract

This paper aims at analysing two relevant dimensions of well-being: living a healthy life and social interaction. A link between the two dimensions of well-being has been highlighted in the literature. The model assumes that both these concepts, i.e. social interaction and healthy life, are latent and manifest themselves through a number of indicators. The indicators adopted are those available in the 2011 ISTAT Survey on social inclusion of people with disability in Italy by comparing the well-being attainments with respect to the different levels of functional limitations. In this paper the available indicators are used simultaneously to study the level of social interaction and health through a MIMIC (Multiple Indicators Multiple Causes) model. This allows us to deal directly with endogeneity issues. Results show that women have a lower achievement in social interaction and in health. Moreover, differences occur in the effect of the observable exogenous variables included in the model with a larger negative effect of ageing for women on their health status and a higher negative effect of ageing for men on social interaction. Education plays a significant role only for women for the healthy life dimension. Finally, the latent variable on social interaction has been found to positively affect, consistently with the literature, the health dimension.

Key words: disability; social interaction; healthy life; MIMIC model; latent variables.

JEL Classification codes: J14, I10, C30.

Introduction

This paper focuses on two relevant dimensions of well-being: social interaction (interpreted as the person's acts with respect to the others) and living a healthy life. The existing literature has emphasized that social interaction may affect individual health through multiple channels, including an easier connection with social support and healthcare (e.g. Giordano and Lindstrom 2010), and affecting behaviors and personality aspects (e.g. Fujisawa, Hamano and Takegawa 2009). In addition, it has been recently highlighted the relevance of taking into account the quality of social relations in addition to the quantity of social relations (Fiorillo and Sabatini, 2011a and 2011b). When estimating the relationship between social interaction and health, it has often been privileged the adoption of classical' regression techniques. However, a shortcoming of this strategy consists in the difficulty of taking into account the endogeneity issues possibly characterising the linkage between social interaction and individual health status.

When analysing the relationship between social interaction and health, we adopt a novel modeling framework that is particularly suitable for this type of analysis (Fiorillo and Sabatini, 2011a) and is seldom used in the literature. In particular, we directly deal with the endogeneity issue by considering both variables as latent construct to be measured by a set of indicators, and all the available indicators are used simultaneously in the formulation of our relationship. In this context, an ideal framework is the structural equation modelling framework, and in particular the so-called MIMIC (Multiple Indicators Multiple Causes) model. This model comprises a measurement part (which describes the relationships between the latent factors and their indicators) and a structural part (which introduces the 'causes' of the latent factors). This study endorses the suggestion of taking into account both the quantity and the quality aspects of social relationships, and innovates with respect to the existing literature taking into account the gender issue, by estimating separately the relationship between social interaction and health of males and females. Finally, we add to the existing empirical evidence focusing on people with functional limitations, for which social interaction and health issues assume a predominant role for their life.

In section 1, we refer to the literature on social interaction and health. In section 2, we introduce the data analysed and we describe the characteristics of the population. In section 3, we present the methodology and the empirical model employed, while in section 4 are summarized the main empirical findings of the paper. Section 5 includes a variant of the empirical models employed. Finally, section 6 wraps up the analysis with some concluding remarks.

1. Social interaction and healthy life: the literature

The relevance of being included in a social network of relatives and friends on well-being and life satisfaction has been found, amongst other authors by Mukerjee (2013), with regards to elderly by Fong (2001), Sener *et al.* (2008) and Wolff (2013) and with regards to intellectual disabled persons by Campo, Sharpton, Thompson and Sexton (1997), and by Miller and Chan (2008).

Positive effects of social interaction on self-assessed health have been detected by Mukerjee (2013) about people aged over 18 in the USA by using cross sectional data (General Social Survey 1972-2008). By estimating probit models on the probability of being in excellent or good health with the stronger effect of interaction with friends for the whole sample and youth and middle-aged individuals, with neighbors and relatives for seniors.

Mendes de Leon *et al.* (1999) show that larger networks have a positive effect on the recovery of disability and on reducing its development.

Quality more than quantity of contacts have been found to positively affect elderly well-being as shown by Sener, Oztop, Doğan and Guven (2008) survey on the impact of interaction with children and grandchildren with elderly. They also show mixed evidence as far as the relationship with siblings is concerned, however they warn about the lack of consideration in the literature of the quality of relationship with siblings. The interaction with adult children can have a negative effect on elderly people well-being when undesired as Silverstein, Chen and Heller (1996) show. Making friends has been found to have a more significant and positive effect than relatives' visits or other factors related to the individual according to Wolff (2013) analysis based on the 2007 'Residents in Sheltered Accommodation for Elderly People' survey in France.

Roberto and Husser (2007) by using qualitative interviews to a sample of 58 older women with multiple health problems in the USA show that social relationships act both as resources and as obstacles in the adaptation of women's daily life to their chronic illness problems with contrasting effects on physical health and emotional well-being. They show the occurrence of obstacles from social network to the development of older women's well-being when, 'the receipt of support deflated the women's sense of self and well-being when the provider of support was not knowledgeable of or sensitive to the intersection of their life values and current needs.' (Roberto and Husser, 2007, p.405).

Fiorillo and Sabatini (2011a and 2011b), by applying multivariate analyses on a microdata obtained by statistical matching of the ISTAT Multipurpose Survey on Households and the Bank of Italy's Survey of Household Income and Wealth, show a strong effect of the frequency of meetings with friends (Fiorillo and Sabatini, 2011a) with a larger impact of the quality of interaction

(measured with the level of satisfaction of the relationship) of the relationships with friends on Italian's perceived health status. The authors also stress the importance of considering both the quantity and the quality aspects of social interactions. In addition, they identify and suggest the use of structural equation modelling framework to better assess the relationship between social capital and health (Fiorillo and Sabatini, 2011a and 2011b).

Finally, a negative impact of disability on individual's satisfaction on social life has been found by Powdthavee (2009).

2. Data and descriptive statistics

The aim of this paper is to focus on social interaction and health with reference to people who are more likely to have limitations or chronic diseases in Italy. For this purpose, we use the 2011 Italian National Statistical Office (ISTAT) Survey on Social Inclusion of Not Self Sufficient Individuals (ISTAT, 2011). The survey is directed to people with functional limitations and health problems who live in households and aims to analyse their social integration in everyday life and understand which factors limit their full participation in the society. People involved in the survey (through computer assisted telephone interviews) are those who stated some functional limitations in a previous survey carried out in 2004-2005 ('Health Conditions and Use of Health Services Survey', ISTAT, 2005). Individuals excluded, instead, are those who passed away in the meanwhile, have been institutionalized, have moved abroad or declared slight limitations in the preliminary interview in 2011. Therefore, the sample is composed of 3,121 people between 11 and 87 years old and is representative of 3 million and 947 thousand people of the same age. Given the particular sampling design, the questionnaire is not aimed at people with limitations risen after the period 2004-2005 and this limits the heterogeneity of the sample. Individuals excluded from the analysis are those who passed away in the meanwhile, have been institutionalized, have moved abroad or declared very slight limitations in the preliminary interview in 2011.

Women represent 62% of the sample and, as descriptive statistics in Table 1 show, they are on average older than men: women's average age is 72 against 67 for men, and are more likely to be single (43% of them is single and 17% of men). About 40% of interviewees live in the South of Italy and on average their level of education is low (43% of men and 51% of women have as highest education level a primary school certificate) even if, given the age limits (11 to 87 years old), some can be still attending school (the education variable has been split in five categories as it is more possible for disabled people to tackle some problems in achieving qualifications, so it is more appropriate to use as much education levels as possible, given the characteristics of the population analysed). About 47% of men and women in the sample do suffer from high level of

limitations and 76% of men and 82% of women have chronic diseases, while 48% of men are disabled against 56% of women.

[Table 1 here]

As shown in Table 1, the average age in the sample is particularly high and this seriously limits the number of observations on potentially active people. In fact, the observations on people aged from 15 to 64 are very low (278 males and 339 females), preventing us from carrying out a detailed analysis on the self-perception of employed people about their work. Available information reveals that amongst those in working age the employment rate is rather low, especially for women. For women without limitations it is 20%, while for men it is 72%. If we consider strong limitations, then the employment rate is even lower (less than 10% for women and 32% for men).

We focus our analysis on a subsample of individuals aged over 14 (i.e. 3108 individuals) and we analyse two main dimensions: social interaction and health.

To measure social interaction we have used a set of indicators on the level of satisfaction expressed by individuals with regards to their personal interaction with friends and relatives and on a measure of interaction with relatives connected with individual's judgment on whether the quantity of contacts are as much as they wish, a bit less or much less than they wish (the latter, consistently with the literature surveyed in section 1 can provide a better predictor of health), and the use of internet. All the variables increase with a positive perception on the quantity and quality of social interaction. The degree of satisfaction is normalised to 1 to address the problem of multiple scaling in its single indicators. The level of interaction takes 4 values (i.e. 1 indicates much less contact than wished, and 4 represents as much as wished).

The level of satisfaction on social interaction decreases the higher is the level of limitations, with a steeper decrease for the level of satisfaction for the interaction with friends. In addition, the interaction with relatives is higher the lower is the level of limitations.

The reasons that the individual provides for not reaching the desired level of interaction and web use are different based on the degree of limitations. When without limitations, men are more likely to state as a reason the lack of time, while women are more likely to choose health reasons. Both men and women with limitations find in their health status the reason for the lack of interaction (results available on request).

3. Methodology

Our empirical model on social interaction and healthy life assumes that these concepts can be interpreted as latent factors, which manifest themselves through a set of observed indicators. In this paper, we propose to use different available indicators simultaneously to study the level of social interaction and health for people with disability through a MIMIC (Multiple Indicators Multiple Causes) model.

As this model is an extension to the factor analysis setting, we briefly introduce the notations through the factor analysis model. The MIMIC model, proposed by Joreskog and Goldberger (1975), can be represented as follows:

(1) $y_i = \Lambda f_i + z_i$ Measurement Equations

(2) $f_i = Bx_i + \upsilon_i$ Causal Relationships

with $V(z_i) = \psi$ and $V(\upsilon_i) = \sigma^2 I_m$, and where f_i (m x 1) is a vector of latent factors of individual i (m = number of latent dimensions). y_i (k x 1) is a vector of observed indicators (k = number of indicators), x_i (n x 1) is a vector of latent exogenous variables (n = number of exogenous variables), and Λ and B are corresponding coefficient matrices. The measurement equations show that latent factors manifest themselves through some observed variables, while the causal relationships show the influence of exogenous variables on the latent factors. The disturbance terms (z_i and υ_i) are assumed to have zero means and to be not correlated with one another. For each indicator representing the latent construct, a weight (i.e. a factor loading) is estimated. The factor loading represents how much, compared to the others, the indicator counts in explaining the latent concept. For a detailed review of the model, see Aigner et al. (1984) and Zellner (1970). For an application, see Krishnakumar et al. (2011): they analyse the concept of social policy. Addabbo and Di Tommaso (2011) analyse 'senses, imagination and thought' and 'leisure activities and play' for Italian children; and Di Tommaso (2007) conceptualizes children's well-being for India.

In this paper, the MIMIC model has two latent factors: one called 'interaction' and the other called 'health'. They are explained by a number of indicators. As shown in Figures 1 and 2, the right hand side of the figures corresponds to a factor analysis, while the full diagram reports a full MIMIC model with exogenous variables (covariates). The error terms of the measurement parts are indicated with ε_i and ν_i.

In the MIMIC model on social interaction the measurement indicators (as shown in the right hand side of Figure 1) of the unobserved latent variable are:

- the degree of satisfaction of the relationship with family and other relatives ('sat_family'): categorical variable with 4 categories (not at all satisfied, a little, enough, very satisfied);

- the degree of satisfaction of the relationship with friends ('sat_friends'), which represents the quality aspect of social interaction: categorical variable with 4 categories (not at all satisfied, a little, enough, very satisfied);
- the level of interaction with the family and other relatives ('int_family'): categorical variable with 4 categories (do not meet anyone but (s)he would like, do not meet anyone and (s)he wouldn't like, less than wished, as much as wished);
- frequency of internet use and satisfaction on that ('internet'): categorical variable with 3 categories (never or less than wished, never and not wished, as much as wished).

Due to the strong correlation (0.93) between the two indicators on the degree of interaction with friends and on the degree of interaction with relatives, we introduce in the model only one of them (i.e. level of interaction with relatives). In addition, the values of these four indicators increase with a positive evaluation of the activity.

The structural part of the model (left hand side of Figure 1) shows the individual and family characteristics (x_i) that can interact with the latent social interaction variable namely: civil status (equal to 1 if he lives alone), age, sex (equal to 1 if female), area of residence (Centre or South/Islands, with North as control), the degree of limitation in daily activities (described by the two dummy variables 'highlim', which is equal to 1 if he has a high level of limitations, and 'medium', which is equal to 1 if she has medium level of limitations, and where small or none limitations is the control variable), the evaluation of the economic situation of the family ('resources') and the years of education. The variable on the economic resources is a dummy variable equal to 1 if the whole family economic resources in the last 12 months are defined to be very good or adequate, and it is equal to 0 if they are scarce or absolutely insufficient.

In a variant of the model, we do not insert the variable 'sex' in the left side (among the exogenous variables), but we estimate the model for men and women separately.

[Figure 1 here]

In the MIMIC model on health the measurement indicators (as shown in the right hand side of Figure 2) of the unobserved latent variable are:

- the perception of individual health ('subj_health'): categorical variable with 3 categories (very bad or bad, not so bad, good or very good);
- disability status ('disabled'): dummy variable equal to 1 if disabled person and equal to 0 otherwise (not disabled or slightly disabled);

- presence of chronic illness (‘chronic_ill’): dummy variable equal to 1 if the person suffers of a long term chronic illness and equal to 0 otherwise;
- how often (s)he goes out and the satisfaction about going out (‘go_out’): categorical variable with 4 categories (never or once a week, sometimes during the week but less than wished, sometimes during the week and as much as wished, every day).

The structural part of the model (left hand side of Figure 2) shows the individual and family characteristics (x_i) that can interact with the latent health variable namely: civil status (equal to 1 if he lives alone), age, sex (equal to 1 if female), area of residence (Centre or South/Islands, with North as control), the evaluation of the economic situation of the family (‘resources’) and years of education.

[Figure 2 here]

The descriptive statistics of the variables introduced in the two MIMIC models are displayed in Table 2.

[Table 2 here]

4. Results of MIMIC models estimations

Both social interaction and health are relevant dimensions of well-being though they are not directly observed and, as outlined in section 3, we aim at measuring them, highlighting the effects of individual, family and social variables by using a structural equation modelling framework.
The model has been estimated on the whole sample of people aged over 14. The coefficient displayed in the model are all standardised and the estimation method used is ML (Maximum Likelihood). The indicators chosen for explaining the latent factors are all significant and have the expected sign.

More specifically, as shown in the upper part of Table 3, looking at the social interaction dimension, the indicator that has the highest weight in the measurement of the unobserved dimension of social interaction is the degree of interaction with relatives (‘int_family’) followed by the frequency and satisfaction on the use of internet (‘internet’) and by the level of satisfaction on interaction with friends (‘sat_friends’) and with relatives (‘sat_family’).

For what concerns health, the highest weight is represented by the variables on how much (s)he goes out and the satisfaction about it.

Turning to the effect of individual and family characteristics (structural part of Table 3), results suggest how age decreases social interaction and how women have a low level of social interaction. Education does not affect significantly social interaction while, consistently with the literature, the degree of limitations of the individual does significantly affect social interaction with an effect that increases with the severity of limitations. Being single and the area of residence do not affect social interaction. On the other hand, a higher level of perceived family monetary well-being has a positive effect on individual's social interaction. This is consistent with the positive effect of income on life satisfaction through its effect on social participation found by Rijken and Groenewegen (2008) in their applied analysis on 1,265 patients diagnosed with one or more somatic chronic disease in the Netherlands.

[Table 3 here]

To corroborate our results, the model has been estimated for men and women separately and taking into account the different impact of the same exogenous variables on social interaction and health for men and women (Table 3).

For both men and women the level of interaction with family members and other relatives has the highest weight in the measurement of social interaction with a higher weight for women than for men (Table 3), followed by having as much as wished level of interaction via web (again with a higher weight for women than for men) and satisfaction on the relationship with friends (higher for men than for women). This means that if social interaction increases, it increases more in the degree of interaction with family.

Comparing the effect of the same variables on social interaction by gender we can see that being single does not significantly affect social interaction for both men and women, whereas age has a negative effect on social interaction more for men than for women. Being more educated does not significantly affect social interaction, nor the area where they live.

Social interaction increases (more for women than for men) the higher is the perceived level of monetary well-being of the family (‘resources’). Finally, both men and women's social interaction is negatively affected by limitations, with a similar effect when they have serious limitations, whereas the effect is higher with medium limitations for women.

Turning to the measurement part of the model on health by gender (Table 3) all the factors included in the model are relevant but the perception of one's health status has a higher weight for

women than for men in positively contributing to the latent variable health while the disability status has a larger negative effect on men than on women's health. The exogenous variables by gender show a higher negative effect of ageing on health for women (for men the effect is lower and not significant) and a positive and significant effect of education only for women. The latter can be related to an average lower level of education for disable women than for men leading to a lower access to prevention for disable women. A better evaluation of the economic situation of the family is found to have a positive effect on individual health for both men and women.

For what concerns the models fit, it is quite good. SRMR (standardised root mean squared residual) should be close to 0, and this is the case in all our models, while CD (the coefficient of determination) should be near 1.

5. Influence between social interaction and health

The MIMIC model has been estimated including the latent variable on social interaction in the structural part of the model on health, as shown in Figure 3. Consistently with the literature (Amongst other with Mukerjee (2013) and Fiorillo and Sabatini (2011a,b)) results show that there is a positive and significant effect of social interaction on health for both men and women (Table 4).

[Figure 3 here]

[Table 4 here]

The resulting predicted latent variables have then been normalised and Figures 4 and 5 show their distribution. As one can note the normalised social interaction shows a more concentrated distribution around medium-high achievements especially for men (Figure 4), whereas the normalised health variable distribution is more nuanced and characterised by the presence of a significant number of observations also in the lower tails especially for women.

[Figures 4 and 5 here]

6. Conclusions

This paper analyses social interaction and healthy life of people with functional limitations and health problems who live in households, as provided by the 2011 ISTAT Survey on Social Inclusion of Not Self Sufficient Individuals.

To measure social interaction we have used observable indicators on the degree and level of satisfaction of the interaction with friends and relatives and the use of web by estimating a MIMIC model that allows us to deal with endogeneity issues. All these factors appear to be significant with a larger (and more relevant for women) weight of the level of interaction with relatives. Results on the structural part of the model show that ageing has a higher negative effect on social interaction for women, while more educated women tend to fare better in this dimension than more educated male. A perceived good level of resources contributes to increase social interaction for both men and women. Both men and women's social interaction is lower when individuals have limitations, though the effect of a medium level of limitations is higher for women.

To measure health we have used the observable indicators on the perceived health status, disability, chronic illness and the number of times the individual goes out of the house (frequency and level of satisfaction attached to this activity). All the factors analysed are significant with a higher weight on the latter activity and a larger weight of disability for men and of the perceived level of health for women. Amongst the factors that positively affect the latent variable of living a healthy life, a lower age and being more educated are significant only for women whereas having a perceived good level of resources contributes to better health both for men and for women. The higher risk of being less educated for disabled women and the positive effect of education on health should require more effort by policy actors in addressing the need of prevention for all with a particular attention to the most critical group of disabled women: the lower educated and in improving the level of education of disable women. Taking into account the effect of the latent variable on social interaction amongst the exogenous variables affecting health, results show that social interaction has a large and significant effect on both men and women's health.

In terms of policies dedicated to people with limitations in their daily life, the evidence shown in this paper would suggest to invest in policies able to increase their level of social interaction as it is a relevant dimension of well-being in its own and, given the positive effect of social interaction on health, in terms of the indirect positive effect on health.

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Figure 1 - MIMIC model on Social Interaction

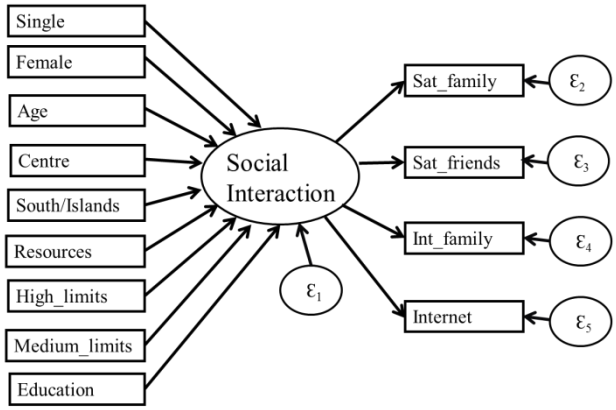


Figure 2 - MIMIC model on Health

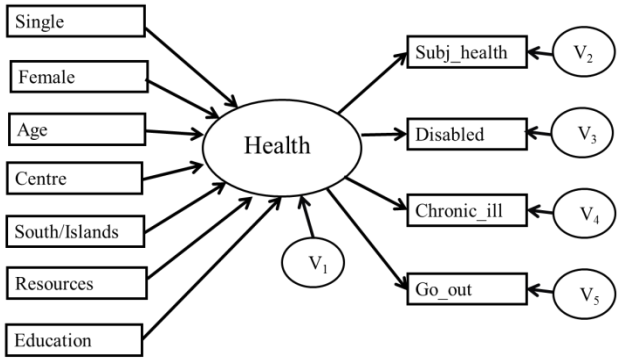


Figure 3 - Social interaction and Health MIMIC model

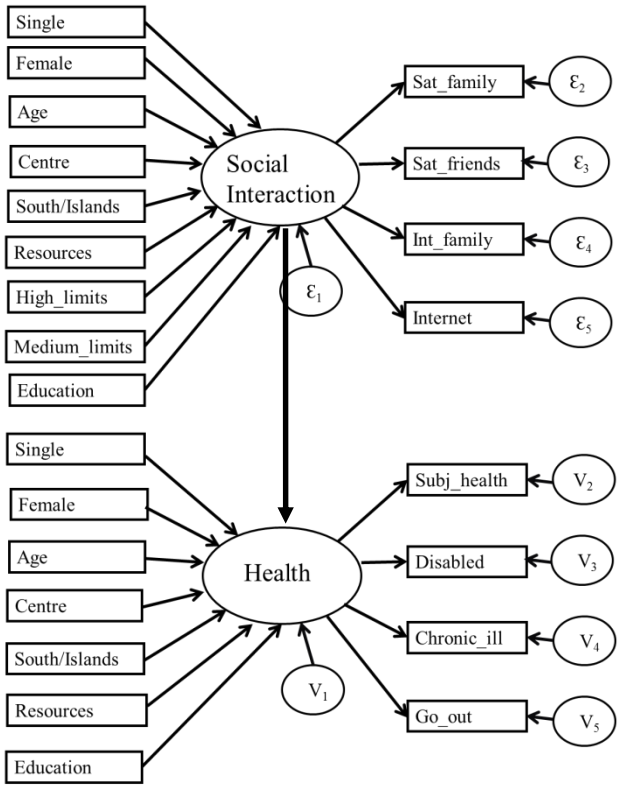


Figure 4 – Normalised Social Interaction distribution

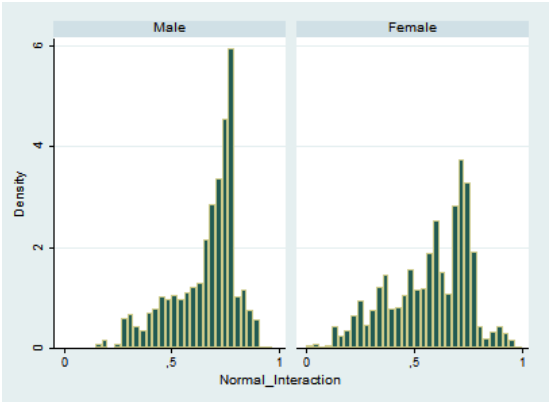
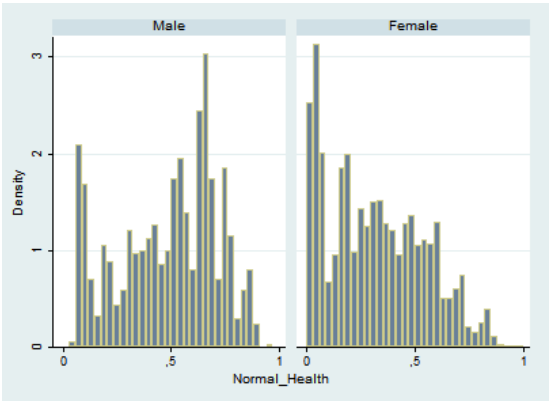


Figure 5 – Normalised Health distribution



List of tables

Table 1 - Descriptive statistics by gender – whole population

	M		F	
Variable	Mean	Std. Dev.	Mean	Std. Dev.
Age	66.62	17.77	71.46	14.52
Single	0.17	0.38	0.43	0.50
North West	0.21	0.41	0.22	0.41
North East	0.18	0.38	0.14	0.35
Centre	0.21	0.41	0.23	0.42
South	0.40	0.49	0.42	0.49
Without Educ.	0.09	0.28	0.18	0.38
Primary Educ.	0.43	0.50	0.51	0.50
Sec. Educ. (first level)	0.27	0.45	0.18	0.38
High School	0.17	0.38	0.10	0.30
Tertiary	0.04	0.19	0.03	0.17
High Lim.	0.46	0.50	0.47	0.50
Medium Lim.	0.33	0.47	0.36	0.48
No limitations	0.21	0.41	0.17	0.37
Chronic disease	0.76	0.43	0.82	0.38
Disabled person	0.48	0.50	0.56	0.50
Weakly disability	0.52	0.50	0.44	0.50
Obs.	1154		1967	

Source: our elaboration based on 2011 ISTAT survey data

Table 2 - Descriptive statistics of the variables included in the MIMIC models – people aged at least 15 years old

Variable	Obs	Weight	Mean	Std. Dev.	Min	Max
Sat_family	3088	3895.89842	.8828148	.321693	0	1
Sat_friends	3074	3876.89972	.7296149	.444231	0	1
Int_family	2669	3344.00593	3.585095	.7840292	1	4
Internet	2994	3792.8102	1.738382	.6528086	1	3
Subj_health	3104	3908.6855	1.696052	.6633506	1	3
Disabled	3108	3916.17738	.5259706	.4994054	0	1
Chronic_ill	3100	3909.26329	.8016919	.3987898	0	1
Go_out	3084	3892.79815	2.671272	1.270742	1	4
Single	3108	3916.17738	.3384895	.473272	0	1
Female	3108	3916.17738	.6238799	.4844887	0	1
Age	3108	3916.17738	70.07526	15.25966	15	87
Centre	3108	3916.17738	.2226533	.4160944	0	1
South/Islands	3108	3916.17738	.4106422	.4920296	0	1
Resources	3094	3901.6404	.5295589	.4992062	0	1
High_limits	3098	3896.44996	.4650176	.4988553	0	1
Medium_limits	3098	3896.44996	.3533385	.4780839	0	1
Education	3108	3916.17738	6.345244	4.116451	0	22

Source: our elaboration based on 2011 ISTAT survey data

Table 3 - MIMIC model on Social Interaction and Health over 14 by gender

Structural Part	M+F	M	F
Social Interaction			
Single	-0,032	-0.002	-0.043
	(-0.910)	(-0.044)	(-0.981)
Female	-0.133***		
	(-3.310)		
Age	-0.168***	-0.231**	-0.134**
	(-3.989)	(-2.541)	(-2.464)
Centre	0.014	0.048	0.001
	(0.327)	(0.754)	(0.012)
South-Islands	-0.014	-0.011	-0.012
	(-0.422)	(-0.193)	(-0.303)
Resources	0.173***	0.104*	0.211***
	(4.191)	(1.686)	(3.820)
High Lim.	-0.320***	-0.366***	-0.326***
	(-5.592)	(-2.797)	(-4.741)
Medium Lim	-0.143***	-0.048	-0.204***
	(-3.288)	(-0.795)	(-3.388)
Education	0.006	0.046	-0.017
	(0.148)	(0.746)	(-0.375)
Healthy Life			
Single	-0.030	-0.046	0.008
	(-0.959)	(-0.968)	(0.186)
Female	-0.227***		
	(-7.000)		
Age	-0.185***	-0.102	-0.240***
	(-4.972)	(-1.479)	(-4.897)
Centre	0.012	-0.005	0.028
	(0.344)	(-0.080)	(0.583)
South-Islands	-0.044	-0.062	-0.030
	(-1.425)	(-1.091)	(-0.691)
Resources	0.174***	0.167**	0.189***
	(4.653)	(2.418)	(4.013)
Education	0.095***	0.080	0.097**
	(2.809)	(1.352)	(2.294)
Measurement Part	M+F	M	F
Social Interaction			
Satisfaction Family	0.368	0.284	0.374
	(.)	(.)	(.)
Satisfaction Friends	0.504***	0.536***	0.472***
	(10.284)	(3.949)	(9.468)
Interaction Family	0.681***	0.592***	0.738***
	(6.658)	(2.857)	(5.716)
Internet	0.610***	0.554***	0.624***

	(5.712)	(2.726)	(4.992)
Healthy Life			
General Health	0.619	0.564	0.631
	(.)	(.)	(.)
Disability	-0.575***	-0.650***	-0.567***
	(-10.994)	(-5.348)	(-8.138)
Chronic Diseases	-0.439***	-0.432***	-0.473***
	(-14.967)	(-9.373)	(-12.135)
Going Out	0.711***	0.661***	0.673***
	(9.299)	(4.616)	(7.528)
Obs.	2544	969	1575
z-statistics in parentheses			
* p < 0.10 ; ** p < 0.05 ; *** p < 0.01			
Goodness of Fit:			
SRMR	0.08	0.097	0.090
CD	0.30	0.219	0.240

Table 4 - MIMIC Health with the latent interaction variable (Interaction) as one of the conversion factors in the Structural part of the model

Structural	M+F	M	F
Interaction	0.425***	0.452***	0.423***
	(16.03)	(10.78)	(13.89)
Single	-0.006	-0.013	0.01
	(-0.236)	(-0.313)	(0.30)
Female	-0.146***		
	(-5.254)		
Age	-0.102***	-0.086**	-0.118***
	(-3.43)	(-2.242)	(-3.672)
Centre	0.011	-0.004	0.026
	(0.367)	(-0.080)	(0.66)
South-Islands	-0.034	-0.044	-0.027
	(-1.241)	(-0.946)	(-0.756)
Resources	0.067**	0.086*	0.061*
	(2.43)	(1.80)	(1.79)
Education	0.113***	0.068	0.141***
	(3.74)	(1.34)	(3.88)
Measurement	M+F	M	F
General Health	0.634	0.582	0.634
	(.)	(.)	(.)
Disability	-0.564***	-0.558***	-0.539***
	(-22.51)	(-17.12)	(-20.55)
Chronic Diseases	-0.440***	-0.397***	-0.440***
	(-13.83)	(-12.07)	(-13.26)

Going Out	0.691***	0.702***	0.667***
	(25.7)	(23.29)	(22.64)
Obs.	3061	1130	1931
z-statistics in parentheses			
* p < 0.10 ; ** p < 0.05 ; *** p < 0.01			
Goodness of Fit:			
SRMR	0.036	0.049	0.036
CD	0.34	0.283	0.28