Predicting mortality among older adults in Europe employing SHARE longitudinal data

Introduction

Mortality is a complex phenomenon, associated directly with the status of one's health and indirectly with several socio-demographic factors and risky health behaviours. Mortality rates are a function of age and differentiate by sex; although females are characterised by higher morbidity they also have lower mortality across all age groups (Arber and Cooper 1999). Marital status is also linked to the odds of dying; marriage has a protective effect, especially among males (Blomgren et al. 2012).

A socio-economic gradient in health and mortality is a well established finding (Mackenbach et al. 1997; Huisman et al. 2003; Mackenbach et al. 2003). Persons of lower socio-economic profile experience worse health and higher morbidity and disability rates; they are more likely to suffer from chronic diseases, cognitive impairment and depression while they are also subjected to higher mortality rates. Socio-economic status (SES), however, does not act directly on mortality; its effect is mediated by a number of factors, including risky health behaviours. Unhealthy lifestyle practices are more widespread among persons of lower SES and have a strong association with morbidity and mortality. For instance, smoking, obesity, being underweight (Body Mass Index -BMI- below 18.5) and low levels of physical activity are important predictors of poor health, disability and premature mortality (Reynolds and Silverstein 2003; Flegal et al. 2005; Simons et al.2005; Jensen et al. 2006; Orpana et al. 2009).

Ill-health is in many instances a precursor to death; certain diseases and chronic conditions (e.g. cancer, stroke, diabetes, hypertension), disability, poor cognitive function, depression etc are strongly associated with higher risks of mortality (Korten et al. 1999; Simons et al. 2005; Rolland et al. 2006; Ferlay et al. 2007). In many surveys, due to a lack of biometric measures and medical tests and examinations, health status is represented by self-reported "objective" measures and indices on specific chronic conditions, limitations in physical functioning, physical symptoms, symptoms of depression etc. Several such measures, for instance EURO-D (depression), limitations in Activities of Daily Living (ADLs) and in Instrumental Activities of Daily Living (IADLs) (functional limitations), though self-reported, have been validated in various studies (Prince et al. 1999; Katz et al. 1963; Katz 1983).

Additionally, in such surveys respondents often report their own view of their health, providing a basis for constructing subjective health indicators and measures such as Self-Rated Health (SRH) and the Global Activity Limitation Indicator (GALI) (Robine and Jagger 2003). GALI is subjective in the sense that respondents do not report on specific mobility or functional limitations but to a general question on whether they consider themselves as 'limited in activities people usually do'. These subjective indices have strong associations with morbidity while it has been found that SRH is also a predictor of mortality even when controlling for poor health (Idler and Kasl 1991; Idler and Benyamini 1997; Baron-Epel and Kaplan 2001; Jagger et al. 2010). GALI, on the other hand, has been developed and validated fairly recently and, though used extensively in estimating healthy life years, its potential usefulness in predicting mortality has not been explored, yet (Van Oyen et al. 2006). Such subjective measures, based on a single question each, have two potential advantages; first, they may capture conditions undetected at the time of a health evaluation, a fact suggested in the case of SRH, and second, they may substitute in short surveys a whole range of questions on objective health indicators (De Salvo et al. 2005).

The present study uses data on the survival status of the respondents of the Survey of Health, Ageing and Retirement in Europe (SHARE) wave 1 at the second wave (carried out about 2 to 3 years apart) to consider three main research questions: First, controlling for socio-demographic characteristics and risky health behaviours at baseline, which seem stronger predictors: self-reported objective or subjective health indicators? Second, is GALI of importance in predicting mortality risks? Finally, how do associations differentiate between men and women?

Methods

Data

The data used in the analysis come from release 2-5-0 (May 2011) of waves 1 and 2 of the SHARE study. Wave 1 of the survey was conducted in 2004 in 11 countries ranging from Northern (Sweden, Denmark) to Central (the Netherlands, Germany, Austria, Switzerland, Belgium and France) to Southern Europe (Spain, Italy, Greece) (Börsch-Supan et al. 2005). The survey collected, among others, information on socio-demographic characteristics, self-reported objective and subjective health

indicators and risky health behaviours of persons aged 50 or higher. The average response rate at wave 1 was 61.6%, ranging from 38.8% in Switzerland to 81.0% in France (SHARE 2013). Individual response rates - i.e. the numbers of interviewed individuals divided by the numbers of eligible persons in the household - ranged from 73.7% in Spain to 93.3% in France, the average being 85.3%. The second wave of the survey was conducted over 2006/2007.

Of the respondents at the first wave 2.3% had died by wave 2 while another 1.7% had moved out of their country of residence without leaving contact details. Excluding these cases, the average attrition rate between the two waves was estimated at 27.9%; it was highest in Germany (41%) and lowest in Greece (13%) (Schröder 2008). Persons whose status at the second interview was unknown have been excluded from the analysis; these individuals comprise a higher proportion of younger (below 58) and older (above 75) respondents whose SRH is, on average, worse than of the individuals who were successfully re-interviewed at the second wave (Schröder 2008). The final longitudinal sample used in the present study (excluding cases where date of death or covariates of interest were missing) comprises 18,432 persons, out of which 17,938 were successfully re-interviewed at wave 2 while 483 (270 males and 213 females) had died.

Measures

Socio-demographic variables

All variables represent baseline characteristics. Three age groups are considered in the analysis: persons aged 50-64 (reference category), those aged 65-74 and those aged 75 or higher. Regarding marital status, partnered persons (married and in registered partnerships) are contrasted to unpartnered individuals (single, divorced, widowed and separated). Socio-economic status is represented by educational attainment in binary form, comparing persons with 0-6 years of schooling (=1) to those with at least 7 years (=0).

Behavioural risk factors

Three relevant variables are included in the study, smoking, BMI and physical inactivity. Smoking deals with whether a respondent was a regular smoker at baseline (=0), had stopped smoking, or was a non-smoker (i.e. never smoked daily for at least a year). Regarding BMI, a 5-category variable was constructed initially comprising the following categories: underweight (BMI<18.5), normal weight ($18.5 \leq$ BMI<25), overweight ($25 \leq$ BMI<30), obese class I ($30 \leq$ BMI<35) and obese class II or higher (BMI $\geq$ 35). Following preliminary analysis, however, it was found that there were no significant differentiations in mortality among most of these groups; hence, a binary construct has been used in the models, comparing underweight individuals (=1) to all others (=0). Finally, persons who reported themselves as "almost never engaging in moderate or vigorous physical activities" (such as gardening, cleaning the car etc) were classified as physically inactive (=1) and compared to all others (=0).

Self-reported 'objective' health indicators

SHARE includes information on a number of self-reported health indicators: limitations in activities of daily living (ADLs) (Katz et al. 1963; Katz et al. 1970), instrumental activities of daily living (IADLs) (Lawton and Brody 1969) and mobility difficulties regarding 10 activities related to stamina, strength, arm and fine motor function (Fonda and Herzog 2004). Respondents also reported on 14 chronic health conditions including heart attack, stroke, cancer, asthma, high blood pressure, diabetes etc. Mental health was evaluated on the basis of 12 symptoms of depression (EURO-D) (Prince et al. 1999). The variables used in the analysis are indicators showing whether the respondent suffered from specific chronic conditions at wave 1, at least one IADL limitation, three mobility difficulties, or four symptoms of depression. Certain chronic conditions and ADLs were not significant in preliminary analysis and were not included in the final models. Cognitive function is represented by orientation in time and ranges from 0 (bad) to 4 (good).

Self-reported 'subjective' health indicators

The "US global version" of SRH was included in the questionnaire; the respondents at the survey rated their health as excellent, very good, good, fair or poor. The 5-category variable was included in the models and the most numerous group, good

SRH, served as the reference category. Another indicator of 'subjective' health stems from a question on whether the respondent considered himself as 'strongly limited in activities people usually do', 'limited but not strongly', or 'not limited', for at least the six months preceding the survey due to a health problem. That question served to construct the GALI indicator (Robine and Jagger 2003). In the analysis limited and strongly/severely limited persons are compared to those not limited.

Statistical Methods

Associations between covariates and mortality were estimated using Cox's proportional hazards regression models; survival time is represented by number of months between the first interview and death or between the first and the second interview (censored cases). Three models have been included; the first assesses associations with objective health indicators, controlling for socio-demographic characteristics of the respondents, country of residence and behavioural risk factors at baseline. The second includes subjective instead of objective health indicators. Comparison of the first to the second model aims at evaluating the importance of the various 'objective' and 'subjective' indicators. Finally, the third, comprehensive model includes all predictors to further evaluate the relative significance of the abovementioned health indicators. The analysis has been carried out for males and females separately using STATA 10.1. The assumption of proportionality has been tested based on Schoenfeld residuals and was satisfied for all models. The analysis was run also considering a binary outcome variable (alive/dead – logistic regression) to evaluate the effect of 44 fewer cases in Cox's analysis due to missing dates of death; the results were reassuringly similar.

Results

Descriptive findings

The percentage distribution and means (standard deviations in parentheses) for the variables included in the models are presented in Table 1 by sex and survival status at wave 2. Comparing the characteristics of those who died to those who remained alive between the waves, striking differences can be observed. As expected, persons who

had died by wave 2 are older (60.4% aged 75 or higher against 17.6% among those alive), they include higher proportions of men and of unpartnered persons (single, separated, divorced and widowed) while they also tend to be have lower educational attainment. Regarding risky health behaviours at wave 1, they include a higher percentage of ex-smokers, of underweight persons (BMI below 18.5) and markedly fewer of them report doing some physical activity. Their health at baseline is, as expected, worse; more of them suffer from chronic conditions, depression, mobility limitations, IADLs and they have lower orientation in time scores. This also holds for their subjective health status; a higher proportion among them rated their health as 'poor' or 'fair' and reported being mildly or severely limited in activities 'people usually do'. These contrasting patterns between persons alive and dead at wave 2 are broadly similar across genders. However, specific characteristics differentiate somewhat by sex. For example, women, independently of survival status, tend to be unpartnered and non-smokers in higher proportions compared to men, less educated, they have a lower BMI and report more functional limitations.

(Table 1 around here)

Cox's Proportional Hazards Regression Model

Table 2a shows hazard ratios for mortality, adjusted for country of residence, for males. All models control for socio-demographic characteristics and risky health behaviours at baseline; increasing age of the respondent, being unpartenered, a smoker and lack of physical activity significantly increase the odds of dying. Model 1 shows associations with objective health indicators; following preliminary analysis, only chronic conditions that were significant have been retained in the model. Having cancer at baseline more than triples the odds of dying (HR 3.625) while asthma is quite important (HR 1.667) but at the 5% significance level. Depression, mobility difficulties, IADL limitations and worse orientation in time are also significantly linked to higher chances of mortality. Model 2 includes subjective instead of objective health indicators. SRH is a significant predictor; having reported excellent instead of good SRH reduces substantially odds of mortality (HR 0.061) while the opposite holds for men reporting fair (HR 2.248) or poor (HR 2.258) SRH. GALI, on the other hand, is not a significant predictor. In the full model, both subjective and objective

health indicators are included (model 3). Of the objective health indicators, chronic conditions and orientation in time remain significant. Of the subjective health indicators, associations with SRH are still strong though hazard ratios are a bit reduced.

(Table 2a about here)

For females the respective models are presented in Table 2b. Age is a very strong predictor among women as well, but partnership status is less important compared to men. Higher educational attainment, on the other hand, has a protective effect, significant in all models. Regarding risky health behaviours, non-smoking is only borderline significant while being underweight is a strong predictor, roughly doubling chances of dying. Physical inactivity also substantially increases chances of mortality in all models. Regarding objective health indicators (model 1), only cancer (HR 2.264), orientation in time scores (HR 0.736) and IADLs (HR 1.584) are very significant among women. Among subjective health indicators (model 2) SRH is not important. GALI, on the other hand, significantly increases chances of death for the severely limited (HR 2.669) and the mildly limited (HR 2.269). All these factors, with the exception of IADLs, remain significant in the full model (model 3), too.

(Table 2b about here)

Discussion

The present study uses longitudinal data from waves 1 and 2 of the SHARE study to assess first, the relative importance of self-reported objective versus subjective health indicators in predicting mortality risks among older adults, while controlling for socio-demographic characteristics of the respondents and risky health behaviours at baseline and second, the significance of GALI, a recently constructed and validated measure of limitations in activities. Finally, disparities in these associations between genders are discussed since mortality levels and confounders differentiate by sex. The analysis has been carried out using Cox's proportional hazard regression models for males and females separately.

Regarding the relative importance of objective versus subjective indicators of health, the findings of the study indicate that most of them are strong predictors of mortality, even when controlling for the socio-demographic characteristics of the respondents and risky health behaviours. Additionally, they are, to a great extend, independent predictors, since when introduced to a comprehensive model, most of them retain their significance. In this instance, only IADLs for both sexes and mobility difficulties and depression for males became non-significant in the full model. Hence, a combination of objective and subjective indicators of health seems more efficient in predicting mortality than objective or subjective measures alone.

The results also show that GALI is a significant predictor of mortality but only among women in this instance. Its predictive power remains strong in spite of the inclusion of objective health indicators and of measures related to physical functioning, such as ADLs, IADLs and mobility difficulties, which have been found to predict mortality in past research (Carey et al. 2004; Millan-Calenti et al. 2010). It seems, hence, that GALI has some advantages as a measure, quite similar to those of SRH: though it is based on a single, subjective question and a person's self-perception about his activity limitation status instead of a group of 6 or 7 "objective" questions on specific limitations, as do ADL and IADL, it is a stronger predictor of mortality than these objective indicators. Further research, however, is needed to determine whether it could also substitute such questions. Another important point emerging from the analysis is that SRH and GALI are independent predictors, evidently expressing different aspects of subjective health, but complement each other and are best used in conjunction.

Between genders, some similarities and some differences can be observed. Cancer and orientation in time, the latter here representing cognitive function, are strong predictors of mortality among older persons for both sexes and this is in accord with past studies (Mehta et al. 2003). Cancer is the second most important cause of death in Europe. Asthma here, on the other hand, significantly predicts death only for males. What differentiate sexes markedly in the present analysis, however, are subjective health indicators; SRH is a significant predictor only among men whereas GALI is significant only among women. This is rather unexpected given that SRH has been found a strong predictor of death in numerous studies (Idler and Benyamini 1997; Burström and Fredlund 2001). The importance of GALI for women, on the other hand, may not be surprising given that this index is linked to functional

limitations which seem to affect women more than men (Merrill et al. 1997; Puts et al. 2005).

Further, the analysis indicates some differences by gender in the importance of risky health behaviours. For instance, smoking significantly increases chances of mortality but is of greater import among men. Low BMI is linked to a higher hazard of death, significant only among women. These results, however, do not necessarily mean that smoking has not an unhealthy effect for women or low BMI is not a risk factor for men. It rather indicates that these behaviours are not as widespread concerning the specific gender and hence, do not reach statistical significance in the models; the importance of smoking and low BMI in increasing chances of mortality have been noted before (Dey et al. 2001; Simons et al.2005; Orpana et al. 2008). Physical inactivity, on the other hand, remains a strong predictor of death in all models and for both sexes. Finally, the results confirm the importance of educational attainment, albeit only for women, and the protective effect of being partnered for men.

Some limitations of the study should be noted. The small number of deaths by sex may have affected the estimated strength of associations and some hazard ratios may have failed to reach significance level. Use of the pooled data, on the other hand, would have not allowed observation of differentials by sex.

Conclusion

The analysis shows that objective and subjective self-reported health indicators work best in conjunction to predict death while SRH and GALI seem to complement each other. The main novelty of the study lies in the emergence of GALI as a strong predictor of mortality. The implications are important; GALI, already widely used in estimating healthy life years, being simpler than other similar measures of functional limitations, could perhaps substitute them in brief surveys. This matter deserves further exploration and attention in context where additional objective and biometric indicators of health may be included in the analysis.

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Table 1 Percentage distribution and means (standard deviations in parenthesis) of variables used in the analysis by sex and status of the respondent at wave 2

Variables (baseline)	**Dead (N=483)**			**Alive (N=18,432)**		
Sex						
Male	55.0			45.4		
Female	45.0			54.6		
	Males	**Females**	**Both sexes**	**Males**	**Females**	**Both Sexes**
Socio-Demographic characteristics						
Age						
50-64	21.0	9.8	16.0	54.6	54.7	54.6
65-74	28.0	18.4	23.6	29.3	26.5	27.8
75 or higher	51.0	71.8	60.4	16.0	18.9	17.6
Partnership status						
Single/Sep/Div/Widowed	31.3	68.8	48.3	18.4	36.8	28.4
Partnered	68.7	31.2	51.7	81.6	63.2	71.6
Educational Attainment						
0-6 yrs	42.4	55.7	48.4	25.2	32.5	29.2
7 yrs or more	57.6	44.4	51.6	74.8	67.5	70.8
Behavioural Risk Factors						
Smoking						
Smoker	21.3	11.5	16.9	23.2	15.3	18.9
Non-smoker	26.6	75.6	48.6	34.9	67.3	52.6
Ex-smoker	52.1	12.8	34.4	41.9	17.4	28.5
BMI						
Under weight (BMI<18.5)	1.8	6.6	3.9	0.34	1.7	1.1

All others	98.2	93.4	96.1	99.6	98.3	98.9
Physical Activity						
Some (ref cat)	68.5	44.0	57.5	93.6	89.7	91.5
Nearly none	31.4	56.0	42.5	6.4	10.3	8.5
"Objective" health indicators						
Specific Chronic Conditions						
High blood pressure/hypertension	39.9	44.9	42.2	29.3	34.1	31.9
High blood cholesterol	16.8	16.2	16.5	21.3	21.1	21.2
Asthma	10.1	6.4	8.5	4.0	4.8	4.4
Cancer	17.1	15.8	16.5	4.2	5.7	5.0
Depression symptoms (EUROD)						
At least 4	38.1	44.8	45.5	15.5	31.7	24.4
Less than 4 (ref cat)	61.9	55.2	54.5	84.5	68.3	75.6
Mobility difficulties						
At least 3	48.6	70.9	58.7	12.9	27.4	20.9
No limitations	51.4	29.1	41.3	87.1	72.6	79.1
IADL limitations						
At least 1	40.9	66.5	47.6	9.6	18.5	14.5
No limitations	59.1	33.5	52.4	90.4	81.5	85.5
Orientation in time (0 bad – 4 excellent)	3.21 (1.35)	2.77 (1.53)	3.01 (1.45)	3.78 (0.60)	3.80 (0.61)	3.79 (0.60)
"Subjective" health indicators						
Self-Rated Health						
Excellent	0.3	2.1	1.1	12.5	9.4	10.8
Very good	8.4	7.7	8.1	22.8	19.9	21.2

Good	28.0	21.8	25.2	40.7	40.1	40.4
Fair	42.0	36.8	39.6	18.9	24.0	21.7
Poor	21.3	31.6	26.0	5.1	6.6	5.9
GALI						
Severely/Strongly limited	34.3	44.5	38.8	10.8	13.1	12.0
Mildly limited	36.7	39.7	38.1	25.4	31.1	28.5
Not limited	29.0	15.8	23.1	63.8	55.8	59.5

Table 2a Adjusted Hazard Ratios of death between waves 1 and 2 of the SHARE survey (and 95% CI): Males

Variables (baseline)	Model 1	Model 2	Model 3 (Full Model)
Socio-Demographic characteristics			
Age			
50-64 (ref cat)	1.00	1.00	1.00
65-74	2.092** [1.456 to 3.004]	2.046** [1.440 to 2.907]	1.948** [1.355 to 2.801]
75 or higher	3.954** [2.764 to 5.658]	4.130** [2.946 to 5.792]	3.598** [2.514 to 2.801]
Partnership status			
Single/Sep/Div/Widowed (ref cat)	1.00	1.00	1.00
Partnered	0.681** [0.514 to 0.903]	0.611** [[0.468 to 0.797]	0.654** [0.493 to 0.867]
Educational Attainment			
0-6 yrs (ref cat)	1.208 [0.860 to 1.697]	1.206 [0.873 to 1.666]	1.108 [0.790 to 1.553]
7 yrs or more	1.00	1.00	1.00
Behavioural Risk Factors			
Smoking			
Smoker (ref cat)	1.00	1.00	1.00
Non-smoker	0.609** [0.420 to 0.883]	0.632* [0.440 to 0.909]	0.616** [0.424 to 0.895]
Ex-smoker	0.862 [0.619 to 1.201]	0.919 [0.666 to 1.268]	0.830 [0.595 to 1.157]
BMI			
Under weight (BMI<18.5)	0.785 [0.246 to 2.499]	1.574 [0.640 to 3.870]	0.784 [0.246 to 2.502]
All others	1.00	1.00	1.00
Physical Activity			
Some (ref cat)	1.00	1.00	1.00
Nearly none	1.920** [1.358 to 2.716]	2.164** [1.577 to 2.970]	1.859** [1.307 to 2.644]
"Objective" health indicators			
Specific Chronic Conditions			
Asthma	1.667* [1.083 to 2.566]		1.601* [1.040 to 2.464]
Cancer	3.625** [2.601 to 5.050]		3.243** [2.320 to 4.534]
No (ref cat)	1.00		1.00
Depression symptoms (EUROD)			
At least 4	1.544**[1.147 to 2.0790]		1.345 [0.997 to 1.815]
Less than 4 (ref cat)	1.00		1.00
Mobility difficulties			
At least 3	1.791** [1.277 to 2.513]		1.352 [0.959 to 1.908]
No limitations (ref cat)	1.00		1.00
IADL limitations			
At least 1	1.453* [1.028 to 2.054]		1.319 [0.935 to 1.861]
No limitations (ref cat)	1.00		1.00
Orientation in time (0 bad – 4 excellent)	0.811** [0.704 to 0.933]		0.813** [0.706 to 0.937]
"Subjective" health indicators			
Self-Rated Health			
Excellent		0.061** [0.008 to 0.439]	0.066** [0.009 to 0.477]
Very good		0.744 [0.462 to 1.198]	0.689 [0.416 to 1.141]
Good (ref cat)		1.00	1.00
Fair		2.248** [1.619 to 3.120]	1.866** [1.324 to 2.631]
Poor		2.258* [1.650 to 4.033]	1.694* [1.032 to 2.780]
GALI			
Severely limited		1.492 [0.963 to 1.855]	1.053 [0.809 to 1.599]
Mildly limited		1.336 [0.993 to 2.241]	1.137 [0.676 to 1.638]
Not limited (ref cat)		1.00	1.00
LogLikelihood	-1990.3	-2,165.6	-1966.5

All models are adjusted for country of residence

** p<0.01; * p<0.05

Table 2b Adjusted Hazard Ratios of death between waves 1 and 2 of the SHARE survey (and 95% CI): Females

Variables (baseline)	Model 1	Model 2	Model 3 (Full Model)
Socio-Demographic characteristics			
Age			
50-64 (ref cat)	1.00	1.00	1.00
65-74	2.979** [1.772 to 5.152]	3.029** [1.785 to 5.139]	2.974** [1.717 to 5.151]
75 or higher	7.121** [4.162 to 12.185]	7.692** [4.625 to 12.793]	6.982** [4.078 to 11.953]
Partnership status			
Single/Sep/Div/Widowed (ref cat)	1.00	1.00	1.00
Partnered	0.786 [0.557 to 1.109]	0.680* [0.496 to 0.933]	0.769 [0.545 to 1.085]
Educational Attainment			
0-6 yrs (ref cat)	1.630* [1.057 to 2.515]	1.912** [1.267 to 2.885]	1.620* [1.047 to 2.509]
7 yrs or more	1.00	1.00	1.00
Behavioural Risk Factors			
Smoking			
Smoker (ref cat)	1.00	1.00	1.00
Non-smoker	0.603* [0.372 to 0.980]	0.689 [0.429 to 1.107	0.600* [0.368 to 0.977]
Ex-smoker	0.807 [0.450 to 1.450]	0.803 [0.456 to 1.147]	0.791 [0.441 to 1.421]
BMI			
Under weight (BMI<18.5)	1.934* [1.075 to 3.478]	2.190** [1.241 to 3.862]	2.024* [1.122 to 3.650]
All others	1.00	1.00	1.00
Physical Activity			
Some (ref cat)	1.00	1.00	1.00
Nearly none	2.591** [1.812 to 3.705]	3.159** [2.290 to 4.356]	2.345** [1.630 to 3.374]
"Objective" health indicators			
Specific Chronic Conditions			
Cancer	2.264** [1.516 to 3.381]		2.057** [1.368 to 3.095]
No (ref cat)	1.00		1.00
Depression symptoms (EUROD)			
At least 4	1.079 [0.777 to 1.498]		1.003 [0.715 to 1.407]
Less than 4 (ref cat)	1.00		1.00
Mobility difficulties			
At least 3	1.248 [0.844 to 1.845]		0.978 [0.648 to 1.475]
No limitations (ref cat)	1.00		1.00
IADL limitations			
At least 1	1.584* [1.072 to 2.341]		1.401 [0.944 to 2.078]
No limitations (ref cat)	1.00		1.00
Orientation in time (0 bad – 4 excellent)	0.736** [0.644 to 0.842]		0.753** [0.657 to 0.862]
"Subjective" health indicators			
Self-Rated Health			
Excellent		1.212 [0.465 to 3.157]	1.294 [0.492 to 3.402]
Very good		1.281 [0.724 to 2.266]	1.304 [0.719 to 2.366]
Good (ref cat)		1.00	1.00
Fair		1.145 [0.779 to 1.682]	1.123 [0.745 to 1.692]
Poor		1.797* [1.151 to 2.804]	1.140 [0.747 to 2.058]
GALI			
Severely limited		2.669** [1.464 to 3.516]	2.470** [1.273 to 3.263]
Mildly limited		2.269** [1.624 to 4.388]	2.038** [1.424 to 4.284]
Not limited (ref cat)		1.00	1.00
LogLikelihood	-1428.4	-1.658.6	-1420.8

All models are adjusted for country of residence

** p<0.01; * p<0.05