# Mortality determinants in Western Europe: what do the SHARE data tell us?

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Extended abstract

## ABSTRACT

It is argued that the country-specific factors (behavioral patterns, dietary habits, etc.) play a major role in magnifying the difference in mortality across the countries of Western Europe. Using the Survey of Health, Ageing and Retirement in Europe (SHARE[2]) data, this study aims at exploring mortality determinants among people aged 50 years and above in ten European countries. In particular, it focuses on the role of health-related factors (limitations in activities, disease duration, etc.) and other risk factors such as smoking and drinking in influencing cross-country and gender variations in mortality levels. The Cox proportional hazards model is applied to estimate the relative risk of death between the first two waves of the survey. The results indicate that disease duration, hospitalization, smoking and drinking are the major factors explaining the cross-country variations in mortality. The gender differences are determined by the presence of limitations in activities, hospitalization, and smoking.

## INTRODUCTION

Life expectancy in Western Europe has been growing steadily for the last two decades. Yet, there is notable divergence across the countries in terms of mortality levels and the pace of mortality reduction. For example, in 2005, life expectancy at birth in Switzerland was 81.5 years while in Denmark on average a person was expected to live 78.3 years. Between 1991 and 2005, the increase in life expectancy in Italy constituted 5.3% versus 3.2% in the Netherlands. Similarly, there is no uniformity in the trends and levels of life expectancy at older ages. Life expectancy at age 65 increased by 15% in Austria versus 9% in Denmark and the Netherlands. In 2005, life expectancy at age 65 ranged from 18.5 years in the Netherland to 20.3 years in France (*Human Mortality Database[3]).*

Although the factors associated with changes in mortality levels and their divergence across regions have been extensively investigated, they have still remained a subject of open debates for demographers, epidemiologists and sociologists. *The theory of the epidemiological transition* postulated by Omran (1971 and 1998) emerged as the one of major milestones in research of health and mortality determinants. Omran's theory provides valuable insights on driving forces of the extraordinary improvement in health achieved by the industrialized countries during the last two centuries. There is a number of other excellent studies providing empirical evidence on causes of the divergence in mortality determinants within and across the European countries. In general, the cross-country divergence is likely to be linked to the different stages of demographic development and epidemiological transition that countries experience even through similar period of time. The country-specific factors such as behavioral patterns (smoking or drinking), dietary habits, availability and affordability of health care resources, etc. all act as the major contributors to the enlargement of the differences in health and mortality between populations in Europe *(Spijker J., 2004; Avendano and Mackenbach, 2008, Marmot, 1999).* The impact of individual's socio-economic status (mainly measured as the level of education, type of occupation, income or a

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[3] Human Mortality Database (HMD): http://www.mortality.org/

combination of them) on mortality is also well documented *(Mackenbach et al., 1997; Marmot et al., 1991; Hoffmann, 2005).*

In addition to the cross-country variation, there is also a well documented mortality gap between men and women. In all European countries life expectancy at birth is higher for women than for men. Meanwhile, research suggest that women tend to suffer from severe limitations and disability more than men *(Arber and Cooper, 1999; Börsch-Supan et al., 2005; Case and Paxson, 2005).*

Understanding the factors associated with the risk of death is very important as it facilitates the development of policies dealing with the prevention of disease, disability and death. Besides, knowledge of mechanisms that are behind mortality trends and variation is critical for the future forecasts of mortality trends *(Kunst et al., 1999; Willekens, 1990).*

The principal aim of this paper is to examine the association between health-related and socio-demographic factors on one side and mortality on the other. In particular, it has a three-fold research objective: 1) Investigating the impact of health-related factors on the risk of death; 2) Exploring determinants of the sex mortality differential; 3) Providing new evidence on mortality determinants and their variation across the countries of Western Europe.

## DATA

The present study is based upon SHARE data, a multidisciplinary and cross-national panel database on health, socio-economic status and social and family networks of more than 40,000 individuals aged 50 or over (the details of study design, sampling strategies, and data description see in Börsch-Supan and Jürges, 2005).

Ten countries are considered for the analysis: Austria, Belgium, Denmark, France, Germany, Italy, the Netherlands, Spain, Sweden and Switzerland. The data are drawn from the second release of 2004 wave of the survey and the first release of the 2006 wave. The sample used for this study is restricted to only those individuals who participated in both waves (i.e. those respondents interviewed in the first wave, who return in the second wave) and who were at least 50 year old in 2004. Information on the respondents belonging to the new ("refresher") sample is omitted. In addition, all observations with incomplete information on censoring or dependent variable are omitted. In total, about 16.4 thousands cases are used in the analysis, including 465 cases referring to deaths occurred between both waves of the survey.

There is a number of data limitations that are worth considering here. The first one is related to the sample selection while the second is linked to the entirety of the data on the deceased individuals. Since the SHARE is mainly represented by the community-based population and for the most countries excludes the institutionalized people (who have substantially higher mortality rates), the selection bias towards more healthy participants is very likely to occure. It might be particularly relevant for the northern and continental SHARE countries, which have higher density of nursing and elderly homes compared to the southern countries *(Andersen-Ranberg K. et al., 2008).* Keeping this selection bias in mind, the results of the survey might underestimate mortality level and thus, can not be fully consistent with the official mortality statistics.

In terms of completeness of the data on the participants died between two waves, some information is available even for those who lived alone before the death (from a relative, a neighbor or a friend). However, there is no identification on how biased the results of the survey are. According to Jürges (2008) more than 60% of the cases of deceased respondents are covered by the "end-of-life interviews". These interviews are mostly missing for the participants who lived as singles. In such cases when a member of the deceased's household could be conducted, interviews were carried out in 88% of cases.

In addition to the above mentioned data limitations, a variation across countries in reporting, attrition and non-response rate might also affect the cross-country difference in the incidence of diseases, disability and death *(Avendano and Mackenbach, 2008).* For the first wave of the survey (2004) the individual response rate varied from 73.7% in Spain to 93% in Denmark while the household response rate ranged from about 39% for Switzerland and Belgium to 79% in France. The rate of participation declined over the two-year follow-up, leaving from only 51.3% of participants in Germany to 74.3% in Belgium. Since this study deals with mortality determinants, it

is crucial to have a sample which adequately represents the oldest-old population. The participation rate of the oldest old (aged 80 years and above) at the follow-up constituted only 54%. Among those who left the survey, 12% died, 6% declined their participation in the second wave, and 28% were with unknown vital status *(Andersen-Ranberg K. et al., 2008).* The last group may consist of the oldest old who died, been hospitalized or moved. There is a great variation among countries; with 17% in Denmark to 44% in Germany *(Andersen-Ranberg K. et al., 2008)*.

## METHOD AND VARIABLES

To estimate the relative risk of mortality among people aged 50 years and above, Cox proportional hazard model is applied. The process time is the duration between the 50$^{th}$ birthday and death; adjustments are made to specify time under observation for every subject. Cases are censored on the date of the second interview. The model is applied for the whole sample, for three welfare states and each sex separately. The overall models fit as well as the assumption of proportionality are checked by applying Cox-Snell, scaled Schoenfeld residuals and test on interaction of time and age. With the highest level of significance (0.01), the proportionality assumption is not violated for each covariate.

The dependent variable (risk of death) is constructed on the basis of the information on the death of former respondents provided by the proxy (relatives or friends).

Since only two waves of the SHARE are available at present, the baseline individual's characteristics are used as the covariates. Among them, the following are chosen to estimate the impact of individual's health status on mortality risk:

*Degree of limitations in activities*. This variable is categorized to separate those who are: severely limited, limited but not severely and not limited in activities.

*Self-perceived health (SPH)*. The variable is based on the European version of grouping and consists of four categories: very good, good, fair, and bad or very bad health.

*Body Mass Index (BMI)*. The index is defined as the individual's weight in kilograms over the square of the height in meters. For the present analysis the index values are reclassified as recommended by the World Health Organization *(WHO, Global Database on Body Mass Index)* into four groups (underweight, normal weight, overweight and obese).

*Age of death of parents*. The variable represents the mean age of death of both parents and is introduced categorically: both parents of a respondent are still alive, died at the age below 50 years, died at the age between 50 and 70 years and died aged 70 years and above. Under some considerations, this covariate is assumed to capture the genetic constitution of the respondents (the predisposition to premature death).

*Presence of limitations with activities of daily living (ADL).* A dummy variable with two categories: no limitations in activities and at least one limitation. Six activities are considered: dressing, including putting on shoes and socks; walking across a room; bathing or showering; eating, such as cutting up your food; getting in and out of bed and using the toilet, including getting up or down.

Similarly to the previous variable, the covariate for *the limitation with instrumental activities of daily living (IADL)* is constructed. Seven activities are considered: using a map to figure out how to get around in a strange place; preparing a hot meal; shopping for groceries; making telephone calls; taking medications; doing work around the house or garden and managing money, such as paying bills and keeping track of expenses.

*Disease duration*. The variable is constructed on the basis of the respondent's age when he/she first had a "heart attack", "stroke or another heart problem", and "cancer or malignant neoplasms". These three particular health conditions are selected as they represent the main causes of death. In case of presence of multiple diseases (very common for old people), the condition occurred earlier is referred as a main disease.

The variable *being in a hospital in the last 12 months* is simply dichotomized to separate those who spent some time in a hospital 12 months prior the survey and those who didn't stay in the hospital.

Two variables (smoking and drinking) are added to the model in order to estimate the impact of respondent's behavioral patterns on the risk of dying. *Drinking* is split into three categories which differentiate between "not drinking at all", "not drinking more than two glasses daily or 5-6 times a week" and "drinking more than two glasses 5-6 days a week or on the daily basis". *Smoking* defines the current status of a respondent and compares those who currently smoke, never smoked and stopped smoking.

The variables such as age, sex and marital status are know to be associated with mortality risk and therefore, are also considered here. *Age* is controlled using for groups: 50-60, 60-70, 70-80 and 80 yeas and above. *Marital status* is divided into three categories: "never married", "married and living with a partner", and "divorced, widowed or married but living separate from a spouse".

To capture the impact of the place of residence on mortality, two different variables are identified. The first variable is *country,* which consists of all ten countries as separate categories. Since both life expectancy at birth and at age 50 are found to be the highest in Switzerland, this country was chosen as the benchmark.

The second regional variable (*welfare state*) is used to contrast the countries by the state of welfare regime. A revised Esping-Andersen's typology of welfare states is assumed *(Esping-Andersen, 1990; Ferrera, 1996; Bambra, 2007; Reimat, 2009)*; the countries are divided into three welfare regimes: social insurance-based (Denmark and Sweden), market-based (Austria, Germany, Belgium, France, the Netherlands and Switzerland) and family-based (Italy and Spain).

## SELECTED RESULTS

The discussion of the results consists of three parts. The first part focuses on the exploration of the impact of health-related factors on the risk of death for the whole sample while the remaining two parts deal, respectively, with the analysis of gender and cross-country determinants of mortality. The results are summarized in tables 1-3 below.

Health-related factors play a significant role in determining mortality, especially at older ages. Regardless the specifics of applied models (cross-country variations or gender difference), having limitations in activities, hospitalization, disease duration, and smoking have considerable direct impact on the risk of death among the people aged at least 50 years. Such factors as age and marital status are also shown to be closely related with the mortality risk; being younger and married guarantee the lowest relative risk of death.

Mixed finding emerged from the relationship between body mass index and drinking habit on the one side and mortality risk on the other. It is found that at older ages the positive association between overweight and obese categories and the risk of death does not hold. At the same time, the results reveal that being an abstainer from alcohol does not minimize mortality risk. Meanwhile, being the alcohol abstainer might be already a consequence of bad health.

In terms of gender differences in the mortality determinants, only effect of welfare state and drinking are pronounced similarly for both men and women. The impact of limitations with ADLs and IADLs on mortality is more pronounced among women, while hospitalization has greater effect among men. Self-perceived health is found to have statistically insignificant impact for women which might be evidence of well-known phenomenon: bias self-reporting of health by women. Smoking is found to have a strong impact on the risk of death among men, while there is no differentiation in the effect of drinking between men and women.

Regarding the welfare states, the main difference is found for the factors such as marital status, duration with the disease, hospitalization, smoking and drinking. Marital status plays a determining factor of mortality only in the countries with the family-based welfare, while disease duration – in the market-based model.

Table 1. Cox proportional hazard risks of death

| Variables | Model 1 | | Model 2 | |
|---|---|---|---|---|
| Age: | | | | |
| 50-60 | 1 | | 1 | |
| 60-70 | 1.52* | (0.33) | 1.52* | (0.33) |
| 70-80 | 2.74*** | (0.58) | 2.75*** | (0.58) |
| 80+ | 5.34*** | (1.14) | 5.42*** | (1.16) |
| Gender: | | | | |
| Men | 1 | | 1 | |
| Women | 0.50*** | (0.06) | 0.50*** | (0.06) |
| Marital status: | | | | |
| Married | 1 | | 1 | |
| Never married | 1.50** | (0.28) | 1.54** | (0.28) |
| Divorced, widowed, living separate | 1.43*** | (0.16) | 1.43*** | (0.16) |
| Country: | | | | |
| Austria | 0.85 | (0.27) | | |
| Germany | 0.96 | (0.30) | | |
| Sweden | 0.87 | (0.27) | | |
| Netherlands | 0.93 | (0.29) | | |
| Spain | 1.32 | (0.40) | | |
| Italy | 0.95 | (0.29) | | |
| France | 1.02 | (0.31) | | |
| Denmark | 1.08 | (0.33) | | |
| Switzerland | 1 | | | |
| Belgium | 0.60 | (0.19) | | |
| Welfare state: | | | | |
| Social insurance based | | | 1.10 | (0.14) |
| Market based | | | 1 | |
| Family based | | | 1.29** | (0.15) |
| Number of limitations with activities of daily living: | | | | |
| No limitations | 1 | | 1 | |
| At least one limitation | 1.43*** | (0.18) | 1.43*** | (0.17) |
| Number of limitations with instrumental activities of daily living: | | | | |
| No limitations | 1 | | 1 | |
| At least one limitation | 1.83*** | (0.23) | 1.83*** | (0.23) |
| Degree of limitations in activities: | | | | |
| Severely limited | 1.57*** | (0.26) | 1.54** | (0.26) |
| Limited but not severely | 1.37** | (0.19) | 1.40** | (0.20) |
| Not limited | 1 | | 1 | |
| Disease duration: | | | | |
| No disease | 1 | | 1 | |
| Sick for 0-10 years | 1.54*** | (0.19) | 1.52*** | (0.19) |
| Sick for more than 10 years | 1.50*** | (0.19) | 1.47*** | (0.19) |
| Staying in a hospital in the last 12 months: | | | | |
| Yes | 1.45*** | (0.15) | 1.45*** | (0.15) |
| No | 1 | | 1 | |
| Self-perceived health: | | | | |
| Very good | 0.42*** | (0.12) | 0.42*** | (0.13) |
| Good | 1 | | 1 | |
| Fair | 1.30* | (0.17) | 1.31** | (0.18) |
| Bad or very bad | 1.70*** | (0.28) | 1.74*** | (0.29) |
| Body mass index | | | | |
| Underweight | 1.25 | (0.31) | 1.26 | (0.31) |
| Normal weight | 1 | | 1 | |
| Overweight | 0.70*** | (0.08) | 0.70*** | (0.08) |
| Obese | 0.64*** | (0.09) | 0.64*** | (0.09) |

Table 1 (cont.)

| Variables | Model 1 | | Model 2 | |
|---|---|---|---|---|
| Average age of death of parents | | | | |
| Both parents are still alive | 1 | | 1 | |
| Died at the age 0-50 years | 4.97** | (3.72) | 5.08** | (3.81) |
| Died at the age 50-70 years | 3.75* | (2.71) | 3.77* | (2.73) |
| Died at the age 70 years and above | 3.34* | (2.41) | 3.33* | (2.41) |
| Current smoker | | | | |
| Yes | 1.80*** | (0.26) | 1.82*** | (0.26) |
| No, never smoked | 1 | | 1 | |
| Stopped smoking | 1.41*** | (0.17) | 1.40*** | (0.17) |
| Drinking habit | | | | |
| Not drinking at all | 1 | | 1 | |
| Not drinking more than 2 glasses daily or 5-6 a week | 0.67*** | (0.07) | 0.66*** | (0.07) |
| Drinking more than 2 glasses 5-6 days a week or every day | 0.68** | (0.11) | 0.68** | (0.11) |
| Number of subjects | 16401 | | 16401 | |
| Number of deaths | 465 | | 465 | |
| Time at risk | 450377 | | 450377 | |
| Log likelihood | -3952.3 | | -3958.4 | |
| LR $chi^2$ (degrees of freedom) | 932.9 (38) | | 920.9 (31) | |
| Prob> $chi^2$ | 0.000 | | 0.000 | |

*Notes: Flag variables for missing information were added to the regression.*
*Figures in parentheses are standard errors.*
*P<0.01 ***; 0.01<p<0.05 **; 0.05<p<0.10**
*Source: author's calculations from the SHARE, 2004, 2006*

Table 2. Cox proportional hazard risks of death by sex

| Variables | | Men | | Women | |
|---|---|---|---|---|---|
| Age: | 50-60 | 1 | | 1 | |
| | 60-70 | 1.54* | (0.40) | 1.85 | (0.72) |
| | 70-80 | 2.57*** | (0.65) | 3.88*** | (1.45) |
| | 80+ | 4.57*** | (1.20) | 8.29*** | (3.10) |
| Marital status: | Married | 1 | | 1 | |
| | Never married | 1.59* | (0.39) | 1.47 | (0.43) |
| | Divorced, widowed, living separate | 1.28 | (0.21) | 1.54*** | (0.26) |
| Welfare state: | | | | | |
| Social insurance based | | 1.11 | (0.18) | 1.07 | (0.21) |
| Market based | | 1 | | 1 | |
| Family based | | 1.20 | (0.19) | 1.35* | (0.24) |
| Number of limitations with activities of daily living: | | | | | |
| No limitations | | 1 | | 1 | |
| At least one limitation | | 1.22 | (0.22) | 1.71*** | (0.30) |
| Number of limitations with instrumental activities of daily living: | | | | | |
| No limitations | | 1 | | 1 | |
| At least one limitation | | 1.70*** | (0.29) | 2.12*** | (0.40) |
| Degree of limitations in activities: | | | | | |
| Severely limited | | 1.09 | (0.24) | 2.37*** | (0.63) |
| Limited but not severely | | 1.16 | (0.20) | 1.85*** | (0.43) |
| Not limited | | 1 | | 1 | |
| Disease duration: | | | | | |
| No disease | | 1 | | 1 | |
| Sick for 0-10 years | | 1.47** | (0.24) | 1.63*** | (0.30) |
| Sick for more than 10 years | | 1.48** | (0.25) | 1.40* | (0.27) |
| Staying in a hospital in the last 12 months: | | | | | |
| Yes | | 1.85*** | (0.26) | 1.03 | (0.17) |
| No | | 1 | | 1 | |
| Self-perceived health: | | | | | |
| Very good | | 0.39** | (0.15) | 0.48 | (0.23) |
| Good | | 1 | | 1 | |
| Fair | | 1.90*** | (0.33) | 0.80 | (0.16) |
| Bad or very bad | | 2.61*** | (0.59) | 1.07 | (0.25) |
| Body mass index | | | | | |
| Underweight | | 0.83 | (0.39) | 1.78* | (0.54) |
| Normal weight | | 1 | | 1 | |
| Overweight | | 0.57*** | (0.08) | 0.93 | (0.16) |
| Obese | | 0.56*** | (0.11) | 0.74 | (0.16) |
| Current smoker | | | | | |
| Yes | | 2.02*** | (0.38) | 1.68** | (0.39) |
| No, never smoked | | 1 | | 1 | |
| Stopped smoking | | 1.54*** | (0.24) | 1.46* | (0.32) |
| Drinking habit | | | | | |
| Not drinking at all | | 1 | | 1 | |
| Not drinking more than 2 glasses daily or 5-6 a week | | 0.66*** | (0.10) | 0.63*** | (0.10) |
| Drinking more than 2 glasses 5-6 days a week or every day | | 0.67** | (0.12) | 0.66 | (0.25) |
| Number of subjects | | 7476 | | 8925 | |
| Number of deaths | | 256 | | 206 | |
| Time at risk | | 204656 | | 245721 | |
| Log likelihood | | -2014.6 | | -1608.6 | |
| LR $chi^2$ (26 degrees of freedom) | | 437.6 | | 498.1 | |
| Prob> $chi^2$ | | 0.000 | | 0.000 | |

*Notes: as for table 1*
*Source: author's calculations from the SHARE, 2004, 2006*

Table 3. Cox proportional hazard risks of death in three welfare state models

| Variables | Model 1 | | Model 2 | | Model 3 | |
|---|---|---|---|---|---|---|
| Age: 50-60 | 1 | | 1 | | 1 | |
| 60-70 | 1.49 | (0.73) | 1.81** | (0.51) | 1.58 | (0.74) |
| 70-80 | 3.94*** | (1.81) | 2.73*** | (0.76) | 3.11** | (1.40) |
| 80+ | 5.87*** | (2.72) | 6.85*** | (1.91) | 5.11*** | (2.32) |
| Gender: Men | 1 | | 1 | | 1 | |
| Women | 0.57** | (0.13) | 0.48*** | (0.08) | 0.45*** | (0.11) |
| Marital status: | | | | | | |
| Married | 1 | | 1 | | 1 | |
| Never married | 1.39 | (0.58) | 0.92 | (0.29) | 3.25*** | (0.93) |
| Divorced, widowed, living separate | 1.52* | (0.36) | 1.02 | (0.16) | 2.73*** | (0.60) |
| Number of limitations with activities of daily living: | | | | | | |
| No limitations | 1 | | 1 | | 1 | |
| At least one limitation | 1.30 | (0.35) | 1.79*** | (0.32) | 1.14 | (0.26) |
| Number of limitations with instrumental activities of daily living: | | | | | | |
| No limitations | 1 | | 1 | | 1 | |
| At least one limitation | 1.73** | (0.46) | 1.73*** | (0.31) | 2.19*** | (0.50) |
| Degree of limitations in activities: | | | | | | |
| Severely limited | 2.06* | (0.78) | 1.50* | (0.34) | 1.99** | (0.68) |
| Limited but not severely | 2.10** | (0.65) | 1.16 | (0.23) | 1.91** | (0.53) |
| Not limited | 1 | | 1 | | 1 | |
| Disease duration: | | | | | | |
| No disease | 1 | | 1 | | 1 | |
| Sick for 0-10 years | 1.26 | (0.35) | 1.90*** | (0.33) | 1.32 | (0.30) |
| Sick for more than 10 years | 1.46 | (0.40) | 1.89*** | (0.34) | 1.20 | (0.30) |
| Staying in a hospital in the last 12 months: | | | | | | |
| Yes | 1.94*** | (0.44) | 1.35** | (0.21) | 1.38 | (0.27) |
| No | 1 | | 1 | | 1 | |
| Self-perceived health: | | | | | | |
| Very good or good | 1 | | 1 | | 1 | |
| Fair | 1.51 | (0.41) | 1.30 | (0.25) | 1.75* | (0.51) |
| Bad or very bad | 2.30** | (0.78) | 1.45 | (0.35) | 2.37*** | (0.78) |
| Body mass index: Underweight | 0.39 | (0.29) | 2.10** | (0.64) | 1.54 | (0.84) |
| Normal weight | 1 | | 1 | | 1 | |
| Overweight | 0.70 | (0.17) | 0.63*** | (0.10) | 0.99 | (0.21) |
| Obese | 0.44** | (0.18) | 0.81 | (0.16) | 0.57** | (0.15) |
| Current smoker: Yes | 1.91** | (0.55) | 1.91*** | (0.38) | 1.73* | (0.54) |
| No, never smoked | 1 | | 1 | | 1 | |
| Stopped smoking | 1.61* | (0.41) | 1.06 | (0.18) | 2.00*** | (0.49) |
| Drinking habit | | | | | | |
| Not drinking at all | 1 | | 1 | | 1 | |
| Not drinking more than 2 glasses daily or 5-6 a week | 0.97 | (0.25) | 0.62*** | (0.10) | 0.52*** | (0.12) |
| Drinking more than 2 glasses 5-6 days a week or every day | 1.15 | (0.46) | 0.64* | (0.15) | 0.58* | (0.16) |
| Number of subjects | 3248 | | 9948 | | 3205 | |
| Number of deaths | 101 | | 224 | | 140 | |
| Time at risk | 92792 | | 261847 | | 95738 | |
| Log likelihood | -685.4 | | -1810.6 | | -963.4 | |
| LR $chi^2$ (24 degrees of freedom) | 224.0 | | 414.7 | | 299.4 | |
| Prob> $chi^2$ | 0.000 | | 0.000 | | 0.000 | |

*Notes: as for table 1.* *Source: author's calculations from the SHARE, 2004, 2006*

## REFERENCES


Andersen-Ranberg K., Robine J.-M., Thinggaard M., Christensen K. (2008). What has happened to the oldest old SHARE participants after two years? In: Börsch-Supan A. et al (2008). Health, Ageing and Retirement in Europe (2004-2007). Mannheim: MEA., pp.66-73.

Arber S., Cooper H. (1999). Gender differences in health in later life: the new paradox? Social Science and Medicine, 48, pp.61-76.

Avendano, M., Mackenbach J. (2008). Changes in Physical Health Among Older Europeans. In: A. Börsch-Supan et al. Health, Ageing and Retirement in Europe (2004-2007) – Starting the longitudinal dimension, 116-22. Mannheim: MEA., pp.118-124.

Börsch-Supan A. (2005). Health, ageing and retirement in Europe – first results from the SHARE. Mannheim: MEA.

Börsch-Supan A. and Jürges H. (2005). The Survey of Health, Aging, and Retirement in Europe – methodology. Mannheim: MEA. Available on-line at: http://www.share-project.org/t3/share/fileadmin/pdf_documentation/SHARE_FRB1_METHODOLOGY_Wave1.pdf

Bambra C. (2007). Going beyond The three worlds of welfare capitalisms: regime theory and public health research. Epidemiol Community Health, 61, p.1098-1102.

Case A., Paxson C. (2005). Sex differences in morbidity and mortality. Demography, 42-2, p.189-214.

Esping-Andersen G. (1990). The three worlds of welfare capitalism. London: Polity.

Ferrera M. (1996). The Southern model of welfare in social Europe. Journal of European Social Policy, 6, pp.17-37.

Jürges, H. (2008). Health, Bequests, and Social Support in the Last Year of Life: First Results from the SHARE End-of-Life Interviews. In: A. Börsch-Supan et al. Health, Ageing and Retirement in Europe (2004-2007) - Starting the Longitudinal Dimension, 74-83. Mannheim: MEA., pp.74-83.

Kunst A.E, J.H. Wolleswinkel-van den Bosch, J.P. Mackenbach (1999), Medical demography on the Netherlands: recent advances, future challenges. In: L. Van Wissen, P.A. Dykstra (eds.). Population issues: An interdisciplinary focus. Kluwer Academic/Plenum Publishers, New York.

Mackenbach J.P. et al. (1997). Socioeconomic inequalities in morbidity and mortality in Western Europe. The Lancet, 349, pp.1655-1659.

Marmot M. et al. (1991). Health inequalities among British civil servants: The Whitehall II study. The Lancet, 337, pp.1387-1393.

Marmot M. (1999). Epidemiology of socioeconomic status and health: are determinants within countries the same as between countries? In The Society and POPULATION Health Reader, by Tarlov A.R., Peter R.F.St., The New Press, NY.

Omran A.R. (1971). The epidemiological transition. Millbank Memorial Fund Quarterly, 49, pp.509-538.

Omran A.R. (1998). The epidemiological transition theory revised thirty years later. World Health Statistics Quart., 51, pp.99-119.

Reimat A. (2009). Welfare models and long-term care for the elderly people in Europe. IMPALLA-ESPAnet Joint conference, March 6-7, 2009.

Spijker J. (2004). Socioeconomic determinants of regional mortality differences in Europe. Dissertation manuscript. University of Groningen.

Willekens F.J. (1990). Demographic forecasting: State of the art and research needs. In: G.A.B. Frinking, C.A. Hazeau (eds.). Emerging issues in demographic research. Elsevier, Amsterdam.