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A panel data approach of income-related health inequalities among the 50+ in Sweden

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Abstract

This thesis examines income-related health inequalities among an elderly population over time in Sweden. The concentration indices are estimated and decomposed for two time periods in order to uncover which socioeconomic variables determine the level of health inequality in Sweden. The determinants of health are estimated using a panel data fixed effects model, hence allowing for a comparison of health inequality over time. Two waves of data from the Survey of Health, Ageing and Retirement in Europe (SHARE) are used, and parallel analyses are performed for Denmark, France and Germany to check the robustness of the Swedish results. The results suggest that while income-related health inequalities are present, none of the included socioeconomic variables seem to have a considerable impact on income-related health inequalities for the elderly in Sweden. This result is confirmed by similar results obtained from identical analyses of France and Germany.

Keywords: health inequality, concentration index, decomposition, elderly

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“This paper uses data from SHARE wave 4 release 1.1.1, as of March 28th 2013(DOI: 10.6103/SHARE.w4.111) or SHARE wave 1 and 2 release 2.6.0, as of November 29 2013 (DOI: 10.6103/SHARE.w1.260 and 10.6103/SHARE.w2.260) or SHARELIFE release 1, as of November 24th 2010 (DOI: 10.6103/SHARE.w3.100). The SHARE data collection has been primarily funded by the European Commission through the 5th Framework Programme (project QLK6-CT-2001-00360 in the thematic programme Quality of Life), through the 6th Framework Programme (projects SHARE-I3, RII-CT-2006-062193, COMPARE, CIT5- CT-2005-028857, and SHARELIFE, CIT4-CT-2006-028812) and through the 7th Framework Programme (SHARE-PREP, N° 211909, SHARE-LEAP, N° 227822 and SHARE M4, N° 261982). Additional funding from the U.S. National Institute on Aging (U01 AG09740-13S2, P01 AG005842, P01 AG08291, P30 AG12815, R21 AG025169, Y1-AG-4553-01, IAG BSR06-11 and OGHA 04-064) and the German Ministry of Education and Research as well as from various national sources is gratefully acknowledged (see www.share-project.org for a full list of funding institutions).”

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1. Introduction

Income-related health inequalities have gained much attention in recent years. Equity in health and health care access is one of the most important goals for health policy research as lower income groups often are disadvantaged when it comes to health and access to health care compared to the richer groups in most countries (O'Donnell et al. 2008). Many studies examine income-related health inequalities in several countries using different populations and settings; Van Doorslaer et al. (1997), Van Doorslaer and Koolman (2004) and Wildman (2003), to name a few. In addition, other studies have observed patterns of increasing health inequalities, for example Burström et al. (2005).

At the same time, the share of the elderly is increasing. According to the United Nations (UN), 12% of the world population was aged 60 or older in 2013, a figure expected to increase to 21 per cent in 2050 (UN 2013, pp. 6). As the share of the elderly is expected to increase, it is appropriate to consider the impact of such an increase on income-related health inequalities. When individuals become older their lifestyles change and the question of which factors continue to affect the health status of an individual, as well as which socioeconomic factors affect health inequalities in a society arise.

Many studies use the concentration index to quantify income-related health inequalities (e.g. Wildman, 2003; Islam et al. 2010; Van Doorlsaer et al. 1997). The concentration index quantifies the amount of socioeconomic inequality present in a variable describing the health of an individual, and can be decomposed in order to describe which socioeconomic variables contribute to inequalities in health. Thus decomposition analysis using an elderly sample can be interesting in order to uncover which socioeconomic factors affect health inequalities among an ageing population. Moreover, such an analysis may be useful for health policy as well. If the variables explaining income-related health inequality are known, policymakers can make use of such information in order to reduce such. To summarise, *the purpose of this essay is to examine income-related health inequalities among an older population using the concentration index. By decomposition of the concentration index the aim is to explain such health inequalities, and also explain income-related health inequalities over time.*

This study uses the Survey of Health, Ageing and Retirement in Europe (SHARE), a large cross-national database consisting of information collected from several European countries of individuals aged 50 and over. The data, now consisting of four waves, allows for the use of panel methods, hence enabling a study of income-related health inequalities over time. This study uses two waves of the data, collected in 2006/7 and 2011. The dependent variable used in this study is self-assessed health, and independent variables include household income, age, employment status, household size, marital status and a variable describing the subjective financial status of an individual. The decomposition analysis can then be used to explain the contributions of these independent variables on income-related health inequality over time. The analysis is carried out for a Swedish population, however, parallel analyses are carried out for Denmark, France and Germany for comparative purposes. Denmark is chosen because of its geographical proximity to Sweden, while France is chosen because of similar estimates of the concentration index. Germany is chosen as previous research (e.g. Van Doorslaer and Koolman, 2004) indicates that income-related health inequalities tend to be low in Germany. Performing the analysis for more than one country allows one to explore the degree of external validity of the results obtained in the Swedish setting.

This essay is organised as follows. The next chapter reviews the literature on income-related health inequalities. Chapter 3 presents the method of calculating the concentration index and the model used for the decomposition of inequalities in health. Next follows the description of the data, including the dependent and independent variables. Chapter 5 presents the results for the Swedish sample, and chapter 6 compares the Swedish result to selected European countries. Finally, chapter 7 provides a discussion of the results as well as suggestions for further research.

2. Inequalities in health – previous research

Previous studies have used a variety of different measures of socioeconomic health inequalities. Wagstaff et al. (1991) review different measures that have been used to determine socioeconomic health inequalities. The measures considered are the range; the Lorenz curve and Gini coefficient; the pseudo-Lorenz curve; the index of dissimilarity; the slope and relative index of inequality; and, finally, the concentration index.[1] By using empirical examples of measurements of socioeconomic inequalities in Britain, Sweden and Finland, the authors conclude that the concentration index and the slope index of inequality are the best measures of inequality in health as they are sensitive to the socioeconomic dimension to health inequalities, they do not only take into account the highest and lowest social classes but encompass the whole population, and the measures take into account deviations in the distribution of the population for different social classes. The authors (Wagstaff et al. 1991) further state how the other measures fail to satisfy these three conditions. For example the range measure satisfies only the first condition, while the Gini coefficient (including the

[1] For more information on these indices, refer to the following studies. Gini coefficient: Illsey and Le Grand (1987) and Le Grand and Rabin (1986); Pseudo-Lorenz curves: Preston et al. (1981) and Lecrec et al. (1990); the index of dissimilarity: Preston et al. (1981) and Koskinen (1985); the slope and relative indices of inequality: Preston et al. (1981), Pamuk (1985) and Pamuk (1988).

associated Lorenz curve), the pseudo-Lorenz curve and the index of dissimilarity satisfy only the second and third condition.

Van Doorslaer et al. (1997) use the concentration index in order to examine income-related health inequalities in various European countries and the US. The authors find that health is generally better in higher income groups, and found evidence that income inequality and health inequality in a country are strongly correlated. They also find that income-related health inequalities are significantly higher in Great Britain and the US than in Germany, Finland and Sweden. Furthermore, Van Doorslaer and Koolman (2004) also use the concentration index in a cross-country setting and find that while income is an important factor, it is not the only one. The authors find that also education, employment status and region are variables that affect health inequality. In addition, the authors find that the health and income of the economically inactive population, such as the retired, contribute towards health inequalities in most countries.

Islam et al. (2010) how ageing affects income-related health inequality. The authors use the method of the concentration index and focus on a panel data sample of the Swedish population. They conclude that "changes in individuals' income rankings over the life cycle seem to be the driving force in boosting the observed trend in income related health inequality. When one controls for age-related income mobility over the life cycle, there is little evidence that income-related health inequality increases as the population ages in Sweden" (Islam et al. 2010: 347).

Furthermore, Wildman (2003) also uses the concentration index to examine income-related health inequalities over time using mental health as a dependent variable. The results indicate that there is income-related health inequality affecting the poorest in Great Britain. The author also finds that income-related health inequality decreases between the two waves analysed and that men are more affected by these inequalities than women, although women have worse mental health in absolute terms.

Other studies have also examined income-related health inequalities over time. For example Burström et al. (2005) measure the change in socioeconomic health inequalities between 1980 and 1997 using the concentration index approach combined with Cox proportional hazard models and multiple regression analysis. The authors find a widening gap in health between the lowest and highest socioeconomic groups in Sweden.

The literature on income-related health inequalities among an ageing population using the concentration index is not vast. Some studies have used the relative index of inequality, for example Huisman et al (2003), while others have used multiple logistic regression models to fit odd ratios

(Rueda et al. 2008, Fors et al. 2007). Huisman et al. (2003) study socioeconomic inequalities in morbidity in the ageing populations in eleven European countries using education and income as measures of socioeconomic status. While they find decreasing inequalities in morbidity with age, their results indicate that a substantial amount of inequality persists even in the oldest age groups. Rueda et al. (2008) use SHARE data to examine gender inequalities in health and to find out which socioeconomic factors affect health in Europe. The authors find that there are inequalities in health among the elderly, and that women tend to have a lower health status than men. They also find that poor health is more concentrated among the less educated, and that the living arrangements of individuals (e.g. living alone or with a partner) affect health for both men and women. However, these studies only take into account one period of time instead of adopting a panel approach.

Nevertheless, Van Ourti (2003) uses the concentration index and applies Belgian panel data of subsamples consisting of individuals aged 65- and 65+ and finds that among the 65- inequalities are favouring the rich, while inequalities are close to absent in the older subsample. The advantage of this essay is that it consists of data from two periods in time for an ageing population, enabling a panel data approach to the decomposition of the concentration index not previously undertaken with an ageing population.

3. Method

3.1. Measuring health

In order to analyse health inequalities among a population a good measure of health is needed. The SHARE dataset provides the subjective health measure of self-assessed health (SAH). This measure is typically based on a question like 'How good is your health in general' with responses ranging from excellent to very poor. However, the ordinal scale of such a measure becomes a problem in inequality analysis using the concentration index (Van Doorslaer and Jones, 2003: 62). The problem of an ordinal scale of for example 1,2,3,4,5 is that the distances between the categories are not equal so the true scale is not known (O'Donnell et al. 2008: 58).

O'Donnell et al. (2008) summarise the possible solutions to the problem of an ordinal scale. First, one can choose to dichotomise the variable, i.e. recode the variable to describe the percentage of people with for example 'less than good' health. A second option is the use a scoring algorithm that has been previously endorsed by the use of other data (examples of index scoring algorithms are the McMaster Health Utilities Index, HUI; the SF-36 or the WHO index[2]). One can then use the mean or median of one of these indices, e.g. median HUI, and assign the median HUI score to the corresponding SAH category. Third, one can choose to assume an arbitrary functional form for the distribution of health across the responses of the variable. Fourth and finally, one can estimate a predicted level of health using probit/logit models or by the use of an interval regression approach. I will be using a scoring algorithm and hence simply assign the median HUI to each of the SAH categories, explained in more detail in section 4.2.

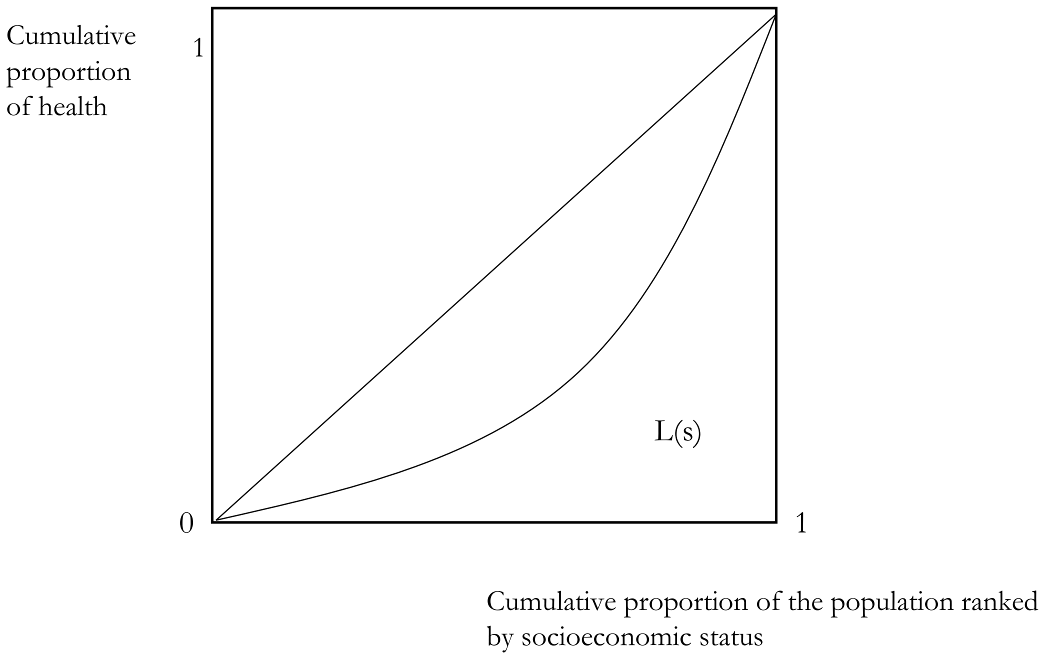
3.2. Measuring inequality

As stated in the introduction, this paper will use the concentration index to examine income-related health inequalities. The reason for choosing this measure instead of the slope index of inequality is that the concentration index is relatively easy to calculate, it has an intuitive visual presentation (see Figure 1 in section 3.2) and since it is closely related to the slope index (Wagstaff et al. 1991: 550) the concentration index is a suitable choice. The authors show that the concentration index possesses the desired properties of a measure designed to quantify socioeconomic inequalities in health, as it does not only take into account the highest and lowest social classes but encompasses the whole population, and it takes into account deviations in the distribution of the population for different social classes.

The concentration index is a measure of socioeconomic health inequality and is directly associated to the concentration curve. The concentration curve, defined as L(s), illustrated in Figure 1 plots the cumulative proportion of the population against the cumulative proportion of illness. The population is ranked based on their socioeconomic status, going from the most disadvantaged to the least disadvantaged (Kakwani et al. 1997: 88).

[2] The HUI, SF-36 and the WHO index are different health classification systems used widely in health inequality analysis. For more information on the HUI, see Feeny et al. (2002); for the SF-36, see Brazier et al. (1998); and for the WHO index, see Salomon et al. (2002).

Figure 1. The health concentration curve.



When L(s) is situated below the 45 degree line, the concentration of good health is among the rich, and if L(s) lies above the diagonal the poor are advantaged when it comes to health. On the diagonal the concentration index (C) equals zero and there is no inequality, whereas the index takes a positive value if health favours the rich and a negative value if health disproportionately favours the poor. Furthermore, the concentration index lies in the range (-1, 1) (O'Donnell et al. 2008: 83-84).

The health concentration index, is then twice the area between L(s) and the equality line. More formally, Kakwani et al. (1997: 88) defines the concentration index, C, as:

$$C = 1 - 2\int_0^1 L(s)\, ds \tag{1}$$

Furthermore, by using individual-level data the authors shows that the health concentration index can be estimated by the following equation:

$$C = \frac{2}{n \cdot \mu} \sum_{i=1}^{n} H_i R_i - 1 \tag{2}$$

$$\mu = \left(\frac{1}{n}\right) \sum_{i=1}^{n} H_i$$

where n is the number of individuals, h_i is the health variable (i.e. self-assessed health), μ is the mean of h_i, and R_i is the relative rank of individual i. By looking at equation (2) one can see that C influences the distribution of health through its socioeconomic factor as the relative rank is included. Including the relative rank of each individual hence allows for comparisons of health between individuals. If person A's health decreases by a certain amount and person B's health increases by the same amount, the effect of C is positive if person A is more disadvantaged than person B. Finally, equation (2) also indicates that the concentration index is dependent on all individuals in a population (Kakwani et al. 1997: 88-89).

In accordance with Wildman (2003: 297), this paper uses the convenient regression method to estimate the concentration index:

$$2\sigma_R^2\left[\frac{H_i}{\mu}\right] = \alpha + \gamma R_i + u_i \tag{3}$$

where σ_R^2 is the variance of the relative rank, H_i is the health variable (self-assessed health), μ is the mean of H_i, α is the intercept and R_i represents the relative rank of individual i. The estimate γ is then the estimate of the health concentration index, and hence, equal to C from equation (2) above.

3.3. *Estimation of the determinants of health*

In order to determine the marginal contribution of each of the independent variables a determinant of health model, similar to Wildman (2003), is estimated. This paper exploits the longitudinal nature of the SHARE dataset which allows for panel data estimation. A linear model is then specified:

$$H_{it} = \mu_t + \alpha_i + \beta' X_{it} + \varepsilon_{it} \tag{4}$$

where μ_t is the mean intercept, α_i is the fixed effect, i.e. the time-invariant unobserved aspect, β is the coefficient of X_{it} which contains the partial effects of the independent variables, and ε_{it} is the error term. The above equation is then estimated using the fixed effects model where α_i is eliminated by demeaning the data. As α_i is constant it is removed and the effect of α_i has been eliminated. This is seen in the following equation:

$$H_{it} - \bar{H}_i = \mu_t - \bar{\mu} + \beta'(X_{it} - \bar{X}_i) + (\varepsilon_{it} - \bar{\varepsilon}_i) \tag{5}$$

Where each variable is subtracted by its individual mean over time. By using this method of fixed effects, the identification of the variables is dependent on the variation within the two time periods examined. As time or the number of individuals approaches infinity ($N \text{ or } t \rightarrow \infty$), estimation of equation (4) generates consistent and unbiased estimators of the coefficients (β) (Wildman, 2003).

3.4. *Decomposing the health concentration index*

Income-related health inequality can be measured by the concentration index as defined in the subsection above. By decomposing the concentration index one can explain the sources of income-related health inequality; decomposition allows one to examine what the relative contributions of each variable are in explaining inequalities in health, as well as explain the potential changes in health inequality over time (Wagstaff et al. 2003: 208).

The concentration index is additively decomposable and decomposed in accordance to Wagstaff et al. (2003). The decomposition can be written as

$$C_H = \sum_l \left(\frac{\beta_l \bar{X}_l}{\bar{H}}\right) C_{X_l} + \frac{GC_\varepsilon}{\bar{H}} = \sum_l \eta_l C_{X_l} + \frac{GC_\varepsilon}{\bar{H}} \quad (6)$$

where C_H is the concentration index of the dependent variable (i.e. self-assessed health), C_{X_l} represent the concentration indices of the independent variables used in equation (5) and GC_ε is the generalised concentration index for the error term[3]. $\bar{H}$ is the mean of the (dependent) health variable, $\bar{X}_l$ are the means of the independent variables, and η_l is the elasticity of H (self-assessed health) with respect to X_l (the independent variable in question). The beta coefficient (β) is taken from equation (5), i.e. the determinants of health equation, making it possible to calculate the contribution of each independent variable while taking into account the two time periods considered (Wildman, 2003; Wagstaff et al. 2001).

The elasticity, η_l, can be thought of as the weight for the l'th independent variable. Thus, equation (6) illustrates that the larger the elasticity, η_l, and the larger the concentration index of the independent variable in question, C_{X_l}, the larger is the contribution of the independent variable to income-related health inequality. Hence, the contribution of the independent variable in question is calculated by multiplying the elasticity and the concentration index of that variable. This allows for an independent variable to be an important determinant to health, but if it is equally distributed across groups with different levels of income, the contribution of the variable will be small and therefore does not explain income-related inequalities in health (Wagstaff et al. 2001: 8).

The main purpose of the decomposition analysis is that it offers an explanation of income-related health inequalities by including the contributions of each independent variable to such inequality. Even though this decomposition analysis does not provide a causal interpretation to the determinants of health and health inequality, it gives a more comprehensive description of the contributions of the independent variables than simply estimating the concentration index based on the income rank of the individuals. The decomposition analysis can then be used by policy makers in order to reduce income-related health inequalities, as the analysis shows which factors

[3] The generalised concentration index is identical to the slope index of inequality and can be estimated as a residual using equation (6) (Wagstaff et al. 2001: 8).

have an impact on inequality, rather than simply assuming that redistributing income results in reduced health inequalities.

Therefore, the method can be summarised in a four steps. First, the overall concentration index is calculated, measuring the degree of income-related inequality in self-assessed health. Second, the determinants of health are estimated using a panel data fixed effects model. The results from the estimation of the determinants of health are then used to decompose the concentration index calculated in the first step. Finally, by performing the decomposition the contribution of each independent variable can then be calculated.

4. Data

4.1. Survey of Health, Ageing and Retirement in Europe

This essay utilises data from the Survey of Health, Ageing and Retirement in Europe (SHARE)[4]. The SHARE study includes individual-level data on the ageing population in several countries in Europe[5], examining the living situation of 50+ Europeans. There are four waves of SHARE (three panel waves and one wave containing retrospective information), the first wave of data was collected in 2004 and the fourth wave was collected in 2011. This gives researchers the opportunity to perform panel data analysis using an ageing population. I use two waves of the SHARE data; wave two and wave four, collected in 2006/2007 and 2011 respectively. There are two main reasons for choosing waves two and four. First, wave three is a survey focusing on retrospective information, i.e. individuals' life histories, including for example work history and childhood circumstances. Therefore wave three does not contain the suitable information for this study. Second, wave one is not used because of simplicity reasons; wave two and wave four contain a comparable imputed measure of total household income which is not included in wave one.

The main analysis is based on a Swedish sample, and in order to test the robustness of the results, the analysis is carried out for samples from Denmark, France and Germany as well. Denmark is chosen because of geographical reasons; one would assume that two neighbouring countries could produce similar results. France is chosen because of similar concentration indices as Sweden, and Germany is chosen because of a lower concentration index. Furthermore, Van Doorslaer and

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4 For more information see Börsch-Supan et al. 2013, Börsch-Supan et al. 2013b, Börsch-Supan et al. 2008 and Malter and Börsch-Supan 2013.

5 The following countries are part of the SHARE project: Austria, Germany, Sweden, the Netherlands, Spain, Italy, France, Denmark, Greece, Switzerland, Belgium, Israel, Czech Republic, Poland, Ireland, Hungary, Portugal, Slovenia and Estonia (SHARE, 2013b:5).

Koolman (2004) also find that income-related health inequalities are low in Germany. In general, I expect similar results from these countries compared to the Swedish result.

In order to perform a panel data analysis, the sample had to be constructed so that only those respondents who participated in both wave two and wave four are used. This reduces the sample, and after deleting respondents with missing values in the variables of interest the number of observations for the two waves are 1,282 for women and 1,083 for men, resulting in a total number of observations of 2,365 in the Swedish sample. The statistical software used for the data analysis is Stata 12.0 Special Edition.

4.2. Dependent variable

The self-assessed health (SAH) variable used is a response to the question "How good is your health" and takes five different values: excellent, very good, good, fair and poor. It is hence an ordinal variable, which raises concerns for the estimation of concentration indices. Wagstaff (2005) proposes a normalisation of the concentration index in order to deal with the problem of a binary health variable for the estimation of the concentration index, and solves the problem by normalising the index by dividing it with one minus the mean. However, Erreygers (2009) points out the limitations of using a dichotomous variable when estimating the concentration index. Erreygers and Van Ourti (2011) suggest that the only reasonable solution is to cardinalise the variable in order to be able to perform a meaningful analysis using the concentration index.

I have used the self-assessed health category-specific McMaster HUI (Health Utilities Index) values when constructing my SAH variable. I have assigned the median HUI-values estimated from Canadian data to the corresponding categories of my SAH variable, thus creating a cardinal variable which can be used in the inequality analysis, as suggested by O'Donnell et al (2008). This method of cardinalising a variable involves the strong assumption that health is essentially equal in Canada and Europe within the SAH categories (O'Donnell et al. 2008).

The variable 'hui' is then created, representing the category specific median values from the Canadian health utility index. The values and the frequencies are shown in table 1 below.

Table 1. The new cardinal SAH variable for the Swedish sample.

hui	Freq.	Percent	Cum.	SAH
0.557	155	6.52	6.52	Poor
0.758	526	22.12	28.64	Fair
0.876	685	28.81	57.44	Good
0.923	597	25.11	82.55	Very good
0.945	415	17.45	100.00	Excellent
Total	2,378	100.00		

4.3. Independent variables

4.3.1 Income variables

The main variable used as a measure of total income of an individual is total net household income reported in annual terms (logincome). This variable is one of SHARE's imputed variables which consists of measures of different income sources. More specifically, total net income is an aggregated variable consisting of the following measures: annual earnings from employment, annual earnings from self-employment, old age and early retirement pensions, disability, unemployment, survivor and war pensions, other regular payments (e.g. life insurance payments and payments from charities), income from other household members and, finally, bonds, stocks and mutual funds. The variables from wave two and four are otherwise comparable, but the currency in which they are reported differ between the waves. I have therefore converted the Swedish income variable in wave four from euros to Swedish kronor in order to make the two variables comparable. Finally, I have also taken the log of income to account for nonlinearities.

A limitation arising from the use of an imputed variable from both wave two and wave four is that the method of imputations differ slightly between the waves. In wave four, the imputations no longer include non-responding partners and some variables are aggregated to avoid multicollinearity during the imputation process. In a panel data analysis using imputations from different waves the problem of uncongeniality (Meng, 1994) arises, meaning that the model used for the imputation process could be of a less general form than the model used in the panel data analysis resulting in potentially inconsistent estimates.[6]

[6] See section 4.5 for more information on the imputation procedure.

Similar to Wildman (2003), I also add one variable describing a respondent's subjective financial status. The respondent is asked the following: 'Thinking of your household's total monthly income, would you say that your household is able to make ends meet…' with the possible responses: with great difficulty, with some difficulty, fairly easily and easily. In order to encompass this in my analysis I have generated dummy variables for each category: great_diff, some_diff, fairly_easy and easily, where the category 'easily' is the reference category.

4.3.2. Other independent variables

Age is included in the analysis, and is constructed from the variables month of birth and year of birth combined with month and year of interview. The square of age is also included and the minimum age is 50 years while the maximum is 98 years. The size of the household, current job situation and marital status are also included as independent variables. For current job status, dummies are created for retired, employed of self-employed, unemployed, permanently sick and disabled, and homemaker. The variable 'homemaker' is excluded in the analysis for men due to a small sample size. For the variable describing marital status the SHARE survey contains the following categories: married and living together with the spouse; registered partnership; married and living separate from spouse; never married; divorced; and widowed. Therefore, due to a small sample size for some of the categories, three categories were created: married, not married and widowed. For job situation, being retired is the reference category, while married is the reference category for the variable describing marital status. Table 2 below provides a variable description and the sample means for each of the variables, separately for women and men.

Table 2. Variables and sample means for women and men in Sweden.

		Women (N=1282)	Men (N=1083)
hui	Self-assessed health	0.8484	0.8578
logincome	Log of annual net household income	12.51	12.69
age	Age at interview	67.43	68.12
age2	Age squared	4630.0	4719.6
hhsize	Household size	1.751	1.961
Married (ref. cat)	Married (Living with spouse, living separate from spouse, registered partnership)	0.6825	0.8227
Not married	Not married (Never married, divorced)	0.1677	0.1071
Widowed	Widowed	0.1482	0.0665
Retired (ref. cat)	Retired	0.6427	0.6316
Employed	Employed or self-employed	0.3105	0.3380
Unemployed	Unemployed	0.0086	0.0083
Sick_disabled	Permanently sick or disabled	0.0234	0.0148
Homemaker	Homemaker	0.0117	
Great_diff	With great difficulty	0.0304	0.0092
Some_diff	With some difficulty	0.1225	0.1006
Fairly_easy	Fairly easily	0.3658	0.3601
Easily (ref. cat)	Easily	0.4813	0.5300

Table 2 shows that mean health (hui) is greater for men than for women, i.e. the absolute level of (self-assessed) health for women is lower than for men. By comparing means for other variables, men are in general wealthier, older, more likely to be married, more likely to be employed and more likely to feel better off financially.

4.4. *Survey participation – attrition and nonresponse*

As with other survey studies, SHARE suffers from problems of unit nonresponse and attrition, potentially causing sample selection bias. Such bias can result in a less representative dataset as well as less generalizable results (Börsch-Supan et al. 2013: 998). However, results from a nonresponse follow up study using a small subset of the variables in SHARE show that nonresponse bias is not a concern (Börsch-Supan, 2013: 60). SHARE provides calibrated weights in order to minimise the potential sample selection bias, and it is up to the researcher to choose whether to use weights in the analysis or not.

Due to the structure of my analysis, I have decided not to use weights. This is due to the fact that the longitudinal weights provided by SHARE are designed for a fully balanced sample containing all four waves of SHARE. As I use only waves two and four there are no calibrated longitudinal weights readily available, hence I have decided not to include weighting in my analysis. This is of course a limitation to the study.

4.5. *Imputations in SHARE*

Due to the presence of missing values in a large survey like SHARE, an imputation procedure has to be constructed. In SHARE the imputation procedure is implemented using the strategy of multiple imputations. This means that instead of just one imputed value for every missing value there are five imputed values for every missing value. The reason for using a multiple imputations approach is to avoid relying on one guess of the missing value, and instead, conditional on the actual values of the other variables, attempt to reconstruct the distribution of the missing value of a certain variable. As SHARE contains five imputed values for every missing value there are essentially five different datasets that should all be used in the analysis because all five datasets represent a different draw from the distribution of missing values (SHARE, 2013a: 24).

As the SHARE guide (SHARE, 2013a) points out that any one of these five datasets are not preferable to another, and the method for using all five datasets simultaneously is complicated, I have decided to use one of the five imputed sets. This is of course a limitation to this study. In order to check whether choosing one dataset over another changes the results, the same analysis was performed using another of the five datasets with imputed values. The results for Sweden were almost identical, indicating that there are no large deviations in the results from using one of the other datasets, hence suggesting that using only one of the five datasets of imputed values is (at least to some extent) justified.

As already described in section 4.3.1, the income variable used in my analysis is derived by multiple imputation. Therefore, in addition to the problem of comparing imputed values in wave two and wave four of SHARE, there is yet another limitation when it comes to the method of multiple imputation.

5. Results – Sweden

5.1 Concentration index

The concentration index is estimated separately for women and men and separately for the two waves of SHARE data using the convenient regression method described in Section 3.2. The results are summarised in table 3 below, where both standard errors and the 95% confidence intervals are included; showing the upper bound (UB) and the lower bound (LB).

Table 3. Concentration index of the SAH variable with the population ranked by income

	Concentration index: Sweden					
	Women	UB	LB	**Men**	UB	LB
Wave 2	0.010630 (0.000296)	0.014386	0.006874	0.011733 (0.004435)	0.068079	-0.044614
Wave 4	0.018625 (0.001208)	0.033978	0.003272	0.017103 (0.001345)	0.034196	0.000010

(Standard errors in brackets)

The positive concentration indices for both women and men in both waves indicate that the health variable is disproportionally concentrated on the wealthier part of the population. This is the expected results based on previous research, which suggests that there are income-related health inequalities favouring the rich (e.g. Van Doorlsaer et al. 1997; Van Doorslaer and Koolman, 2004; Wildman, 2003).

The concentration index for women increase between wave two and wave four, indicating an increase in income-related health inequalities. However, the confidence intervals of the indices from the two waves overlap, indicating that there is no dominance. This result of no dominance indicates that one cannot state that there is a major increase in income-related health inequalities between the two waves. A similar trend can be seen for men, although the index increases less than for women. The confidence intervals of the concentration indices for men also overlap, hence there is no dominance. In addition, when comparing men and women one can see that the confidence intervals for men and women in both wave two and wave four overlap, again suggesting no dominance. In summary, men have a higher concentration index than women in wave two, while income-related health inequality seem to be higher for women than for men in wave four.

5.2. *Results from the estimation of the determinants of health*

In order to capture the time-varying factors of health inequality, panel data models have been used. The fixed effects model described in Section 3.3 has been estimated separately for women and men. An F-test was preformed to see whether the data can be pooled or not. The F-test indicates that all the coefficients in the model are different from zero, suggesting that the data cannot be pooled. Furthermore, to check if the random effects model could be used, a Hausman test (see for example Verbeek, 2004: 351) indicates whether the model can be estimated using fixed or random effects. The Hausman statistic is large and significant, indicating that one can reject the null hypothesis that the difference in coefficients is not systematic. Hence the FE model should be used. Finally, a Chow test (see for example Verbeek, 2004: 64) is performed in order to find out if males and females should be regarded as separate samples. The Chow test indicates that the determinants of health are different for men and women as the test statistic is significant, suggesting that one can reject the null hypothesis that the coefficients for men and women are the same.

The results from the estimation of the determinants of health equation are shown in table 4 below. These results illustrate the determinants of health for women and men separately (columns 1 and 2 respectively), controlling for the unobserved time-invariant factors. It is clear from table 4. that only a few coefficients are statistically significant. For women, age and age squared are significant at the 5% level, while being sick or disabled is significant at 1% and logincome is significant at the 5% level. For men age and age squared are significant at the 5% and 1% level, respectively. In addition the variable describing that households are able to make ends meet fairly easily (fairly_easy) is statistically significant at the 5% level. While the coefficient of logincome for both men and women is very small, it is interesting that they differ in sign. This means that an increase in income results in better health for women, while the opposite is true for men. When looking at the coefficients for age and age squared, one can see a positive coefficient for age and a negative coefficient for age squared for both women and men, indicating that the effect of age is diminishing.

Table 4. Estimation results for the determinants of health

VARIABLES	Women hui	Men hui
logincome	0.0103**	-0.00150
	(0.00452)	(0.00681)
age	0.0117*	0.0187**
	(0.00673)	(0.00902)
age2	-0.000116**	-0.000167**
	(4.88e-05)	(6.48e-05)
hhsize	-0.0103	-0.0128
	(0.00927)	(0.0108)
not married	0.0342	-0.0338
	(0.0386)	(0.0583)
widowed	-0.0415	-0.0110
	(0.0271)	(0.0462)
employed	0.0133	0.0195
	(0.0108)	(0.0133)
unemployed	0.0430	0.00154
	(0.0340)	(0.0452)
sick_disabled	-0.0641***	-0.0324
	(0.0233)	(0.0298)
homemaker	0.0288	
	(0.0301)	
great_diff	-0.0278	-0.0180
	(0.0250)	(0.0484)
some_diff	0.0135	-0.00499
	(0.0125)	(0.0167)
fairly_easy	0.00329	0.0190**
	(0.00709)	(0.00888)
constant	0.477**	0.407
	(0.240)	(0.331)
Observations	1,295	1,083
R-squared	0.078	0.062

Standard errors in parentheses
(*** p<0.01, ** p<0.05, * p<0.1)

5.3. Inequality analysis: decomposition of the CI

The decomposition is performed separately for women and men. The results are shown in the tables below, where table 5 and 6 show the results from the decomposition for women in wave two and wave four, and tables 7 and 8 show the decomposition results for men in the two waves. Column 2 contains the concentration index while column 3 contains the beta values from the determinants of health estimation (presented in section 5.2). Columns 4 and 5 show the means and the elasticities, while columns 6 and 7 contain the contribution and percentage contribution of each variable.

The beta values do not vary between waves as they represent the coefficients from the determinants of health regression, estimated separately for women and men only. These values are then used in order to calculate the contributions of each independent variable.

5.3.1. Women

The results from the decomposition of the concentration index for women can be seen in tables 5 and 6. As explained earlier, the concentration index for women has increased between the two waves, i.e. between 2006/07 and 2011. The tables below then show the effect of each of the variables in the determinants of health equation. All variables are shown, i.e. even though some of the variables were not significant in the determinants of health regression they are still included.

The concentration index of each independent variable is shown in column (2). A positive concentration index for e.g. household size means that a larger household is more common among the richer individuals in the population. Furthermore, the contribution of the variable (column 6) is calculated by multiplying the elasticity (column 5) and the concentration index (column 2) as explained in section 3.3. To illustrate this, consider for example logincome for women in wave two (i.e. Table 5). The elasticity of logincome is 0.1507, meaning that a 10% increase in income increases health by approximately 15.1%, while the concentration index for logincome is 0.0286, indicating that a higher income is more common amongst the better off. Thus, the contribution of logincome is 0.0043, which suggests that inequality in income contributes positively to health inequalities as it is of the same sign as the total concentration index. This means that without inequality in income, health inequalities would have been smaller than they are now. However, if the contribution of a variable is negative, for example in the case of household size (hhsize), health inequality would be larger if there was no inequality in the variable in question.

Therefore, by looking at table 5, the variables that contribute positively to inequality (i.e. health inequalities would have been smaller in the absence of inequalities in the variable) in 2006/07 are logincome, age2, being widowed, being employed, and if the household is able to make ends meet with great difficulty. The sign of the beta value and the elasticity of age indicate that up to a certain point age positively influences health, while the variable age squared shows that the relationship is not linear. Therefore, age influences health positively up to a certain point, when the negative sign of the beta value of age squared indicate that age influences health negatively.

The percentage contributions of these variables are then showed in column 7, where it is apparent that the greatest contribution to health inequalities are the age coefficients. The variable age squared indicates that the percentage contribution to income-related health inequality of this variable is 5%, more than any other variable. However, the total age effect (combined effect of age and age squared) is 0.85%. Logincome has a percentage contribution of 0.40% while being widowed and being employed also contribute positively to health inequalities; the percentage contributions for these variables are 0.38% and 0.18%, respectively.

Table 5. Decomposition results for women, wave two.

1	2	3	4	5	6	7
	CI	Beta	Mean	Elasticity	Contribution	% contribution
logincome	0.0286	0.0103	12.505	0.1507	0.0043	0.4044
age	-0.03279	0.0177	65.305	1.354	-0.0444	-4.1697
age2	-0.67002	-0.0002	4342.4	-0.7968	0.05338	5.0149
hhsize	0.11108	-0.0101	1.8163	-0.0214	-0.0023	-0.2228
Not married	-0.42090	0.0320	0.1648	0.0062	-0.0026	-0.2435
Widowed	-0.59663	-0.0425	0.1381	-0.0069	0.00409	0.3841
Employed	0.270387	0.0159	0.3721	0.0069	0.00187	0.1755
Unempl	-0.28841	0.0664	0.0120	0.0009	-0.0003	-0.0231
Sick_disabled	0.106918	-0.0652	0.0220	-0.0017	-0.0002	-0.0168
Homemaker	-0.202437	0.0290	0.0126	0.0004	-0.0001	-0.0081
Great_diff	-0.65166	-0.0249	0.0345	-0.0010	0.0010	0.0614
Some_diff	-0.332001	0.0159	0.1193	0.0022	-0.0010	-0.0691
Fairly_easy	-0.07463	0.0058	0.3862	0.0026	-0.0001	-0.0184

The results from the decomposition if the concentration index in wave four are shown in table 6 below. Thus, for wave four, the following independent variables contribute positively to income-related health inequalities: logincome, age2, being widowed, employed, unemployed and permanently sick or disabled, as well as if the household is able to make ends meet with great difficulty; meaning that in the absence of inequality in these variables, income-related health inequality would be lower. Age and age squared are still the variables with the largest contributions to income-related health inequalities, although the total age effect is small again, similar to the results from wave one.

When comparing the two waves (table 5 and table 6), the results are quite similar, except for the variables being unemployed and being sick or disabled which now contribute positively to health inequalities. Furthermore, one can see that the percentage contributions of all variables have decreased during the four-year time period.

Table 6. Decomposition results for women, wave four.

1	2	3	4	5	6	7
	CI	Beta	Mean	Elasticity	Contribution	% contribution
logincome	0.3354	0.0103	12.514	0.1536	0.0052	0.2761
age	-0.0316	0.0177	69.532	1.467	-0.0464	-2.485
age2	-0.0651	-0.0002	4914.1	-0.9181	0.0598	3.205
hhsize	0.1024	-0.0101	1.6868	-0.0202	-0.0021	-0.1109
Not married	-0.3134	0.0320	0.1705	0.0065	-0.0020	-0.1090
Widowed	-0.5529	-0.0425	0.1581	-0.0080	0.0044	0.2368
Employed	0.2912	0.0159	0.2496	0.0047	0.0014	0.0737
Unempl	0.4122	0.0664	0.0062	0.0005	0.0002	0.0108
Sick_disabled	-0.1281	-0.0652	0.0248	-0.0019	0.0002	0.0132
Homemaker	-0.0288	0.0290	0.0109	0.0004	-0.00001	-0.0006
Great_diff	-0.6341	-0.0249	0.0264	-0.0008	0.0005	0.0265
Some_diff	-0.3947	0.0159	0.1256	0.0024	-0.0009	-0.0502
Fairly_easy	-0.0675	0.0058	0.3457	0.0024	-0.0002	-0.0087

5.3.2. Men

The results from the decomposition of the concentration index for men in wave two are shown in table 7. Again, the concentration index for each independent variable is shown, as well as the mean of the variable, the beta value from the determinants of health equation, as well as the elasticity, the contribution and the percentage contribution of each variable. For men, logincome contributes negatively towards health inequality, captured by the negative elasticity in column (5) and the negative value for logincome in column (6). A 10% increase in logincome therefore decreases health by 2%, and the contribution of logincome to health inequality is -0.05%.

The variables with a positive contribution towards income-related inequality in health are age2, not married, widowed, being employed, being sick or disabled, and if the household are making ends meet with great difficulty and with some difficulty. Hence, in absence of inequality in these variables, inequalities in health would be reduced. The percentage contributions of the independent variables, shown in column (7), indicate that age and age squared are the largest contributors to income-related health inequality at -3.0% and 3.7%, respectively. However, the total age effect is only 0.67%. Column (7) suggests that the percentage contributions of all other independent variables are very small.

Table 7. Decomposition results for men, wave two.

1	2	3	4	5	6	7
	CI	Beta	Mean	Elasticity	Contribution	% contribution
logincome	0.0263	-0.0015	12.686	-0.0220	-0.0006	-0.0493
age	-0.0245	0.0187	65.873	1.421	-0.0354	-3.009
age2	-0.0510	-0.0002	4414.11	-0.8484	0.0433	3.680
hhsize	0.0741	-0.0128	2.0018	-0.0296	-0.0022	-0.1864
Not married	-0.5397	-0.0338	0.1105	-0.0043	0.0023	0.1980
Widowed	-0.5712	-0.0110	0.0608	-0.0008	0.0004	0.0374
Employed	0.2346	0.0195	0.4070	0.0091	0.0022	0.1830
Unempl	-0.1685	0.0015	0.0110	0.00002	-3.30e-06	-0.0003
Sick_disabled	-0.1037	-0.0324	0.0203	-0.0008	0.00008	0.0067
Great_diff	-0.7552	-0.0180	0.0110	-0.0002	0.0002	0.0147
Some_diff	-0.3071	-0.0050	0.1013	-0.0006	0.0002	0.0152
Fairly_easy	-0.0609	0.0190	0.3702	0.0081	-0.0005	-0.0420

Table 8 below illustrates the results for men in wave four. In general the results are fairly similar when compared to the results in wave two. Only the variable being unemployed is changed, and now contributes positively rather than negatively to health inequality. Furthermore, most variables have a reduced percentage contribution in wave four compared to wave two, similar to the results for women. Only being sick or disabled and making ends meet fairly easily have and increased (in absolute value) percentage contribution. In general, the percentage contributions to income-related inequality for men are very small for all independent variables.

Table 8. Decomposition results for men, wave four.

1	2	3	4	5	6	7
	CI	Beta	Mean	Elasticity	Contribution	% contribution
logincome	0.0299	-0.0015	12.6998	-0.0225	-0.0007	-0.0393
age	-0.0234	0.0187	70.372	1.551	-0.0362	-2.114
age2	-0.0481	-0.0002	5026.9	-0.9873	0.0475	2.770
hhsize	0.0784	-0.0128	1.9204	-0.0290	-0.0023	-0.1326
Not married	-0.4586	-0.0338	0.1037	-0.0041	0.0019	0.1107
Widowed	-0.4881	-0.0110	0.0722	-0.0009	0.0005	0.0266
Employed	0.2590	0.0195	0.2686	0.0062	0.0016	0.0935
Unempl	0.0266	0.0015	0.0056	0.00001	2.68e-07	0.00001
Sick_disabled	-0.4738	-0.0324	0.0093	-0.0004	0.0002	0.0098
Great_diff	-0.4935	-0.0180	0.0074	-0.0002	0.0001	0.0045
Some_diff	-0.3138	-0.0050	0.1000	-0.0006	0.0002	0.0108
Fairly_easy	-0.1307	0.0190	0.3500	0.0078	-0.0010	-0.0597

In summary, age and age squared are the greatest contributors to income-related health inequality for both women and men, although the contributions lessen in the four-year period, although the total age effect for both women and men is small. In addition, the percentage contributions for (most of) the independent variables are reduced between wave two and wave four. Otherwise the results differ between men and women. Logincome has a positive contribution towards health inequality for women while it is negative for men, and for example not being married increases health inequalities for men while the opposite is true for women. On the other hand, being widowed results in a larger contribution to health inequality for women than for men.

5.4. *Discussion of the Swedish results*

The results from the estimation of the concentration indices for women and men in the two waves of the SHARE data using self-assessed health (section 5.1) indicate that income-related health inequalities are present in Sweden. Positive concentration indices are obtained for both women and men in wave two and wave four of the data, indicating that good self-assessed health favours the higher income groups in Sweden. Furthermore, the concentration indices indicate that income-related health inequalities increase over the measured time period, although there is no dominance for either women or men. In addition, by wave four, women experience a higher level of income-related health inequalities than men.

This general result is supported by previous studies performed in both Sweden and other countries. For example Islam et al. (2010) study income-related health inequalities in Sweden and find that the concentration indices for health are positive and increasing over time, hence suggesting that in similar fashion to the results in this study, good health is more concentrated among the richer individuals in Sweden. Furthermore, Van Doorslaer and Koolman (2004) find that income-related health inequalities are present in a number of European countries, where inequality is high in e.g. Portugal and the UK, and lower in Germany and the Netherlands.

By simply looking at the concentration indices estimated using the method described in section 3.2 the policy implication would be to redistribute income in order to reduce income-related health inequalities. However, as for example Van Doorslaer and Koolman (2004) showed, other socioeconomic variables such as employment status and education level also affect health inequality. Hence income inequality is not the only factor affecting health inequality. A decomposition of income-related health inequality is therefore required in order to uncover the more complex determinants of such inequality.

The determinants of health regression explained in section 3.3 is based on a fixed effects model estimated separately for women and men. The estimation reveals that only a few variables seem to have a significant impact on self-assessed health in Sweden. For women income, age, age squared and being sick or disabled significantly affect self-assessed health, while the corresponding variables for men are age, age squared, and making ends meet fairly easily. It is recognised that the subjective financial status variables may be correlated with the income variable. However, after trying a number of different model specifications it seems like including a categorical subjective financial status variable does not considerably change the estimated coefficients.

Based on the results of the inequality analysis presented in section 5.3, the most obvious observation is that the contributions of all the independent variables are small for both men and women in Sweden. Wagstaff et al. (2001) point out that both the elasticity and the degree of inequality of the independent variable in question plays an important role in the decomposition of income-related health inequality. The elasticity of a variable tells by what amount health will increase or decrease as a result of an increase in the amount of the variable in question. The concentration index of an independent variable measures the degree to which that specific variable is unequally distributed across income groups. As explained in section 3.4, a variable can be an important determinant of health, but if the elasticity of this variable is small, the contribution of this variable to income-related health inequality will be small as well.

The variables with the largest contribution for both men and women are age and age squared, indicating that most of the income-related inequalities in the sample arise as the oldest individuals are more concentrated in the poorer end of the income distribution. Nevertheless, the percentage contributions are still small, for example the percentage contribution for the age variable for women in wave two is only -4.2%. The perhaps most surprising result is that the contribution of income is very small for both women and men, and according to the determinants of health regression, income does not have a significant impact on health for Swedish men. This analysis therefore suggests that redistributing income among an elderly population will not reduce health inequalities significantly.

Wildman (2003) points out that health inequalities are caused by a number of factors such as wealth, income, lifestyle choices and other exogenous aspects. This study uses a number of similar variables as Wildman (2003), but fails to produce similar results. For example, Wildman (2003) find that subjective financial status is a large contributor to health inequality for men while being widowed increases health inequality for women. This is only partly supported by the Swedish results presented in this paper. While being widowed does indeed increase inequality in health in Sweden, the percentage contribution of this variable is only 0.38%. Similarly, making ends meet with great difficulty also increase health inequalities in Sweden, but with the almost negligible percentage contribution of 0.01%. Wildman (2003) concludes based on his results that redistributing income to widowed women and making individuals feel better off could be possible options for policymakers hoping to reduce health inequalities. Nevertheless, no such conclusion can be drawn based on the results for Sweden in this study.

This study has therefore not been able to explain income-related inequality among an elderly population in Sweden, although it points towards the direction that there is a number of exogenous influences that play part in the complex composition of health inequalities. The following chapter compares the Swedish results to three other European countries with the intention to examine whether the general result is similar for an elderly population.

6. Comparative results

As an attempt to check the robustness of the results in chapter 5, this chapter includes results from elderly populations in three other countries. These results are then compared to the Swedish results above in order to discover both similarities and differences. The countries presented below are Denmark, France and Germany. The analysis is identical to the Swedish case; the same model specification and the same method is used in order to make the results comparable. The analysis is based on SHARE data collected from the three countries, resulting in an identical treatment of dependent and independent variables outlined in Chapter 4. However, it is important to remember that the results are based on separate analyses for each country, and factors varying between countries have not been controlled for.

6.1. Denmark

Denmark is chosen mainly because of its geographical proximity to Sweden, and because out of the nine other countries in SHARE (with participants in waves two and four) Denmark and Sweden are assumed to be the most similar[7]. The concentration index of self-assessed health in Denmark for women and men are shown in Table 9 below. The estimation of the concentration index for Denmark involves a total of 1,651 observations, including 877 women and 774 men.

Table 9. Concentration index of the SAH variable with the population ranked by income in Denmark and Sweden.

Concentration index: Denmark			**Concentration index: Sweden**	
	Women	Men	Women	Men
Wave 2	0. 010146	0.009802	0.010630	0.011733
	(0.004285)	(0.004862)	(0.000296)	(0.004435)
Wave 4	0.014402	0.01461	0.018625	0.017103
	(0.004374)	(0.004814)	(0.001208)	(0.001345)

(Standard errors in brackets)

By looking at the concentration indices for women and men in Denmark, the results are similar to Sweden (also shown in table 3, section 5.1.) As with the Swedish case, the concentration index increases for both men and women in Denmark over the four-year time period. However, the analysis could not be continued for Demark because of insufficient variation in the data to perform the determinants of health estimation. The fact that the analysis fails to provide enough variation to perform a fixed effects panel estimation is a major limitation to this study as it cannot be reproduced using any country. Therefore the external validity of the results can be questioned.

[7] The other SHARE countries with participants in waves two and four are Austria, Germany, the Netherlands, Spain, Italy, France, Switzerland and Belgium (SHARE, 2013b: 5).

6.2. France

France was chosen as the estimated concentration indices were close to the Swedish results presented in table 3 in section 5.1. Compared to the other countries, for example Germany, the concentration indices in France were closest to the Swedish equivalents. The French sample consists of 2,549 observations; 1,489 women and 1,060 men. The sample means are shown in Table A1 in Appendix 1. The French sample is relatively similar to the Swedish sample. The income and SAH variables have slightly smaller means in France, but in both countries men have a higher absolute level of health as well as a higher income. The age variables are also very similar, men age for men and women in France are 67 and 66 for men and women, respectively. In Sweden the mean age for the female sample is 67 and the mean age for men is 68. The results from the estimation of the concentration index according to the method described in section 3.2 are shown in table 10. Again, the concentration index is measured separately for women and men and wave two and wave four.

Table 10. Concentration index of the SAH variable with the population ranked by income in France and Sweden.

	Concentration index: **France**		Concentration index: **Sweden**	
	Women	Men	Women	Men
Wave 2	0.01667	0.019455	0.010630	0.011733
	(0.003264)	(0.003848)	(0.000296)	(0.004435)
Wave 4	0.025540	0.021874	0.018625	0.017103
	(0.003350)	(0.004591)	(0.001208)	(0.001345)

(Standard errors in brackets)

When comparing the concentration indices for France and Sweden one can see that income-related health inequalities are higher in France. Over time this inequality seems to increase for both men and women in both countries, and both French and Swedish women experience a higher increase than their male counterparts.

The determinants of health equation described in section 5.2 was also estimated for France in order to compare the results to the Swedish case. However, the estimation of determinants of health using the French sample does not pass a Hausman test, indicating that random effects should be used instead of the fixed effects model. The analysis of the determinants of health for France is therefore performed using a random effects model. However, the decomposition analysis follows the same method as outlined in section 3.3. The results are shown in Table A2 in Appendix I. The results indicate that logincome, being sick or disabled, making ends meet with great difficulty and making ends meet with some difficulty are significant at the 1 percent level for both women and men. In addition, never married and making ends meet with some difficulty are significant at 5 percent for women. In contrast to the Swedish case, none of the age variables are significant for either women or men.

The results from the decomposition analysis for France are shown in Appendix I (Tables A3 and A4 for women, and A5 and A6 for men). What is immediately evident is that the contributions to income-related health inequality are very small for France as well. When comparing the results from the analysis using the French sample with the Swedish results, one can see that the decomposition analysis is very similar in the two countries. For women, logincome, age and age squared are the variables with the highest contributions to health inequality, and have the same signs for both countries (i.e. logincome and age have positive contributions while age squared contribute negatively to health inequality). However, the decomposition for men reveals that, in contrast to Swedish men, logincome and age have a positive contribution to income-related health inequalities. Logincome is the variable with the highest percentage contribution for men in France, while age and age squared appear to have a lower percentage contribution than in Sweden.

In addition, the contributions of the independent variables are decreasing over time for both women and men in Sweden, while this is true for French women, the results for French men indicate that the contributions are increasing for most of the independent variables. In general, the contributions of the independent variables are small for both Sweden and France, indicating that the variables do not appear to explain income-related health inequality.

6.2. Germany

As a third country I chose Germany to see if the analysis changes with a country with differing concentration indices compared to Sweden. The sample means for German women and men are shown in table B1 in Appendix II. In contrast to Sweden, mean self-assessed health for women is slightly higher than for men in the German sample. The mean income is higher for men in Germany, and German men have a higher mean age; similar to the Swedish case. The German sample consists of 949 women and 828 men. The mean self-assessed health in Germany is very similar for women and men; women experience a slightly higher mean level of health. Logincome and age are higher for men, and a higher share of men have a better subjective financial status (measured by the dummy variable 'easily'). The concentration indices for women and men in waves two and four of the German sample are shown in table 11.

Table 11. Concentration index of the SAH variable with the population ranked by income in Germany and Sweden.

	Concentration index: Germany		**Concentration index: Sweden**	
	Women	Men	Women	Men
Wave 2	0.005421	0.019201	0.010630	0.011733
	(0.004239)	(0.004685)	(0.000296)	(0.004435)
Wave 4	0.014788	0.013805	0.018625	0.017103
	(0.004393)	(0.005163)	(0.001208)	(0.001345)

(Standard errors in brackets)

Comparing the concentration indices for Germany and Sweden indicate that in contrast to Swedish men, German men experience a decrease in income-related health inequalities over time. However, inequalities increase for both German and Swedish women over the time period. In addition, the concentration indices for German women are lower than for Swedish women. German men have a higher concentration index initially, but at wave four the index is lower for German men than for Swedish men.

The determinants of health estimation results for Germany are shown in Table B2 in Appendix II. The model passes the Hausman test and hence the fixed effects model is used. Like in the case of Sweden, an F-test is performed to confirm that the data cannot be pooled, and a Chow test shows that the German sample should be estimated separately for men and women. For German women the only significant coefficients in the determinants of health estimation are age squared (at the 5% significance level) and sick or disabled (at the 10% level). Estimation using the male sample results in three significant coefficients: age squared (5% sign. level), never married (1% sign. level) and sick or disabled (10% sign. level).

The results from the decomposition analysis for German women are shown in tables B3 and B4 and for German men in tables B5 and B6 in Appendix II. The general result is once again that the contributions to income-related health inequality of the independent variables are very small for both women and men in the German sample. The results for women in Germany are similar to the Swedish sample, both countries suffer from positive contributions to income-related health inequality of logincome, age, age squared, being widowed, and making ends meet with great difficulty. In addition, the variables with the largest contributions to health inequality are similar in the two countries: age, age squared and logincome. Finally, in both countries the contributions of the independent variables to health inequality is decreasing from wave two to wave four.

Comparing the results for German men and their Swedish counterparts suggests that there are fairly large differences in the composition of income-related health inequalities between the countries. For German men 'not married' is the variable contributing most to health inequality, whereas age and age squared are the largest contributors in the Swedish case. Finally, the results indicate that the contributions of most independent variables to health inequality are increasing over time, while the opposite is true in the Swedish case. Nevertheless, for both women and men in Sweden and Germany the contributions of the independent variables are very small, again indicating that none of the included variables seem to explain income-related health inequalities in either one of the two countries.

7. Discussion and conclusion

The purpose of this study is to analyse income-related health inequalities for an older population. Sweden is the main country of interest, although data collected in Germany, France and Denmark are also analysed for comparative reasons. This study uses the concentration index to quantify income-related health inequalities, and in addition, provides a decomposition analysis with the intention to describe which factors explain such inequality among older individuals. The analysis is performed using two waves of SHARE data, which enables the use of a panel data fixed effects model in the decomposition analysis.

The Swedish results indicate that both men and women suffer from income-related health inequalities. However, when incorporating a number of independent variables and performing the decomposition the results indicate that income does not play a large part in explaining health inequality in Sweden. In order to investigate if a similar conclusion can be drawn in other countries, the same analysis was performed for Denmark, Germany and France. For Denmark the determinants of health equation could not be performed due to insufficient variation of the data. The fact that a panel data approach was not suitable for Denmark may suggest that the time period between the two waves of the data is not long enough for substantial changes in health to occur. It could also suggest that elderly individuals are fairly constant in assessing their own health and that the socioeconomic factors do not vary as much in old age as they do for younger individuals. The Danish example therefore suggests that the external validity of this study may be questioned.

Nevertheless, the analysis was performed successfully for both Germany and France. The results obtained for these two countries were similar to the Swedish result; the contributions to health inequality of the independent variables are small. However, the decomposition results for Germany and France do show that the composition of inequality does vary between the countries, but the general result of small contributions remain. This seems to support the possibility that the time period of this study is too short for an elderly population, or that the factors contributing to health inequalities for the elderly are determined earlier in life and vary little in later stages in life. The concentration indices still show that income-related health inequalities are present, however the decomposition analysis performed does not seem to be able to explain the inequalities.

A working paper by Gerdtham et al. (2012) explores the causal pathways of income and health inequalities. Previous studies (including this paper) rely on the assumption that socioeconomic factors like income and education influence health. Gerdtham et al. (2012) therefore use a twin-pair decomposition approach, where the unobserved characteristics of the twin pairs are controlled for in order to address the endogeneity problem present in this setting. The results suggest that income-related inequalities cannot simply be assumed to be caused by income and education, but that there are a number of unobserved factors such as early life conditions and genetic factors that affect both the socioeconomic variables and health inequality. These unobserved factors are very important (albeit extremely difficult) to measure if policymakers want to properly address the problem of inequity in health. Consequently, the results from the decomposition analysis presented in this paper suggest that studies need not only focus on the present health and socioeconomic statuses of individuals, but also on their background and early life conditions.

Moreover, Gerdtham et al. (2012) point out that studies using panel data fixed effects models like this paper does, suffer from the problem of being forced to exclude time-constant factors such as education. This study has been able to encompass only time-varying factors like income and employment status, while an analysis of income-related health inequalities could greatly benefit from the inclusion of education and for example region of residence.

There are also a number of additional improvements this study could have benefited from. There are some limitations concerning the dataset and the treatment of the data. Attrition and nonresponse are problems apparent in most survey designs, and the use of a weighting strategy could have improved the results but was too complex to construct for this paper. In addition, the SHARE dataset contains a fairly large number of missing values which is a problem solved by a multiple imputations process. As explained in section 4.5, only one of the five datasets containing missing values were used. However, the analysis was performed using another of the five datasets in order to check whether this changes the results. The coefficients in the determinants for health equation were very similar to the results in the initial analysis for both women and men, and the signs of the coefficients remained the same. Furthermore, the variables that were significant in the initial analysis were also significant when using another of the five datasets, and the decomposition analysis indicated that the results were close to identical. This therefore justifies, at least in part, the use of only one of the five datasets of imputed values. Nevertheless, this study could have been improved by the use of all five datasets representing different draws from the distribution of missing values.

Furthermore, the treatment of the self-assessed health variable can be questioned. The task of creating a cardinal variable from an ordinal health variable was resolved by assigning median Health Utilities Index (HUI) values to the different categories of the health variable in the SHARE dataset. This study could have been improved by using the interval regression approach (see section 4.2) to convert the ordinal self-assessed health variable to a cardinal one.

Another limitation that deserves to be mentioned is the method used for calculating the concentration index. There has been a great deal of debate about the concentration index and the assumptions around it. Erreygers (2009) proposes a corrected concentration index which satisfies four requirements (transfer, level independence, cardinal invariance and mirror) which the author regard as essential for an indicator of income-related health inequality.

Erreygers (2009) addresses three main criticisms of the concentration index. First, the bounds of the concentration index depend on the mean of the health variable, which reduces the comparability of the index between populations with different mean levels of health. Second, the ranking based on the concentration index differs depending on whether one considers inequalities in ill-health or inequalities in (good) health. Third, if the health variable is qualitative, the concentration index is more or less arbitrary. Erreygers (2009) therefore proposes a corrected concentration index that satisfies the key requirements, has maximum bounds of -1 and +1 and can be decomposed relatively easily. It would be very interesting to use the corrected concentration index in the same setting as this study and compare the results

In conclusion, this study indicates that income-related health inequalities for an older population do exists, but the decomposition analysis performed fails to explain which factors greatly influence health inequalities. This general result is obtained for Sweden as well as for both Germany and France that are included for comparative purposes. The result obtained in this study is hypothesised to arise because of the possibility that the time period of this study was not large enough, or that the factors contributing to health inequalities for the elderly are determined earlier in life and therefore do not change much later in life. Further research that examines the causal pathways of socioeconomic factors and health inequality is needed in order to fully uncover the causes of income-related health inequalities. This can be attempted by employing methods using for example sibling or, preferably, twin data.

8. References

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A. Appendix 1: France

Table A1. Variables and sample means for women and men in France.

		Women (N=1489)	**Men (N=1060)**
hui	Self-assessed health	0.8177	0.8264
logincome	Log of annual net household income	10.10	10.30
age	Age at interview	67.60	66.89
age2	Age squared	4671.4	4562.1
hhsize	Household size	1.772	2.075
Married	Married (Living with spouse, living separate from spouse, registered partnership)	0.5514	0.7698
Not married	Not married (Never married, divorced)	0.1760	0.1491
Widowed	Widowed	0.2767	0.0792
Retired	Retired	0.6320	0.7340
Employed	Employed or self-employed	0.2035	0.2085
Unemployed	Unemployed	0.0188	0.0226
Sick_disabled	Permanently sick or disabled	0.0181	0.0179
Homemaker	Homemaker	0.1162	
Great_diff	With great difficulty	0.0766	0.0538
Some_diff	With some difficulty	0.2424	0.2028
Fairly_easy	Fairly easily	0.4197	0.4217
Easily	Easily	0.2612	0.3217

Table A2. Determinants of health estimation results for France.

VARIABLES	(1) women hui	(2) men hui
logincome	0.00938***	0.0107***
	(0.00307)	(0.00370)
age	0.00274	-0.00438
	(0.00433)	(0.00559)
age2	-4.13e-05	4.38e-06
	(3.03e-05)	(3.96e-05)
hhsize	-0.00374	0.00234
	(0.00479)	(0.00460)
Not_married	0.0222**	-0.00428
	(0.00959)	(0.0116)
widowed	-0.00270	-0.0130
	(0.00889)	(0.0148)
employed	0.00402	-0.00411
	(0.00945)	(0.0109)
unempl	0.0165	0.0248
	(0.0180)	(0.0209)
Sick_disabled	-0.120***	-0.0897***
	(0.0213)	(0.0233)
Homemaker	0.00788	
	(0.00881)	
Great_diff	-0.0628***	-0.0725***
	(0.0110)	(0.0142)
Some_diff	-0.0338***	-0.0317***
	(0.00753)	(0.00897)
Fairly_easy	-0.0133**	-0.00967
	(0.00611)	(0.00677)
Constant	0.752***	1.002***
	(0.159)	(0.198)
Observations	1,489	1,060

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A3. Decomposition results for women for France, wave two.

1	2	3	4	5	6	7
	CI	Beta	Mean	Elasticity	Contribution	% contribution
logincome	0.0468	0.00938	10.13	0.1153	0.0054	0.3240
age	-0.0245	0.00274	65.66	0.2188	-0.0054	-0.3214
age2	-0.0487	-4.13e-05	4407.7	-0.2207	0.0108	0.6451
hhsize	0.0883	-0.00374	1.819	-0.0083	-0.0007	-0.0437
Not married	-0.2307	0.0222	0.1759	0.0047	-0.0011	-0.0656
Widowed	-0.3457	-0.00270	0.2720	-0.0009	0.0003	0.0185
Employed	0.2434	0.00402	0.2503	0.0012	0.0003	0.0179
Unempl	0.0611	0.0165	0.0230	0.0005	0.00003	0.0017
Sick_disabled	-0.3962	-0.120	0.0189	-0.0028	0.0011	0.0655
Homemaker	-0.1105	0.00788	0.1340	0.0013	-0.0001	-0.0085
Great_diff	-0.4499	-0.0628	0.0785	-0.0060	0.0027	0.1616
Some_diff	-0.2459	-0.0338	0.2463	-0.0101	0.0024	0.1489
Fairly_easy	0.0674	-0.0133	0.4303	-0.0069	-0.0005	-0.0280

Table A4. Table A3. Decomposition results for women for France, wave four.

1	2	3	4	5	6	7
	CI	Beta	Mean	Elasticity	Contribution	% contribution
logincome	0.04544	0.00938	10.065	0.1163	0.0053	0.2069
age	-0.0316	0.00274	69.515	0.2350	-0.0074	-0.2904
age2	-0.0632	-4.13e-05	4931.3	-0.2506	0.0158	0.6120
hhsize	0.0990	-0.00374	1.727	-0.0079	-0.0008	-0.0308
Not married	-0.2154	0.0222	0.176	0.0049	-0.0010	-0.0405
Widowed	-0.3512	-0.00270	0.2733	-0.0009	0.0003	0.0125
Employed	0.3371	0.00402	0.1573	0.0008	0.0003	0.0103
Unempl	-0.0273	0.0165	0.0147	0.0003	-8.140e-06	-0.0003
Sick_disabled	-0.3429	-0.120	0.0173	-0.003	0.0009	0.0343
Homemaker	-0.2087	0.00788	0.0987	0.001	-0.0002	-0.0078
Great_diff	-0.3889	-0.0628	0.0747	-0.006	0.0022	0.0880
Some_diff	-0.2164	-0.0338	0.2387	-0.001	0.0021	0.0841
Fairly_easy	-0.0023	-0.0133	0.4093	-0.007	0.00002	0.0006

Table A5. Decomposition results for men for France, wave two.

1	2	3	4	5	6	7
	CI	Beta	Mean	Elasticity	Contribution	% contribution
logincome	0.0430	0.0107	10.315	0.1318	0.0057	0.2914
age	-0.0156	-0.00438	64.83	-0.3393	0.0053	0.2727
age2	-0.0310	4.38e-06	4287.9	0.0225	-0.0007	-0.0358
hhsize	0.0236	0.00234	2.140	0.0060	0.0001	0.0073
Not married	-0.2534	-0.00428	0.1477	-0.0008	0.0002	0.0098
Widowed	-0.1798	-0.0130	0.0766	-0.0012	0.0002	0.0111
Employed	0.2271	-0.00411	0.2654	-0.0013	-0.0003	-0.0152
Unempl	-0.3578	0.0248	0.0243	0.0007	-0.0003	-0.0132
Sick_disabled	-0.5738	-0.0897	0.0187	-0.0020	0.0012	0.0591
Great_diff	-0.6158	-0.0725	0.0523	-0.0045	0.0028	0.1435
Some_diff	-0.2662	-0.0317	0.2037	-0.0077	0.0021	0.1056
Fairly_easy	0.00055	-0.00967	0.4355	-0.0050	-2.347e-06	-0.0001

Table A6. Decomposition results for men for France, wave four.

1	2	3	4	5	6	7
	CI	Beta	Mean	Elasticity	Contribution	% contribution
logincome	0.0417	0.0107	10.29	0.1350	0.0056	0.2574
age	-0.0217	-0.00438	68.99	-0.3705	0.0080	0.3669
age2	-0.0439	4.38e-06	4841.46	0.0260	-0.0011	-0.0523
hhsize	0.0493	0.00234	2.0076	0.0056	0.0003	0.0130
Not married	-0.3678	-0.00428	0.1505	-0.0008	0.0003	0.0133
Widowed	-0.2911	-0.0130	0.0819	-0.0013	0.0004	0.0174
Employed	0.3023	-0.00411	0.1505	-0.0008	-0.0002	-0.0105
Unempl	-0.3206	0.0248	0.0210	0.0006	-0.0002	-0.0093
Sick_disabled	-0.1527	-0.0897	0.0171	-0.0019	0.0003	0.0132
Great_diff	-0.3559	-0.0725	0.0552	-0.0049	0.0017	0.0799
Some_diff	-0.2500	-0.0317	0.2019	-0.0078	0.0020	0.0897
Fairly_easy	0.0088	-0.00967	0.4076	-0.0048	-0.00004	-0.0020

B. Appendix 2: Germany

Table B1. Variables and sample means for women and men in Germany.

		Women (N=949)	**Men (N=828)**
hui	Self-assessed health	0.8255	0.8222
logincome	Log of annual net household income	10.02	10.24
age	Age at interview	66.04	67.45
age2	Age squared	4435.1	4610.3
hhsize	Household size	1.9410	2.091
Married	Married (Living with spouse, living separate from spouse, registered partnership)	0.7503	0.8744
Not married	Not married (Never married, divorced)	0.0917	0.0749
Widowed	Widowed	0.1581	0.0507
Retired	Retired	0.5638	0.7198
Employed	Employed or self-employed	0.2329	0.2138
Unemployed	Unemployed	0.0327	0.0386
Sick_disabled	Permanently sick or disabled	0.0148	0.0121
Homemaker	Homemaker	0.1454	
Great_diff	With great difficulty	0.0358	0.0435
Some_diff	With some difficulty	0.1897	0.1884
Fairly_easy	Fairly easily	0.4341	0.3889
Easily	Easily	0.3404	0.3792

B2. Determinants of health estimation results for Germany.

VARIABLES	(1) women hui	(2) men hui
logincome	0.00314	0.00857
	(0.00238)	(0.00566)
age	0.0121	0.0147
	(0.00810)	(0.0108)
age2	-0.000120**	-0.000138*
	(6.01e-05)	(7.79e-05)
hhsize	-0.00980	0.00490
	(0.00907)	(0.00897)
Not_married	0.0451	-0.283***
	(0.0932)	(0.0995)
widowed	-0.0154	-0.0321
	(0.0259)	(0.0709)
employed	-0.0169	-0.0177
	(0.0124)	(0.0158)
unempl	-0.0102	-0.0115
	(0.0217)	(0.0237)
Sick_disabled	0.0502*	-0.0646*
	(0.0298)	(0.0364)
Homemaker	0.00337	
	(0.0129)	
Great_diff	-0.0186	0.0276
	(0.0230)	(0.0224)
Some_diff	-0.0142	0.00543
	(0.0130)	(0.0130)
Fairly_easy	-0.00820	-0.00820
	(0.00910)	(0.00973)
Constant	0.554**	0.398
	(0.279)	(0.381)
Observations	949	828
R-squared	0.059	0.088

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table B3. Decomposition results for women for Germany, wave two.

1	2	3	4	5	6	7
	CI	Beta	Mean	Elasticity	Contribution	% contribution
logincome	0.0437	0.00314	10.113	0.0381	0.0017	0.3078
age	-0.0203	0.0121	63.89	0.9307	-0.0189	-3.4874
age2	-0.0411	-0.000120	4151.3	-0.6003	0.0247	4.5605
hhsize	0.0673	-0.00980	1.9958	-0.0235	-0.0016	-0.2924
Not married	-0.5064	0.0451	0.0926	0.0050	0.0025	-0.4696
Widowed	-0.3699	-0.0154	0.1432	-0.0026	0.0010	0.1812
Employed	0.2539	-0.0169	0.2758	-0.0056	-0.0014	-0.2630
Unempl	-0.3124	-0.0102	0.0484	-0.0006	0.0002	0.0341
Sick_disabled	-0.3170	0.0502	0.0168	0.0010	-0.0003	-0.0595
Homemaker	0.0933	0.00337	0.1474	0.0006	0.00006	0.0103
Great_diff	-0.4262	-0.0186	0.0400	-0.0009	0.0004	0.0703
Some_diff	-0.3284	-0.0142	0.1726	-0.0029	0.0010	0.1784
Fairly_easy	-0.0284	-0.00820	0.4947	-0.0049	0.0001	0.0256

Table B4. Decomposition results for women for Germany, wave four.

1	2	3	4	5	6	7
	CI	Beta	Mean	Elasticity	Contribution	% contribution
logincome	0.0532	0.00314	9.926	0.0381	0.0020	0.1370
age	-0.0156	0.0121	68.19	1.010	-0.0158	-1.066
age2	-0.0313	-0.000120	4719.6	-0.6942	0.0217	1.469
hhsize	0.0700	-0.00980	1.8861	-0.0226	-0.0016	-0.1069
Not married	-0.3578	0.0451	0.0907	0.0050	-0.0018	-0.1209
Widowed	-0.3599	-0.0154	0.1730	-0.0033	0.0012	0.0793
Employed	0.1738	-0.0169	0.1899	-0.0039	-0.0007	-0.0461
Unempl	-0.3356	-0.0102	0.0169	-0.0002	0.00007	0.0048
Sick_disabled	-0.2178	0.0502	0.0127	0.0008	-0.0002	-0.0114
Homemaker	0.0142	0.00337	0.1435	0.0006	8.370e-06	0.0006
Great_diff	-0.3387	-0.0186	0.0316	-0.0007	0.0002	0.0165
Some_diff	-0.2934	-0.0142	0.2068	-0.0036	0.0011	0.0711
Fairly_easy	-0.0499	-0.0082	0.3734	-0.0037	0.0002	0.0126

Table B5. Decomposition results for men for Germany, wave two.

1	2	3	4	5	6	7
	CI	Beta	Mean	Elasticity	Contribution	% contribution
logincome	0.0427	0.00857	10.205	0.1053	0.0045	0.2342
age	-0.0030	0.0147	65.260	1.1553	-0.0035	-0.1818
age2	-0.0057	-0.000138	4314.3	-0.7167	0.0041	0.2128
hhsize	0.0303	0.00490	2.1277	0.0126	0.0004	0.0199
Not married	-0.5757	-0.283	0.0723	-0.0247	0.0142	0.7406
Widowed	-0.2367	-0.0321	0.0482	-0.0019	0.0004	0.0230
Employed	0.2681	-0.0177	0.2627	-0.0056	-0.0015	-0.0782
Unempl	-0.6537	-0.0115	0.0530	-0.0007	0.0005	0.0251
Sick_disabled	-0.4911	-0.0646	0.0072	-0.0006	0.0003	0.0144
Great_diff	-0.5184	0.0276	0.0386	0.0013	-0.0006	-0.0346
Some_diff	-0.2300	0.00543	0.1904	0.0012	-0.0003	-0.0149
Fairly_easy	-0.0967	-0.00820	0.4337	-0.0043	0.0004	0.0216

Table B6. Decomposition results for men for Germany, wave four.

1	2	3	4	5	6	7
	CI	Beta	Mean	Elasticity	Contribution	% contribution
logincome	0.0387	0.00857	10.27	0.1080	0.0042	0.3031
age	-0.0025	0.0147	69.65	1.2572	-0.0031	-0.2261
age2	-0.0046	-0.000138	4907.8	-0.8313	0.0038	0.2767
hhsize	0.0202	0.00490	2.0533	0.0124	0.0002	0.0181
Not married	-0.4683	-0.283	0.0775	-0.0270	0.0126	0.9149
Widowed	-0.2542	-0.0321	0.0533	-0.0021	0.0005	0.0386
Employed	0.2064	-0.0177	0.1646	-0.0036	-0.0007	-0.0534
Unempl	-0.5917	-0.0115	0.0242	-0.0003	0.0002	0.0147
Sick_disabled	-0.5583	-0.0646	0.0169	-0.0013	0.0008	0.0544
Great_diff	-0.4233	0.0276	0.0484	0.0016	-0.0007	-0.0503
Some_diff	-0.1985	0.00543	0.1864	0.0012	-0.0002	-0.0179
Fairly_easy	-0.0967	-0.00820	0.3438	-0.0035	0.0003	0.0243