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Abstract

Although there is a growing interest in subjective well-being (SWB) and its determinants, the extent of socioeconomic inequalities in SWB has not yet been analyzed. This study assesses socioeconomic inequalities in SWB in twelve European countries and the United States (US), by estimating concentration indices. They are then decomposed to document how individual income, relative income (i.e. how individual income compares to those of peers), individual health, and relative health contribute to these inequalities. The analysis focuses on the population aged 50 and over, using data from the 'Survey of Health, Ageing, and Retirement in Europe' and the 'Health and Retirement Study' for the US. All countries display some socioeconomic inequalities in SWB, with SWB being concentrated among individuals with higher socioeconomic status. Of the countries studied, the Netherlands and Belgium have the lowest socioeconomic inequalities in SWB, while Poland and the Czech Republic have the highest. The US has significantly higher inequalities than the former and significantly lower inequalities than the latter countries. The decomposition reveals that individual and relative health contribute largely to these inequalities in all countries. In contrast, individual and relative income matter in some countries, such as the US, and not in others, for example Spain. These results indicate that attention needs to be paid to socioeconomic inequalities in SWB of the baby boomers and elderly population and that, in most countries, policies focusing on health would be more effective at reducing them than targeting income.

Keywords: subjective well-being; socioeconomic inequalities; income; health

1. Introduction

Over the last decade, there has been increasing awareness that individual and societal development cannot solely be measured by traditional indicators, such as income or the Gross Domestic Product (GDP), but that well-being has to be considered as well (Kahneman et al., 2004; Diener and Seligman, 2004; Stiglitz et al., 2009; OECD, 2011; Helliwell et al., 2013). In Europe and the United States (US), the measurement of well-being is receiving growing attention, because the enhancement of well-being is now considered as one of the objectives of public policy (NEF, 2009; OECD, 2013a; Eurofound, 2013; NAS, 2013). For example, the promotion of well-being is an explicit goal of the European Union (Lisbon Treaty, art. 3) and one of the goals of the US federal initiative 'Healthy People 2020' (CDC, 2010). Simultaneously, the reduction in socioeconomic inequalities is perceived as a way to improve social cohesion (EC, 2009; 2010; Stiglitz, 2012). While the measurement of well-being and the study of its determinants have gained ground, there is no evidence on socioeconomic inequalities in well-being and the main factors explaining them.

Socioeconomic inequalities in well-being capture the degree to which well-being is (un)equally distributed in the population, by socioeconomic status (SES). So far, the measurement of inequalities has primarily focused on (i) unequal distributions of income or health *per se*, which are two determinants of well-being (e.g. Le Grand, 1987; Gakidou et al., 2000; World Bank, 2014), or on (ii) the socioeconomic inequalities in health, i.e. how health is distributed by SES (e.g. Wagstaff et al., 1991; van Doorslaer et al., 1997; van Doorslaer and Koolman, 2004; van Ourti et al. 2009). These empirical studies provide incomplete views of the extent of inequalities because they focus on specific contributors of well-being, but not on well-being itself (Fleurbaey, 2009; Fleurbaey and Schokkaert, 2011; Bleichrodt et al, 2012).

Subjective well-being (SWB) —i.e. happiness or quality of life— consists in people's self-assessment of their well-being (Diener et al., 1984). The use of SWB measures relies on three main assumptions: individuals make decisions based on their subjective perceptions and emotions, they are able to attribute a value to their well-being, and different values of SWB discriminate across life circumstances (Kahneman et al., 1997; Loewenstein, 2000; Kahneman and Krueger, 2006; di Tella and MacCulloch, 2006). The most common measure of SWB is life satisfaction (Stiglitz et al., 2009; Blanchflower, 2009; OECD, 2013a). It captures the cognitive dimension of SWB by asking individuals to make a personal judgment about the quality of their life in general (Diener et al., 1985). It is broadly used because it is a parsimonious way to capture SWB and its validity and reliability are documented (Kahneman and Krueger 2006; Dolan et al., 2008; Krueger and Schkade, 2008; Kobau et al., 2010; Oswald and Wu, 2010; OECD, 2011; Diener et al., 2013). Life satisfaction correlates well —negatively or positively— with various objective, indirect, or composite measures of well-being, such as hypertension, high blood pressure, frequency of smile, stress level, or the OECD Better Life Index (Blanchflower, 2009; OECD, 2011; 2014).

A large body of literature explores the determinants of SWB. For reviews, refer to Dolan et al. (2008), Stutzer and Frey (2010), Graham (2011), or Ferrer-i-Carbonell (2013). Most studies provide average estimates that pertain to the typical individual. Similarly, the majority of international comparisons focus on mean estimations by country (e.g. Blanchflower and Oswald, 2004a; Deaton, 2008; Diener et al., 2010; Blanchflower and Oswald, 2011; Helliwell et al., 2013). Some studies assess the correlation between regional inequalities in income, measured by the Gini index, and individual SWB (Alesina et al. 2004; Schwarze and Härpfer, 2007; Rözer and Kraaykamp, 2012). The Gini index enters into the SWB model as an explanatory variable. The results are inconclusive; SWB is either negatively or positively associated with regional

inequalities in income, or no association is found. The research on SWB has paid little attention to the distribution of SWB in general, and no work has looked at its distribution by SES (see section 2).

This study fills that gap by assessing socioeconomic inequalities in SWB in twelve European countries and the US. We first estimate concentration indices to compare levels of inequalities across countries. Then, these indices are decomposed to determine the contributions of income and health, i.e. the proportion of inequalities attributable to income or health. We focus on income and health because they are two vital components of people's life (see section 3). More specifically, this study considers the distinct contributions of individual income and relative income, as well as individual health and relative health. Relative income and relative health capture the social comparisons that people may make of their own income or health with those of their peers (see section 4). The decomposition of the concentration indices also informs on the pathways through which each factor may contribute to the estimated inequalities: its association with SWB and its own unequal distribution across SES (O'Donnell et al., 2008; van Doorslaer and van Ourti, 2011).

This study focuses on the population aged 50 and over. Because of the economic and social consequences of aging, the well-being of the baby boomers and elderly individuals is a major social and political challenge in Europe and the US. SWB is increasingly viewed as an important indicator to monitor for the elderly population (Diener et al., 2003), as should the level of inequalities in SWB.

2. Comparisons across countries

There is growing interest in knowing which countries perform better and why. The ranking of countries by average SWB is fairly similar across surveys and measures of SWB. Overall, SWB

tends to be higher in Western Europe and North America than in other parts of the world. In Europe, the highest levels of SWB are typically reported for Switzerland and Northern countries, e.g. Denmark or Sweden. Southern countries, such as Italy or Spain, tend to have middle level SWB, when Eastern Europe displays lower average SWB, e.g. Poland or Hungary (Deaton, 2008; Diener et al., 2010; OECD, 2011; Eurofound, 2013; OECD, 2013b; Helliwell et al., 2013; Veenhoven, 2014). Some works compare the determinants of SWB across countries and provide mixed results regarding whether they differ or not (e.g. di Tella et al., 2003; Blanchflower and Oswald, 2004a, 2011). Most studies focus on the entire adult population. Blanchflower (2009) reports some estimates on the 52+ populations and there is an increasing interest in the SWB of the elderly population (e.g. Walker, 2005; George, 2010; Lopez et al., 2013).

All the above studies compare mean estimates across countries. The distribution of SWB in the population has received little attention. A handful of studies have estimated the 'overall inequalities in SWB'. They compare means between top and bottom percentiles or quintiles of the SWB distribution (OECD, 2011; Eurofound, 2013), estimate the Gini index (Eurofound, 2013; Weaver and Gonçalves, 2014), or the variance of SWB across sociodemographic groups (Stevenson and Wolfers, 2008). In Europe, the lowest overall inequalities in SWB are found in the Northern countries, the Netherlands, or Belgium. Italy and Spain tend to have lower inequalities in SWB than Germany, for example. The Eastern European countries perform the least well (OECD, 2011; Eurofound, 2013; Weaver and Gonçalves, 2014). For the US, the evidence is scarce; in OECD (2011), the US display larger overall inequalities in SWB than most European countries. Without estimating inequalities, Binder and Coad (2010) assess how a set of factors correlates with SWB at different levels of the SWB distribution in Great Britain, via a quantile regression. Lastly, some studies estimate multidimensional inequalities in well-being, which are not directly observed (van Praag and Ferrer-i-Carbonell, 2007; Decancq and Lugo,

2012). Inequalities in different domains are aggregated to obtain the overall inequalities in well-being. Our study is the first to use a bivariate measure of inequality, i.e. the concentration index, to compare the level of socioeconomic inequalities in SWB across Europe and the US.

3. SWB, income, health

Income, as a proxy for financial resources, and health are basic and vital resources that individuals need to function in society and achieve some life objectives. As determinants of SWB, income and health have received a lot of attention. Compared to other factors, income tends to play a limited role, whereas health appears as a major contributor of SWB (Blanchflower and Oswald, 2004; Helliwell, 2003; Graham, 2008; Ferrer-i-Carbonell, 2013). The interest paid to the link between income and SWB originated in the work by Easterlin (1974). The Easterlin paradox is the fact that, at the aggregate level, people are not becoming happier over time despite increasing per capita income, when at the individual level, small positive (and marginally decreasing) correlations are found between income and SWB. The seemingly contradictory results between macro- and micro-level studies may be due to the role played by relative income. Relative income is the comparison that individuals make between their own income and the income of their peers, or reference group. As suggested by Verme (2013), no distinction is made here between relative income and relative deprivation. Numerous studies find that higher income of the reference group, compared to the person's own income, results in lower SWB (e.g. Luttner, 2005; Ferrer-i-Carbonell, 2005; Dynan and Ravina, 2007; Clark et al., 2008; van Praag, 2011). There is conflicting evidence on whether SWB is more responsive, in absolute terms, to higher or lower income of the reference group (Duesenberry, 1949; McBride, 2001; Ferrer-i-Carbonell, 2005). Once such social comparisons are taken into account, the correlation of individual income and SWB remains positive, but is smaller or non-

significant. The inclusion of relative income in the SWB model is a way to capture the association between micro-level inequalities in income (among peers) and individual SWB.

Contrary to income, good health has a large positive association with SWB regardless of the measure of health, e.g. self-assessments, medical conditions, or disability (Ferrer-i-Carbonell and Frijters, 2004; Graham et al., 2011; Binder and Coad, 2013). When assessing their SWB, individuals are also likely to compare their own health with the one of their reference group (Festinger, 1954; Sirgy, 2012). Few studies have accounted for health-related social comparisons (De Mello and Tiongson, 2009; Blanchflower et al., 2009; Graham et al, 2011; Carrieri, 2012). Having a bad health, compared to the reference group, may impact SWB negatively if health of others serves as a personal benchmark. On the contrary, having a good health, compared to peers, may provide a feeling of satisfaction that may increase SWB. Such pathways require that people are able to assess health of others. No work has explored the existence of asymmetric effects of low and high relative health on SWB.

Building on this evidence, this study disentangles the contributions of individual income and health from the contributions of relative income and relative health to the socioeconomic inequalities in SWB. Social comparisons at the micro-level are assumed to contribute to the socioeconomic inequalities in SWB at the macro-level, i.e. nationwide. Furthermore, asymmetric responses are considered by distinguishing between low and high relative income and health.

To summarize, the contributions of this study are threefold. First, we compare the level of socioeconomic inequalities in SWB across Europe and the US. Second, we decompose them to observe the contributions of income, relative income, health, and relative health to these inequalities and the pathways through which they operate. Third, we consider the asymmetric effects of low and high relative income and health.

4. Data

Two datasets are used: the 'Survey of Health, Ageing, and Retirement in Europe' (SHARE) for the European countries, and the 'Health and Retirement Study' (HRS) for the US. SHARE is a multi-country survey based largely on HRS; it is why they share common features. They are nationally representative surveys of non-institutionalized individuals aged 50 and over at baseline, and spouses regardless of age. The first waves of HRS and SHARE were collected in 1992 and 2004/5, respectively. They are longitudinal surveys with new cohorts of participants being added over time. Individual interviews are conducted approximately every two years. The analyses are conducted on two waves: 2008/9 and 2010/11 for the US (waves 9 and 10), and 2006/7 and 2011/12 for Europe (waves 2 and 4). The two selected waves are treated as two cross-sections, with adjustment for individual level clustering resulting from observing some individuals twice. In HRS, the life satisfaction measure is available since 2008. In this study, the longitudinal structure of SHARE cannot be used for the following reasons. Eastern European countries took part in SHARE for the first time at W2. At W3, a different questionnaire was used, which focused on the life course —i.e. SHARELIFE. Lastly, refreshment samples were added at W4 for nine of the twelve countries participating at W2. Only Germany, Sweden, and Poland did not have a refreshment sample at W4. The analysis is conducted on the twelve European countries present at W2 and W4. The central European countries are Germany, France, Switzerland, Austria, Belgium, and The Netherlands. Two Northern countries are included: Denmark and Sweden. The Southern countries consist of Spain and Italy, and the Eastern countries are the Czech Republic and Poland. The analysis is restricted to the population aged 50+, i.e. born prior to 1961. After dropping observations with missing information, the final samples range from 3,709 in Poland to 8,034 in the Czech Republic, when the US sample includes 29,148 observations.

In SHARE and HRS, life satisfaction scales are available. In SHARE, the scale has 11 levels; 0 means completely dissatisfied and 10 means completely satisfied. In HRS, the SWB measure is based on a five-point scale. To be able to compare results across Europe and the US, the life satisfaction variable is coded similarly by linearly rescaling SWB to the interval [0; 1]. With such measure, the estimates in the SWB model correspond to percentage point changes in SWB (see section 5). Another life satisfaction scale with seven levels is available in the psychosocial leave-behind questionnaire of HRS. Overall, the US results and the comparison with Europe are not impacted by the choice of the SWB measure for the US (available on request).

Income is captured by the 'disposable individual-equivalent household income' and is reported in Euros (€) and US dollars ($). Income is disposable because net of taxes and deductions. It is adjusted for household size, using OECD's square root equivalence scale (OECD, 2013b). The differences in cost of living across European countries are taken into account by applying the 'purchasing power parity' (PPP) conversion, based on 2005 prices in Germany. Missing income values are imputed by SHARE and HRS. The results presented here are based on one imputation set. Multiple imputation estimations were also conducted, using the five available imputation sets. They provide the same results as one set (available on request). To capture nonlinearities, income is used in its natural logarithm form.

As mentioned in section 2, social comparisons are important determinants of SWB. In this study, the focus is on comparisons that individuals make with persons similar to them. The reference group is defined as individuals of the same gender, five-year age group, country, and wave. Education level and region were also considered. The use of these additional indicators to create reference groups did not impact the results (available on request), but they resulted in some cells with too few observations ($n<10$). Potential asymmetric effects of being better-off or worse-off than peers are taken into account by 'low relative income' and 'high relative income'. They are

binary indicators of whether household income is in the bottom or top deciles of the peers' income distribution. Household income, and not individual income, is used to construct relative income to limit multicollinearities between individual income and the two relative income variables.

Health is measured by a continuous index in order to have one single variable capturing multiple aspects of health status associated with SWB. Self-assessed health (SAH) is regressed on a set of health variables (via an ordered probit model), for each country independently. Such strategy is increasingly used to obtain health measures that encompass both subjective and more objective dimensions of health (Bound et al, 1991; Bonsang, 2009; Lindeboom and Kerkhofs, 2009). The variables in the model are comorbidity, limitations in the activities of daily living and instrumental activities of daily living, diagnoses, mental health, and cognition. They all have the expected signs and most of them are statistically different from zero (available upon request). The health index varies between 0 (worse health) and 10 (perfect health). Low and high relative health are based on SAH, and constructed in the same fashion as relative income.

5. Methods

The analysis is conducted separately by country. This strategy provides the most flexible functional form by accounting for the potential interactions between macro-level and individual factors. Calibrated cross-sectional individual weights are used to obtain nationally representative results. These weights adjust for the sampling designs and selection bias due to attrition over time. The standard errors of all estimates are obtained by 100 bootstrap iterations and are adjusted for individual level clustering. The analysis has two parts. First, the socioeconomic inequalities in SWB of each country are measured by concentration indices (CI). Second, they

are decomposed to document the contributions of income, relative income, health, and relative health to these inequalities, as well as the pathways through which they operate.

Socioeconomic inequalities in subjective well-being

The concentration index (CI) is a bivariate measure of inequalities that illustrates the relationship between the socioeconomic position of individuals and the corresponding cumulative distribution of SWB in each country. The CI is a generalization of the Gini index. In the present case, the ranking of individuals is based on socioeconomic status (SES), measured by income (van Doorslaer and van Ourti, 2011; van Ourti et al., 2014). The CI varies between -1 and 1. A negative CI means that the inequalities are in favor of the persons with low incomes and a positive CI corresponds to inequalities in favor of higher incomes. If all individuals have the same SWB, there is perfect equality, CI = 0. The main interest of this study is not the value of the CIs *per se*, but their relative level across countries.

The general formula of the CI is provided by Eq. (1). The population size of each country is *N*. For individual *i*, the fractional rank, r_i, corresponds to her weighted position in the national distribution of income. The level of SWB reported by each individual is SWB_i, and μ_{SWB} is the weighted mean of SWB in the population. Eq. (1) shows that the socioeconomic inequalities in SWB result from the variability of SWB_i in the population and the covariance between SWB_i and the fractional rank, r_i. Empirically, the CI and its standard errors are estimated by a convenient weighted least squares regression (Kakwani et al., 1997).

$$CI = f \cdot \sum_{i=1}^{N} r_i \ (SWB_i - \mu_{SWB}) \qquad (1)$$

Diverse CIs are available in the literature and they all have the same form as Eq. (1). They differ only in their normalizing factor, *f*. There is an ongoing debate on which specific index is the most appropriate based on the properties of the indices and the nature of the variable of interest (Erreygers and van Ourti, 2011; Wagstaff, 2011; Kjellsson and Gerdtham, 2013). As SWB is a bounded variable that varies between [0, 1], we estimate the Erreygers index (Erreygers, 2009). For this index, the normalizing factor is $f = \frac{8}{N^2(b-a)}$, where $[a, b]$ are the bounds of SWB; thus, $a=0$ and $b=1$. As a sensitivity check, the ranking of countries resulting from the Erreygers index is compared with rankings based on different CIs (see end of section 6).

Decomposition and contributions

The decomposition reveals the two pathways through which income, relative income, health, and relative health contribute to the socioeconomic inequalities in SWB. Following Erreygers (2009), these pathways are the association of each factor with SWB (Eq. 2) and the socioeconomic inequalities of each factor (Eq. 3). The two pathways are combined to obtain the contributions of each factor to the socioeconomic inequalities in SWB (Eq. 4).

$$SWB_i = \beta_0 + X_{ik}\beta_k + \varepsilon_i \tag{2}$$

$$GCI(X_k) = \frac{2}{N^2}\sum_{i=1}^{N} r_i \ (X_{ik} - \mu_{Xk}) \tag{3}$$

$$CI = 4\left[\sum_{k=1}^{K} \widehat{\beta_k} GCI(X_k) \ + GCI(\hat{\varepsilon})\right], with\ k = 1, \dots, K \tag{4}$$

Such decomposition requires a linear relationship between SWB and its associated factors (Eq. 2). If SWB was viewed as a cardinal variable, its linearization could be achieved by an interval

regression model, which require another validated measure of SWB (van Doorslaer and Jones, 2003). In our model, X_{ik} includes the income and health variables, as well as a set of cofounders, for a total of K variables. The estimated associations are β*'s* and the error term is ε_i. As SWB ranges from 0 to 1, the β*'s* correspond to percentage point variations in SWB. The estimates on income and health are hypothesized to be positive. If someone is in a worse situation than her reference group, it is hypothesized to reduce her SWB. Inversely, if this person is in a better situation comparatively, it may positively influence her SWB. Hence, low relative income and health are expected to have negative coefficients and high relative income and health should have positive coefficients.

Individual demographic characteristics, region fixed effects, and time trend are included in the SWB model. Gender and age groups are interacted to observe whether the demographic composition of the population explains differences in socioeconomic inequalities in SWB across countries. For the US sample, being 'Black' or 'Hispanic' are also included. Their exclusion does not impact the results (available on request). In addition, regional and national factors may explain SWB, in particular the social, economic, and political environments in which individuals live. These macro-level factors are unobserved but likely to interact with individual characteristics (Di Tella et al., 2003; Helliwell, 2003; Blanchflower and Oswald, 2004a; Graham, 2005). It is why the analysis is done separately by country and the decomposition includes region and time fixed effects. Individual fixed effects are not included because SHARE cannot be used longitudinally (see section 4) and random effects require being uncorrelated with income and health to provide valid estimates, which is unlikely in the present case.

Most of the existing evidence on the determinants of SWB is correlative (Ferrer-i-Carbonell and Frijters, 2004; Dolan et al., 2008). However, higher SWB may lead to higher income or better

health (e.g. Binder and Coad, 2010; Diener and Chan, 2011; Sabatini, 2014). In addition, personality traits, life circumstances, or mood at the time of the interview may be related to income, health, and SWB, but they are rarely observed. In this study, such endogeneity is not an issue, because the focus is on the 'total effects' and 'total contributions' of income and health. The estimates on the income and health variables capture all the decisions and behaviors resulting from or influencing income and health status, e.g. education, wealth, professional activity, marital status, or personality traits. Therefore, these choice variables are not part of the model, as often done in the inequality literature (O'Donnell, 2009).

The second pathway through which the selected factors may explain socioeconomic inequalities in SWB is the degree of their own unequal distribution by income level (Eq. 3). The generalized CI (GCI) is a measure of absolute socioeconomic inequalities of each factor entering into the decomposition (Erreygers, 2009). A non-zero GCI indicates that the variable is unequally distributed across income. For example, the GCI for individual health corresponds to the socioeconomic inequalities in own health, holding relative health and other factors constant. The GCI on income is a measure of the overall inequalities in income: it relates the cumulative ranking by income to the cumulative distribution of income itself; akin the Gini index.

Once the SWB model and GCIs are estimated, they are combined to obtain the overall contributions of each factor to the socioeconomic inequalities in SWB (Eq. 4). The contribution of each variable is reported in percentages of the CI (X_k). For any variable X_k, $C_k = 4\widehat{\beta_k} GC(X_k)/CI$ (Erreygers, 2009). The interpretation of this contribution is the following: the socioeconomic inequalities in SWB would be C_k percent lower if X_k was not correlated with SWB ($\widehat{\beta_k}=0$) or was equally distributed across income ($GCI(X_k)=0$). As illustration, let's consider health. For a given association between health and SWB, a reduction in socioeconomic inequalities in health

translates into a reduction in socioeconomic inequalities in SWB. Inversely, for a given level of socioeconomic inequalities in health, a weaker association of this factor with SWB implies smaller socioeconomic inequalities in SWB.

6. Results

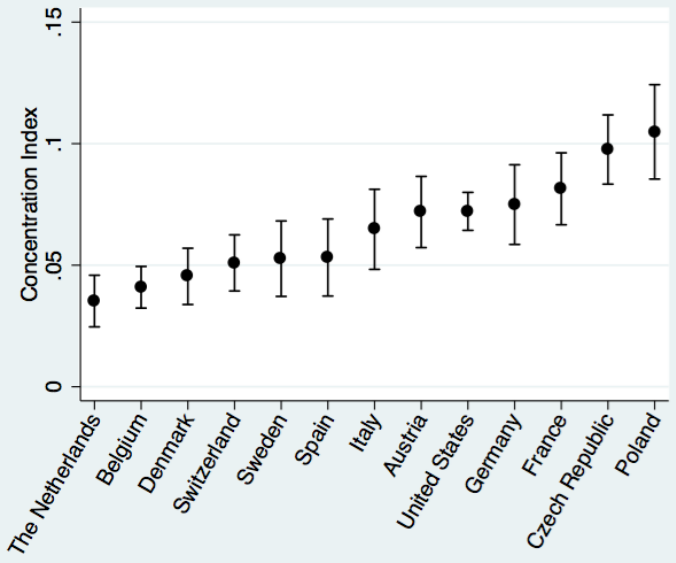
Descriptive statistics of SWB and the contributing factors are available in Appendix A. Mean SWB is the highest in the Northern countries —i.e. Denmark, Sweden— and Switzerland (SWB=0.84-0.85). The lowest SWB is found in the Czech Republic, Poland, and the US (SWB=0.69-0.72). Mean income is the highest in Switzerland and the US, and the lowest in Poland and the Czech Republic. The highest and lowest average health are in Switzerland and Poland, respectively, with the US being in the middle. The demographic composition of the sample is fairly similar across countries. Mean age varies between 64.8 in Denmark and 67.8 in Sweden. The proportions of respondents by age groups are alike across countries. Finally, women represent between 53 percent of the respondents in Denmark or Germany, 56 percent in the US, and 57 percent in the Czech Republic or Poland.

Socioeconomic inequalities in SWB

Figure 1 presents the estimated socioeconomic inequalities in SWB ordered by increasing level of inequalities (Appendix B contains the specific estimates). In all countries, the CI are statistically different from zero ($p<0.05$), indicating the presence of some socioeconomic inequalities in SWB. The Netherlands have the lowest inequalities (CI=0.035), but they are not statistically different from the ones in Belgium, Switzerland, the Northern and Southern European countries. All these countries have significantly lower inequalities than the Czech

Republic and Poland; with the latter having the highest inequalities (CI=0.101). Interestingly, socioeconomic inequalities in SWB in Germany, France and Austria are not statistically different from the two Eastern European countries. The US has statistically smaller socioeconomic inequalities in SWB than the Eastern European countries, but statistically larger inequalities than the Netherlands, Belgium, Denmark, and Switzerland.

Figure 1. Socioeconomic inequalities in SWB by country



Concentration indices and 95% confidence intervals.

Decomposition: SWB model

Tables 1 to 3 contain the decomposition of the CI and the contributions of each factor. Significance levels are illustrated by gray cells; the darker the cell, the higher the significance level (standard errors are available under request). Table 1 contains the estimated SWB model by country; it summarizes the first pathway through which the selected factors explain socioeconomic inequalities in SWB. Individual and relative income are significant in some countries, when individual and relative health are highly significant in all countries.

Specifically, individual income is significantly and highly associated with SWB in five European countries and the US ($p<0.05$). In the US, a 1 percent increase in income is associated with a 1.6 percentage point increase in SWB, on average. When significant, the relative income variables have the expected signs. Low relative income significantly reduces SWB in some countries, with the largest negative associations in Northern Europe and Austria. Low relative income is highly significant ($p<0.01$) in the Northern countries only, i.e. Denmark and Sweden. In contrast, high relative income plays a limited role: it is significant at 5 percent in the US only.

In all countries, better individual health is significanlty associated with higher SWB. The largest associations are observed in Austria, the Czech Republic, and Southern Europe. For example in Italy, a 1 point increase in health status results in a 2.5 percentage points increase in SWB. Interestingly, the lowest association is found in The Netherlands (0.007). Low and high relative health are significantly correlated with SWB and have the expected sign, negative and positive, respectively. Low relative health displays the largest (negative) association with SWB in the US (-0.097). From a methodological point of view, these results confirm the need to take into account relative health when modeling SWB.

The significance and magnitude of age and gender differ across countries. Large estimates are found for the older age groups in some countries, such as the US. This may be explained by two phenomena. People who have higher SWB may be more likely to survive into advanced ages —i.e. selection into advanced ages— and they may adapt to specific living conditions, such as disability —i.e. 'hedonic treadmill' (Brickman and Campbell, 1971; Kahneman et al., 2004; Oswald and Powdthavee, 2008). In the US, being Hispanic is positively associated with SWB (0.035), compared to being non-Hispanic White. Finally, SWB tends to be lower in 2006/7 than 2011/12 in Europe; the former being a period of economic recession. In the US, 2008/9 displays

slighly higher mean SWB than 2010/11, but this difference does not even reach 1 percentage point (0.009).

Decomposition: generalized concentration indices

The second channel through which the selected factors contribute to socioeconomic inequalities in SWB is the degree to which they are themselves unequally distributed by income. Table 2 reveals that all income and health dimensions are unequally distributed by income, with GCI being statistically different from zero ($p<0.01$). Without surprise, the overall inequalities in income are non negligible (GCI of individual income in Table 2). They are the largest in Southern Europe and the US. Comparatively, Eastern Europe performs relatively well. Individual health is also unequally distributed by income (GCI of health in Table 2). This result is similar to what is found in the literature on socioeconomic inequalities in health (e.g. van Doorslaer and Koolman, 2004; van Ourti et al., 2009). Intestingly, these socioeconomic inequalities in health are the largest in the US, followed by Denmark. As expected, low relative income and health are concentrated in the bottom of the national income distribution and high relative income and health are more prevalent among richer individuals (negative and positive GCI, respectively). Low relative health is the most unequally distributed by income in the US. To summarize, for both income and health, social comparisons with peers translate into nationwide inequalities. Note that older individuals tend to be concentrated among low income, mainly females 70+ (negative GCI). Similarly in the US, Blacks and Hispanics are overrepresented among low income individuals.

Table 1. SWB model by country

	The Netherlands	Belgium	Denmark	Switzerland	Sweden	Spain	Italy	Austria	Germany	France	Czech Republic	Poland	United States
Income													
Ln(income)	0.0140	-0.0010	0.0149	0.0086	0.0113	0.0026	0.0025	0.0160	0.0142	0.0185	0.0327	0.0315	0.0162
Low relative income	-0.0126	-0.0198	-0.0571	-0.0253	-0.0470	-0.0169	-0.0245	-0.0352	-0.0164	-0.0275	-0.0130	-0.0215	-0.0133
High relative income	-0.0039	0.0057	-0.0052	0.0190	0.0020	0.0142	0.0250	-0.0028	-0.0077	0.0128	0.0183	0.0190	0.0159
Health													
Health	0.0073	0.0170	0.0135	0.0241	0.0089	0.0249	0.0247	0.0336	0.0219	0.0167	0.0310	0.0162	0.0121
Low relative health	-0.0494	-0.0530	-0.0529	-0.0872	-0.0600	-0.0943	-0.0887	-0.0819	-0.0705	-0.0556	-0.0756	-0.0961	-0.0967
High relative health	0.0287	0.0198	0.0287	0.0410	0.0390	0.0515	0.0584	0.0546	0.0468	0.0549	0.0544	0.0494	0.0533
Demographics													
Male 60-69	0.0140	0.0167	0.0116	0.0171	0.0401	0.0245	-0.0006	0.0168	0.0282	0.0161	0.0445	0.0163	0.0459
Male 70-79	0.0189	0.0358	0.0405	0.0386	0.0414	0.0179	-0.0221	0.0378	0.0426	0.0071	0.0376	0.0452	0.0872
Male 80+	-0.0213	0.0408	0.0250	0.0246	0.0295	-0.0171	-0.0334	0.0164	0.0559	-0.0168	0.0531	0.0423	0.1051
Female 50-59	-0.0130	-0.0074	0.0074	-0.0179	0.0078	-0.0079	-0.0285	0.0218	0.0345	-0.0198	-0.0204	0.0018	0.0093
Female 60-69	0.0120	0.0026	0.0396	0.0098	0.0386	-0.0127	-0.0268	0.0114	0.0403	-0.0214	0.0263	-0.0006	0.0549
Female 70-79	0.0065	0.0137	0.0509	0.0179	0.0445	-0.0146	-0.0651	0.0304	0.0352	-0.0180	0.0115	-0.0126	0.0665
Female 80+	0.0110	0.0227	0.0275	0.0533	0.0049	-0.0252	-0.0594	-0.0002	0.0349	-0.0264	0.0283	0.0343	0.1000
Black													0.0021
Hisp													0.0351
Time trend													
Wave 2	-0.0162	-0.0155	-0.0048	0.0023	-0.0100	-0.0274	-0.0303	-0.0640	-0.0074	0.0047	-0.0276	-0.0648	0.0095
Region fixed effects	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
R-squared	0.100	0.153	0.115	0.153	0.107	0.172	0.198	0.237	0.198	0.127	0.194	0.188	0.134
N	4,983	7,651	4,477	4,767	4,278	5,068	5,953	5,978	3,826	7,665	8,034	3,709	29,148
Statistical significance:	$p < 0.01$	$p < 0.05$	$p < 0.1$										
Region fixed effects are not reported here.													

Table 2. Generalized concentration indices with respect to income, by country

	The Netherlands	Belgium	Denmark	Switzerland	Sweden	Spain	Italy	Austria	Germany	France	Czech Republic	Poland	United States
Income													
Ln(income)	0.3599	0.4631	0.2862	0.4271	0.3022	0.5727	0.4841	0.3424	0.4108	0.4029	0.3455	0.3953	0.5274
Low relative income	-0.1036	-0.0862	-0.0839	-0.0941	-0.1075	-0.0920	-0.1037	-0.0881	-0.0996	-0.0861	-0.0830	-0.0997	-0.0774
High relative income	0.0811	0.0963	0.0763	0.0763	0.0751	0.0876	0.0801	0.0883	0.0822	0.0939	0.0819	0.0798	0.0985
Health													
Health	0.1362	0.1430	0.2538	0.0860	0.1909	0.1471	0.1153	0.1106	0.1759	0.1956	0.1249	0.1149	0.2886
Low relative health	-0.0397	-0.0267	-0.0488	-0.0352	-0.0262	-0.0226	-0.0248	-0.0284	-0.0337	-0.0429	-0.0360	-0.0408	-0.0687
High relative health	0.0208	0.0188	0.0203	0.0078	0.0210	0.0079	0.0222	0.0194	0.0328	0.0267	0.0252	0.0163	0.0226
Demographics													
Male 60-69	0.0139	0.0069	0.0184	0.0244	0.0306	0.0057	0.0099	0.0197	0.0163	0.0154	0.0151	0.0189	0.0155
Male 70-79	-0.0102	-0.0026	-0.0257	-0.0018	-0.0072	-0.0033	0.0001	0.0028	0.0043	0.0000	-0.0004	0.0064	-0.0065
Male 80+	-0.0049	-0.0046	-0.0159	-0.0072	-0.0121	-0.0050	-0.0011	0.0019	0.0010	-0.0007	-0.0036	-0.0007	-0.0076
Female 50-59	0.0176	0.0158	0.0453	0.0111	0.0216	0.0196	0.0076	0.0083	0.0104	0.0086	0.0075	0.0059	0.0192
Female 60-69	-0.0001	-0.0012	0.0005	0.0030	0.0131	0.0009	0.0036	0.0032	0.0053	0.0057	-0.0054	-0.0038	-0.0052
Female 70-79	-0.0179	-0.0200	-0.0414	-0.0221	-0.0313	-0.0153	-0.0176	-0.0246	-0.0231	-0.0209	-0.0288	-0.0147	-0.0223
Female 80+	-0.0222	-0.0149	-0.0357	-0.0255	-0.0394	-0.0238	-0.0158	-0.0207	-0.0202	-0.0227	-0.0208	-0.0154	-0.0201
Black													-0.0248
Hisp													-0.0235
Time trend													
Wave 2	-0.0095	-0.0651	-0.0023	-0.0930	-0.0229	0.0027	0.0170	-0.0033	0.0125	0.0134	-0.0167	0.0094	-0.0026
Statistical significance:	p < 0.01	p < 0.05	p < 0.1										
Region fixed effects are not reported here.													

Overall contributions

The contributions of each factor to the socioeconomic inequalities in SWB are obtained by combining the SWB model estimates and the GCI (Eq. 4). Table 3 reports the contribution, in percentages, of each variable to the estimated inequalities. Three main results are worth pointing out. First, the list of significant contributing factors differs across countries, confirming the need to conduct the analysis separately by country. Second, the contributions of the income variables are heterogeneous across countries, when the contributions of the health ones are highly significant in most countries. In some countries, individual income contributes to the socioeconomic inequalities in SWB,when in others countries, it is low or high relative income. In five countries, the contribution of individual income is not statistically different from zero ($p>0.1$). This result means that income matters little for the well-being of those 50+ in Belgium, Switzerland, Sweden, Spain, and Italy. The largest contributions of individual income are found in The Netherlands, Eastern Europe, and the US. They are mainly due to the significant association of individual income and SWB in these countries (Table 1). In contrast, the contribution of individual health is the largest or second largest in eight countries. For example in Germany, it is the second largest after the individual income contribution. The socioeconomic inequalities in SWB would be 20.7 percent lower if individual health was not associated with SWB or was equally distributed by income. Low and high relative health play a significant role in all countries, except high relative health in Switzerland and Spain. The important role played by health in general is best understood when summing up the contributions of all three health variables: this sum ranges from 25.2 to 62.9 percent in Poland and the US, respectively. In most countries, such contributions are attributable to both strong associations with SWB (Table 1) and unequal distributions of the health variables by income (GCI in Table 2). The third key result of

this study is that low relative income and health contribute more to socioeconomic inequalities in SWB than high relative income and health —except for relative income in the Czech Republic and the US. Overall, unfavorable social comparisons explain more socioeconomic inequalities in SWB than favorable comparisons. The US is the country where low relative health contributes the most to socioeconomic inequalities in SWB, with 36.8 percent. Females 70-79 and 80+ reduce inequalities in about half of the countries, including the US. Females of these ages tend to report higher SWB than younger groups (positive association in SWB model, Table 1) and to be overrepresented among low incomes (negative GCI of ages 70-79 and 80+, Table 2).

Table 3. Contributions in percentages to socioeconomic inequalities in SWB, by country

	The Netherlands	Belgium	Denmark	Switzerland	Sweden	Spain	Italy	Austria	Germany	France	Czech Republic	Poland	United States
Income													
Ln(income)	0.5714	-0.0435	0.3757	0.2890	0.2587	0.1101	0.0743	0.3041	0.3121	0.3666	0.4627	0.4748	0.4739
Low relative income	0.1483	0.1670	0.4225	0.1872	0.3839	0.1171	0.1572	0.1725	0.0873	0.1163	0.0443	0.0819	0.0571
High relative income	-0.0359	0.0536	-0.0347	0.1135	0.0112	0.0934	0.1236	-0.0139	-0.0339	0.0593	0.0614	0.0579	0.0868
Total income	**0.6839**	**0.1771**	**0.7635**	**0.5896**	**0.6538**	**0.3205**	**0.3551**	**0.4627**	**0.3655**	**0.5422**	**0.5684**	**0.6147**	**0.6178**
Health													
Health	0.1125	0.2371	0.3022	0.1624	0.1290	0.2754	0.1756	0.2069	0.2056	0.1608	0.1589	0.0712	0.1937
Low relative health	0.2227	0.1385	0.2271	0.2409	0.1193	0.1602	0.1358	0.1294	0.1269	0.1170	0.1114	0.1496	0.3684
High relative health	0.0678	0.0363	0.0515	0.0253	0.0622	0.0306	0.0800	0.0588	0.0819	0.0719	0.0561	0.0307	0.0668
Total health	**0.4030**	**0.4118**	**0.5808**	**0.4286**	**0.3104**	**0.4662**	**0.3915**	**0.3951**	**0.4144**	**0.3498**	**0.3264**	**0.2516**	**0.6289**
Demographics													
Male 60-69	0.0221	0.0112	0.0189	0.0326	0.0932	0.0105	-0.0004	0.0184	0.0244	0.0121	0.0275	0.0117	0.0395
Male 70-79	-0.0219	-0.0091	-0.0917	-0.0054	-0.0226	-0.0044	-0.0001	0.0059	0.0098	0.0000	-0.0007	0.0110	-0.0313
Male 80+	0.0118	-0.0185	-0.0350	-0.0140	-0.0271	0.0064	0.0023	0.0018	0.0031	0.0005	-0.0079	-0.0012	-0.0445
Female 50-59	-0.0259	-0.0114	0.0297	-0.0157	0.0128	-0.0117	-0.0134	0.0101	0.0191	-0.0083	-0.0063	0.0004	0.0100
Female 60-69	-0.0001	-0.0003	0.0018	0.0023	0.0383	-0.0008	-0.0059	0.0020	0.0115	-0.0060	-0.0058	0.0001	-0.0159
Female 70-79	-0.0132	-0.0268	-0.1858	-0.0311	-0.1057	0.0168	0.0710	-0.0417	-0.0435	0.0185	-0.0135	0.0070	-0.0823
Female 80+	-0.0276	-0.0331	-0.0865	-0.1068	-0.0146	0.0451	0.0579	0.0003	-0.0375	0.0294	-0.0241	-0.0202	-0.1113
Black													-0.0029
Hispanic													-0.0457
Total demographics	**-0.0547**	**-0.0880**	**-0.3487**	**-0.1380**	**-0.0257**	**0.0619**	**0.1114**	**-0.0032**	**-0.0130**	**0.0462**	**-0.0308**	**0.0089**	**-0.2845**
Time trend													
Wave 2	0.0174	0.0987	0.0010	-0.0172	0.0174	-0.0056	-0.0319	0.0116	-0.0050	0.0031	0.0188	-0.0233	-0.0014
Total regions	**-0.0075**	**0.1737**	**0.0000**	**0.0563**	**-0.0204**	**-0.0502**	**0.0748**	**-0.0223**	**0.1238**	**-0.0349**	**-0.0282**	**0.0261**	**-0.0312**
Error term	-0.0421	0.2266	0.0034	0.0806	0.0646	0.2072	0.0991	0.1561	0.1143	0.0936	0.1454	0.1220	0.0704
Sum of contributions	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**
Statistical significance:	$p < 0.01$	$p < 0.05$	$p < 0.1$										

Alternative measures

The implications of the choice of two measures are explored. First, we observe whether the results are sensitive to the measure of the CIs. Beside the Erreygers index, three additional CIs are reported in Appendix B: the Wagstaff index (alternative CI for bounded variables with different properties than the Erreygers index; van Ourti and Erreygers, 2011), the standard CI, and the generalized CI (GCI). The values of the indices cannot be directly compared, due to different underlying assumptions, but the ranking of countries by level of inequalities provides an overview of relative inequalities across countries. With all four CIs, the Netherlands and Belgium have the lowest inequalities and the two Eastern European countries the highest ones. Most countries keep the same ranking or move by one position. Five countries see their ranking change more with the Wagstaff index, but they remain in the middle of the ranking, as with the other indices —i.e. Denmark, Switzerland, Spain, Italy, and the US. Overall, the picture of socioeconomic inequalities in SWB across countries is the same with all indices.

Second, alternative measures of relative income and health are tested. In the literature, diverse measures have been used (for a review on relative income, see Clark et al., 2008). We use the top and bottom quintiles, instead of decides, as well as three continuous measures, based on Ferrer-i-Carbonell (2005) and Graham et al. (2011). Instead of binary measures, we include the average income and health of the reference groups, the difference between individual income and income of the reference group (similarly for health), and variables to capture continuous asymmetric effects (refer to Ferrer-i-Carbonell (2005) for their construction). We find unstable results, explained by high correlations between these relative income or health measures and individual income or health. For example, the correlations between the person's income and mean income of peers is 0.86; and 0.91 for health. In contrary, using the deciles reduce drastically these

correlations. Therefore, close attention need to be paid to multicollinearities when using relative measures, which has rarely been done in the literature.

Discussion

To our knowledge, this study is the first to assess the extent of socioeconomic inequalities in SWB and to decompose them. The focus is on the roles played by income and health because without them, not much can be accomplished in life, especially after the age of 50. Special attention is paid to the contributions of relative income and relative health, which capture the comparisons that people may make with the income and health of their reference group. This study is also the first to investigate asymmetric effects of low and high relative health.

The estimation of the CI and its decomposition provide three main results and implications. First, socioeconomic inequalities in SWB vary largely across countries, as do the factors contributing to them. Any attempt to reduce such inequalities may be more effective if they take into account each country's specificities, especially in Europe. Second, individual and relative health contribute greatly to these inequalities in all countries, when individual and relative income do not display a clear pattern across countries. Holding other things constant, reductions in socioeconomic inequalities in health (GCI in Table 2) would reduce socioeconomic inequalities in SWB, as would weakening the association between health and SWB (Table 1). Because of the limited role played by income in some countries, tackling income inequalities is likely to have limited impact on socioeconomic inequalities in SWB. This is due to the fact that the income variables have poor associations with SWB in these countries (Table 1). Third, negative social comparisons, measured by low relative income and health, tend to contribute more to socioeconomic inequalities in SWB than the favorable ones, i.e. high relative measures.

Comparing socioeconomic inequalities in SWB with the 'overall inequalities in SWB' available in the literature shows that the rankings of countries are similar for both types of inequalities (OECD, 2011; Eurofound, 2013; Weaver and Gonçalves, 2014). In Europe, the lowest overall inequalities in SWB —measured by the Gini index or the differential in mean SWB between the top and bottom percentiles/quintiles— are found in the Northern countries, The Netherlands, or Belgium. These countries also have the lowest socioeconomic inequalities in SWB in our study. Italy and Spain have lower overall inequality in SWB than Germany, for example. It is true for the socioeconomic inequalities in SWB as well. The Eastern European countries perform the least well, both for the overall inequalities in SWB found in the literature and the socioeconomic inequalities in SWB estimated here. Finally, the US has similar positions with both measures.

This study suffers from some caveats. The concentration index gives uniform weight to all levels of SES. Other indices attribute different weights to inequalities along the income distribution, e.g. the Atkinson or Theil indices (Atkinson, 1970; Theil, 1967). Such weighted approach requires normative judgments that are beyond the scope of this study. Although multidimensional measures of inequalities in well-being have received attention, this body of research is largely theoretical. Well-being is considered as a latent concept and the best way to aggregate the different components of well-being is debated (e.g. Maasoumi, 1986; Tsui, 1995; Weymark, 2006; Fleurbaey, 2009; Decancq and Lugo, 2012). The extent of adaptation to long-term changes in income, health and SWB —i.e. 'hedonic treadmill'— cannot be considered with cross-sectional data. Here, they are encompassed into the 'total effects' and 'total contributions' of income and health. Next, the level of SWB may be interpreted differently across countries. Observed differences in socioeconomic inequalities in SWB may be partly due to scale of reference bias rather than true differences in inequalities (e.g. Groot, 2000; Lindeboom and van Doorslaer, 2004). Here, such risk is reduced by the focus on countries with similar cultural

heritage. In addition, the separate estimation by country is a way to adjust for unobserved country differences and the region fixed effects control for time-invariant local differences. Overall, endogeneity is not a concern because of these estimation strategies and the focus on the total effects and contributions of income and health. Next, the life satisfaction scale can be viewed as a continuous or cardinal variable. In this study, the former is favored and a linear model is estimated because the decomposition of the CI is straightforward to interpret (van Doorslaer and Jones, 2003). A cardinal measure, and a nonlinear SWB model, would require a different decomposition strategy (van Doorslaer and van Ourti, 2011). Lastly, as any results based on survey data, some selection may be at play. In the present case, people with low SWB may decline participation in the survey.

Future studies could expand this area of research by using other measures of inequalities and SWB. Beside life satisfaction, other single or composite measures of SWB are available, e.g. CASP-19 (Hyde et al., 2003), National Time Accounting (Krueger et al., 2009), the OECD Better Life Index (OECD, 2014), or the Gallup-Healthways Well-Being Index (Gallup, 2013). Although promising, these measures still need to be validated and are not available at the individual level in most countries. Once they are, it will be interesting to compare socioeconomic inequalities resulting from diverse SWB measures. Similarly, the results from diverse measures of inequalities could be compared, in particular by using non-rank measure indicators. Here, the main finding is that health is a major contributor to socioeconomic inequalities in SWB. There is the need to understand which health dimensions or medical conditions impact these inequalities the most. In this study, social comparisons are made with peers of similar sociodemographic background. Individuals may also compare themselves with spouses, relatives, friends, or neighbors. Disentangling the roles of individual and macro factors —such as economic, social, and political contexts— would help identify the causes of socioeconomic inequalities in SWB.

For example, the differences by type of welfare states are of interest (e.g. social security, health insurance, and social support types). Lastly, research could be conducted on the entire adult population to observe whether the contributions of individual and relative health and the limited role of income are consistent across age groups.

This study not only documents the level of socioeconomic inequalities in SWB across Europe and the US, but also reveals the importance of health at shaping them. Some attention needs to be paid to these inequalities, especially when economic growth is no longer considered the sole objective of societies. Effective policies, to limit or reduce socioeconomic inequalities in SWB of the baby boomers and the elderly, may want to focus on their health status rather than their income, at least in most of the countries considered here.

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Appendix A. Summary statistics by country

	Minimum	Maximum	The Netherlands	Belgium	Denmark	Sweden	Switzerland	Spain	Italy	Germany	Austria	France	Czech Republic	Poland	United States
N			4,983	7,651	4,477	4,767	4,278	5,068	5,953	5,978	3,826	7,665	8,034	3,709	29,148
SWB	0	1	0.80	0.77	0.85	0.84	0.84	0.75	0.74	0.77	0.81	0.73	0.72	0.69	0.72
Income															
Income	0	285,464	26,887	29,570	21,621	23,193	43,316	12,596	14,912	21,778	20,181	22,945	11,160	6,760	42,409
Low relative income	0	1	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
High relative income	0	1	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Health															
Health	0	10	7.50	7.13	7.31	7.08	7.63	7.43	7.21	7.40	7.03	6.73	7.61	6.71	7.38
Low relative health	0	1	0.28	0.25	0.21	0.24	0.18	0.20	0.24	0.30	0.26	0.23	0.23	0.29	0.26
High relative health	0	1	0.16	0.21	0.23	0.21	0.21	0.25	0.21	0.23	0.25	0.23	0.28	0.26	0.24
Demographics															
Age[(a)]	50	104	65.38	65.33	64.79	67.78	65.44	67.39	66.48	66.40	66.11	65.83	65.28	65.66	67.11
Female[(a)]	0	1	0.55	0.54	0.53	0.54	0.54	0.54	0.54	0.53	0.58	0.56	0.57	0.57	0.56
Male 60-69	0	1	0.17	0.15	0.16	0.18	0.16	0.14	0.16	0.18	0.15	0.14	0.16	0.15	0.13
Male 70-79	0	1	0.10	0.10	0.09	0.13	0.10	0.13	0.13	0.14	0.11	0.10	0.09	0.11	0.13
Male 80+	0	1	0.05	0.05	0.04	0.07	0.04	0.06	0.05	0.04	0.04	0.05	0.04	0.04	0.06
Female 50-59	0	1	0.18	0.19	0.20	0.12	0.19	0.16	0.15	0.16	0.16	0.18	0.17	0.19	0.16
Female 60-69	0	1	0.21	0.16	0.17	0.22	0.18	0.16	0.20	0.19	0.21	0.17	0.22	0.19	0.18
Female 70-79	0	1	0.11	0.12	0.10	0.13	0.12	0.14	0.14	0.13	0.15	0.12	0.12	0.12	0.15
Female 80+	0	1	0.05	0.07	0.06	0.07	0.06	0.08	0.05	0.06	0.06	0.08	0.06	0.06	0.07
Black															0.16
Hispanic															0.10
Time trend															
Wave 2	0	1	0.50	0.38	0.53	0.59	0.29	0.40	0.46	0.63	0.21	0.34	0.33	0.62	0.43

(a) Age and female are shown for descriptive purposes; the interaction between age groups and gender enter into the model.

(b) Income in dollars for the US.

Appendix B. Comparison of different concentration indices and ranking of countries

	SWB		Erreyger's index		Wagstaff's index		Standard CI		Generalized CI	
	Mean	Std. dev.								
The Netherlands	0.80	0.11	0.0366	1	0.0562	2	0.0115	1	0.0091	1
			[0.0237 ; 0.0495]		[0.0369 ; 0.0754]		[0.0074 ; 0.0156]		[0.0057 ; 0.0126]	
Belgium	0.77	0.14	0.0385	2	0.0547	1	0.0124	2	0.0096	2
			[0.0288 ; 0.0481]		[0.0393 ; 0.0700]		[0.0095 ; 0.0154]		[0.0072 ; 0.0120]	
Denmark	0.85	0.14	0.0432	3	0.0863	6	0.0126	3	0.0108	3
			[0.0299 ; 0.0564]		[0.0611 ; 0.1115]		[0.0089 ; 0.0164]		[0.0078 ; 0.0138]	
Sweden	0.83	0.15	0.0486	4	0.0846	5	0.0147	5	0.0122	4
			[0.0307 ; 0.0665]		[0.0549 ; 0.1144]		[0.0095 ; 0.0199]		[0.0082 ; 0.0161]	
Switzerland	0.84	0.14	0.0491	5	0.0900	8	0.0147	4	0.0123	5
			[0.0374 ; 0.0607]		[0.0688 ; 0.1112]		[0.0112 ; 0.0181]		[0.0094 ; 0.0152]	
Spain	0.74	0.18	0.0539	6	0.0701	3	0.0182	6	0.0135	6
			[0.0398 ; 0.0681]		[0.0483 ; 0.0920]		[0.0131 ; 0.0233]		[0.0099 ; 0.0170]	
Italy	0.74	0.18	0.0623	7	0.0804	4	0.0211	7	0.0156	7
			[0.0465 ; 0.0781]		[0.0615 ; 0.0992]		[0.0163 ; 0.0259]		[0.0114 ; 0.0197]	
Germany	0.76	0.17	0.0705	8	0.0975	9	0.0231	8	0.0176	8
			[0.0520 ; 0.0890]		[0.0729 ; 0.1220]		[0.0174 ; 0.0289]		[0.0122 ; 0.0230]	
Austria	0.79	0.18	0.0757	9	0.1153	11	0.0239	9	0.0189	10
			[0.0622 ; 0.0892]		[0.0940 ; 0.1367]		[0.0184 ; 0.0293]		[0.0151 ; 0.0228]	
United States	0.72	0.19	0.0721	10	0.0882	7	0.0253	10	0.0180	9
			[0.0643 ; 0.0800]		[0.0793 ; 0.0971]		[0.0229 ; 0.0277]		[0.0161 ; 0.0200]	
France	0.73	0.17	0.0809	11	0.1031	10	0.0276	11	0.0202	11
			[0.0674 ; 0.0944]		[0.0848 ; 0.1214]		[0.0225 ; 0.0328]		[0.0163 ; 0.0242]	
Czech Republic	0.72	0.20	0.0992	12	0.1233	13	0.0344	12	0.0248	12
			[0.0843 ; 0.1142]		[0.1049 ; 0.1418]		[0.0289 ; 0.0399]		[0.0211 ; 0.0285]	
Poland	0.69	0.20	0.1007	13	0.1179	12	0.0364	13	0.0252	13
			[0.0809 ; 0.1205]		[0.0974 ; 0.1384]		[0.0294 ; 0.0434]		[0.0207 ; 0.0297]	
In brackets are the 95 percent confidence intervals.										