Explaining the differences in income-related health inequalities across European countries

by

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Abstract

This paper provides new evidence on the sources of differences in the degree of income-related inequalities in self-assessed health in thirteen European Union member states. It goes beyond earlier work by measuring health using an interval regression approach to compute concentration indices and by decomposing inequality into its determining factors. New and more comparable data were used, taken from the 1996 wave of the *European Community Household Panel*. Significant inequalities in health (utility) favouring the higher income groups emerge in all countries, but are particularly high in Portugal and – to a lesser extent – in the UK and in Denmark. By contrast, relatively low health inequality is observed in the Netherlands and Germany, and also in Italy, Belgium, Spain Austria and Ireland. There is a positive correlation with income inequality *per se* but the relationship is weaker than in previous research. Health inequality is not merely a reflection of income inequality. A decomposition analysis shows that the (partial) income elasticities of the explanatory variables are generally more important than their unequal distribution by income in explaining the cross-country differences in income-related health inequality. Especially the relative health and income position of non-working Europeans like the retired and disabled explains a great deal of "excess inequality". We also find a substantial contribution of regional health disparities to socio-economic inequalities, primarily in the Southern European countries.

Key words: health inequality, Europe, self-reported health, decomposition, income inequality

1. Introduction

Persistent differences in health by socio-economic status (SES) have long been a serious health policy concern in many European countries and have recently also been put at the forefront of the European Union's National Action Plans as agreed upon at the Lisbon European Council. In the recent Atkinson Report's [1] recommendations on Indicators for Social Inclusion in the EU, a less unequal distribution of self-reported health by income quintiles is seen as an intrinsic part of the broad goals of social inclusion and cohesion endorsed by the European Union. Comparative research which exploits cross-national variation but uses comparable data from all member states offers the prospect of providing insights into the reasons for cross-country differences.

In previous work [2], we have employed concentration indices and curves to test for differences across eight European countries and the US in the extent to which self-reported (ill-) health was unequally distributed across income. We then found that significant income-related health inequalities were present in all countries but also found substantial differences across countries. A country's degree of (income-related) health inequality appeared to be particularly closely associated with its degree of income inequality. While a fair degree of comparability was achieved, it was still limited by the fact that the comparison had to be based on secondary analysis of country-specific health interview and socioeconomic surveys. Inevitably, and despite all efforts at harmonization and improved comparability, differences in income and health variable definitions constrained the type of comparisons that could be performed. A similar study [3] for six European countries using comparable methods also found that income-related inequality in self-assessed health was strongly associated with income inequality. They noted that the measured degree of income-related health inequality decreased substantially when other socio-economic indicators, notably education level, occupational status and especially employment status were controlled for.

This paper updates and substantially extends the evidence on income-related inequalities in Europe by using both new data sources and new methods. First, we use new data from the

third wave (1996) of the *European Community Household Panel* (ECHP) Study, which were recently released by the European Commission's Statistical Office (EUROSTAT). It provides a rich new source of comparable household level data on income, health and various other socio-economic characteristics from all European Union member states. Second, we measure and explain self-reported health using a recently proposed method based on interval group regression [4]. Third, we explore potential causes of cross-country differences in income-related health inequality using a new method for decomposing the estimated inequality into the contributions of various determinants [5]. Fourth, we examine the causes of 'excess inequality' by decomposing the differences with the European country with the lowest degree of inequality. Finally, we perform statistical inference based on a bootstrapping procedure of the decomposition method.

The paper is organised as follows. In the next section we set out the methods used to measure, explain and decompose the sources of inequality. Section three describes the data and variables used and section four gives the results of the analysis. We end with conclusions and discussion in section 5.

2. Methods

2.1 Measurement of health

As in previous work, we mainly use respondents' self-assessments as our measure of general health status. While this measure may seem simple and subjective, it has been shown to be a powerful predictor of subsequent mortality [6] and, more importantly, its predictive power does *not* appear to vary systematically by SES [7] which means that inequalities in self-assessed health (SAH) also have predictive power for inequalities in mortality [8]. It basically provides an ordinal ranking of individuals' self-perception of their health status. However, in contrast to previous work we now have empirical distributions of SAH based on the same question "How is your health in general?" and the same five response categories ranging from "very good" to "very bad". This is the WHO [9] recommended wording for self-perceived health questions in European health interview surveys. This health ranking variable basically provides an ordinal ranking to which many previous researchers have responded by dichotomising it into two categories: individuals reporting to be in good or very good health versus those in less-than-

good-health. This practice has been shown to have the undesirable property of leading to rank reversals when comparing health inequality over time in the Netherlands [10] or across countries in Europe [11].

One approach used to exploit all information contained in the 5-point scale, was to assume that underlying these responses is a latent self-assessed health variable with a skewed, standard lognormal distribution to obtain latent ill-health scores for each of the response categories [2, 10]. While this approach makes the arbitrary assumption that the distribution of latent ill-health is identical (i.e. the standard lognormal one) in all countries, its joint distribution with income can still vary and the relative inequality associated with income around this identical mean can still be examined. The restrictive assumption of a common underlying health distribution was necessitated by lack of a cardinal scale for the ill-health scores and by the differing questions and response categories across countries.

The availability of one SAH measure with an identical wording of question and response categories in the ECHP (albeit translated and asked in the various European languages) makes this restrictive standard lognormal assumption redundant. A more promising strategy is to use information on the empirical distribution of generic health measures with well-tested properties. While preference-based valuations of health states are now available also for generic instruments like the SF-36 [12] and the EuroQol [13], the Canadian Health Utilities Index (HUI) Mark III [14, 15] is the only instrument which is now routinely included in a general population health survey. Scoring the SAH levels using external information on an instrument such as the HUI therefore has the attraction of obtaining a more 'natural' index for the SAH scores as utilities between 0 and 1.

Appropriate econometric analysis of an ordered categorical dependent variable, such as SAH, is typically based on the ordered probit or logit model or, if information on the scaling of the variable is available, the interval (or grouped data) regression model. Interval, or grouped data, regression provides a more efficient alternative to the ordered probit model when the values of the boundaries of the intervals are known [16]. Our approach here is to use the empirical distribution function of HUI scores in the 1994 Canadian *National Population Health Survey* sample obtained in [4] to scale the intervals of SAH for all European countries. To do this we assume that there is a stable mapping from HUI to the (latent) variable that determines reported

SAH and that this applies not only to Canadian but also to European individuals. We compute the cumulative frequency of observations for each category of SAH and then find the thresholds μ_j of the empirical distribution function (EDF) for HUI that match these frequencies. Formally,

$$\mu_j = F^{-1}(G_j) \quad (1)$$

where $F^{-1}(.)$ is the inverse of the EDF of HUI and G_j is the cumulative frequency of observations for category j of SAH.

Because we use HUI thresholds to scale SAH, the linear index $x_i\beta$ for the interval regression model gives us a prediction of each individual's level of health utility as derived from the observed SAH level. It is the predicted level of HUI knowing that an individual has characteristics x. The prediction is both continuous and linear in the x_i's. Linearity is a useful property which implies that concentration indices calculated using the predictions are suitable for decomposition analysis (cf. section 2.3). In effect, the interval regression technique exploits the between-SAH category variation to generate some within-SAH category variation in HUI, while HUI itself is unobserved. Moreover, by incorporating external information to scale the categorical observations of SAH, the predictions are measured on the same scale as HUI and do not require *ex post* re-scaling, as is often done with ordered probit predictions.

2.2. Measurement of inequality

As before, we use the *health concentration index* as our measure of *relative* income-related health inequality [17]. Suppose we have a continuous cardinal measure of health (utility) y_i. A concentration curve $L(s)$ plots the cumulative proportion of the population (ranked by income, beginning with the lowest incomes) against the cumulative proportion of health. If $L(s)$ coincides with the diagonal, everyone enjoys the same health. If, by contrast, $L(s)$ lies *below* the diagonal, inequalities in health exist and favour the richer members of society. The further $L(s)$ lies from the diagonal, the greater the degree of inequality. The health concentration index, C, is defined as twice the area between $L(s)$ and the diagonal. C takes a value of zero when $L(s)$ coincides with the diagonal and is negative (positive) when $L(s)$ lies above (below) the diagonal. The minimum and maximum values of C using individual-level data are -1 and +1 respectively:

these occur when all the population's ill-health is concentrated in the hands of the most and least disadvantaged persons respectively.

Since the estimation and comparison of inequality estimates across countries requires representative and therefore suitably weighted sample data, the computation formula for C given by [18] can be modified to accommodate sample weighting as follows:

$$C = \frac{2}{\mu}\sum_{i=1}^{N} w_i y_i R_i - 1 \qquad (2)$$

where,

$$\mu = \sum_{i=1}^{N} w_i y_i \qquad (3)$$

is the (weighted) mean health of the sample, N is the sample size, w_i is the sampling weight of individual i (with the sum of w_i equal to N), and R_i is the (weighted) relative fractional rank of the ith individual. The latter is defined as [19]:

$$R_i = \tfrac{1}{N}\sum_{j=1}^{i-1} w_j + \tfrac{1}{2} w_i \quad \text{where } w_0 = 0 \qquad (4)$$

and thus indicates the weighted cumulative proportion of the population up to the midpoint of each individual weight.

C can be computed conveniently using the weighted covariance of μ and the (weighted) fractional rank as [18]:

$$C = \frac{2}{\mu}\sum_{i=1}^{N} w_i \left(y_i - \mu\right)\left(R_i - \tfrac{1}{2}\right) = \frac{2}{\mu}\ \mathrm{cov}_w(y_i, R_i) \qquad (5)$$

where cov_w denotes the weighted covariance.

2.3 Decomposing inequality

A straightforward way of decomposing the measured degree of inequality into the contributions of explanatory factors, proposed in [5], requires the specification of a linear additive regression model of health such as

(6) $$y_i = \alpha + \sum_k \beta_k x_{ki} + \varepsilon_i$$

where y is the health measure, the x_k variables are health determinants and ε is a disturbance term. One could think of this equation as a reduced form of a demand for health equation where all x_k are exogenous determinants. Given the relationship between y_i and x_{ki} in eqn (6), the concentration index for y, C, can be written as:

(7) $$C = \sum_k (\beta_k \bar{x}_k / \mu) C_k + GC_\varepsilon / \mu ,$$

where μ is the mean of y, $\bar{x}_k$ is the mean of x_k, C_k is the concentration index for x_k (defined analogously to C) and GC_ε is the generalized concentration index for ε_i. Eqn. (7) shows that C is equal to a weighted sum of the concentration indices of the k regressors, where the weight or "share" for, say, x_k, is the elasticity of y with respect to x_k. The residual component — captured by the last term — reflects the inequality in health that is not explained by systematic variation across income groups in the x_k. In the case of the interval regression approach, no residuals can be computed and the decomposition reduces to the first term in eqn. (7).

If we define the estimated health elasticity of determinant k as

(8) $$\hat{\eta}_k \equiv \hat{\beta}_k \bar{x}_k / \mu_k$$

and using estimated concentration indices, we can rewrite the decomposition as

$$\hat{C} = \sum_k \hat{\eta}_k \hat{C}_k \tag{9}$$

In other words, estimated health inequality is just a weighted sum of the inequality in each of its determinants, with the weights equal to the health elasticities of the determinants. As a result, total inequality can be partitioned into what has been labeled (cf. [18]) 'potentially avoidable' and 'unavoidable' health inequality. The unavoidable part of the inequalities is comparable to, for instance, the age-sex expected health inequality by income due to demographics. Using the method of indirect standardisation [18], one can compute the age-sex expected inequality as C^* and subtract this from C to obtain an estimate of 'potentially avoidable' inequality as $I^* = C - C^*$. Note that if y is predicted *only* on the basis of age and sex (as in [2]), then $\hat{C}$ in eq. (9) is identical to C^*, i.e. the degree of inequality to be expected simply on the basis of the unequal distribution of age and sex across income groups. The current approach, based on 'full' equations rather than 'auxiliary' standardising regressions for age and sex only, has two advantages. First, we standardise only for the purely 'demographic', i.e. partial effects on health, not the 'total' effects of age and gender. If other relevant variables are omitted in the standardising equations, these 'partial' effects run the risk of omitted variable bias [20, 21]. Secondly, the unavoidability of, for instance, gender-related differences in income-related health inequality is contentious and it seems therefore preferable to decompose the total relative inequality in health into its various determinants, including demographic structure, leaving it to the user of the results to standardise for whatever background characteristics are deemed appropriate.

The decomposition also makes clear how each determinant *k*'s separate contribution to total income-related health inequality can be decomposed into two meaningful parts: (i) its impact on health, as measured by the health elasticity (η_k), and (ii) its degree of unequal distribution across income, as measured by the (income) concentration index (C_k). This decomposition method therefore not only allows to separate the contributions of the various determinants, but also to identify the importance of each of these two components within each factor's contribution. This property makes it a powerful tool for unpacking the mechanisms contributing to a country's degree of health inequality.

2.4 Statistical inference

When inequality has been measured and decomposed into its sources, it is useful to be able to statistically test for cross-country differences. Given the complexity of the survey designs of the ECHP samples and the complex composition of the contribution terms in eqn. (9), we have opted to use a "bootstrap" method [22, 23] to assess sampling variability and to obtain standard errors for the estimates of both C and for $\eta_k C_k$, for each *k*. A bootstrap procedure hinges on the assumption that the observed distribution is a random sample of the underlying population distribution, and that individuals within the sample are independent. In our bootstrap we have corrected for differences in sampling probability, but not for the different types of the multi-stage sampling designs used in the ECHP. The latter was impossible because the necessary information ─ such as the primary sampling units ─ was not provided for all countries. Our bootstrap estimators of the t-statistics were computed using a five-step approach. First, we have inflated our sample size to allow for the differences in sampling probability by multiplying the sampling weights by the inverse of the smallest weight and rounded to the nearest integer. Second, from this expanded sample we have drawn a random sub-sample of the size of the

original sample with replacement. Third, we have run the entire procedure to obtain estimates of the factor contributions and I^*, including the interval regression, the construction of a fractional rank and a covariance matrix. This procedure differs from the calculation of the point estimates in that it is not weighted, as the differences in sampling probability are taken into account in the inflation of the sample. Fourth, by repeating this whole process, we generated 1000 resample data sets, each providing us with estimates of the contributions. Fifth, using these datasets we computed the standard deviations and t-statistics for each factor's contribution and for I^*.

2.4 Decomposing inequality differences between countries

More interesting than a mere country-by-country decomposition of inequality is the decomposition of *between-country differences* in health inequalities into (a) the differences in inequality in the determinants of health, and (b) differences in the health effects of these determinants across countries. This is not straightforward because some differences (e.g. in the mean of x_k) may be offset by other differences (e.g. in C_k). These changes will, in general, not be independent of one another and the decomposition method has to take these interdependencies into account. One approach of dealing with this problem is to apply a decomposition method proposed in [5]. If we denote by η_{ki} the elasticity of y with respect to x_{ki} for country i, and by C_{ki} the concentration index of determinant k in country i, then we can apply Oaxaca's [24] method by choosing country i for reference values of η_{ki} and country j for values of C_{ki} to obtain:

$$(10) \qquad \Delta C = C_i - C_j = \sum_k \eta_{ki}\left(C_{ki} - C_{kj}\right) + \sum_k C_{kj}\left(\eta_{ki} - \eta_{kj}\right),$$

with the alternative being:

$$(11) \qquad \Delta C = C_i - C_j = \sum_k \eta_{kj}\left(C_{ki} - C_{kj}\right) + \sum_k C_{ki}\left(\eta_{ki} - \eta_{kj}\right)$$

Then ΔC_k, the contribution of any variable x_k to ΔC, equals the sum of two terms, i.e.

$$\Delta C_k = \eta_{ki}\left(C_{ki} - C_{kj}\right) + C_{kj}\left(\eta_{ki} - \eta_{kj}\right) \quad (12)$$

Both terms consist of a product of an elasticity and a concentration index. Note that while equations (10) and (11) produce identical ΔC's and ΔC_k's, their decomposition in eqn. (12) is not unique and may lead to slightly differing results depending on the choice of *i* or *j* as 'index country' for the estimates of η_{ki} and C_{ki}. To facilitate some assessment of the relative importance of the inequality versus the elasticity component of ΔC_k, we have computed, for each determinant, the *relative excess* elasticity compared to the Netherlands, i.e. $\left(\eta_{ki} - \eta_{kj}\right)/\eta_{kj}$ and the *relative excess* inequality, i.e. $\left(C_{ki} - C_{kj}\right)/C_{kj}$, for *j* = NL.

3. Data and variable definitions

The data used in this paper were taken from the third wave (held in 1996) of the *European Community Household Panel* Users Database [25] (Eurostat, 1999). The ECHP is a survey based on a standardised questionnaire that involves annual interviewing of a representative panel of households and individuals 16 years and older in each EU member state. It covers a wide range of topics including demographics, income, social transfers, health, housing, education, employment, etc.

Our health measure is the answer to the question "How is your health in general?" rated in 5 categories (Very Poor, Poor, Fair, Good to Very Good) [26]. The relative frequencies of the European-wide 1996 ECHP responses were (2.4%, 7.9%, 24.3%, 42.2% and 23%). These are remarkably close to the relative frequencies for the response categories (Poor, Fair, Good, Very Good and Excellent) in the Canadian 1994 NPHS, which were (2.4%, 8.6%, 27%, 37.2% and

24.8%) despite the different wording. For the estimation of the interval regression we have used the HUI thresholds obtained in [4]: 0, 0.428, 0.756, 0.897, 0.947 and 1

Our income measure (i.e. our ranking variable) is disposable (i.e. after-tax) household income per equivalent adult, using the modified OECD equivalence scale. This gives a weight of 1.0 to the first adult, 0.5 to the second and each subsequent person aged 14 and over, and 0.3 to each child aged under 4 in the household. Total household income includes all the net monetary income received by the household members during the reference year (which is 1995 for the 1996 wave). It includes income from work (employment and self-employment), private income (from investments and property and private transfers to the household), pensions and other direct social transfers received. No account has been taken of indirect social transfers (e.g. reimbursement of medical expenses), receipts in kind and imputed rent from owner-occupied accommodation. All incomes were converted from national monetary units into a common reference unit (the "purchasing power standard") [25].

Other health determinants included in the analysis are: (i) Education level, i.e. the highest level of general or higher education completed is available at three levels: recognised third level education (ISCED 5-7), second stage of secondary level of education (ISCED 3) and less than second stage of secondary education (ISCED 0-2)); (ii) Marital status distinguishes between married, separated/divorced, widowed and unmarried (including co-habiting); (iii) Activity status includes full-time employed, part-time employed, self-employed, student, unemployed, retired, doing housework and 'other economically inactive' [27]. Region of residence uses the EU's NUTS 1 level (*Nomenclature of Statistical Territorial Units*), except for countries where such information was withheld for privacy reasons (NL, D) or because the country is too small (DK, L). Sample sizes before and after deletion of cases with missing observations, as well as the

means for all variables are presented in Table 1. Most country's sample sizes are between 7000 and 11000 adults, but some are larger (Spain, Italy) and some are smaller (Denmark and Luxembourg). Cross-sectional sample weights at the individual level were applied in all analyses.

4. Results

4.1 Measuring and decomposing inequality by country

The country means of the predicted health and explanatory variables presented in Table 1 provide an interesting basis for simple cross-country comparisons. The predicted HUI means (using the interval regressions from Table 2) show average health utility values above 0.9 for some of the richer countries such as Belgium, Denmark and the Netherlands, but also for poorer countries like Ireland and Greece. By far the lowest mean health is predicted for Portugal (0.82 only) but also France and Italy have relatively low mean health scores.

Luxembourg is the richest country in the EU with by far the highest disposable income per equivalent adult, but not the best health. Greek and the Irish adults, on the other hand, report better health than would be expected on the basis of their mean incomes. The countries' demographic structures, as presented by the age-sex dummies, do not differ dramatically but illustrate that Ireland and the Netherlands are relatively younger countries whith just 20% of adults over 60, while in most other countries this age group represents almost a quarter or more of their population (see bottom of table). While cross-country differences in education are somewhat more difficult to compare due to inter-country differences in definitions of educational qualifications, the low proportion of Portuguese with secondary level education is striking. Among the activity status variables, most notable are the high percentages of self-employed in

Greece and Portugal, the low percentage of retired in Ireland, and the high variability of proportions reporting to be doing housework or to be in the non-economically-active category.

The analysis of inter-individual variation in health requires the specification of a theoretical model explaining health behaviour. The models estimated below are not derived from a formal model of health production and investment but could be thought of as reduced-form estimates of a static model of the demand for health. By definition, these reduced form estimates do not provide any guidance as to *how* individual choice behaviour affects health but they do allow for the estimation of the impact of partial changes in exogenous health determinants, some of which may be amenable to policy intervention.

We estimated an interval regression equation per country using the Canadian HUI thresholds for the SAH variable and including the following explanatory variables: (i) the logarithm of equivalent disposable household income (to capture well-known concavity in this relationship), (ii) ten age-sex categories indicating the age groups 16-29, 30-44, 45-59, 60-69 and 70+ for both males and females, (iii) three education level categories, (iv) eight categories of activity status, (v) four categories of marital status, and, where available, (vi) three categories of country of birth (dummies for other European and other non-European country) and (vii) where relevant and available, the region of residence. In the case of the dummies, one reference category was omitted, of course. The profile of the omitted reference category was the young, highly educated, employed, married, male with average income, born in the country in question and (if applicable) living in the omitted region (usually the capital region).

The results of the interval regressions are presented in Table 2. No causal interpretation can be given to the coefficient estimates because they are purely cross-sectional and because the

exogenous status of some of the explanatory variables (in particular household income and activity status) is contentious. Some general observations emerge. First, the (logarithm of) household income has a significantly positive coefficient in all countries except one: only in Denmark no significant partial association between health and income remains when these other factors are controlled for. The estimated coefficients are directly comparable because both income and health are measured in the same units in all countries. In general, and as expected, the income elasticity of health is lower in countries with higher income (Luxembourg is the exception). Secondly, the demographic effects are largely as expected: lower health for females and decreasing health with rising age. However, there seems to be sufficient variation across countries for homogeneity of (partial) age-gender effects across Europe to be rejected. Third, without any exception, higher levels of education are significantly associated with better health in all countries. Countries with the lowest 'health return' to education are Ireland and Belgium. Fourth, those who are married or cohabiting generally report better health than those who are not (or not any more), but there is substantial variation across countries in this pattern. Fifth, there is little or no clear health effect of being born in another country, European or other. Sixth, not surprisingly, there is important variation in reported health by activity status. Being unemployed, retired or otherwise not economically active (i.e. because of disability status) is associated with significantly *lower* health, but generally – and more surprisingly – the same is true for those doing housework. Especially the partial association between retirement and other non-active status (and the difference between these two probably differs across countries) and health turns out to be strong. Notable exceptions include the Netherlands (for retirement status) and France and Germany (for inactivity status). Finally, for a number of countries it was possible to include dummies indicating region of residence to allow for regional variation in health status. The names of the corresponding regions are given in Table 5. In some countries – France in particular

– none of the region dummies is significant. In some other European countries, however, significant partial regional health effects emerge. Regions with, *ceteris paribus*, relatively worse health appear to be: the south of Belgium (Wallonia), the North West of the UK (including Northern England, Yorkshire and Humberside, East Midlands, the North West, Northern Ireland and Wales), the South of Italy, the non-Athens regions in Greece, the North-West of Spain, the North and the Lisbon area in Portugal and the South East of Austria.

The concentration indices, computed using equation (5) and presented in Table 3, tell an interesting story about income-related inequalities in themselves. First of all, in *all* EU member states self-reported health is unequally distributed in favour of the higher income groups. But there are substantial differences between countries. Portugal has far greater income-related health inequality than the UK and Greece. The Netherlands and Germany have very low health inequality, but also Italy, Belgium and Austria have relatively low CIs. To some degree, the pattern of income inequality (as measured by the CI of log income) follows the pattern of income-related health inequality, but exceptions are Denmark and Luxembourg, both of which show higher health inequality than expected on the basis of their income inequality. In terms of age groups, it is striking to see older women concentrated in lower income groups everywhere, but least of all in Spain and Italy. By contrast, older males tend to rank low in income only in Denmark, the UK, Ireland, Greece and Portugal. In all countries, higher educated are strongly concentrated amongst the richest, but most of all in Portugal and least of all in Germany. Retired are more concentrated among the lower income groups and the same is true for unemployed in all countries but Denmark. Immigrants seem worse off in most countries, but not in Austria and Portugal. The concentration indices of the regional dummies also clearly show which are the

relatively wealthy and which are the less well-off regions. Regional income disparities are particularly pronounced in Italy, Spain and Portugal.

We now turn to the more important question: how do these various characteristics contribute – or not – to the observed income-related health inequality in European countries? It is clear that a determinant's contribution to inequality can be either positive or negative, depending on the sign of its health effect and its distribution by income, as reflected in its concentration index. Table 4 summarizes the decomposition of each country's income-related health inequality into the percentage contributions of the regressor variables. A positive (negative) x% contribution of variable X is to be interpreted as follows: income-related health inequality would, *ceteris paribus*, be x% lower if variable X were equally distributed across the income range, or if variable X had a zero health elasticity. The second row presents estimates of $I^* = C - C^*$, defined as the health inequality *not* due to demographics, i.e. the degree of inequality which would be observed if age and sex were equally distributed by income, or had no effect on health. It is computed by subtracting the contributions of age and gender from total inequality and it is comparable to the degree of potentially avoidable inequality as it was labelled in past work using the indirect method of standardisation (e.g. [2]). The important difference is, however, that the age-sex contributions here are now estimated as *partial* effects, i.e. while controlling for income and other influences on health. We can see that I^* is often but not always smaller than C. In other words: the health and income distribution of age and gender can both increase and decrease observed health inequality.

Figure 1 shows the countries' ranking by I^* with the confidence intervals obtained from the bootstrapped standard errors. In all countries, the degree of non-age-sex related — and therefore potentially avoidable — inequality I^* is highly significant and different from zero. But

there are large differences between countries. In the Netherlands, inequality is significantly lower than in any other country except Germany. In Portugal, on the other hand, inequality is significantly greater than in any other country. Table A1 summarizes the results of all pair wise comparisons by showing the t statistics of the between-country differences in I* values.

Figure 2 shows a simple scatter diagram of health inequality (as measured by *I**) and income inequality (as measured by the Gini coefficient of income). The correlation is positive, but weak and not significant (r=0.47; P=0.10). The correlation with unstandardised inequality *C* is higher and significant(r=0.66; P =0.019) but also much lower than the r=0.87 reported in [2]. The positive correlation is mainly due to the outlier position of Portugal, a role played by the US in [2]. Especially Denmark and the UK show a much higher health inequality than would be expected on the basis their income inequality. The decompositions will allow us to explore these findings in greater detail.

Some general findings emerge from the decomposition results presented in Table 4. First, in all countries except Denmark, income itself accounts for a significant and sizeable contribution: between 25% and 40% of all measured inequality. The peculiar Danish result does not arise because Denmark has the lowest income inequality in the EU, but because of the complete lack of any (partial) linear association between household income and adult health. Apart from income itself, age, education and activity status are the most important 'contributors' to health inequality. While older females contribute significantly to higher health inequality, middle aged males — with worse health but better incomes than young males — reduce health inequality. Higher educational differences invariably and significantly contribute to inequality. The contributions of the activity status variables are less straightforward to generalise. This may be related to the variation in social security schemes across European countries leading to

differences in meaning and uses of this categorization. In some countries (e.g. Denmark, Germany), it is mainly the (health and income distribution of the) retired which contributes to inequality, while in others (Netherlands, UK, Ireland and Spain), the 'other economically inactive' group has a greater contribution. In France the largest contribution comes from those reporting to be doing housework [28]. The important thing to note for a proper interpretation is that all of these contributions are *partial*, i.e. after having controlled for demographics and income. This means that, for instance, the retired report worse health than others of the same age and income. It must therefore mainly reflect the disadvantaged position of the *early* retired. In the next section we will further zoom in on the differences between the countries.

Marital status and immigration status generally show only minor contributions to health inequality. The contribution of region is mixed and again depends also on the regional detail available and the choice of the reference region. In general, the estimates show that region of residence does matter in the Mediterranean countries, especially in Spain and Italy, and to a lesser extent in Portugal and Greece. There is also some regional contribution in the UK but — perhaps surprisingly — none at all in France [28].

4.2 Decomposing "excess inequality"

The next interesting question is why some countries appear to be able to enjoy much lower health inequality than others. We have further explored the factors driving these differences between countries using the Oaxaca-type decomposition method presented in eqns. (10) and (12). In principle, with 13 countries and two index options, there are 24 possible ways of decomposing the inequality differences. With the information in Tables 1-4, the reader can reproduce all of these possible comparisons. In Table 6 we present the ΔC_k estimates for just one

of these options, with all countries compared to the country with the lowest inequality, i.e. the Netherlands, as the 'index' country. In effect, this shows a decomposition of the 'excess inequality' compared to the Netherlands and the (column) percentage contributions presented here are comparable to the ones presented in Table 4. Generally, the same variables as in Table 4 (i.e. income itself, female elderly, retirement and other non-active status) account for most of the differences, although the relative shares differ because of the relatively favourable position of older females and retired in the Netherlands. Note that virtually all of the excess inequality in Denmark is due to the worse health and income position of the Danish retired compared to the Dutch retired.

Another interesting question is: which of the two components of any contribution — the health elasticity or the inequality by income — is the most important contributor to excess inequality? This distinction is not unimportant from a policy perspective, since in many cases health policies cannot directly alter the distribution of these characteristics by income, but they may be able to influence the health elasticity of some of these characteristics. As explained in section 2, the relative magnitudes of their contributions cannot easily be ascertained from comparing the two composite terms in each ΔC_k described in equation (12) since they are both a product of a concentration index and an elasticity. Rather, a comparison of the relative differences $\left(C_{ki} - C_{kj}\right)/C_{kj}$ and $\left(\eta_{ki} - \eta_{kj}\right)/\eta_{ki}$ can provide some insight. These differences are presented in Table 7 as excess percentages versus the Dutch concentration indices and elasticities.

Again, some general observations emerge. In many cases, the elasticity differences appear to dominate the inequality differences. Take the contribution of income: in all countries,

without exception, the relative excess elasticity is greater — often much greater — than the relative excess inequality. This implies that it is not so much the differences in income inequality *per se*, but in the partial association between income and health that matter for income-related health inequality. The same observation holds for another important influence on such inequality: the partial association between health and retirement status appears in all countries as more influential than the degree to which retired are ranked lower in the income distribution. This is an important finding because, as we said before, it implies that reducing health inequalities seems more a matter of reducing these associations through appropriate health related policies than a matter of redistributing income. The observation does not hold for all other variables, but on the basis of Table 7, policy makers from each of the other countries can learn where the greatest opportunities lie for reducing income-related health inequalities if the goal is to come closer to the, apparently achievable, low degree of health inequality in the Netherlands.

5. Conclusion and discussion

This paper adds considerably to the existing knowledge on inter-individual health disparities by income in Europe. First, by using a new data set with better and far more comparable measures of income and health, it provides more reliable estimates of the cross-country differences in health inequalities. Secondly, by using an interval regression approach to estimating more fully specified health (utility) equations, it achieves a more consistent and reliable estimate of the degree of health inequalities which is not due to demographic differences. Thirdly, by using a new decomposition technique, it allows to decompose the total observed income-related health inequality into the contributions of the health elasticity and the inequality by income for all health determinants included in the analysis. Fourth, by bootstrapping the

entire estimation and decomposition procedure, it was possible to not only estimate but also statistically test for cross-country differences in the factors which drive inequality. Finally, an Oaxaca-type decomposition of cross-country differences enabled the identification of the relative contribution of 'excess elasticity' and 'excess inequality' in each of the determinants compared to a low-inequality country.

We find that especially Portugal, but also the UK and Denmark, show up with a high degree of such inequality, while countries like the Netherlands, Germany, but also Italy, Belgium, Spain, Austria and Ireland show a relatively low level of health inequality. The correlation with income inequality is positive, but weaker than in previous research. The decomposition shows that (the health effect and distribution of) income itself is the most important but not the only driving factor. When abstracting from the contributions of demographic variables, mainly (the health effect and distribution of) education, labour force status and region are the prime other contributors to health inequality. This is in line with findings for Canada [4]. But there are exceptions. Denmark's relatively high level of income-related health inequality is *not* due to its income inequality (which is low) but almost entirely to the fact that early retired individuals have much worse health and are strongly concentrated among the lower income groups. Early retirement in this country may be used as a vehicle for those withdrawing from the labour force (early) for health reasons. In most other countries, it is either the health and income position of the retired, of other categories of non-labour force participants (e.g. the other economically inactive), or of those with the lowest education, which are the most important contributors after income itself. In the southern European countries, a non-negligible portion of the income-related inequality is also due to regional health inequalities.

But apart from the similarities, there are also some dramatic differences between European countries. Some are achieving a much lower degree of health inequality than others. The decomposition of these cross-country differences into the excess inequalities and elasticities of the determinants in comparison to the country with the lowest inequality (the Netherlands) brings out that in general the excess elasticities play a much greater part than the excess inequalities by income. This finding has very important policy implications. It means that reducing health inequalities appears to be more a matter of health policy than of income redistribution.

Of course, the latter conclusion crucially hinges on a causal interpretation of the health equations and this brings us to the limitations of this study. As explained in section 4.1, the estimated health equations do not generally allow for such a causal interpretation. The partial cross-sectional association between income and health as measured in the regression coefficient of (log) income may also to some extent reflect reverse causality or joint determination by some unobserved underlying factor. The same applies to some of the other variables, notably the variables reflecting labour force participation status. In this paper, we did not attempt to account for endogeneity or unobserved heterogeneity. In the near future, when sufficient waves of the ECHP panel will become available, we intend to use panel data techniques to address this limitation of the present study. A second caveat concerns the external validity of using the Canadian threshold values for health utility to scale the SAH categories in the interval regression. While we do not expect this to be very influential for the inequality results obtained, ideally this ought to be tested using some European source of health utility thresholds and applying the validity tests applied in [4] on the Canadian data. Recent results from similar tests (and decompositions) using Finnish and Danish data [29] indicate that extremely similar results

for both countries are obtained when instead of the Canadian HUI threshold values, thresholds based on the distribution of the Finnish distribution of another generic health measure: the EQ15D. It therefore appears unlikely that our results are very sensitive to the choice of generic measure for the threshold values.

The new empirical evidence on cross-European differences in income-related health inequalities provided in this paper also generates some important new policy insights. Some European countries achieve much lower degrees of such inequality than others. These are not necessarily the healthiest or the richest countries. While a lower degree of income inequality will certainly help in reducing health inequalities, it is certainly not the sole or the main driver of the inequality differences. What appears crucial is the following: (i) the strength of the partial association between income and health; measures which can reduce either the health-harming effects of income losses or the income consequences of health losses (e.g. through replacement incomes) will definitely help; (ii) the associations between health and income (rank) of being outside of the labour force; only if it is very hard or nearly impossible to reduce the health elasticities by improving or maintaining the health of the non-active (e.g. in the case of the disabled or aged), then the only option to reduce these inequalities may be through appropriate income policies; (iii) regional differences in health and income; if there were no systematic regional disparities, clearly income-related inequality would also be lower. While the paper does not tell us what could be done and how to change the inequality components, it does show where the greatest potential for inequality reductions lie. Future research which can exploit longitudinal changes in income and health could help to further unravel the underlying causal pathways which generate the patterns of income-related health differences which have emerged from this study.

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26. There is one important exception: the French questionnaire asked respondents to indicate the satisfaction with their general health, ranging from very satisfied to very dissatisfied.

27. Due to an apparent coding error in the data, the status 'retired' for the Netherlands had to be reconstructed from age and income source information.

28. This peculiarity may have to do with the fact that only in France the question was one of a series asking about satisfaction with work, income, housing, health and leisure.

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Figures

Fig 1: Degree of income-related inequality in health utility, by country, with 95% confidence intervals (ECHP, 1996, age-sex standardised)

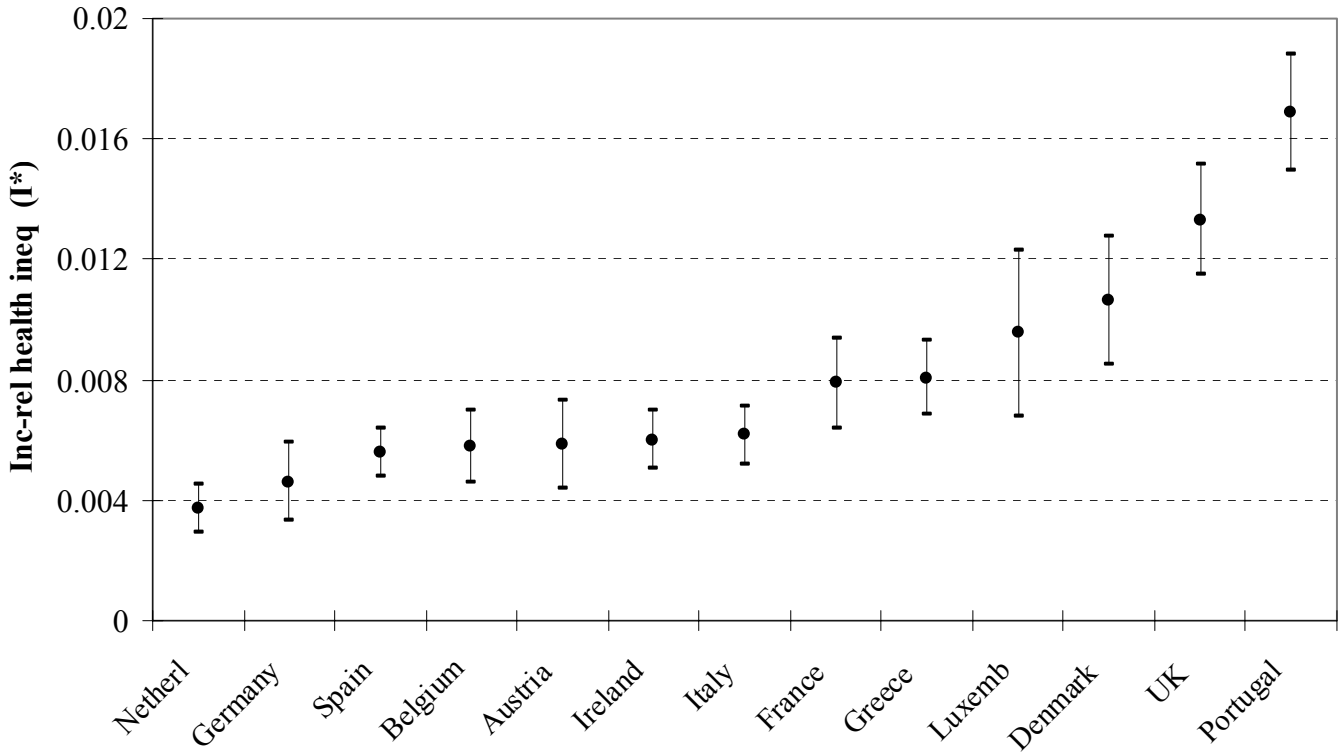

Fig 2: Income inequality and health inequality (r(*G,C*)= 0.64; r(*G,I**)=0.47)

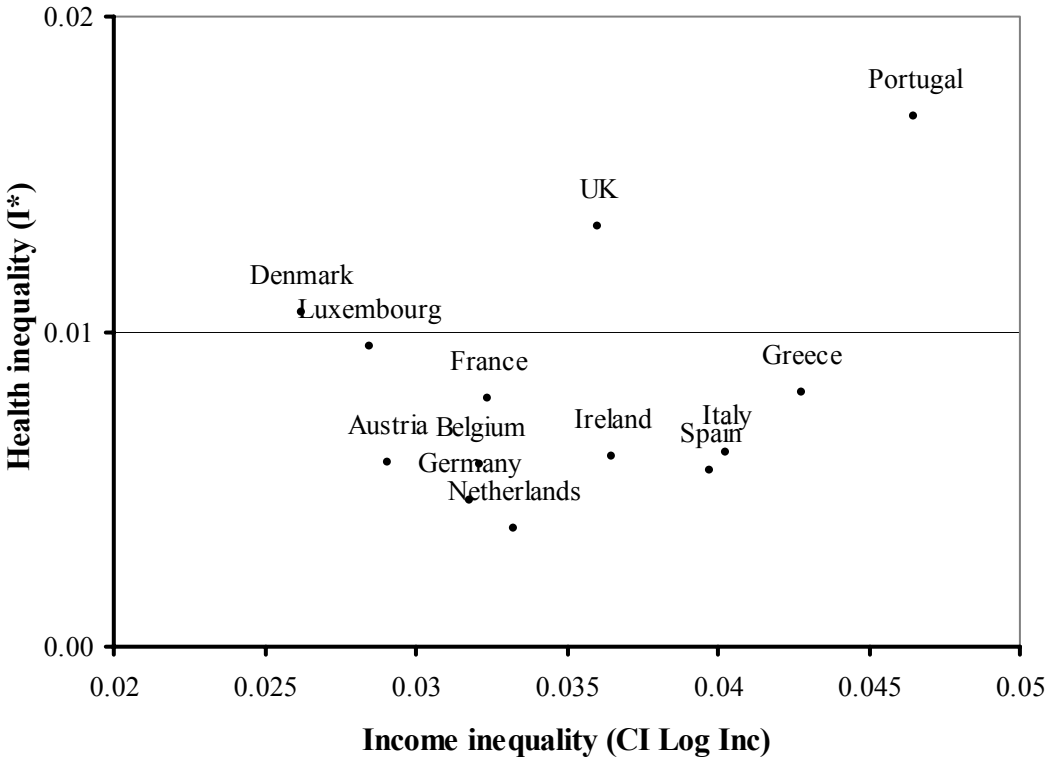

Fig 3: Contributions to concentration indices of income-related inequality, by country, by source

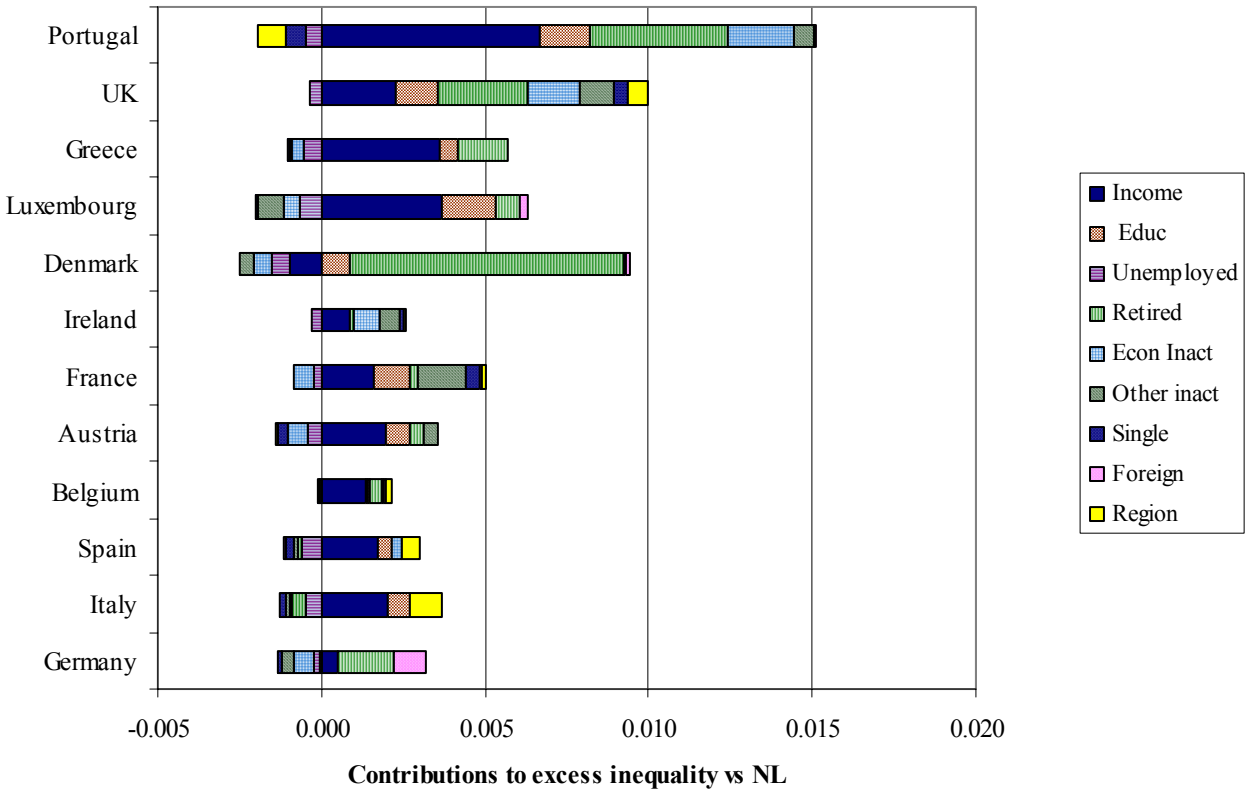

Table 1: Means of variables per country

	Germany	Denmark	Netherl	Belgium	Luxemb	France	UK	Ireland	Italy	Greece	Spain	Portugal	Austria
HUI predicted	0.8851	0.9077	0.9040	0.9027	0.8947	0.8692	0.8972	0.9236	0.8668	0.9077	0.8822	0.8183	0.8983
Log Income	9.4491	9.4927	9.3840	9.4261	9.9107	9.3738	9.4004	9.0952	9.0058	8.7821	8.9365	8.6797	9.5084
M30-44	0.1375	0.1483	0.1619	0.1445	0.1576	0.1373	0.1339	0.1482	0.1205	0.1295	0.1310	0.1329	0.1404
M45-59	0.1232	0.1194	0.1265	0.1048	0.1176	0.1156	0.1078	0.1066	0.1090	0.1089	0.0975	0.1065	0.1090
M60-69	0.0662	0.0507	0.0512	0.0686	0.0690	0.0567	0.0596	0.0479	0.0718	0.0749	0.0621	0.0617	0.0514
M70+	0.0442	0.0559	0.0401	0.0473	0.0384	0.0510	0.0551	0.0433	0.0552	0.0608	0.0499	0.0473	0.0420
F16-29	0.1002	0.1198	0.1130	0.1168	0.1139	0.1076	0.1141	0.1379	0.1153	0.1157	0.1364	0.1213	0.1217
F30-44	0.1443	0.1373	0.1656	0.1501	0.1520	0.1497	0.1574	0.1584	0.1215	0.1346	0.1326	0.1395	0.1446
F45-59	0.1245	0.1207	0.1227	0.1160	0.1086	0.1166	0.1241	0.1054	0.1195	0.1208	0.1061	0.1192	0.1192
F60-69	0.0735	0.0525	0.0576	0.0790	0.0726	0.0733	0.0696	0.0515	0.0871	0.0765	0.0688	0.0760	0.0606
F70+	0.0923	0.0744	0.0567	0.0738	0.0628	0.0806	0.0858	0.0612	0.0787	0.0718	0.0764	0.0709	0.0821
Second Educ	0.4707	0.3568	0.5218	0.2651	0.2602	0.3046	0.3305	0.3051	0.2808	0.2508	0.1830	0.1145	0.5921
Higher Educ	0.1781	0.2723	0.1587	0.2302	0.1341	0.1624	0.2069	0.1073	0.0560	0.1602	0.1398	0.0447	0.0594
Part-time empl	0.0089	0.0027	0.0210	0.0137		0.0081	0.0123	0.0023	0.0036	0.0011	0.0060	0.0026	0.0031
Self-employed	0.0388	0.0399	0.0367	0.0556	0.0473	0.0518	0.0748	0.0914	0.0993	0.1836	0.0856	0.1511	0.0710
Student	0.0454	0.0800	0.0837	0.0836	0.0663	0.0793	0.0275	0.0730	0.0824	0.0546	0.0886	0.0788	0.0515
Unemployed	0.0424	0.0543	0.0707	0.0847	0.0174	0.0637	0.0353	0.0763	0.0646	0.0612	0.1138	0.0452	0.0331
Housework	0.1049	0.0150	0.2470	0.1159	0.2026	0.1069	0.1415	0.2616	0.1991	0.2055	0.2035	0.0822	0.1520
Econ inactive	0.0014	0.0113	0.0850	0.0214	0.0064	0.0123	0.0316	0.0285	0.0242	0.0135	0.0641	0.0504	0.0049
Retired	0.2782	0.2592	0.1616	0.2539	0.2261	0.2403	0.2298	0.0972	0.2507	0.2243	0.1418	0.2113	0.2159
Divorced/sep	0.0562	0.0654	0.0460	0.0646	0.0413	0.0467	0.0764	0.0258	0.0144	0.0190	0.0143	0.0205	0.0443
Widowed	0.0924	0.0763	0.0604	0.0821	0.0773	0.0854	0.0934	0.0763	0.0981	0.0922	0.0800	0.0868	0.0867
Unmarried	0.1761	0.1887	0.1849	0.1972	0.2078	0.2190	0.1631	0.3145	0.2664	0.1998	0.2846	0.2417	0.2140
Born oth Euro		0.0133		0.0509	0.2804	0.0356	0.0159	0.0432	0.0056		0.0064	0.0066	0.0205
Born non-Euro		0.0258		0.0354	0.0337	0.0571	0.0401	0.0056	0.0103		0.0080	0.0206	0.0077
Region 2				0.5806		0.1760	0.0936	0.3094	0.0198	0.1967	0.1003	0.1736	0.2314
Region 3				0.3212		0.0667	0.0676		0.1270	0.3932	0.1260	0.3588	0.3482
Region 4						0.0799	0.0355		0.0624	0.0893	0.1329	0.0591	
Region 5						0.1288	0.3071		0.1054		0.2759	0.0364	
Region 6						0.1018	0.0853		0.0905		0.2096	0.0098	
Region 7						0.1179	0.0970		0.0332		0.0414	0.0206	
Region 8						0.1226	0.1128		0.1033				
Region 9							0.0422		0.1152				
Region 10							0.0848		0.0838				
Region 11							0.0323		0.0334				
N	8535	4952	8934	5656	1891	11166	6023	6663	16703	10549	15184	10520	7042
% of pop 60+	27.6%	23.4%	20.6%	26.9%	24.3%	26.2%	27.0%	20.4%	29.3%	28.4%	25.7%	25.6%	23.6%
% higher educ	64.9%	62.9%	68.0%	49.5%	39.4%	46.7%	53.7%	41.2%	33.7%	41.1%	32.3%	15.9%	65.2%

Table 2: Health equations: interval regression coefficients per country

	Germany	Denmark	Netherl	Belgium	Luxemb	France	UK	Ireland	Italy	Greece	Spain	Portugal	Austria
Constant	**0.8765**	**0.9380**	**0.8986**	**0.8685**	**0.7768**	**0.8510**	**0.8297**	**0.9014**	**0.8615**	**0.8682**	**0.8559**	**0.7731**	**0.8765**
Log Income	**0.0047**	0.0003	**0.0031**	**0.0072**	**0.0150**	**0.0077**	**0.0088**	**0.0054**	**0.0073**	**0.0112**	**0.0069**	**0.0156**	**0.0099**
M30-44	**-0.0162**	**-0.0179**	**-0.0123**	**-0.0186**	**-0.0164**	**-0.0357**	**-0.0154**	**-0.0085**	**-0.0277**	**-0.0181**	**-0.0174**	**-0.0341**	**-0.0185**
M45-59	**-0.0445**	**-0.0281**	**-0.0236**	**-0.0285**	**-0.0339**	**-0.0517**	**-0.0271**	**-0.0217**	**-0.0484**	**-0.0416**	**-0.0406**	**-0.0626**	**-0.0581**
M60-69	**-0.0164**	0.0029	-0.0121	**-0.0316**	-0.0055	**-0.0527**	-0.0114	**-0.0269**	**-0.0685**	**-0.0610**	**-0.0534**	**-0.0829**	**-0.0309**
M70+	**-0.0483**	-0.0015	-0.0129	**-0.0487**	**-0.0547**	**-0.0725**	-0.0049	**-0.0549**	**-0.1348**	**-0.1122**	**-0.0929**	**-0.1124**	**-0.0912**
F16-29	**-0.0057**	-0.0019	-0.0033	**-0.0105**	**-0.0102**	**-0.0083**	-0.0011	0.0006	**-0.0073**	0.0007	-0.0027	-0.0021	0.0032
F30-44	**-0.0114**	**-0.0189**	**-0.0133**	**-0.0193**	**-0.0217**	**-0.0277**	-0.0055	**-0.0103**	**-0.0259**	**-0.0144**	**-0.0183**	**-0.0409**	**-0.0107**
F45-59	**-0.0377**	**-0.0284**	**-0.0282**	**-0.0336**	**-0.0524**	**-0.0461**	**-0.0202**	**-0.0162**	**-0.0631**	**-0.0449**	**-0.0578**	**-0.0909**	**-0.0462**
F60-69	**-0.0237**	-0.0079	**-0.0219**	**-0.0500**	**-0.0479**	**-0.0475**	0.0004	**-0.0389**	**-0.1030**	**-0.0760**	**-0.0923**	**-0.1253**	**-0.0574**
F70+	**-0.0564**	-0.0322	**-0.0426**	**-0.0724**	**-0.0797**	**-0.0775**	**-0.0225**	**-0.0627**	**-0.1421**	**-0.1240**	**-0.1195**	**-0.1389**	**-0.1034**
Second Educ	**0.0073**	**0.0168**	**0.0081**	0.0049	**0.0199**	**0.0101**	**0.0102**	0.0040	**0.0155**	**0.0100**	**0.0107**	**0.0164**	**0.0176**
Higher Educ	**0.0154**	**0.0224**	**0.0115**	**0.0100**	**0.0206**	**0.0187**	**0.0215**	**0.0076**	**0.0207**	**0.0118**	**0.0117**	**0.0352**	**0.0210**
Part-time empl	0.0037	-0.0344	**-0.0152**	**-0.0958**		-0.0058	-0.0022	-0.0014	-0.0006	-0.0065	-0.0046	-0.1045	0.0085
Self-employed	0.0001	-0.0028	-0.0005	**0.0085**	0.0022	-0.0040	-0.0041	-0.0008	**0.0050**	**0.0042**	0.0008	-0.0020	**-0.0104**
Student	**0.0103**	**0.0082**	**0.0064**	0.0059	**0.0176**	**0.0121**	-0.0066	0.0039	**0.0144**	**0.0097**	**0.0074**	0.0077	**0.0182**
Unemployed	**-0.0373**	**-0.0212**	**-0.0245**	**-0.0232**	**-0.1039**	**-0.0136**	**-0.0172**	**-0.0106**	-0.0042	-0.0012	0.0019	**-0.0185**	**-0.0281**
Housework	**-0.0118**	**-0.0234**	**-0.0174**	-0.0077	0.0038	**-0.0608**	**-0.0351**	**-0.0153**	**-0.0086**	**-0.0170**	**-0.0084**	**-0.0412**	**-0.0200**
Econ inactive	-0.0207	**-0.1144**	**-0.0616**	**-0.0792**	**-0.0783**	-0.0029	**-0.1967**	**-0.1466**	**-0.0964**	**-0.2080**	**-0.1158**	**-0.1814**	**-0.2390**
Retired	**-0.0557**	**-0.1014**	-0.0073	**-0.0162**	**-0.0544**	**-0.0372**	**-0.0526**	**-0.0205**	**-0.0264**	**-0.0515**	**-0.0341**	**-0.1175**	**-0.0484**
Divorced/sep	**-0.0160**	**-0.0169**	**-0.0165**	-0.0100	-0.0215	**-0.0231**	-0.0068	-0.0117	-0.0014	-0.0206	-0.0091	-0.0039	-0.0119
Widowed	0.0044	-0.0015	-0.0076	-0.0046	**0.0228**	-0.0113	-0.0132	-0.0091	-0.0101	**-0.0189**	0.0109	0.0134	0.0020
Unmarried	**0.0067**	-0.0008	-0.0015	-0.0001	**0.0145**	**-0.0138**	-0.0010	-0.0022	-0.0011	**-0.0065**	-0.0019	**-0.0132**	-0.0050
Born oth Euro		0.0067		-0.0058	-0.0065	0.0012	-0.0157	-0.0033	-0.0029		**0.0193**	0.0080	0.0041
Born non-Euro		-0.0131		-0.0083	**-0.0195**	-0.0085	-0.0123	-0.0302	-0.0030		0.0007	0.0069	-0.0100
Region 2				0.0064		-0.0033	0.0075	0.0010	0.0020	0.0002	**0.0221**	0.0013	-0.0012
Region 3				**-0.0085**		-0.0010	0.0129		0.0058	**-0.0057**	**0.0101**	0.0006	**0.0067**
Region 4						0.0005	**0.0247**		-0.0021	**-0.0112**	**0.0089**	**0.0172**	
Region 5						0.0003	**0.0201**		-0.0045		**0.0175**	**0.0228**	
Region 6						0.0001	**0.0222**		-0.0014		**0.0103**	**0.0286**	
Region 7						0.0022	**0.0154**		-0.0033		**0.0097**	**0.0569**	
Region 8						-0.0077	0.0132		-0.0063				
Region 9							-0.0056		-0.0147				
Region 10							**0.0194**		-0.0013				
Region 11							0.0150		-0.0108				
Adj R^2	0.142	0.180	0.119	0.159	0.159	0.112	0.126	0.171	0.218	0.298	0.263	0.330	0.236

Note: Regression coefficients which differ significantly from zero (at P<0.05) are in bold typeface. Constant term not reported.

Table 3: Concentration indices of dependent and independent variables per country

	Germany	Denmark	Netherl	Belgium	Luxemb	France	UK	Ireland	Italy	Greece	Spain	Portugal	Austria
	DE	DK	NL	BE	LU	FR	UK	IE	IT	GR	ES	PT	AT
HUI predicted	0.0043	0.0094	0.0034	0.0071	0.0104	0.0075	0.0129	0.0077	0.0063	0.0119	0.0066	0.0218	0.0073
Log Income	0.0318	0.0262	0.0332	0.0321	0.0285	0.0324	0.0360	0.0365	0.0403	0.0428	0.0397	0.0465	0.0291
M30-44	0.0862	0.1463	0.0374	0.1142	0.0868	0.0399	0.1324	0.1087	0.1091	0.1208	0.0803	0.0529	0.0500
M45-59	0.1468	0.2236	0.1503	0.0958	0.0396	0.1409	0.1968	0.0650	0.0352	0.0751	0.0117	0.0920	0.1354
M60-69	-0.0123	-0.1448	0.0395	-0.0607	0.0074	0.0288	-0.0041	-0.0123	0.0461	-0.0322	-0.0219	-0.0652	-0.0032
M70+	-0.0032	-0.3305	-0.0571	-0.1593	-0.0665	-0.0263	-0.2701	-0.1819	-0.0176	-0.2425	-0.0367	-0.2487	-0.1245
F16-29	-0.1054	-0.1044	-0.0996	-0.0241	-0.0102	-0.1182	-0.0523	0.0112	-0.0992	-0.0295	-0.0395	0.0554	-0.0431
F30-44	-0.0127	0.1400	-0.0291	0.0236	-0.0138	-0.0073	0.0231	0.0020	0.0264	0.1045	0.0553	0.0274	-0.0226
F45-59	0.0952	0.1580	0.1150	0.0584	0.0112	0.1387	0.1276	0.0505	0.0417	0.0517	-0.0075	0.0491	0.1246
F60-69	-0.1001	-0.2515	-0.0503	-0.0915	-0.0438	-0.0222	-0.1654	-0.1170	-0.0344	-0.1029	-0.0126	-0.1319	-0.1303
F70+	-0.1790	-0.3281	-0.1795	-0.2213	-0.1641	-0.1906	-0.3600	-0.3274	-0.0650	-0.2468	-0.0988	-0.2730	-0.2404
Second Educ	0.0000	-0.0136	-0.0045	0.0223	0.1502	0.0569	0.0556	0.1733	0.1601	0.1555	0.1452	0.3192	0.0822
Higher Educ	0.2176	0.2521	0.3676	0.3034	0.4951	0.4503	0.3688	0.5503	0.4495	0.4210	0.4315	0.7940	0.3409
Part-time empl	-0.0141	-0.0929	0.0745	-0.2190		-0.0875	0.0443	0.2194	-0.0223	0.0050	-0.2097	-0.1368	0.1111
Self-employed	0.2131	0.1306	0.1363	-0.0567	0.0845	0.0912	0.3071	0.1861	-0.0503	0.0335	-0.0508	-0.1630	-0.0662
Student	-0.2023	-0.2217	-0.3104	-0.0633	-0.1434	-0.0851	-0.1997	-0.0607	-0.0889	-0.0121	-0.0033	0.1052	-0.0973
Unemployed	-0.2161	-0.0017	-0.2931	-0.2777	-0.4209	-0.3212	-0.3160	-0.3428	-0.3674	-0.1989	-0.2326	-0.1007	-0.1153
Housework	-0.0953	-0.3005	-0.1241	-0.1875	-0.1066	-0.2641	-0.2672	-0.2357	-0.1964	-0.0850	-0.1462	-0.1853	-0.2455
Econ inactive	-0.2455	-0.0674	-0.1079	-0.3104	-0.2132	-0.0503	-0.3196	-0.3116	-0.2024	-0.0808	-0.1140	-0.2408	-0.0222
Retired	-0.1053	-0.2941	-0.0980	-0.1058	-0.0959	-0.0386	-0.2146	-0.1249	0.0397	-0.1317	-0.0041	-0.1431	-0.0476
Divorced/sep	-0.1887	-0.1828	-0.1758	-0.1603	-0.0851	-0.0869	-0.2990	-0.4044	0.1643	0.0412	-0.0720	-0.1396	-0.0470
Widowed	-0.1447	-0.2974	-0.1029	-0.1805	-0.0464	-0.2149	-0.3706	-0.2723	-0.0706	-0.1169	-0.0616	-0.1804	-0.1999
Unmarried	-0.0359	-0.1685	-0.1238	-0.0074	0.0437	-0.0781	-0.0042	-0.0166	-0.0299	0.0340	0.0022	0.0358	0.0120
Born oth Euro		-0.1354		-0.0508	-0.0670	-0.1755	0.1191	-0.0288	0.0437		-0.0823	0.0693	0.1077
Born non-Euro		-0.2421		-0.1862	-0.1661	-0.1820	-0.0516	-0.0383	-0.0188		-0.0431	0.2101	0.2047
Region 2				0.0187		-0.0561	-0.1116	0.1015	0.2658	-0.0938	0.1402	-0.1613	-0.0575
Region 3				-0.0405		-0.1804	-0.0178		0.1976	0.1549	0.2890	0.1733	-0.0468
Region 4						-0.0099	-0.1228		0.2298	-0.0335	-0.1540	-0.1376	
Region 5						-0.0837	0.1514		0.1039		0.0995	-0.1770	
Region 6						-0.1240	0.0242		0.0704		-0.1986	-0.2608	
Region 7						0.0150	-0.0376		-0.0574		-0.2253	-0.2993	
Region 8						-0.0625	-0.0284		-0.2591				
Region 9							-0.2104		-0.2907				
Region 10							-0.0960		-0.3017				
Region 11							-0.1335		-0.3322				

Table 4: Health inequality contributions of regressors per country (in % of HUI conc index, and with bootstrapped t-values)

	Germany		Denmark		Netherlands		Belgium		Luxembourg		France		UK	
	CI contr	t-val	CI contr	t-val	CI contr	t-val	CI contr	t-val	CI contr	t-val	CI contr	t-val	CI contr	t-val
C HUI pred	0.00434		0.00938		0.00337		0.00710		0.01036		0.00745		0.01286	
I* = C - C*	0.00461	7.05	0.01062	9.85	0.00372	9.22	0.00579	9.37	0.00955	6.80	0.00788	10.25	0.01332	14.39
Ln (Inc)	**36.7%**	2.68	0.9%	0.10	31.6%	2.74	33.9%	4.49	45.8%	3.80	36.1%	3.30	25.8%	4.44
M30-44	**-5.0%**	-3.90	-4.6%	-4.29	-2.4%	-2.42	-4.8%	-3.82	-2.4%	-1.87	-3.0%	-2.94	-2.4%	-3.42
M45-59	**-21.0%**	-7.10	-8.8%	-5.47	-14.8%	-6.39	-4.5%	-3.50	-1.7%	-0.97	-13.0%	-7.50	-5.0%	-5.05
M60-69	0.3%	0.47	-0.3%	-0.29	-0.8%	-1.13	2.1%	1.79	0.0%	-0.07	-1.3%	-1.26	0.0%	0.12
M70+	0.2%	0.12	0.3%	0.13	1.0%	1.21	5.7%	3.85	1.5%	0.91	1.5%	1.06	0.6%	0.54
F16-29	**1.6%**	2.15	0.3%	0.56	1.2%	1.39	0.5%	1.01	0.1%	0.24	1.6%	2.74	0.1%	0.27
F30-44	0.5%	0.82	-4.3%	-4.09	2.1%	1.94	-1.1%	-1.22	0.5%	0.40	0.5%	0.58	-0.2%	-0.86
F45-59	**-11.6%**	-5.18	-6.4%	-4.66	-13.1%	-5.52	-3.5%	-2.42	-0.7%	-0.28	-11.5%	-6.71	-2.8%	-3.80
F60-69	4.5%	2.84	1.2%	0.72	2.1%	1.81	5.6%	3.10	1.6%	0.95	1.2%	1.11	0.0%	-0.05
F70+	24.3%	5.42	9.2%	2.35	14.3%	4.35	18.4%	5.73	8.9%	2.66	18.4%	6.64	6.0%	2.60
Second Educ	0.0%	0.00	-1.0%	-1.12	-0.6%	-0.74	0.5%	1.27	8.4%	3.97	2.7%	3.22	1.6%	2.98
Higher Educ	15.6%	4.67	18.1%	5.81	22.1%	4.89	10.9%	3.99	14.7%	3.31	21.1%	6.01	14.2%	7.30
Part-time empl	0.0%	-0.11	0.1%	0.34	-0.8%	-1.59	4.5%	2.33			0.1%	0.47	0.0%	-0.19
Self-employed	0.0%	0.02	-0.2%	-0.55	-0.1%	-0.14	-0.4%	-1.20	0.1%	0.21	-0.3%	-0.90	-0.8%	-1.25
Student	-2.5%	-3.01	-1.7%	-2.46	-5.5%	-2.65	-0.5%	-1.28	-1.8%	-1.88	-1.3%	-2.40	0.3%	1.29
Unemployed	8.9%	4.51	0.0%	0.05	16.7%	5.37	8.5%	4.78	8.2%	2.21	4.3%	2.86	1.7%	2.56
Housework	3.1%	3.01	1.2%	2.08	17.6%	5.92	2.6%	1.88	-0.9%	-0.56	26.5%	8.81	11.5%	7.01
Econ inactive	0.2%	0.64	1.0%	0.92	18.6%	4.64	8.2%	4.23	1.2%	1.37	0.0%	0.29	17.2%	6.10
Retired	42.5%	6.86	90.8%	10.54	3.8%	1.47	6.8%	3.30	12.7%	3.01	5.3%	3.02	22.5%	7.26
Divorced/sep	4.4%	2.52	2.4%	2.47	4.4%	2.88	1.6%	1.95	0.8%	0.78	1.4%	2.29	1.3%	1.32
Widowed	-1.5%	-0.73	0.4%	0.15	1.6%	1.53	1.1%	0.71	-0.9%	-0.90	3.2%	1.77	4.0%	1.92
Unmarried	-1.1%	-1.78	0.3%	0.23	1.1%	0.69	0.0%	0.01	1.4%	1.55	3.6%	3.20	0.0%	0.07
Born oth Euro			-0.1%	-0.62			0.2%	0.74	1.3%	1.27	-0.1%	-0.19	-0.3%	-1.40
Born non-Euro			1.0%	1.42			0.9%	1.08	1.2%	1.26	1.4%	1.53	0.2%	0.90
Region 2							1.1%	1.43			0.5%	0.96	-0.7%	-0.94
Region 3							1.7%	1.75			0.2%	0.22	-0.1%	-0.55
Region 4											0.0%	-0.05	-0.9%	-2.04
Region 5											-0.1%	-0.08	8.1%	2.97
Region 6											0.0%	-0.02	0.4%	0.91
Region 7											0.1%	0.38	-0.5%	-1.25
Region 8											0.9%	1.62	-0.4%	-0.97
Region 9													0.4%	0.54
Region 10													-1.4%	-2.18
Region 11													-0.6%	-1.44

Table 4 (Continued): Health inequality contributions of regressors per country (in % of HUI conc index and with t-values)

	Ireland		Italy		Greece		Spain		Portugal		Austria	
	CI contr	t-val	CI contr	t-val	CI contr	t-val	CI contr	t-val	CI contr	t-val	CI contr	t-val
C HUI pred	0.00769		0.00626		0.01190		0.00663		0.02180		0.00730	
I* = C - C*	0.00600	12.49	0.00617	12.51	0.00805	12.72	0.00558	13.37	0.01686	17.07	0.00583	7.91
Ln (Inc)	25.1%	4.13	48.9%	5.63	39.1%	7.61	42.1%	6.58	35.4%	8.66	41.9%	4.05
M30-44	-1.9%	-2.48	-6.7%	-6.57	-2.6%	-5.09	-3.1%	-4.76	-1.3%	-3.45	-2.0%	-2.67
M45-59	-2.1%	-2.86	-3.4%	-2.64	-3.2%	-4.36	-0.8%	-0.82	-3.4%	-4.98	-13.1%	-6.29
M60-69	0.2%	0.41	-4.2%	-2.86	1.4%	1.61	1.2%	1.24	1.9%	2.64	0.1%	0.11
M70+	6.1%	4.31	2.4%	1.02	15.3%	7.79	2.9%	2.00	7.4%	6.83	7.3%	3.18
F16-29	0.0%	0.17	1.5%	3.67	0.0%	-0.31	0.3%	1.58	-0.1%	-0.69	-0.3%	-1.21
F30-44	0.0%	-0.11	-1.5%	-2.07	-1.9%	-3.98	-2.3%	-3.61	-0.9%	-1.96	0.5%	1.27
F45-59	-1.2%	-2.11	-5.8%	-3.36	-2.6%	-3.23	0.8%	0.54	-3.0%	-3.00	-10.5%	-5.65
F60-69	3.3%	3.31	5.7%	2.44	5.5%	4.60	1.4%	0.77	7.0%	5.88	6.9%	3.90
F70+	17.7%	6.99	13.4%	4.44	20.3%	9.08	15.4%	6.23	15.1%	9.19	31.1%	7.64
Second Educ	3.0%	2.23	12.8%	10.06	3.6%	4.62	4.9%	6.18	3.3%	5.75	13.0%	6.38
Higher Educ	6.3%	3.14	9.6%	7.10	7.4%	5.07	12.1%	6.24	7.0%	8.84	6.5%	4.29
Part-time empl	0.0%	-0.08	0.0%	0.03	0.0%	-0.01	0.1%	0.58	0.2%	1.47	0.0%	0.45
Self-employed	-0.2%	-0.33	-0.5%	-1.88	0.2%	1.88	-0.1%	-0.36	0.3%	0.66	0.7%	1.76
Student	-0.2%	-1.33	-1.9%	-4.36	-0.1%	-0.49	0.0%	-0.21	0.4%	2.34	-1.4%	-2.88
Unemployed	3.9%	3.81	1.8%	1.55	0.1%	0.44	-0.8%	-1.03	0.5%	3.05	1.6%	2.53
Housework	13.2%	5.21	6.2%	3.21	2.7%	4.74	4.3%	2.99	3.5%	5.64	11.4%	4.89
Econ inactive	18.3%	6.42	8.7%	5.56	2.1%	1.59	14.5%	6.38	12.3%	7.73	0.4%	0.21
Retired	3.5%	3.14	-4.8%	-4.40	14.1%	7.13	0.3%	0.38	19.9%	10.20	7.6%	3.18
Divorced/sep	1.7%	1.75	-0.1%	-0.28	-0.1%	-0.83	0.2%	0.94	0.1%	0.47	0.4%	1.03
Widowed	2.7%	1.64	1.3%	2.09	1.9%	2.97	-0.9%	-1.89	-1.2%	-1.79	-0.5%	-0.29
Unmarried	0.2%	0.68	0.2%	0.44	-0.4%	-1.70	0.0%	-0.18	-0.6%	-2.49	-0.2%	-0.71
Born oth Euro	0.1%	0.48	0.0%	-0.19			-0.2%	-1.14	0.0%	0.52	0.1%	0.51
Born non-Euro	0.1%	0.33	0.0%	0.20			0.0%	-0.05	0.2%	1.01	-0.2%	-0.84
Region 2	0.5%	0.62	0.2%	0.37	0.0%	-0.08	5.3%	5.79	-0.2%	-0.36	0.2%	0.42
Region 3			2.7%	2.29	-3.2%	-2.79	6.3%	3.45	0.2%	0.23	-1.7%	-2.41
Region 4			-0.6%	-0.58	0.3%	1.49	-3.1%	-2.65	-0.8%	-2.92		
Region 5			-0.9%	-1.56			8.2%	5.74	-0.8%	-2.81		
Region 6			-0.2%	-0.44			-7.3%	-3.42	-0.4%	-2.09		
Region 7			0.1%	0.74			-1.6%	-2.12	-2.0%	-5.36		
Region 8			3.1%	2.34								
Region 9			9.1%	4.70								
Region 10			0.6%	0.43								
Region 11			2.2%	2.23								

Table 5: Region dummies by country

	Belgium	France	UK	Ireland	Italy	Greece	Spain	Portugal	Austria
Region 1	Brussels	Île de France	North	Non-Dublin	Nord Ovest	Voreia Ellada	Noroeste	Norte	Ost
Region 2	Flanders	Bassin Parisien	Yorkshire and Humberside	Dublin	Lombardia	Kentriki Ellada	Noreste	Centro (P)	Süd
Region 3	Wallonia	Nord - Pas-de-Calais	East Midlands		Nord Est	Attiki	Comunidad de Madrid	Lisboa e Vale do Teio	West
Region 4		Est	East Anglia		Emilia-Romagna	Nisia Aigaiou,	Centro (E)	Alentejo	
Region 5		Ouest	South East		Centro (I)		Este	Algarve	
Region 6		Sud-Ouest	South West		Lazio		Sur	Açores	
Region 7		Centre-Est	West Midlands		Abruzzo-Molise		Canarias (	Madeira	
Region 8		Méditerranée	North West		Campania				
Region 9			Wales		Sud				
Region 10			Scotland		Sicilia				
Region 11			Northern Ireland		Sardegna				

Source: EUROSTAT, User's Database Documentation

Table 6: Contributions of regressors to excess health inequality per country versus Netherlands (in % of excess concentration index of HUI in first row)

	Germany	Denmark	Netherl	Belgium	Luxemb	France	UK	Ireland	Italy	Greece	Spain	Portugal	Austria
Excess ineq $CI - CI_{NL}$	0.00097	0.00602		0.00373	0.00700	0.00409	0.00949	0.00433	0.00290	0.00853	0.00326	0.01844	0.00394
Ln (Inc)	54.3%	-16.2%		36.0%	52.6%	39.8%	23.7%	20.1%	69.1%	42.1%	53.0%	36.1%	50.7%
M30-44	-13.8%	-5.8%		-6.9%	-2.4%	-3.5%	-2.3%	-1.5%	-11.6%	-2.7%	-3.8%	-1.1%	-1.6%
M45-59	-42.4%	-5.5%		4.8%	4.6%	-11.6%	-1.5%	7.7%	9.7%	1.4%	13.6%	-1.4%	-11.6%
M60-69	4.3%	0.1%		4.6%	0.3%	-1.8%	0.3%	1.0%	-8.1%	2.2%	3.3%	2.4%	0.8%
M70+	-2.6%	0.0%		10.0%	1.8%	1.9%	0.5%	10.1%	4.1%	21.0%	4.9%	8.6%	12.6%
F16-29	2.7%	-0.3%		-0.2%	-0.4%	1.9%	-0.4%	-0.9%	1.9%	-0.5%	-0.8%	-0.3%	-1.5%
F30-44	-4.9%	-7.8%		-3.9%	-0.3%	-0.9%	-1.0%	-1.7%	-5.8%	-3.4%	-6.8%	-1.4%	-0.8%
F45-59	-6.7%	-2.6%		5.0%	5.3%	-10.2%	0.9%	8.0%	2.7%	1.5%	15.1%	-1.1%	-8.2%
F60-69	13.0%	0.7%		8.8%	1.4%	0.4%	-0.8%	4.2%	9.8%	6.9%	0.6%	7.9%	11.0%
F70+	58.8%	6.4%		22.2%	6.3%	21.8%	3.1%	20.3%	12.4%	22.7%	16.6%	15.2%	45.5%
Second Educ	2.2%	-1.1%		1.4%	12.7%	5.5%	2.4%	5.8%	28.4%	5.3%	10.5%	4.1%	24.7%
Higher Educ	-7.1%	15.8%		0.7%	11.2%	20.3%	11.4%	-6.0%	-5.0%	1.5%	1.8%	4.2%	-6.9%
Part-time empl	2.6%	0.6%		9.2%		0.8%	0.3%	0.6%	0.9%	0.3%	1.0%	0.4%	0.8%
Self-employed	0.3%	-0.2%		-0.7%	0.5%	-0.5%	-1.1%	-0.3%	-0.9%	0.4%	0.0%	0.3%	1.4%
Student	8.1%	0.4%		4.0%	-2.6%	2.2%	2.4%	3.8%	2.2%	2.1%	5.6%	1.4%	2.1%
Unemployed	-18.1%	-9.3%		1.2%	14.8%	-5.9%	-3.7%	-6.1%	-15.4%	-6.4%	-18.9%	-2.5%	-11.2%
Housework	-47.1%	-7.9%		-10.8%	-9.3%	33.9%	9.3%	9.9%	-6.9%	-3.1%	-9.4%	1.0%	6.1%
Econ inactive	-63.4%	-8.8%		-1.1%	-6.7%	-15.2%	16.7%	18.1%	-2.8%	-4.4%	10.2%	11.2%	-15.1%
Retired	176.1%	139.4%		9.5%	9.9%	6.6%	29.1%	3.3%	-14.9%	18.1%	-3.2%	22.9%	10.8%
Divorced/sep	4.6%	1.2%		-0.9%	-0.9%	-1.0%	0.3%	-0.4%	-5.2%	-1.9%	-4.2%	-0.7%	-3.1%
Widowed	-12.3%	-0.2%		0.6%	-2.1%	4.5%	4.8%	3.5%	1.0%	2.0%	-3.5%	-1.7%	-2.3%
Unmarried	-8.9%	-0.2%		-1.0%	1.6%	5.7%	-0.4%	-0.6%	-1.0%	-1.0%	-1.2%	-1.0%	-1.3%
Born other Euro		-0.2%		0.4%	2.0%	-0.2%	-0.3%	0.1%	0.0%	0.0%	-0.4%	0.0%	0.3%
Born non-Euro		1.5%		1.6%	1.7%	2.5%	0.3%	0.2%	0.0%	0.0%	0.0%	0.2%	-0.4%
Region 2				2.1%		0.9%	-0.9%	0.8%	0.4%	0.0%	10.8%	-0.2%	0.4%
Region 3				3.3%		0.3%	-0.2%		5.8%	0.0%	12.8%	0.3%	-3.1%
Region 4						0.0%	-1.3%		-1.2%	0.0%	-6.3%	-0.9%	
Region 5						-0.1%	11.0%		-2.0%		16.7%	-1.0%	
Region 6						0.0%	0.5%		-0.4%		-14.8%	-0.5%	
Region 7						0.1%	-0.7%		0.3%		-3.2%	-2.3%	
Region 8						1.7%	-0.5%		6.7%				
Region 9							0.6%		19.6%				
Region 10							-1.9%		1.3%				
Region 11							-0.8%		4.8%				

Table 7: Relative 'excess' elasticity and inequality (vs NL) of determinants per country

	DE		DK		BE		LU		FR		UK	
	Elast	Conc ind	Elast	Conc ind	Elast	Conc ind	Elast	Conc ind	Elast	Conc ind	Elast	Conc ind
Ln (Inc)	56.5%	-4.3%	-89.8%	-21.1%	134.4%	-3.4%	420.4%	-14.2%	159.6%	-2.5%	188.0%	8.3%
M30-44	14.4%	130.6%	33.3%	291.4%	35.4%	205.4%	31.6%	132.3%	156.7%	6.8%	4.4%	254.1%
M45-59	87.4%	-2.3%	11.9%	48.8%	0.0%	-36.3%	34.7%	-73.6%	108.1%	-6.2%	-1.5%	31.0%
M60-69	78.9%	-131.2%	-123.9%	-466.5%	250.4%	-253.6%	-38.6%	-81.3%	401.6%	-27.2%	10.4%	-110.4%
M70+	321.9%	-94.4%	-83.4%	478.4%	347.2%	178.7%	310.7%	16.4%	645.5%	-54.0%	-47.0%	372.6%
F16-29	54.0%	5.8%	-39.9%	4.8%	227.2%	-75.8%	213.3%	-89.7%	145.6%	18.7%	-67.0%	-47.5%
F30-44	-23.9%	-56.4%	17.2%	-580.4%	31.8%	-181.1%	51.4%	-52.7%	95.7%	-74.9%	-60.5%	-179.2%
F45-59	38.5%	-17.2%	-1.5%	37.4%	12.7%	-49.2%	66.1%	-90.3%	61.5%	20.7%	-26.9%	11.0%
F60-69	40.9%	98.8%	-67.2%	399.5%	212.7%	81.7%	178.0%	-12.9%	186.1%	-56.0%	-102.0%	228.5%
F70+	119.8%	-0.3%	-1.4%	82.8%	121.3%	23.3%	109.5%	-8.6%	169.0%	6.2%	-19.6%	100.5%
Second Educ	-17.1%	-99.4%	40.8%	200.9%	-69.4%	-592.3%	23.6%	-3413.3%	-24.2%	-1356.0%	-19.8%	-1326.5%
Higher Educ	53.3%	-40.8%	232.1%	-31.4%	25.5%	-17.5%	52.3%	34.7%	72.7%	22.5%	144.3%	0.3%
Part-time empl	-110.5%	-119.0%	-71.1%	-224.7%	311.8%	-394.0%			-84.7%	-217.5%	-91.7%	-40.6%
Self-employed	-116.4%	56.3%	544.9%	-4.2%	-2887.8%	-141.6%	-133.3%	13.5%	1165.6%	-33.1%	1695.4%	125.2%
Student	-11.8%	-34.8%	20.5%	-28.6%	-7.9%	-79.6%	-6996.1%	-205.2%	84.7%	-72.6%	-133.6%	-35.7%
Unemployed	-6.9%	-26.3%	-33.8%	-99.4%	13.6%	-5.2%	-437.8%	35.6%	-48.0%	9.6%	-64.8%	7.8%
Housework	-70.7%	-23.2%	-91.8%	142.0%	-79.2%	51.0%	-144.8%	-63.6%	57.0%	112.8%	16.1%	115.2%
Econ inactive	-99.5%	127.5%	-75.4%	-37.6%	-67.6%	187.7%	-88.2%	71.7%	-99.3%	-53.4%	19.5%	196.2%
Retired	1238.1%	7.5%	2115.2%	200.2%	249.5%	8.0%	137.3%	-11.1%	686.2%	-60.6%	930.2%	119.0%
Divorced/sep	21.1%	7.3%	45.1%	3.9%	-15.1%	-8.8%	18.3%	-51.6%	47.0%	-50.6%	-31.5%	70.0%
Widowed	-190.8%	40.6%	-74.9%	189.0%	-18.3%	75.4%	-486.3%	-54.9%	117.2%	108.8%	170.3%	260.2%
Unmarried	-528.6%	-71.0%	-47.0%	36.1%	-94.9%	-94.0%	-1186.4%	-135.3%	1017.8%	-36.9%	-43.3%	-96.6%

Table 7 (Continued): Relative 'excess' elasticity and inequality (vs NL) of determinants per country

	IE		IT		GR		ES		PT		AT	
	Elast	Conc ind	Elast	Conc ind	Elast	Conc ind	Elast	Conc ind	Elast	Conc ind	Elast	Conc ind
Ln (Inc)	65.6%	9.8%	138.0%	21.1%	239.9%	28.8%	119.8%	19.5%	419.1%	39.8%	228.5%	-12.4%
M30-44	-37.7%	190.9%	75.0%	191.8%	17.4%	223.1%	17.4%	114.9%	151.7%	41.5%	31.2%	33.9%
M45-59	-24.2%	-56.8%	84.1%	-76.6%	51.0%	-50.0%	35.8%	-92.2%	146.3%	-38.8%	113.2%	-9.9%
M60-69	103.6%	-131.1%	727.2%	16.6%	635.0%	-181.5%	447.8%	-155.3%	811.9%	-265.0%	157.6%	-108.0%
M70+	350.5%	218.3%	1404.2%	-69.3%	1216.2%	324.3%	820.5%	-35.8%	1037.9%	335.2%	645.9%	118.0%
F16-29	-122.7%	-111.2%	134.0%	-0.4%	-122.0%	-70.4%	1.9%	-60.3%	-26.9%	-155.6%	-205.0%	-56.7%
F30-44	-27.4%	-107.0%	49.0%	-190.6%	-12.6%	-458.7%	12.9%	-290.0%	185.6%	-194.1%	-29.5%	-22.4%
F45-59	-51.7%	-56.1%	127.4%	-63.7%	55.9%	-55.0%	81.7%	-106.5%	245.7%	-57.3%	60.2%	8.4%
F60-69	55.2%	132.5%	639.8%	-31.7%	357.9%	104.4%	414.9%	-75.1%	732.2%	162.1%	176.5%	158.9%
F70+	55.5%	82.4%	382.8%	-63.8%	266.9%	37.5%	286.9%	-45.0%	350.2%	52.1%	253.5%	33.9%
Second Educ	-71.7%	-3923.2%	7.1%	-3631.2%	-41.2%	-3528.6%	-52.5%	-3302.7%	-51.1%	-7139.2%	147.4%	-1912.8%
Higher Educ	-56.5%	49.7%	-34.1%	22.3%	2.6%	14.5%	-8.2%	17.4%	-5.0%	116.0%	-31.4%	-7.3%
Part-time empl	-99.0%	194.6%	-99.3%	-129.9%	-97.8%	-93.3%	-91.1%	-381.5%	-5.5%	-283.7%	-108.3%	49.2%
Self-employed	325.5%	36.5%	-3115.9%	-136.9%	-4552.1%	-75.5%	-528.0%	-137.3%	1845.9%	-219.5%	4250.9%	-148.5%
Student	-47.7%	-80.5%	129.3%	-71.4%	-2.3%	-96.1%	24.7%	-98.9%	24.4%	-133.9%	75.0%	-68.6%
Unemployed	-54.4%	17.0%	-83.6%	25.4%	-95.7%	-32.1%	-112.5%	-20.6%	-46.7%	-65.6%	-45.9%	-60.7%
Housework	-9.2%	89.8%	-58.3%	58.2%	-19.3%	-31.5%	-59.3%	17.8%	-13.1%	49.2%	-29.0%	97.7%
Econ inactive	-22.0%	188.8%	-53.5%	87.6%	-46.4%	-25.1%	45.3%	5.6%	93.0%	123.1%	-77.6%	-79.5%
Retired	65.0%	27.5%	483.3%	-140.5%	873.8%	34.4%	320.0%	-95.9%	2222.2%	46.1%	789.9%	-51.5%
Divorced/sep	-61.2%	130.0%	-97.3%	-193.4%	-48.8%	-123.4%	-82.4%	-59.0%	-88.4%	-20.6%	-30.3%	-73.3%
Widowed	47.1%	164.6%	123.5%	-31.4%	277.6%	13.6%	-294.9%	-40.1%	-378.9%	75.3%	-138.2%	94.3%
Unmarried	140.5%	-86.6%	8.7%	-75.9%	359.5%	-127.5%	94.7%	-101.8%	1153.8%	-128.9%	284.2%	-109.7%

Appendices

Appendix Table A1: Pairwise comparisons of *I** estimates between countries: t-test statistics

	Netherl	Germany	Spain	Belgium	Austria	Ireland	Italy	France	Greece	Luxemb	Denmark	UK
Netherl												
Germany	1.03											
Spain	**2.64**	0.96										
Belgium	**2.46**	1.06	0.24									
Austria	**2.27**	1.04	0.26	0.04								
Ireland	**3.07**	1.34	0.55	0.22	0.15							
Italy	**3.26**	1.49	0.77	0.38	0.30	0.20						
France	**4.35**	**2.72**	**2.37**	1.80	1.58	1.83	1.64					
Greece	**5.09**	**3.07**	**2.85**	**2.10**	1.82	**2.21**	**1.99**	0.14				
Luxemb	**3.85**	**2.94**	**2.61**	**2.28**	**2.13**	**2.28**	**2.16**	0.95	0.90			
Denmark	**5.66**	**4.24**	**4.10**	**3.48**	**3.19**	**3.62**	**3.46**	1.79	1.83	0.47		
UK	**8.83**	**6.66**	**7.05**	**5.92**	**5.37**	**6.37**	**6.17**	**3.81**	**4.09**	1.72	1.51	
Portugal	**11.52**	**9.05**	**9.80**	**8.40**	**7.67**	**9.05**	**8.83**	**6.12**	**6.61**	**3.29**	**3.43**	**2.16**

Note: Countries ranked by *I**. Values significantly different from zero (at P<0.05) in bold typeface.