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HOW WIDE IS THE INEQUALITY GAP? SOCIOECONOMIC HEALTH INEQUALITIES IN CATALONIA.

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Abstract

This paper empirically examines social class and income related inequalities using individual self reported health status data. Health inequalities are estimated by different index using individual standardised and unstandardised health status data. The population was partitioned by income and social class. From this we obtain two main results: inequalities are sensitive to the health status variable and the reference variable employed. Whereas significant health related social class inequalities were found no significant inequalities exist when income employed as a reference variable. An explanation of this may be that the illness gap may be affected by a large set of determinants (i.e education, lifestyles, etc) but also may differ at different points of the ill health distribution. To account for this feature, we define an *ad hoc* ill health gap and we employ standard and quantile regression techniques to estimate the determinants at each of the quantiles of the health distribution function. Health related behaviour and socio-economic determinants were significant determinants of reduction in the ill health gap. Further, ill health gap reduced more significantly in middle quantiles of the cumulative ill health gap distribution function than for the extreme quantiles. The explanation of this results is that programs improving living standards may be reducing illness of those with a fair health status rather than those individuals with small health status

Key words: Health inequalities, concentration index, quantile regression.

1. INTRODUCTION

The relative stability of the so-called *socio-economic health inequalities* is a matter of general concern in many occidental countries. In the UK the Acheson report and before the Balck report have strengthen this feature. Further, the "Health for all in year 2000" WHO program targeted the reduction of both within and between countries health inequalities. This has set up a huge literature on the determinants of health inequalities at the country and cross-country level. As far as reduction of inequalities in health is generally accepted as a main health policy goal in all countries -even though its preference strength will depend on the degree of societal inequality aversion - , its important looking at factors that explain their emergence and causes such as to investigate the applicability of alternative methodologies to deal with this issue. Within this framework there is an unclear evidence on the relationship of two variables : income and social class. Achenson´s recommendations assume that policies improving living standards of the poorest may reduce health inequalities. However, as Birch (1999) argues, the poorest groups in society may benefit little form increasing prosperity. Evidence shows health inequalities do not significantly reduce after improving the access to public health care.

Average health status is claimed to be influenced by a set of "layers" as individual lifestyles (Kenkel, 1995), working conditions and other determinants that may be related to a "cultural and socio-economic network" (Birch,1999). Other determinants are psychological factors (Wilkinson, 1996) , genetic determinants (Baird, 1994) and access to medical care (McCord and Freeman, 1990). Contoyannis and Forster (1999 a,1999b) argue that multiple of these factors may interact influencing health production functions and thus determining the distribution of health among individuals. Therefore, even though inequality measurement may provide some clues on the existence of socio-economic inequalities, other relevant interaction terms should be included. A comprehensive way to understand health inequalities was linking health behaviour to income, however results obtained by Contoyannis and Forster (1999b) as they recognise were extensively dependent on the shape of the of the population health function. However, this evidence may be interpreted as a need for going a step further on examining isolated determinants of health inequalities. This may be done by examining the determinants of the ill health gap by means of group or individual data.

The research on socio-economic related inequalities in Spain is todate still very small. Most of studies are based on analysing mortality in different regions (Pasarín et al ,1994) finding significant regional differences. Borrell (1992) shows evidence of education related inequalities and a significant socio-economic gradient explaining this pattern. Using health related indicators Borrell et al (2000) achieves similar results for health related inequalities usch as inequalities in the access to health care.

This paper deals with estimating relative health inequalities and the determinants of the illness gap in Catalonia. We estimate a set of inequality index following Van Doorsaler et al (1997) and Kakawani et al (1999). As far as differences were found when different socio-economic variables were employed we propose a framework based on examining the determinants of the individual ill health gap using regression and quantile regression techniques. The ill health is defined as the existent gap between individual health status and standardised health status according to the individual age and gender -. From this approach, we may be able to analyse weather lifestyles or socio-economic determinants are more responsive than other variables in explaining health inequalities. This empirical framework is similar to the one used in the labour economics and poverty literature (García et la, 2000). The main limitation of regression analysis is the existence of correlated variables that are not easy to identify isolated.

The structure of the paper is the following. Section two surveys some of the main issues concerning inequality measurement. Section three describes empirical methods and section four the main results achieved. Finally, section five ends with a conclusion section.

2. ISSUES IN MEASURING HEALTH INEQUALITIES

Methodologies implemented to deal with health inequalities are quite broad. They all tend to measure weather there are differences in ill health across socio-economic groups although methodologies differ substantially between studies. In this section we discuss some that are involved in the measurement of health inequalities and we end up proposing the methodology we use in this study.

A first issue is the *reference variable* used to measure health inequalities. Different social position measures have been employed and generally, tend to show consistent results when compared between them. Social position is approached by social class, typically relying on occupation and/or educational attainment measures and less frequently employing income (Aiach and Curtis,1990; Rahkonen and Lahelma, 1992: Otsberg and Vaguero, 1991; Pappas et al 1993; Van Dorsaaler et al , 1997). Other reference variables included are housing tenure (Blaxter,1990) and even car access (McIntyre and West,1991). In this paper we use two different social position variables : income and social class, therefore form this results it might be possible observe the influence of the reference variables in empirical health inequality analysis.

The second issue the selection of the *health status indicator* measure to be employed. To this extent, the empirical discussion is focused on whether we should employ aggregated morbidity or mortality variables or individualised health status indicators. An obvious response is that the first sort of indicators are the result of a technical assessment whereas the second result from an individual subjective assessment. If we accept the second measures, there is typically a technical problem. Self assessed indicators are typically not continuous variables even though in certain circumstances its possible to approximate them in some way to a continuous variable arguing there is an underlying latent continuous variable (Van Doorsaler, 1997).

Self reported health status variables may be classified in three : dichotomic measures, qualitative scale measures (i.e answers to the question on how would you define your own health status ? : excellent, good, bad, very bad) and quantitative scale measures i.e the thermometer. Using dichotomic measures , health inequalities arise when the proportion of individuals in poor (good) health differs between social groups considered[1]. However, in doing so there is a loss of information respect to intermediate groups . Further, heterogeneity in inequality results may appear depending on cut-off point established. The obvious advantage of dichotomic variables is its simplicity, they enable the use of qualitative dependent models, although in this case, statistical

[1]From this tables an simple comprehensive measure may be obtained just by comparing extreme groups, i.e computing the odds ratio form this two groups. That is estimating ratio between the odds of poor health in the lower social groups and the odds of poor health in the upper social group.

inference may be extremely dependent on how social position is measured (see Manor , 1997 for a discussion of the advantages of different scaling methods). The alternative are qualitative measures that allow for a more detailed information on the strength of ill health. However, to be employed as a health status variable some assumptions have to be done. Van Doorsaler et al (1997) impose a lognormal distribution to the perceived health status. Finally, quantitative measures although they share the same limitations as other self reported health status variables may be catalogued as continuous and contain a larger detail on the individuals perceived health status. In this study we use this measure although for comparative reasons the qualitative self reported health status variable is used as well to compute health inequalities. This may allow to observe how inequalities appear at different points of the ill health distribution function.

An additional criticism to some studies on health inequalities is that most of then do account for *avoidable inequalities*. Perfect equality should not be the average health status of the population as i.e a person aged 25 will generally have a better heath than a another aged 65 regardless of his socio-economic status. The comparative variable to be employed following Van Doorsaler et al (1997) is the health status rate according to demographic group where the individual pertains, that is according to the individual gender and age. Reasons for this is that health risks differ according to this characteristics, such as other as occupation variables. In this study we account for this feature standardising illness rates by age and sex groups.

Another issue refers to the *inequality indicator* to be used . A first set of measures are traditional measures used to compute income inequality as the Gini coefficient (Le Grand and Rabin, 1986 and Le Grand 1989), the coefficient of variation, the Atkinson index. However, the three are not scale invariant and do not accomplished the set of criteria established in Wagstaff et la (1991). Second are recently employed measures as the concentration and relative inequality index (Wagstaff et al, 1989) . Finally, dissimilarity, regression and association measures are often employed as well. Dissimilarity measures estimate the distance form the observed distribution to the expected under equality. However they dismiss the ordered nature of social position (Manor, 1997). Association measures show the traditional problems of incorporating a large noise such as large difficulties to establish weather inequalities emerge as a result of one feature or another (for a more detailed discussion see Wagstaff et al 1991). In

this study we employ concentration index following the methodology of VanDoorsaler and Wagstaff (1999).

The forth issue is detail of the analysis. First, we may classify studies in terms of using individual and grouped data. As Van Doorsaler and Wagstaff (1999) show inequality estimates using individual data show smaller standard errors and therefore this may lead to more accurate estimates. Second, and additional classification is between studies dealing with cross country comparisons and other country-specific. Cross country comparisons have been approached by Le Grand (1989) and recently by Van Doorsaler et al (1997). Results from this studies as Le Grand (1989) argues may be appealing, however they may have problems related to the educational and socio-economic classifications used to compute inequality measures . This sort of problems may be even larger when income is treated as the reference variable .

This paper uses survey data on individual perceived health status. This may be better that aggregated data as include as well a measure of psychological well being rather that purely physical. Moreover, we mainly deal with relative inequalities in a first part of the analysis and later on we use a different approach to compute the determinants of the health gap using regression analysis. In this second section the influence of lifestyles as tobacco and alcohol consumption may be better captured by means of individual rather than aggregate data.

3. METHODS

In this section we first describe the methodology used to analyse health inequalities and second we justify the use of regression and the quantile regression models. From this approach its possible the decomposition of health gaps (or illness gaps) at diverse quantiles in order to provide a set of measures of the size of the part of the heath gap that is attributed to different socio-economic , lifestyles and other influential variables.

a) Inequality analysis

As noted previously, we use survey data on income and social health related inequalities. Health data is self assessed health status measured as the thermometer health status -that is respondents were asked to assess their perceived health status in terms of a quantitative scale from 0 to 100- and qualitative self assessed health status in a descendant way "very bad, bad, good, very good and excellent". The thermometer was inverted to measure ill health instead of health status just computing 100 less the revealed score.

The sample was partitioned in income deciles (1-8) and social groups (1-4)in an ascending scale Moreover, since the objective was avoidable inequalities we standardised health scores to correct for demographic (age-sex) factors following Van Doorsaler et al (1997). That is standardised rate of illness was :

$$\mu^{+} = \frac{\sum_{d} n_d \mu_{dt}}{n}$$

where n_d refers to the number of persons in the dth socio-demographic group in the population, μ_{dt} is the ill-health rate amongst the persons in the demographic group for every socio-economic group t and n is the number of persons in the sample. From this was possible to compute the share of the standardised ill health for each socio-economic group.

The concentration curve is defined as the curve plotting the cumulative proportion of the population ranked by socio-economic status against the cumulative proportion of ill health $L(s)$ or standardised ill health $L^{+}(s)$. If $L^{+}(s)$ coincides with the diagonal then no socio-economic health inequalities exist. If $L^{+}(s)$ lies above the diagonal then then less -disadvantaged socio-economic groups experience higher age-sex specific rates of ill-health than the population, and the opposite holds as well. The concentration index following Van Doorsaler et al (1997) is twice the area between $L^{+}(s)$ and the diagonal.

Using individual data Kakwani et al (1999) show that the concentration index (C^+) may be calculated for (i=1,….,n) individuals ranked according to their socio-economic status as :

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

where $\mu = (1/n)\sum_{i=1}^{n}\mu_i$ is the mean level of ill health and R_i

is the relative rank of the ith person as pertaining to a particular socio-economic group t, defined as :

$$R_t = \sum_{\gamma-1}^{t-1} f\gamma + 0.5\, f_t$$

indicating the cumulative proportion of the population up to the midpoint of each group interval. However, the concentration index can be computed from the relative index of inequality, following the Kakwani et al (1997) procedure based on a weighted least squared regression of relative morbidity respect to its relative rank as :

$$\mu_t^+ / \mu^+ \sqrt{n_t} = \alpha\sqrt{n_t} + \beta \cdot R_t\sqrt{n_t} + u_t$$

where β refers to the relative index of inequality. From this it possible to compute the concentration index as $\beta = \frac{C^+}{2\sigma_R^2}$. Since we are employing individual data , we follow Kakawani et al (1999) in undertaking an indirect standardisation by replacing the persons degree of illness by the degree of illness of persons in the same demographic group. From this regression we obtain coefficient estimates and standard errors. This lead to an alternative measure of inequality (I*) defined as the difference between the concentration curves when indirect standardising is carried out (C*) with

and without ill health rate standardisation (C)(see Kakwani et al 1999 for details). By regressing the following equation standard errors can be obtained:

$$s\sigma_R^2\left[\frac{\mu_i}{\mu}-\frac{\mu_i*}{\mu*}\right]=\alpha_1+\beta_1 R_i+u_i$$

where $\mu*$ is the indirectly standardised mean ill health rate and $\mu*$ is the indirect standardised ill health of each individual.

b) The health gap methodology

As has happens in the poverty literature (Cowell, 1988) determining which persons are identified as healthy or in ill health (the ill health line or the cut-off point) may be ambiguous[2]. Therefore dichotomising heath status may suffer from this difficulty and others[3]. However, even when using continuous measures are used there is a need for defining a "equality ill health line" H_{it}^{*} . Often, inequality is measured as the (double) distance between the equality line and the health of a given individual or group of individuals. As explained in Van Doorsaler et al (1997) and Kakwani et al (1999) an operational approach to inequality requires the specification of a reference ill health rate for each demographic group .This would be a benchmark to compare individual's illness rate with the actual illness rate. If μ_i denotes the person's ill health rate, then the health gap may be the difference between each person's illness rate and the illness rate that on average have individuals of its age and sex $G=\mu_i-\mu_{it}$. However, as we are not concerned on the absolute differences but relative differences in health status we weighted individual and demographic group health status its mean as : $g_i=\frac{\mu_i}{\mu}-\frac{\mu_{it}}{\mu_t}$.

A pertinent question is : which are the determinants of the relative health gap? Is the health gap equal across its distribution?. To analyse this we compute regression

[2] Even though, if individuals are assess their own health status we are implicitly assuming that is the individual that is able to define itself as healthy or not.

[3] A health stock affecting only disabled individuals or in generals ill health individuals would leave the inequality index unchanged.

and quantile regression models decomposing health gaps at different quantiles of the illness distribution function.

Analogously as in the labour economics literature, a health gap explained by differences in individual lifestyles may be seen as the result of a higher return to health investment. A standard measure of the impact of different socio-economic variables in the health status would be using simple regression models. As its well known from the first order OLS conditions and using the indirectly standardised relative health status we may compute the ill health gap (measured in logs) as :

$$\hat{g} = S_{it}^{'}(\hat{\beta}_{\mu} - \beta_{\mu^*}) + X_i\beta_x + u^*_{i\mu} - \hat{u}_{i\mu^*}$$

where S refers to socio-economic status, X refers to lifestyles, and individual and regional determinants and u^*_{μ} refers to unobserved factors on the indirectly standardised health .Due to the unobservability of lifestyles, this may be instrumented by smoking behaviour, drinking alcohol and hours of sleep. Moreover visits to the doctor and private health expenditure may be seen as a health investment as well.

The quantile regression model analytical framework is based on Korenker and Bassat (1976). This methodology allow for studying wheather there are socio-economic factors explaining differences in the ill health gap of the population. The model specifies the conditional quantile as a linear function of covariates as follows :

$$\hat{Q}_{\theta}((\mu_i / \mu) / S_t) - \hat{Q}_{\theta}((\mu^*_{it} / \mu_t) / S_t) = S_{it}^{'}(\hat{\beta}_{\mu} - \beta_{\mu^*}) + X_i\beta_x + residual$$

where $Q(\cdot)$ refers to the θ the quantile of the ill health distribution conditional on the socio-economic group, and in general the quantile function is : $Q(\theta) = \inf\{t / F(t) \geq \theta\}$.

c) The data

We obtain our estimates form the *Enquesta de Salut de Catalunya* 1994. This is a survey carried out by the Catalan Health Service. The original sample was of 15000 individuals however, after depurating avoided answers the final sample was of 14282 for social class analysis and 12110 for income inequality analysis. The survey collects information on a very large number of items concerning lifestyles, health status measures and health expenditure.

As noted before, the stratifying variables were social class and income after taxes have been paid. From the original survey design the last 3 income deciles were merged and the two last social class items were merged as well to obtain 8 income deciles and 4 social groups. However, not all income groups and social classes were equally distributed. The reasons for this is that most of the population considers itself in a middle class and income tends to accumulate in the middle income deciles. The survey has less detailed income information as other studies. Respondents were asked to assign themselves to an income scale group, therefore a middle point was chosen to compute individual income.

In the regression analysis we instrument lifestyles using several indicators as number of cigarettes smoked, physical activity, hours of sleep, being on a risky job, pharmaceutical and private health care expenditure, and phi expenditure. Regional differences were considered as may explain differences in the access to health care. Finally individual characteristics were included as age , sex or being married. Even though illness rates were standardised by age and sex, differences may appear due to personal characteristics as well.

4. RESULTS

Table 1 illustrates standardised and unstandardised ill health rates by income deciles. First two columns refer to the thermometer measure (SAHT) and the next to refer to the qualitative self perceived health status measure (SAH). It was found that lower income deciles experience higher levels of ill-health with the exception of the bottom deciles. With some exceptions, ill-health rates increased after standardisation in lower income deciles. Further, Atkinson and Gini inequality were provided as a prior inequality measure. Looking at illness rates by social class in table 2, we find that the effect of standardisation was to increase illness rates in the top of social class distribution. Here, however relevant health inequalities were found. Note as a relevant feature that there were sensible differences between results obtained from the two health status measures.

Table 3 provides the results of the relative inequality (beta 1 and 2 obtained using standardised and unstandardising ill health rates) , and concentration index (C and C+) and the inequality index (I*). Regardless of accounting by the demographic structure of the sample, no significant income related health inequalities were found. However, looking at social class inequalities, the negative values of all the parameters imply that after accounting for the demographic structure, significant inequalities in health favour the top social classes. Moreover, inequalities were more pronounced using the thermometer that using the qualitative self assessed variable. Standardised indices were smaller that the unstandardised what means that some part of the inequality may be unavoidable.

Table 4 shows the descriptive statistics of the variables used in the regression analysis. In table 5, we obtain some evidence on the determinants of the illness gap. First, its noted that the explanatory power of the models is small. This may be due to the existence of other non considered factors influencing health status. Moreover, the large values of the t-tests may be indicative of the association between covariates included.

The ill health gap reduces with social class, what is consistent with the results previously obtained. Actually, the ill health gap is a 54% higher for low social classes respect to high social classes. Regarding income, the only significant variable is middle income (Income4) that appears to show a small income gap respect to lower and upper income groups. Findings suggests that the illness gap decreases with age at al 0.7% a year. The illness gap seems to be a 10% higher for women than for men and significantly higher for married individuals than for unmarried. A healthier health related behaviour is associated with a smaller ill health gap as predicted. Moreover there were sensible regional differences as a low income region was taken as the omitted variable. Finally, education reduced the illness gap, the ill health gap reduces in a 49% if the individual has finished the secondary school respect tom illiterate individuals.

From quantile regression models we may obtain some evidence on how these former effects change over the ill health distribution. Tables 6 and 7 provide information on the change in the determinants of the illness gap as we move along the distribution. Note that the effect of social class education and income shows a U- effect in the ill health gap distribution function. Looking at the middle quantiles of the ill health gap distribution function we find that income appears as a significant variable explaining the emergence of a health gap, the effect of social class and education in this point of the distribution is higher than for other points. Health related behaviour in the bottom points of the distribution function appear to be higher than in the other points of the distribution.

5. DISCUSSION

This study provides empirical evidence on the difficulties that emerge when measuring socio-economic health inequalities. We follow the Van Doorsaler et la (1997) and Kakawani et al (1999) methodology to compute relative inequality and concentration index for a sample of the Catalan population in 1994. Results have shown that no health related income inequalities seem to exists . However when applying the same methodology using social class as a reference variable, we find significant health inequalities. This may be explained from the feature that middle income groups do not

show relevant differences in health status compared to high income groups. Therefore, when social class is considered, the difference with low and middle income groups appears to be larger what leads to higher health inequalities. Therefore, socio-economic health inequalities typically emerge when comparing the lowest income groups with the rest . Moreover, the health status variable shed significant differences when computing inequalities, in particular when the thermometer health status was employed larger health inequalities were achieved. Comparing this results from the results obtained by Van Doorsaler et al (1997) we find that compared to Spain, in Catalonia inequalities seem to be smaller. Finally, standardising ill health reduced health inequalities significantly at one half, what may be showing that one half of apparent health inequalities were unavoidable.

Due to the existent difficulties we find when accounting for income inequalities, we designed an alternative methodology. This was based on defining an ad hoc measure of ill health gap and examining for the whole sample and at different points of the ill health distribution the determinants of the ill health gap. Health related behaviour and socio-economic determinants were significant determinants of reduction in the ill health gap. Further, ill health gap reduced more significantly in middle quantiles of the cumulative ill health gap distribution function than for the extreme quantiles. The explanation of this results is that programs improving living standards may be reducing illness of those with a fair health status rather than those individuals with small health status, however more discussion and analysis of these results may be needed.

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Table 1. Illness rates and income health inequalities according to different health status indicators

Deciles	SAHT (Un)*	SAHT (St)*	SAH(Un)**	SAH (Std)**
1	28.498	28.929	2.981	3.002
2	27.201	27.090	2.921	2.918
3	28.087	27.893	2.971	2.962
4	26.851	27.085	2.963	2.974
5	28.077	27.966	2.971	2.970
6	27.114	27.509	2.968	2.981
7	27.903	28.653	2.945	2.977
8	28.361	28.220	3	2.978
Gini	.0116	.01353	.0041	.0037
Atkinson	.0002	0.003	.00002	.00002

Table 2 . Illness rates and health social class health inequalities according to different health status indicators

Class	SAHT (Un)*	SAHT (St)*	SAH(Un)**	SAH (Std)**
1	42.205	34.938	3.476	3.258
2	32.007	29.722	3.188	3.090
3	24.940	26.128	2.852	2.901
4	20.606	23.612	2.533	2.685
Gini	.1500	.0821	.0656	.03996
Atkinson	.0358	.0107	.0069	.0025

Table 3. Concentration indices and standard errors for individual and group data

SAHT***				SAH**		
Income						
	coeff	s.e	t-test	coeff	s.e	t-test
beta1	0.008	0.029	0.266	0.012	0.009	1.315
beta2	-0.013	0.032	-0.391	0.018	0.008	2.252
C	0.001	0.005	0.266	0.002	0.002	1.017
C+	-0.002	0.005	-0.391	0.002	0.001	1.786
I*	0.003	0.004	1.205	0.000	0.000	1.786
Social Class						
beta1	-0.732	0.186	-3.931	-0.294	0.035	-8.304
beta2	-0.381	0.095	-4.026	-0.172	0.023	-7.608
C	-0.086	0.022	-3.931	-0.035	0.004	-8.304
C+	-0.045	0.011	-4.026	-0.021	0.003	-7.608
I*	-0.046	0.003	-18.076	-0.015	0.004	-4.105

*Thermometer self reported health status
**Qualitative self reported health status

Table 4 Summary statistics

Variable	Description	Obs	Mean	Std. Err.
Age	Individual age	14828	39.495	0.188
Sex	Male=1	14828	0.478	0.004
Married	Married=1	14828	0.513	0.004
Fiscial	Physical activity	12110	2.404	0.009
Sleep	Hours of sleep a day	12110	425.538	1.042
Smoke	Number of cigarettes smoked	12107	4.534	0.086
Risk	Job risk=1	14828	0.222	0.003
Visits	Respondent has visit the doctor (last 3 months)	14828	0.215	0.003
Pharma	Pharmaceutical expenditure	14828	7807.631	183.606
Outpock	Out of pocket health care expenditure	14828	36160.880	1367.594
PHI	Private health insurance expenditure	14826	63889.720	1657.540
Agedrink	Age start drinking alcohol	12110	6.651	0.138
Region 2		14828	0.111	0.003
Region 3		14828	0.122	0.003
Region 4		14828	0.134	0.003
Region 5		14828	0.117	0.003
Region 6		14828	0.119	0.003
Region 7		14828	0.129	0.003
Region 8		14828	0.145	0.003
Income 2		12110	0.137	0.003
Income 3		12110	0.248	0.004
Income 4		12110	0.153	0.003
Income 5		12110	0.054	0.002
Income 6		12110	0.020	0.001
Income 7		12110	0.011	0.001
Income 8		12110	0.068	0.002
Class I		14828	0.078635	0.002
Class II		14828	0.2334772	0.003
Class III		14828	0.6452657	0.004
Class IV		14828	0.0426221	0.002
Educ 2	Respondent has finished primary school	14828	0.274	0.004
Educ 3	Respondent has finished secondary school	14828	0.158	0.003

Table 5. OLS estimates for the illness gap

	Social Class		Income	
	Coef.	t	Coef.	t
Age	-0.007	-5.997	-0.007	-5.739
Sex	0.085	2.647	0.117	3.422
Married	0.061	1.789	0.102	2.832
Fiscial	-0.059	-3.926	-0.056	-3.662
Sleep	0.000	-3.121	0.000	-3.339
Smoke	0.004	2.388	0.005	2.982
Risk	0.198	5.885	0.200	5.819
Visits	0.232	6.757	0.230	6.67
Pharma	0.000	2.087	0.000	2.067
Outpock	0.000	-1.418	0.000	-1.68
PHI	0.000	-2.703	0.000	-2.904
Agedrink	0.000	-0.105	0.000	-0.01
Region 2	-0.255	-4.258	-0.295	-4.941
Region 3	-0.333	-5.36	-0.375	-6.094
Region 4	-0.510	-8.482	-0.526	-8.785
Region 5	-0.399	-6.524	-0.420	-6.896
Region 6	-0.381	-6.438	-0.390	-6.615
Region 7	-0.511	-8.564	-0.544	-9.173
Region 8	-0.491	-8.312	-0.513	-8.695
Class I	0.537	5.529		
Class II	0.217	2.44		
Class III	0.184	2.183		
Income 2			0.197	3.91
Income 3			0.027	0.629
Income 4			-0.126	-2.365
Income 5			-0.097	-1.171
Income 6			-0.181	-1.35
Income 7			-0.053	-0.302
Income 8			-0.037	-0.527
Educ 2	-0.207	-4.531	-0.210	-4.556
Educ 3	-0.312	-5.965	-0.309	-5.669
Intercept	-0.489	-3.56	-0.289	-2.594
R-squared	0.0605		0.0611	
F(24,5792)	16.59		13.44	

Table 6. Quantile regression estimates (social class)

	10%		25%		50%		75%		90%	
	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	t
Age	-0.017	-20.57	-0.002	-1.545	-0.005	-4.111	-0.002	-1.898	-0.001	-1.054
Sex	0.288	13.522	0.073	2.31	-0.075	-2.058	-0.104	-3.486	-0.047	-1.688
Married	0.323	13.75	0.172	5.155	0.044	1.14	0.014	0.418	-0.028	-0.928
Fiscial	-0.010	-1.026	-0.033	-2.28	-0.073	-4.237	-0.061	-4.133	-0.056	-3.785
Sleep	0.000	-3.162	0.000	-3.624	0.000	-2.538	0.000	-0.992	0.000	-1.251
Smoke	0.002	1.919	0.004	2.448	0.004	2.366	0.005	3.053	0.005	3.024
Risk	0.103	4.413	0.256	7.787	0.200	5.228	0.188	6.057	0.110	3.818
Visits	0.088	3.8	0.293	8.691	0.219	5.612	0.213	6.652	0.203	6.726
Pharma	0.000	0.784	0.000	1.511	0.000	2.51E+00	0.000	2.52E+00	0.000	1.239
Outpock	0.000	0.148	0.000	-0.633	0.000	-7.61E-01	0.000	-1.59E+00	0.000	-1.89
PHI	0.000	-1.262	0.000	-1.651	0.000	-3.51E+00	0.000	-4.66E+00	0.000	-1.198
Agedrink	0.002	2.251	-0.002	-1.746	0.001	0.606	0.000	0.254	-0.001	-0.573
Region 2	-0.075	-1.844	-0.190	-3.19	-0.132	-1.937	-0.375	-6.967	-0.528	-10.463
Region 3	-0.048	-1.137	-0.306	-4.964	-0.273	-3.861	-0.496	-8.83	-0.544	-10.136
Region 4	-0.123	-3.057	-0.378	-6.356	-0.410	-5.997	-0.596	-10.918	-0.689	-13.346
Region 5	-0.080	-1.915	-0.351	-5.786	-0.282	-4.059	-0.470	-8.559	-0.550	-10.733
Region 6	-0.053	-1.331	-0.385	-6.581	-0.301	-4.468	-0.474	-8.924	-0.551	-10.956
Region 7	-0.190	-4.735	-0.404	-6.848	-0.402	-5.935	-0.548	-10.232	-0.665	-13.172
Region 8	-0.100	-2.487	-0.428	-7.234	-0.397	-5.928	-0.555	-10.415	-0.658	-13.062
Class I	0.264	3.98	0.484	5.078	0.445	4.042	0.549	6.186	0.460	5.38
Class II	0.100	1.663	0.183	2.109	0.130	1.291	0.172	2.106	0.279	3.581
Class III	0.072	1.26	0.138	1.684	0.148	1.554	0.133	1.723	0.226	3.073
Educ 2	-0.145	-4.835	-0.405	-9.059	-0.271	-5.226	-0.110	-2.522	-0.068	-1.638
Educ 3	-0.116	-3.217	-0.433	-8.38	-0.395	-6.656	-0.268	-5.408	-0.199	-4.112
Intercept	-2.050	-21.112	-1.431	-10.434	-0.250	-1.606	0.202	1.611	0.594	4.943
Pseudo R square	0.053		0.0535		0.0362		0.0545		0.082	

Table 7. Quantile regression estimates (income)

	10%		25%		50%		75%		90%	
	Coef.	t	Coef.	t	Coef.	t	Coef.	t	Coef.	t
Age	-0.017	-18.146	-0.002	-1.896	-0.005	-4.06	-0.003	-2.363	0.000	-0.136
Sex	0.309	11.513	0.101	3.075	-0.010	-0.249	-0.114	-3.589	-0.010	-0.282
Married	0.350	12.463	0.262	7.786	0.106	2.556	0.026	0.775	0.006	0.163
Fiscial	-0.015	-1.388	-0.029	-2.015	-0.069	-3.958	-0.059	-4.021	-0.047	-2.707
Sleep	0.000	-2.698	0.000	-3.786	0.000	-3.161	0.000	-1.394	0.000	-1.001
Smoke	0.002	1.565	0.006	3.788	0.005	2.76	0.005	3.093	0.005	2.936
Risk	0.094	3.526	0.271	8.343	0.198	5.015	0.195	6.151	0.115	3.244
Visits	0.087	3.293	0.268	8.186	0.230	5.833	0.233	7.28	0.208	5.737
Pharma	0.000	3.07E-01	0.000	1.593	0.000	2.091	0.000	2.378	0.000	1.812
Outpock	0.000	3.40E-01	0.000	-0.557	0.000	-1.56	0.000	-2.016	0.000	-2.095
PHI	0.000	-1.05E+00	0.000	-1.895	0.000	-3.054	0.000	-5.096	0.000	-1.328
Agedrink	0.001	1.153	-0.001	-0.854	0.001	0.519	0.000	-0.335	-0.001	-0.621
Region 2	-0.042	-0.928	-0.154	-2.691	-0.138	-2.012	-0.469	-8.61	-0.592	-9.804
Region 3	-0.024	-0.505	-0.305	-5.192	-0.289	-4.096	-0.553	-9.81	-0.615	-9.757
Region 4	-0.093	-2.051	-0.323	-5.639	-0.399	-5.795	-0.684	-12.437	-0.747	-12.176
Region 5	-0.047	-1.013	-0.291	-5.007	-0.291	-4.165	-0.559	-10.1	-0.612	-10.092
Region 6	-0.007	-0.147	-0.344	-6.137	-0.282	-4.165	-0.547	-10.27	-0.619	-10.474
Region 7	-0.147	-3.235	-0.350	-6.196	-0.385	-5.651	-0.635	-11.767	-0.730	-12.22
Region 8	-0.057	-1.264	-0.380	-6.679	-0.376	-5.553	-0.624	-11.583	-0.744	-12.558
Income 2	0.094	2.382	0.199	4.207	0.190	3.286	0.198	4.322	0.055	1.035
Income 3	0.074	2.162	-0.005	-0.116	0.008	0.155	0.037	0.934	0.011	0.251
Income 4	0.004	0.103	-0.185	-3.636	-0.124	-2.024	-0.079	-1.619	-0.138	-2.532
Income 5	0.004	0.057	-0.162	-2.059	-0.176	-1.856	0.024	0.312	0.010	0.115
Income 6	0.037	0.394	-0.150	-1.205	-0.327	-2.138	-0.048	-0.393	-0.197	-1.473
Income 7	0.157	1.213	-0.164	-1.009	-0.139	-0.692	0.114	0.728	0.046	0.26
Income 8	0.038	0.707	-0.025	-0.37	-0.053	-0.655	-0.066	-1.014	-0.112	-1.52
Educ 2	-0.179	-5.253	-0.401	-9.222	-0.243	-4.592	-0.113	-2.576	-0.055	-1.123
Educ 3	-0.153	-3.735	-0.437	-8.419	-0.362	-5.788	-0.290	-5.647	-0.218	-3.788
Intercept	-1.987	-23.165	-1.346	-12.604	-0.125	-0.981	0.466	4.463	0.819	7.006
Pseudo R	0.0521		0.0537		0.376		0.0496		0.0852	