Evolution of social inequalities in health in Quebec?

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Abstract

This paper, based on data from the National Population Health Surveys (NPHS) from 1994 to 2007, analyzes the evolution of social inequalities in health in Quebec since the mid-1990s using two health measures namely self-assessed health (SAH) and health utility index (HUI). Two methods are used. The first is based on concentration indices and their decompositions while the second is based on the income-health matrices. The results confirm the existence of persistent health gradients, but with some variations over time. The findings also suggest an increase, on average, in health inequalities during the period with a peak during the years 2002/2003. These variations appear especially stronger for low-income individuals.

Keywords: Concentration indices, decomposition analysis, self-assessed health, health utility index, income-health matrices, dominance analysis.
JEL Classification: C21, C25, D31, D63, I12, J60.

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1. Introduction

There is relatively abundant literature on the link between socioeconomic status and the health of individuals. Research conducted on aggregate data (Marmot 2005, Pascual, Cantarero and Sarabia 2005, Murthy 2006) as well as on individual data (McLeod et al. 2003, Deaton 2003, Wildman 2003, Safaei 2007, Jones and Wildman 2008) highlights the importance of socioeconomic determinants of health. Social inequalities in health are challenge for public health inasmuch as it is unacceptable, from an ethical point of view, that individuals do not have the same prospects when confronted with illness or death, and that these prospects are strongly determined by social status. Using a conceptual approach, Frenk et al. (1994) identified political institutions as one of the components of social determinants of health. By comparing the health indicators of a few industrialized countries, Starfield and Shi (2002) demonstrated that countries with poor healthcare systems generally perform poorly. Moreover, a comparative analysis of the Canadian and American systems revealed that universal health insurance helps reduce social inequalities in health (Decker and Remler, 2004). Thus, social inequalities in health can evolve over time, based on public health actions undertaken.

In Canada, health promotion began in effect with the Lalonde report (1974) and was reinforced by the 1986 Ottawa Charter. Within this approach, the idea of promoting health goes hand in hand with identifying health determinants that extend well beyond traditional medical care. A Canadian study showed that, between 1971 and 1996, differences in mortality rates among different income quitiles diminished (Wilkens, Berthelot and Ng, 2002). On the other hand, Glouberman and Millar (2003) emphasized that despite modest successes, the population health approach has not resulted in adequate policy development to effectively reduce health inequalities. However, there are differences among Canadian provinces since each province defines its own health policies[1]. In Quebec, the overall trend is to integrate considerations on social and health issues. This is how the 1992 *Policy on Health and Well-Being* states its objective to alleviate health and social problems using a unified approach that considers determinants of well-being and of population health. This policy was reinforced by the adoption of *Québec Priorities in Public Health 1997-2002,* whose objective was to assign the same public health priorities in all regions of Quebec. The policy was bolstered further with the *Québec Public Health Program 2003-2012,* which aims to improve the population's well-being while bearing in mind that health and well-being are not separate. Have these efforts succeeded to change health inequalities over the past two decades?

Few studies have analyzed the evolution of social inequalities in health in Quebec. Among the more recent studies, we can cite Pampalon, Hamel and Gamache (2008*a*, 2008*b*). Their results show that social inequalities in premature mortality also increased to varying degrees

[1] For instance, Bernier (2005) compares the public health policies in Ontario, Alberta and Quebec.

between the end of the 1980s and the early 2000s, based on sex, cause of death and geographical setting. Several other studies have also analyzed the phenomenon, using self-assessed health as a measure of health (Borrell et al., 2000; Dalstra et al., 2002; Krokstad, Kunst and Westin, 2002; Kunst et al., 2004). In general, most of these studies show that social inequalities in health remain fairly stable over time, even though results depend on the preferred measure of health.

The goal of our study, based on data from the National Population Health Surveys (NPHS) for 1994 to 2007, is to analyze the evolution of social inequalities in health in Quebec from the mid-1990s to 2007. Our study differs from those of Pampalon, Hamel and Gamache (2008*a*, 2008*b*) not only in terms of health measures chosen but also of methodological approaches adopted and database used. We used two health measurement instruments, self-assessed health (SAH) and the health utilities index (HUI). This choice was based on our interest in using, on the one hand, a health measure (HUI) generally deemed objective (Humphries and van Doorslaer, 2000) and, on the other hand, a measure (SAH) that reflects an individual's mental and physical health, as well as other dimensions of well-being likely to affect the person's perception of his or her health status. We used two methodological approaches. The first, which is based on concentration indices and curves developed in the literature (Kakwani, Wagstaff and van Doorslaer, 1997; Wagstaff, 2002; O'Donnell et al., 2008), allows us to grasp the level of inequalities. Using the decomposition method suggested by Wagstaff, van Doorslaer and Watanabe (2003), we can analyze how the contribution of some socioeconomic factors to social inequalities in health has evolved, which could prove to be very interesting in terns of public health policy[2]. The second approach is based on the concept of "equal health opportunities". This concept arises from a model borrowed from the literature on income mobility and which is based on transition matrices (Zheng, 2006). For an individual in a given socioeconomic class, a health opportunity conveys the various probabilities of his or her being associated with different levels of health. Certain reasons explain our choice for this approach. Concentration curves and income-health matrices are both useful tools that provide robust normative comparisons of social inequalities in health and well-being.

The following section describes our methodological approaches and data source. The main results are then presented in the third section, and the last section provides a summary of results.

[2] Such a study was conducted by García-Gómez and López Nicolás (2004) for Spain.

2. Methods and Data

2.1. Measuring Health

Generally, two health measures are considered in health inequality analyses that use household surveys.

First, self-assessed health (SAH) is a measure presented as a qualitative variable through which an individual rates his or or own health: poor, fair, good, very good or excellent. Several studies have used this indicator to analyze the evolution of social inequalities in health (Borrell et al., 2000; Dalstra et al., 2002; Krokstad, Kunst and Westin, 2002; Kunst et al., 2004). However, as van Doorslaer and Jones (2003) assert, use of this measure to estimate inequality indices often requires a dichotomization (good health and poor health) that makes comparisons of health inequalities through time unreliable. There is also a lack of variability, which can lead to an unawareness of certain changes in level of health. Use of income-health matrices that consider income scales as well as health scales can help avoid the problem raised by van Doorslaer and Jones (2003), by considering the various health categories as health scales.

The second measurement is the health utilities index (HUI) developed by Torrence et al. (1996) and Feeny et al. (2002). This is a cardinal measure that considers quantitative and qualitative aspects of an individual's health based on 8 attributes: sight, hearing, speech, mobility, dexterity, emotion, cognition and pain. It is considered to be a more objective measure of health than SAH (Humphries and van Doorslaer, 2000). The index varies from -0.3 to 1, where negative values correspond to a health status worse than death and 1 corresponds to a perfect state of health. Like McGrail et al. (2009), we will exclude from the sample individuals whose HUI score is less than zero. While the index is very useful to characterize health inequalities and to draw regional comparisons in terms of actual health, it can also prove to be stable in the medium term when describing, for the most part, states of health that are chronic or linked to ageing; Consequently, a third measure could be more appropriate.

The third measure is based on imposing a cardinal measure on SAH. Van Doorslaer and Jones (2003) compared alternative cardinalization methods, including ordered probit (Groot, 2000) and interval regression (Jones, 2000) models. Although it was demonstrated, using Canadian NPHS data, that the ordered probit model overestimated social inequalities obtained through the HUI, in this case, this is the preferred approach to determine the cardinal measure of SAH. This choice can be explained by the fact that, while SAH can help to understand health as well as other aspects of well-being, we do not expect a perfect correlation between self-assessed health and the health utilities index. The goal is to estimate the following equation:

$$h_i^* = \sum_{k=1}^{K} \beta_k x_{ki} + \varepsilon_i, \qquad \varepsilon_i \sim N(0,1), \tag{1}$$

where h_i^* is the latent health variable for individual i, x_{ki} socioeconomic health determinants, and ε_i the error term that should converge to a standard normal distribution. That is, h_i the qualitative SAH variable observed. It is linked to h_i^* as follows:

$$h_i = j \quad \text{if} \quad \lambda_{j-1} < h_i^* \leq \lambda_j, \quad j = 1, \ldots, J \tag{2}$$

with $\lambda_0 = -\infty$, $\lambda_J = \infty$ and J the number of answer categories. Predicted values h^* are normalised on interval boundaries $[0,1]$, as suggested by van Doorslaer and Jones (2003).

2.2. Measuring social inequalities in health

An appropriate measurement to analyze social inequalities in health is given by the concentration index developed by Wagstaff, Paci and van Doorslaer (1991). The index is used to understand the degree of health inequalities linked to socioeconomic status (e.g. income). The goal is to analyze differences in distribution of health when individuals are classified in ascending order of income or wealth. When dealing with grouped data, as is the case for income in NPHS, the formula for the concentration index is as follows (Kakwani, Wagstaff and van Doorslaer, 1997):

$$C = 1 - \frac{2}{\bar{h}} \sum_{s=1}^{S} p_s \bar{h}_s (1 - R_s), \tag{3}$$

where p_s is the proportion of individuals in group m, $\bar{h}_s$ the group's average level of health, S the number of groups, and $\bar{h}$ the average level of health in the sample as a whole, with $\bar{h} = \sum_{s=1}^{S} p_s \bar{h}_s$. R_s is the relative ranking of group s and is defined by:

$$R_s = \sum_{l=1}^{s-1} p_l + \frac{1}{2} p_s . \tag{4}$$

Kakwani, Wagstaff and van Doorslaer (1997) derived robust standard errors for estimator C.

To take into account inequality aversion, Wagstaff (2002) suggested a more general concentration index. If we designate inequality aversion as θ, the index is expressed as follows (O'Donnell et al., 2008):

$$C(\theta) = 1 - \frac{\theta}{\bar{h}} \sum_{s=1}^{S} p_s \bar{h}_s (1 - R_s)^{\theta - 1} \tag{5}$$

For $\theta = 2$, we find again the proposed concentration in equation form (3). Higher θ values mean increasingly more weight is given to the level of health of individuals from lower socioeconomic classes.

When health is explained using a certain number of seocioeconomic determinants, Wagstaff, van Doorslaer and Watanabe (2003) suggest decomposing social inequalities in health based on averages and indices of inequality determinants, weighted by their respective health effects. Through the equation (1), the cardinality process enables contemplation of this perspective. The concentration index for h^* can then be decomposed as follows:

$$C(\theta) = \sum_{k=1}^{K} \eta_k C_k(\theta) + \frac{GC_\varepsilon(\theta)}{\bar{h}}, \tag{6}$$

where $\eta_k = \frac{\beta_k \bar{x}_k}{\bar{h}}$ is the elasticity of health, $C_k(\theta)$ the concentration index for the determinant k in relation to income, and $GC_\varepsilon(\theta)$ a generalized concentration index for ε. The proof, inspired by that of Wagstaff, van Doorslaer and Watanage (2003), is included in the appendix. More specifically, it is an extension of proof for grouped data, with consideration for aversion to inequality. Moreover, since the variable of interest here is the predicted $\hat{h}_i^* = \sum_{k=1}^{K} \hat{\beta}_k x_{ki}$, then $GC_\varepsilon(\theta) = 0$.

It is also possible to perform decomposition analysis of the concentration index over time by applying the Oaxaca method (Wagstaff, van Doorslaer and Watanabe, 2003). If we consider a population at two periods $t-1$ and t, we get the following equation (6) for Oaxaca decomposition:

$$\Delta C(\theta) = \sum_{k=1}^{K} \eta_{kt} \left(C_{kt}(\theta) - C_{kt-1}(\theta) \right) + \sum_{k=1}^{K} C_{kt-1}(\theta) (\eta_{kt} - \eta_{kt-1}) + \Delta \left(\frac{GC_{\varepsilon t}(\theta)}{\bar{h}} \right) \tag{7}$$

2.3. Measuring health opportunity

Supposing, like Zheng (2006), that the relationship between an individual's health status and socioeconomic class is a stochastic one, health opportunities can be represented on a income-health matrix $\prod = |\alpha_{kl}|$, where k represents socioeconomic class, l is health status and α_{kl} the probability that an individual from class k will be in l health. The idea is similar to income mobility, where researchers like Atkinson (1983) and Dardanoni (1993) theoretically demonstrated that comparison of mobility involved that of well being. In substance, in a society where there is wide-ranging mobility or equitable health opportunities, social well-being is high. We suppose that there are K income and L health statuses, both arranged in order from lowest to highest levels. For a given k group, the profile $(\alpha_{k1}, \alpha_{k2}, ..., \alpha_{kL})$ describes the various probabilities that an individual from this group will benefit from one of these L health statuses. Thus, the $\prod$ matrix gives us the health opportunities for the whole of the population and describes the level of social inequalities in health with respect to income.

Where $P = (p_1, p_2, ..., p_K)$, population distribution over socioeconomic classes, and $Q = (q_1, q_2, ..., q_K)$ distribution over levels of health, we then get $q_l = \sum_{k=1}^{K} p_k \alpha_{kl}$. In a society characterized by an absence of social inequalities in health, each profile $(\alpha_{k1}, \alpha_{k2}, ..., \alpha_{kL})$ should not differ significantly $(q_1, q_2, ..., q_K)$. This means that no matter what socioeconomic class they belong to, these individuals have the same health opportunities or the same equal chances regarding health statuses. However, when there are social inequalities in health, we note significant differences among profiles, with poorer classes tending to have relatively higher probabilities of having lower health statuses. In both cases (absence or presence of social inequalities), from a logical perspective, the matrices are assumed to be logically monotonous.

A matrix is said to be monotonous when each line stochastically dominates the one above it. Formally, this hypothesis is represented as follows (Conlisk 1990, Zheng 2006):

$$\sum_{j=1}^{l} \alpha_{k,j} \geq \sum_{j=1}^{l} \alpha_{k+1,j} \ , \tag{8}$$

for $k = 1,2,..., K-1$ and $l = 1,2,..., L$. This condition signifies that an individual from a given class cannot present poorer health opportunities than those of an individual from a lower class. As noted by Zheng (2006), this hypothesis is supported by many studies that have demonstrated the role of social gradients in health outcomes. Where social inequalities are established, inequality in the equation (8) holds strictly for some k and l.

A stochastic dominance analysis performed using income-health matrices can be interpreted in terms of generalized Lorenz dominance of health expectancies. This means that a population that dominates another also presents a superior level of social well-being. The dominance condition is expressed as follows:

In terms of generalized Lorenz expectancy, a health expectancy $e(\Pi_\alpha)$ *dominates another health expectancy* $e(\Pi_\beta)$ *if and only if*

$$\sum_{i=1}^{k}\sum_{j=1}^{l} p_i \alpha_{ij} \leq \sum_{i=1}^{k}\sum_{j=1}^{l} p_i \beta_{ij} \, , \tag{9}$$

for all $k = 1,2,...,K$ and for all $l = 1,2,...,L$.

Π_α and Π_β represent income-health matrices in two different populations or in a same population at two different periods.

2.4. Data sources

The study is based on National Population Health Surveys (NPHS), in particular on information pertaining to Quebec. The first wave of the survey took place in 1994-95. The survey is conducted every two years. At this time, seven waves are available, covering the years 1994 to 2007: wave 1 (1994-95), wave 2 (1996-97), wave 3 (1998-99), wave 4 (2000-01), wave 5 (2002-03), wave 6 (2004-05) and wave 7 (2006-07). The longitudinal sample, composed of 17 276 individuals selected at wave 1, is not renewed over time. In this sample, 3000 people represent Quebec's 1994-95 population. These surveys provide information on HUI and SAH, as well as on economic, social and demographic factors likely to influence health. To make comparisons over time, we chose to limit the analysis to an age group rather than to consider the entire sample which, given the fact that it is not renewed, is ageing from year to year. For the decomposition analysis, there are three distinct age groups for men and three for women: 12 to 30 years, 31 to 45 years and 46 to 65 years respectively. The exclusion of some age groups (under 12 and over 65) combined with erosion due to non response explain the decline in number of respondents from one wave to another. Therefore, of the 2134 individuals (that is, 2/3 of the representative sample) in 1994-95, there are only 1455 in 2006-07 (that is, 1/2 of the representative sample). Two groups are considered for employment status: currently having or not having a job. Four groups are defined for level of education (less than a high-school diploma, high-school diploma, partial post-secondary education and post-secondary diploma). Individuals are distributed among four groups according to matrimonial status: married or common-law, single, widowed, and separated or divorced. The distributions of individuals among different groups during the various waves are found in Table A2 in the appendix.

For the first 5 waves, household income is listed according to 11 income categories, with 1 signifying no income and 11 indicating income over \$80 000. For waves 6 and 7, a 12th category was introduced, for income over \$100 000. The process followed here is similar to that of van Doorslaer and Jones (2003). The first 2 categories were combined and income for each class is represented as the sum of the values at either end of the category divided by

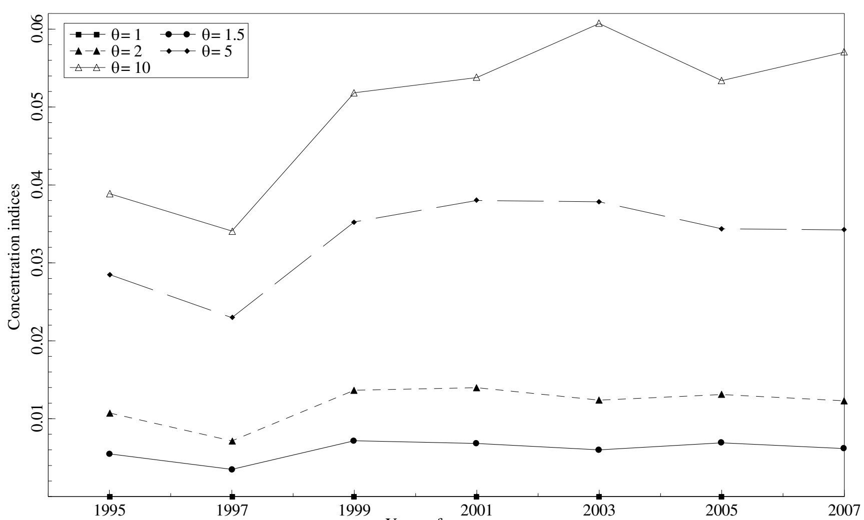
2. Income values assigned for category 1–2 and for category 12 are $2500 and $110 000 respectively. Income was then divided by an equivalence factor, the square root of the size of the corresponding household.

3. Results

3.1. Social inequalities in health

Concentration indices for the 7 waves were estimated for predicted HUI and SAH (h^*). SAH predictions were obtained using an ordered probit model on the equation (1). HUI was introduced as a predictor variable for SAH. To this end, a simple linear regression model linking HUI to the other health predictors was first estimated by ordinary least squares (OLS). Then the difference between HUI and predicted HUI (denoted here by HUI*), which represents the component unexplained by the model's socioeconomic and demographic variables, is used in the equation (1). Results of the OLS regression are also used to perform the decomposition analysis for HUI. Predicted SAH values are not normalized, as suggested by van Doorslaer and Jones (2003). Indeed, a change of scale—even a linear one—can affect the value of the concentration index. Results of all these estimates are presented in Tables A3 and A4 in the appendix.

Graph 1: Evolution of the HUI concentration index in Quebec based on aversion to inequality, 1995-2007.

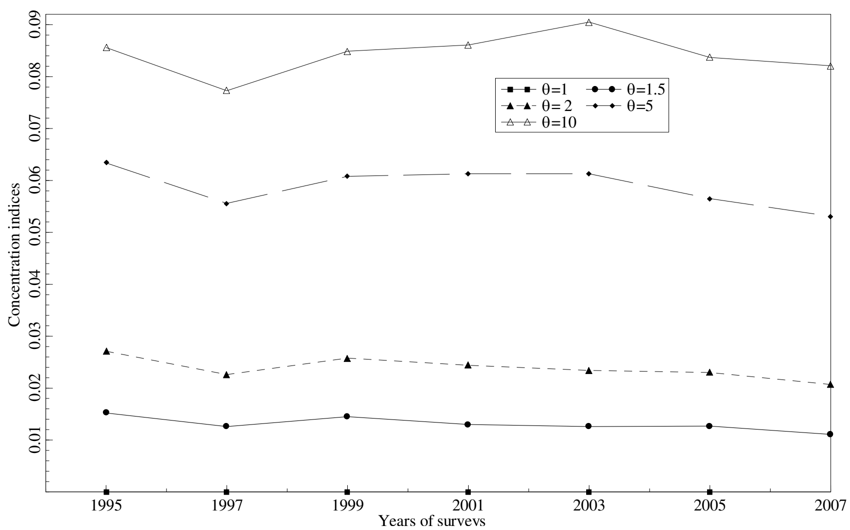


The equation (5) allows us to calculate the concentration index based on aversion to inequality. Graphs 1 and 2 show how these indices have evolved in Quebec for HUI and predicted SAH. The weakest value for the HUI index is in wave 2, which corresponds to the period 1996-97 and indicates that social inequalities in health were less pronounced than in other periods. In the case of the standard concentration index (i.e. $\theta = 2$), inequalities start increasing in wave 3 and remain stable up to wave 7. However, when we assign a great deal of importance to the health of economically disadvantaged individuals, we see a rather uneven evolution, with the strongest inequalities recorded in wave 5.

The evolution of the predicted SAH concentration index (Graph 2) resembles the HUI index (Graph 1), but with less obvious changes. If we consider the standard concentration index, we note a reduction in social inequalities in wave 2, when compared with wave 1. Following an increase in wave 3, we see a slight reduction in the following waves, up to the 7th wave, where we see a weaker level of inequality.

When we focus more specifically on the health of low-income individuals, through higher θ, the index's evolution is comparable to that in Graph 1. After a decrease in inequality in wave 2, we observe a gradual increase up to wave 5. The situation then seems to improve since the last two waves show declines. In general, the evolution of inequalities does not seem to reflect public health reforms that have been ongoing since the 1990s in Quebec. Indeed, the consequences of these reforms should be a gradual reduction in inequalities, which is not the case here. Although we note some decrease in the standard case of predicted SAH concentration index, the same does not apply when we consider the HUI concentration index or when we assign greater weight to the health of low-income individuals. The year 2003 (wave 5) seems to be when inequalities intensified for disadvantaged individuals. If other measures of health were used, it is probable that the situation would differ.

Graph 2: Evolution of the predicted SAH concentration index in Quebec based on aversion to inequality, 1995-2007.

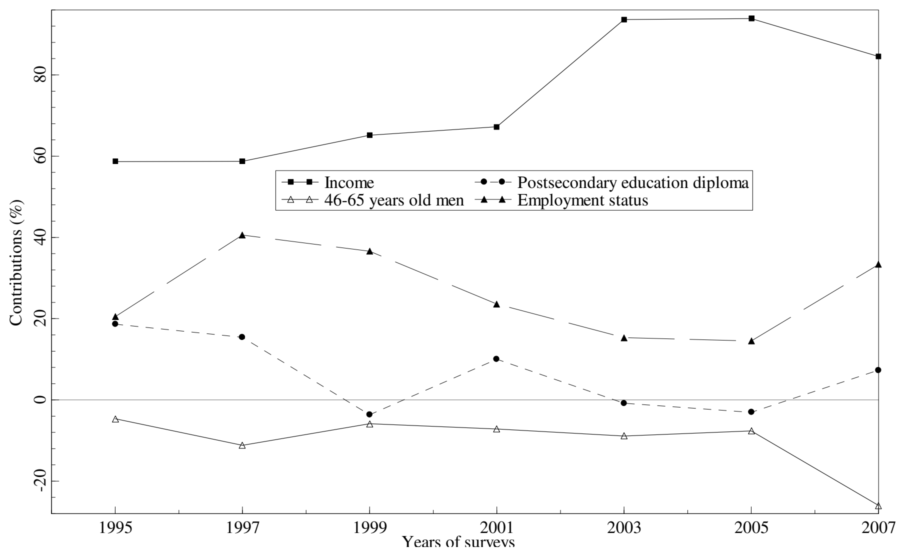


3.2. Decomposition analyses

Inequality can be decomposed as suggested in the equation (6). Decomposition analysis is useful from a perspective of public health policy implications. Thus, HUI and predicted SAH concentration indices are decomposed according to the contribution of socioeconomic and demographic determinants of health. Tables 1 and 2 show the values of the contributions of all variables during the 7 waves. However, as can be seen in Tables A3 and A4 in the appendix, these contributions are not all robust insofar as some coefficients did not prove to be significant. Graphs 3 and 4 describe the evolution of the main contributions (percentages) for which the respective coefficients are not only significant but generally, their absolute values are above 5%.

The contribution of income to HUI (Graph 3), which was 60% in the first wave, gradually rose before jumping to over 80% during the last 3 waves. Its evolution often seems to be compensated by employment status, the second largest contributor, which follows an opposite trajectory.

Graph 3: Evolution of the main contributions to the HUI concentration index in Quebec, 1995-2007

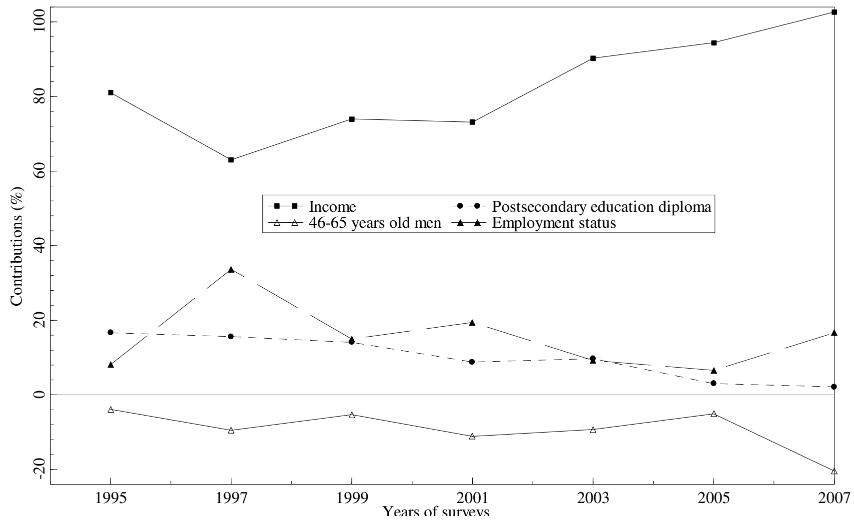


For predicted SAH (Graph 4), evolution is similar for income contribution, except that initially we see a decline between the first and second waves, where it fell from around 80% to 60%. Starting in the second wave, there was a gradual increase until wave 7, where contribution is then around 100%.

Table 1: Evolution of the contributions of variables to health utilities index (HUI) concentration, by income for the 7 waves in Quebec.

Variables	***Wave1***	***Wave2***	***Wave3***	***Wave4***	***Wave5***	***Wave6***	***Wave7***
Log income	0.0063	0.0042	0.0089	0.0094	0.0116	0.0123	0.0104
Education2	-0.0000	-0.0002	-0.0000	-0.0000	-0.0001	-0.0001	-0.0005
Education3	0.0000	0.0001	-0.0000	-0.0002	-0.0000	0.0000	-0.0001
Education4	0.0020	0.0011	-0.0005	0.0014	-0.0001	-0.0004	0.0009
Men31_45	-0.0002	-0.0004	-0.0007	-0.0004	-0.0004	-0.0001	-0.0006
Men46_65	-0.0005	-0.0008	-0.0008	-0.0010	-0.0011	-0.0010	-0.0032
Women12_30	0.0001	-0.0000	-0.0001	-0.0000	0.0003	-0.0002	0.0006
Women31_45	-0.0001	0.0000	-0.0004	-0.0001	-0.0001	-0.0000	-0.0001
Women46_65	-0.0001	0.0003	0.0002	0.0005	0.0000	0.0003	0.0003
Single	0.0002	0.0002	0.0007	0.0002	0.0004	0.0003	0.0007
Widowed	-0.0001	0.0002	0.0006	-0.0003	0.0000	-0.0000	0.0000
Divorced	0.0007	0.0004	0.0005	0.0005	0.0003	0.0004	0.0008
Working	0.0022	0.0029	0.0050	0.0033	0.0019	0.0019	0.0041

Graph 4: Evolution of the main contributions to the concentration index (predicted SAH) in Quebec, 1995-2007



The contribution of employment status always appears to evolve along a trajectory opposite to income, as in Graph 3. In both graphs, the contributions of men aged 46 to 65 follow the same evolution. They are negative, which suggests that belonging to this age group contributes to reducing social inequalities in health. This can be explained by both the negative health effect of belonging to this group and its positive concentration index, which reveals that the proportion of men in this age group tends to increase with higher income groups. This also means that health inequalities within this age group should be weaker than in the other groups.

As regards postsecondary education, Graph 3 shows the evolution of its contribution is unstable, even though the general trend points downwards. While it was almost 20% in wave 1, it is negative or nil in waves 3, 5 and 6. The trend in Graph 4 is more monotonous. Indeed, at just under 20% in the first wave, this contribution progressively decreases, and reaches about 2% in wave 7.

Generally, coefficients for the other categories (sex and age) are significant (cf. Tables A3 and A4), but their contributions are weak and sometimes nil, as we can see in Tables 1 and 2. This can be explained by their quite low levels of elasticity or respective concentration indices. Nor does marital status seem to play an important role. Indeed, their coefficients are not often significant, like those for the other levels of education.

Table 2: Evolution of the contributions of variables to the self-assessed health (SAH) concentration index by income, over the 7 waves in Quebec.

Variables	*Wave1*	*Wave2*	*Wave3*	*Wave4*	*Wave5*	*Wave6*	*Wave7*
HUI*	0.0001	-0.0005	0.0001	0.0005	-0.0003	-0.0001	-0.0004
Log income	0.0209	0.0133	0.0168	0.0158	0.0195	0.0187	0.0191
Education2	-0.0001	-0.0002	-0.0002	-0.0000	-0.0001	-0.0002	-0.0004
Education3	0.0000	0.0002	0.0000	-0.0000	-0.0000	0.0001	0.0001
Education4	0.0043	0.0033	0.0032	0.0019	0.0021	0.0006	0.0004
Men31_45	-0.0006	-0.0016	-0.0010	-0.0008	-0.0007	-0.0004	-0.0009
Men46_65	-0.0010	-0.0020	-0.0012	-0.0024	-0.0020	-0.0010	-0.0038
Women12_30	0.0006	0.0007	0.0009	0.0003	0.0002	-0.0003	0.0003
Women31_45	-0.0002	0.0002	-0.0007	-0.0002	-0.0001	-0.0001	-0.0001
Women46_65	-0.0002	0.0007	0.0005	0.0010	0.0001	0.0003	0.0004
Single	-0.0002	-0.0004	0.0002	0.0008	0.0003	0.0004	0.0006
Widowed	-0.0001	0.0001	0.0005	0.0003	0.0004	0.0002	-0.0000
Divorced	0.0003	0.0001	0.0002	0.0003	0.0002	0.0004	0.0003
Working	0.0021	0.0071	0.0034	0.0042	0.0020	0.0013	0.0031

A Oaxaca decomposition for the predicted SAH standard concentration index was performed for the initial 1995 period and the final period in 2007. Results are presented in Table 3. Between these two periods, the health concentration index declined by 0.0072. Results reveal that the group of postsecondary graduates contributed to the decrease by almost 55%, followed by men aged 46 to 65 (38%), and income (24%). Factors that favoured a rise in the index are employment status (–14%) and, to a lesser degree, being single (–11%) and women aged 46 to 65 (–8%).

Table 3: Oaxaca decomposition for the health concentration index (SAH) in Quebec between 1995 and 2007.

Variables	*n1995*	*CI1995*	*n2007*	*CI2007*	*dc*n*	*dn*c*	*Total*	*in %*
HUI*	0,4907	0,0003	0,3622	-0,0012	-0,0005	0,0000	-0,0006	8,0987
Log income	0,5372	0,0388	0,6741	0,0283	-0,0071	0,0053	-0,0018	24,5853
Education2	0,0037	-0,0333	0,0033	-0,1274	-0,0003	0,0000	-0,0003	4,1368
Education3	0,0063	0,0038	-0,0039	-0,0318	0,0001	0,0000	0,0001	-1,3930
Education4	0,0199	0,2151	0,0019	0,191	0,0000	-0,0039	-0,0039	54,5284
Men31_45	-0,0164	0,0387	-0,0103	0,0902	-0,0005	0,0002	-0,0003	4,0974
Men46_65	-0,0187	0,054	-0,0219	0,1716	-0,0026	-0,0002	-0,0027	38,2524
Women12_30	-0,0059	-0,0958	-0,0017	-0,1608	0,0001	-0,0004	-0,0003	4,0624
Women31_45	-0,009	0,0179	-0,007	0,0139	0,0000	0,0000	0,0001	-0,8880
Women46_65	-0,0236	0,007	-0,0166	-0,0255	0,0005	0,0000	0,0006	-8,1913
Single	0,0021	-0,0926	-0,0092	-0,0684	-0,0002	0,0010	0,0008	-11,4655
Widowed	0,0011	-0,1001	0,0002	-0,1853	0,0000	0,0001	0,0001	-1,0168
Divorced	-0,0015	-0,1675	-0,0015	-0,1843	0,0000	0,0000	0,0000	-0,3508
Working	0,014	0,1473	0,0304	0,102	-0,0014	0,0024	0,0010	-14,4561

The preceding results suggest that the major sources of social inequalities in health are not necessarily those that influenced their evolution the most. Indeed, factors such as postsecondary diploma and being in the group of men aged 46 to 65 were greater determinants of the evolution of health inequalities between 1995 and 2007. To reduce inequalities, several factors should be considered, and not only the major contributors, insofar as it is often easier to act on some of these factors than on other.

3.3. Comparisons of health opportunities

To construct the matrices, the response categories poor and fair are combined so that from now on there are 4 health status columns (poor and fair, good, very good, and excellent) Income quintiles are divided into 5 income classes and form the matrix lines. Let us use Π_c to designate the population income-health matrix at wave c. To illustrate, the income-health matrices for the 7 waves are given as

$$\Pi_1 = \begin{bmatrix} 14.3 & 31.9 & 33.3 & 20.5 \\ 5.6 & 30.8 & 36.0 & 27.6 \\ 7.2 & 28.5 & 37.9 & 26.4 \\ 6.7 & 21.3 & 32.5 & 39.5 \\ 2.6 & 19.1 & 42.8 & 35.5 \end{bmatrix} \Pi_2 = \begin{bmatrix} 13.3 & 33.2 & 33.1 & 20.4 \\ 4.0 & 29.7 & 40.7 & 25.6 \\ 4.7 & 22.2 & 40.9 & 32.2 \\ 4.3 & 25.6 & 41.3 & 28.7 \\ 3.5 & 18.0 & 40.1 & 38.4 \end{bmatrix} \Pi_3 = \begin{bmatrix} 12.5 & 32.0 & 36.3 & 19.2 \\ 3.7 & 23.5 & 46.9 & 25.9 \\ 4.7 & 27.5 & 42.6 & 25.2 \\ 4.5 & 26.4 & 41.0 & 28.1 \\ 2.7 & 15.2 & 47.6 & 34.5 \end{bmatrix}$$

$$\Pi_4 = \begin{bmatrix} 14.2 & 29.3 & 37.5 & 19.0 \\ 11.1 & 27.2 & 37.4 & 24.3 \\ 7.0 & 29.2 & 40.9 & 22.9 \\ 2.3 & 27.6 & 45.2 & 24.9 \\ 1.9 & 18.0 & 32.6 & 47.5 \end{bmatrix} \Pi_5 = \begin{bmatrix} 17.0 & 34.6 & 31.7 & 16.7 \\ 6.5 & 34.5 & 40.5 & 18.5 \\ 4.7 & 32.4 & 39.6 & 23.3 \\ 3.7 & 25.2 & 39.0 & 32.1 \\ 3.1 & 23.1 & 41.8 & 32.0 \end{bmatrix} \Pi_6 = \begin{bmatrix} 13.1 & 42.6 & 29.2 & 15.1 \\ 9.9 & 32.3 & 35.0 & 22.8 \\ 3.7 & 30.5 & 41.9 & 23.9 \\ 3.7 & 34.5 & 35.1 & 26.7 \\ 1.9 & 18.1 & 49.0 & 31.0 \end{bmatrix}$$

$$\Pi_7 = \begin{bmatrix} 11.1 & 38.4 & 31.4 & 19.1 \\ 7.1 & 34.2 & 40.1 & 18.6 \\ 4.1 & 21.9 & 47.7 & 26.3 \\ 4.3 & 25.9 & 50.6 & 19.2 \\ 2.6 & 20.4 & 44.0 & 33.0 \end{bmatrix}$$

Although the monotonicity assumption is not verified for each cell of the matrix, we observe that, with a few exceptions, each line in all 7 matrices seems to stochastically dominate the line above it, as defined by the equation (8). This demonstrates that there are of gradients of health in Quebec, in the sense that level of health is influenced by socioeconomic status.

Let us assume $M\left(\Pi_c\right) = \left|\sum_{i=1}^{k}\sum_{j=1}^{l} p_i \alpha_{ij}^c\right|$, with $p = \left(0.2, 0.2, 0.2, 0.2, 0.2\right)$ and $\Pi_c = \left|\alpha_{ij}^c\right|$. The condition set by the equation (9) suggests that a wave c_1 dominates another wave c_2 in terms of generalized Lorenz if the matrix $M\left(\Pi_{c_1}\right) - M\left(\Pi_{c_2}\right)$ contains only negative or nil values. Since we are comparing 7 waves two-by-two, we thus have a set of 21 possible dominance relations. Of these 21 relations, there are 3 complete dominance relations given by the following matrices:

$$M(\Pi_2)-M(\Pi_5)=\begin{bmatrix}-3.7 & -5.1 & -3.7 & 0.0\\ -6.1 & -12.4 & -10.8 & 0.0\\ -6.1 & -22.6 & -19.8 & 0.0\\ -5.5 & -21.6 & -16.4 & 0.0\\ -5.2 & -26.3 & -22.8 & 0.0\end{bmatrix} \quad M(\Pi_3)-M(\Pi_5)=\begin{bmatrix}-4.6 & -7.1 & -2.5 & 0.0\\ -7.3 & -21.0 & -9.9 & 0.0\\ -7.3 & -25.9 & -11.9 & 0.0\\ -6.6 & -23.9 & -7.9 & 0.0\\ -7.1 & -32.3 & -10.4 & 0.0\end{bmatrix}$$

$$M(\Pi_3)-M(\Pi_6)=\begin{bmatrix}-0.7 & -11.2 & -4.1 & 0.0\\ -6.9 & -26.3 & -7.2 & 0.0\\ -5.9 & -28.3 & -8.6 & 0.0\\ -5.2 & -35.6 & -10.0 & 0.0\\ -4.4 & -37.8 & -13.5 & 0.0\end{bmatrix}$$

These three matrices clearly show that wave 2 dominates wave 5, and that wave 3 dominates waves 5 and 6. This means that in Quebec, the health opportunities of poor individuals declined from the end of the 1990s to the mid 2000s. Such an evolution seems to confirm the results obtained for concentration indices when greater weight is given to the health of poorer individuals (Graphs 1 and 2). Pampalon, Hamel and Gamache (2008*a*) have also observed that even though premature death decreased in between 1989-1993 and 1999-2003, the social inequalities of such deaths have increased.

By broadening our analysis to constrained dominance, other relations can also be highlighted. The six matrices presented below describe these dominances.

$$M(\Pi_1)-M(\Pi_5)=\begin{bmatrix}-2.7 & -5.5 & -3.8 & 0.0\\ -3.6 & -10.1 & -12.9 & 0.0\\ -1.0 & -11.6 & -16.1 & 0.0\\ 2.0 & -12.5 & -23.5 & 0.0\\ 1.4 & -17.1 & -27.0 & 0.0\end{bmatrix} \quad M(\Pi_2)-M(\Pi_4)=\begin{bmatrix}-0.8 & 3.0 & -1.4 & 0.0\\ -7.9 & -1.5 & -2.7 & 0.0\\ -10.2 & -10.8 & -12.0 & 0.0\\ -8.2 & -10.7 & -15.9 & 0.0\\ -6.6 & -9.18 & -6.8 & 0.0\end{bmatrix}$$

$$M(\Pi_2)-M(\Pi_6)=\begin{bmatrix}0.2 & -9.2 & -5.3 & 0.0\\ -5.6 & -17.7 & -8.1 & 0.0\\ -4.7 & -25.0 & -16.5 & 0.0\\ -4.1 & -33.3 & -18.6 & 0.0\\ -2.5 & -31.8 & -26.0 & 0.0\end{bmatrix} \quad M(\Pi_2)-M(\Pi_7)=\begin{bmatrix}2.2 & -3.0 & -1.3 & 0.0\\ -0.8 & -10.6 & -8.4 & 0.0\\ -0.3 & -9.7 & -14.3 & 0.0\\ -0.2 & -9.9 & -23.8 & 0.0\\ 0.7 & -11.4 & -29.3 & 0.0\end{bmatrix}$$

$$M(\Pi_3)-M(\Pi_4)=\begin{bmatrix}-1.7 & 1.01 & -0.2 & 0.0\\ -9.1 & -10.1 & -1.8 & 0.0\\ -11.5 & -14.1 & -4.1 & 0.0\\ -9.3 & -13.1 & -7.3 & 0.0\\ -8.5 & -15.2 & 5.7 & 0.0\end{bmatrix} \quad M(\Pi_3)-M(\Pi_7)=\begin{bmatrix}1.3 & -5.0 & -0.1 & 0.0\\ -2.1 & -19.2 & -7.5 & 0.0\\ -1.5 & -13.0 & -6.4 & 0.0\\ -1.3 & -12.3 & -15.3 & 0.0\\ -1.3 & -17.4 & -16.8 & 0.0\end{bmatrix}$$

The difference arises from the fact that here we have positive values for some of the cells in the matrices. This calls into question the existence of complete dominance, but reflects a certain dominance situation insofar as the main part of each matrix is composed of negative and nil values. These results confirm that social inequalities have increased since the first 3 waves seem to dominate the last 4. However we note some improvement starting at wave 7, since the health opportunities of poor people have improved when compared with waves 5 and 6, as can be seen in the two following matrices:

$$M\left(\Pi_7\right)-M\left(\Pi_5\right)=\begin{bmatrix} -5.9 & -2.1 & -2.4 & 0.0 \\ -5.3 & -1.8 & -2.4 & 0.0 \\ -5.9 & -12.9 & -5.5 & 0.0 \\ -5.3 & -11.7 & 7.4 & 0.0 \\ -5.8 & -14.9 & 6.4 & 0.0 \end{bmatrix} \quad M\left(\Pi_7\right)-M\left(\Pi_6\right)=\begin{bmatrix} -2.0 & -6.2 & -4.0 & 0.0 \\ -4.8 & -7.1 & 0.2 & 0.0 \\ -4.4 & -15.4 & -2.2 & 0.0 \\ -3.9 & -23.4 & 5.3 & 0.0 \\ -3.2 & -20.4 & 3.3 & 0.0 \end{bmatrix}$$

4. Conclusion

This paper describes the evolution of social inequalities in health in Quebec from the mid-1990s to the mid-2000s. Three measures of health were used: the health utilities index (HUI), the self-assess health (SAH) and a predicted SAH variable based on the cardinality of the latter. Two methods are used. The first involves concentration indices and the second is based on transition matrices. The study uses seven longitudinal samples from the National Population Health Surveys for the period 1994-2007.

The lessons learned from the main study results are as follows:

First, results reveal the existence of health gradients in Quebec even though, overall, health inequalities are fairly low. Moreover, these inequalities are not fixed but vary through time. Thus, after a decrease between waves 1 and 2, inequalities grew slightly to reach their worst level in wave 5. What emerges is that although social inequalities vary from wave to wave, overall the situation appears to be better in the first 3 waves than in the last 4.

In addition, the study confirms the pertinence of Quebec's philosophy to deal with social and health issues together. The decomposition of social inequalities in health shows indeed that income inequality is the main cause. The study also reveals the importance of other variables, such as employment status, postsecondary education and being a man aged 46 to 65, when identifying health inequalities.

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Appendices

A.1. Proof of equation 6

Considering that:

$$\bar{h}_s = \frac{1}{n_s}\sum_{i=1}^{n} h_i^* \mathrm{I}\left(x_i = x_s\right), \tag{A.1}$$

with n the size of the population, n_s that of the group s, and $\mathrm{I}\left(x_i = x_s\right)$ an indicator that takes the value of 1 if the condition in parentheses is verified or else the value 0. Since $p_s = \frac{n_s}{n}$, the expression $p_s\bar{h}_s$ is given as:

$$p_s\bar{h}_s = \frac{1}{n}\sum_{i=1}^{n} h_i^* \mathrm{I}\left(x_i = x_s\right) \tag{A.2}$$

The equation (5) can then be rewritten as follows:

$$C\left(\theta\right) = 1 - \frac{\theta}{n\bar{h}}\sum_{s=1}^{S}\sum_{i=1}^{n} h_i^* \mathrm{I}\left(x_i = x_s\right)\left(1 - R_s\right)^{\theta - 1} \tag{A.3}$$

By replacing h_i^* by its expression of the equation (1), we get:

$$C\left(\theta\right) = 1 - \frac{\beta_1\theta}{n\bar{h}}\sum_{s=1}^{S}\sum_{i=1}^{n} x_{1i} \mathrm{I}\left(x_i = x_s\right)\left(1 - R_s\right)^{\theta - 1} - \cdots - \frac{\beta_K\theta}{n\bar{h}}\sum_{s=1}^{S}\sum_{i=1}^{n} x_{Ki} \mathrm{I}\left(x_i = x_s\right)\left(1 - R_s\right)^{\theta - 1}$$

$$- \frac{\theta}{n\bar{h}}\sum_{s=1}^{S}\sum_{i=1}^{n} \varepsilon_i \mathrm{I}\left(x_i = x_s\right)\left(1 - R_s\right)^{\theta - 1} \tag{A.4}$$

The equation (A.3) can also be rewritten as a concentration index for each determinant x_{ki}, as follows:

$$\frac{n\overline{x}_k}{\theta}\left(C_k\left(\theta\right)-1\right)=-\sum_{s=1}^{S}\sum_{i=1}^{n}x_{ki}\mathrm{I}\left(x_i=x_s\right)\left(1-R_s\right)^{\theta-1} \tag{A.5}$$

Considering that:

$$GC_{\varepsilon}\left(\theta\right)=-\frac{\theta}{n}\sum_{s=1}^{S}\sum_{i=1}^{n}\varepsilon_i\mathrm{I}\left(x_i=x_s\right)\left(1-R_s\right)^{\theta-1} \tag{A.6}$$

By substituting the equations (A.5) and (A.6) in the equation (A.4), we get:

$$C\left(\theta\right)=1+\sum_{k=1}^{K}\frac{\beta_k\overline{x}_k}{\overline{h}}C_k\left(\theta\right)+\frac{GC_{\varepsilon}\left(\theta\right)}{\overline{h}}-\sum_{k=1}^{K}\frac{\beta_k\overline{x}_k}{\overline{h}} \tag{A.7}$$

Knowing that $\overline{h}=\sum_{k=1}^{K}\beta_k\overline{x}_k$, based on the equation (1), we thus get equation (6)

A.2. Main tables

Table A1: Distribution of the sample, by SAH through all 7 waves in Quebec

		Poor	Fair	Good	Very good	Excellent
Wave 1	**N. Obs.**	25	131	561	779	638
	in %	1	6	26	37	30
Wave 2	**N. Obs.**	16	104	517	786	583
	in %	1	5	26	39	29
Wave 3	**N. Obs.**	11	91	456	784	486
	in %	1	5	25	43	26
Wave 4	**N. Obs.**	23	99	438	645	462
	in %	1	6	26	39	28
Wave 5	**N. Obs.**	16	95	473	607	386
	in %	1	6	30	39	24
Wave 6	**N. Obs.**	17	75	450	541	340
	in %	1	5	32	38	24
Wave 7	**N. Obs.**	13	72	410	622	338
	in %	1	5	28	43	23

Table A2: Distribution of the Quebec sample of the NPHS among the various socioeconomic characteristics and during the 7 waves.

Variables	**Wave 1**		**Wave 2**		**Wave 3**		**Wave 4**		**Wave 5**		**Wave 6**		**Wave 7**	
	N. Obs.	**in %**	**N. Obs.**	**in %**	**N. Obs.**	**in %**	**N. Obs.**	**in %**	**N. Obs.**	**in %**	**N. Obs.**	**in %**	**N. Obs.**	**in %**
Education1	726	34	617	31	502	28	415	25	380	24	308	22	318	22
Education2	289	13	250	12	226	12	191	11	175	11	149	10	131	9
Education3	464	22	491	24	446	24	409	25	385	24	360	25	373	26
Education4	653	31	648	32	654	36	652	39	637	40	606	43	630	43
Men12_30	382	18	353	18	286	16	244	14	271	17	236	17	273	19
Men31_45	372	17	367	18	339	18	298	18	239	15	202	14	187	13
Men46_65	304	14	296	15	395	16	319	19	308	20	276	19	290	20
Women12_30	390	18	359	18	313	17	229	14	241	15	235	16	262	18
Women31_45	368	17	329	16	307	17	283	17	243	15	209	15	186	13
Women46_65	318	15	302	15	287	16	294	18	276	18	265	19	257	17
Married	1237	58	1109	55	1050	58	970	58	882	56	814	57	793	54
Single	707	33	704	35	600	33	521	31	541	34	387	27	424	29
Widowed	34	2	34	2	24	1	27	2	25	2	22	2	14	1
Divorced	156	7	159	8	153	8	149	9	130	8	103	7	99	7
Working	1251	59	1238	62	1190	65	1174	70	1118	71	1020	72	1055	72

Table A3: Main results of HUI linear regressions.

Variables	**Wave 1**		**Wave 2**		**Wave 3**		**Wave 4**		**Wave 5**		**Wave 6**		**Wave 7**	
	Coef.	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**
Constant	0.761	12.81[a]	0.813	14.33[a]	0.705	10.91[a]	0.657	9.19[a]	0.605	7.89[a]	0.568	6.51[a]	0.589	6.25[a]
Log income	0.015	2.39[b]	0.011	1.94[c]	0.024	3.82[a]	0.026	3.93[a]	0.033	4.46[a]	0.035	4.32[a]	0.032	3.55[a]
Education2	0.007	0.51	0.023	2.19[b]	0.006	0.47	0.028	2.22[b]	0.013	1.16	0.006	0.42	0.040	2.61[a]
Education3	0.010	1.02	0.023	2.63[a]	-0.005	-0.53	0.020	1.75[c]	0.007	0.65	-0.001	-0.04	0.014	0.98
Education4	0.027	2.77[a]	0.014	1.51	-0.007	-0.66	0.019	1.86[c]	-0.001	-0.09	-0.004	-0.33	0.010	0.73
Men31_45	-0.032	-2.60[a]	-0.021	-2.07[b]	-0.049	-3.94[a]	-0.027	-2.54[b]	-0.032	-2.69[a]	-0.009	-0.70	-0.048	-3.09[a]
Men46_65	-0.054	-3.61[a]	-0.052	-3.86[a]	-0.078	-5.61[a]	-0.059	-4.43[a]	-0.064	-4.86[a]	-0.053	-3.60[a]	-0.085	-5.51[a]
Women12_30	-0.005	-0.55	0.001	0.06	0.005	0.49	0.000	0.01	-0.014	-1.06	0.010	0.76	-0.019	-1.65[c]
Women31_45	-0.024	-1.92[c]	-0.016	-1.65[c]	-0.053	-3.83[a]	-0.038	-3.27[a]	-0.038	-2.98[a]	-0.009	-0.71	-0.049	-2.71[a]
Women46_65	-0.062	-3.80[a]	-0.048	-3.45[a]	-0.062	-3.78[a]	-0.058	-4.52[a]	-0.047	-3.89[a]	-0.050	-3.11[a]	-0.068	-4.39[a]
Single	-0.007	-0.76	-0.004	-0.56	-0.022	-2.36[b]	-0.004	-0.55	-0.020	-2.03[b]	-0.013	-1.38	-0.034	-2.90[a]
Widowed	0.028	1.21	-0.054	-1.06	-0.145	-1.15	0.036	1.37	-0.007	-0.32	0.004	0.12	-0.015	-0.46
Divorced	-0.048	-2.43[b]	0.029	-1.84[c]	-0.034	-2.09[b]	-0.036	-2.27[b]	-0.032	-2.45[b]	-0.023	-1.23	-0.056	-3.39[a]
Working	0.023	2.69[a]	0.026	3.47[a]	0.055	6.07[a]	0.038	4.37[a]	0.020	2.20[b]	0.025	2.62[a]	0.051	3.42[a]
Number of obs.	2134		2006		1828		1667		1578		1423		1455	
F (prob)	5.56 (0.000)		5.88 (0.000)		10.03 (0.000)		5.67 (0.000)		4.79 (0.000)		4.40 (0.000)		6.06 (0.000)	
R^2	0.054		0.066		0.113		0.092		0.067		0.077		0.131	

a, b and c indicate that the coefficients are significant at the respective levels of 1%, 5% and 10%.

Table A4: Main results for the SAH ordered probit model regressions

Variables	Wave 1		Wave 2		Wave 3		Wave 4		Wave 5		Wave 6		Wave 7	
	Coef.	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**	**Coef.**	**t-stat**
HUI*	2.874	10.86[a]	3.700	11.65[a]	3.490	11.61[a]	3.660	12.09[a]	3.118	11.87[a]	3.319	11.63[a]	2.693	8.08[a]
Log Income	0.251	6.24[a]	0.195	3.58[a]	0.235	4.24[a]	0.245	4.94[a]	0.368	5.54[a]	0.366	5.55[a]	0.371	5.28[a]
Education2	0.128	1.40	0.122	1.30	0.162	1.68[c]	0.045	0.39	0.115	0.98	0.086	0.68	0.209	1.46
Education3	0.135	1.52	0.216	2.65[a]	0.093	1.19	0.020	0.22	0.007	0.07	-0.068	-0.66	-0.087	-0.80
Education4	0.302	4.33[a]	0.223	2.85[a]	0.247	2.96[a]	0.140	1.64	0.180	2.04[b]	0.041	0.42	0.025	0.24
Men31_45	-0.435	-3.77[a]	-0.457	-4.04[a]	-0.372	-3.02[a]	-0.284	-2.14[b]	-0.342	-2.68[a]	-0.179	-1.27	-0.463	-3.67[a]
Men46_65	-0.607	-5.08[a]	-0.682	-5.78[a]	-0.600	-4.56[a]	-0.791	-5.94[a]	-0.745	-5.44[a]	-0.392	-3.15[a]	-0.633	-4.82[a]
Women12_30	-0.149	-1.34	-0.220	-2.12[b]	-0.176	-1.53	-0.097	-0.87	-0.047	-0.40	0.095	0.75	-0.055	-0.46
Women31_45	-0.242	-2.18[b]	-0.377	-3.41[a]	-0.514	-4.30[a]	-0.346	-2.71[a]	-0.386	-3.12[a]	-0.240	-1.95[c]	-0.316	-2.42[b]
Women46_65	-0.734	-6.07[a]	-0.617	-5.15[a]	-0.738	-5.96[a]	-0.686	-5.34[a]	-0.579	-4.40[a]	-0.368	-2.80[a]	-0.543	-4.23[a]
Single	0.030	0.39	0.055	0.73	-0.026	-0.32	-0.115	-1.28	-0.101	-1.12	-0.132	-1.45	-0.181	-2.01[b]
Widowed	0.306	1.54	-0.172	-0.75	-0.568	-2.40[b]	-0.207	-0.75	-0.423	-1.01	-0.216	-0.65	0.120	0.40
Divorced	-0.098	-1.04	-0.044	-0.44	-0.092	-0.83	-0.122	-1.14	-0.119	-1.02	-0.163	-1.36	-0.129	-1.12
Working	0.110	1.78[c]	0.347	5.00[a]	0.199	2.73[a]	0.282	3.61[a]	0.139	1.78[c]	0.117	1.37	0.242	2.89[a]
Number of obs.	2134		2006		1828		1667		1578		1423		1455	
χ^2 (prob)	222.19 (0.000)		265.62 (0.000)		250.37 (0.000)		258.46 (0.000)		281.41 (0.000)		228.83 (0.000)		145.73 (0.000)	
Pseudo R^2	0.083		0.088		0.085		0.096		0.088		0.075		0.068	

a, b and c indicate that the coefficients are significant at the respective levels of 1%, 5% and 10%.