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Equity in Health and in Medical Care Consumption in Belgium*

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Abstract

The ECuity project, funded by the European Community's BIOMED programme, designed a common methodology to measure and compare existing socioeconomic inequalities in health and medical care consumption between European countries (+ the U.S.). This report discusses the methodology and summarises empirical findings for Belgium and its regions. Where possible, results are compared with those of other ECuity partners.

Significant pro-rich inequalities in health between income groups are found in all countries. Health inequalities in Belgium are high when compared internationally; only the UK and the US do worse. Within Belgium, there is significantly more socio-economic health inequality in Brussels than in the other regions (Flanders, Wallonia). Access to medical services does not seem to be the driving force for these health inequalities. Previous findings, that lower income groups consume more GP care and more hospital care, are confirmed even after standardization for need. For specialist care, however, higher income groups consume relatively more than they need. Aggregation over the different types of care reveals statistically significant pro-poor inequalities in the use of total medical care. These pro-poor inequalities in the consumption of medical care are confirmed at the regional level.

Keywords : Equity, Health, Medical care consumption.

JEL classification : D63, I10.

Introduction

Equity is an important objective for health care policy makers. There appears to be wide agreement among policy makers on the underlying equity principles (Van Doorslaer, Wagstaff & Rutten, 1993). Health should be distributed evenly among the population and the consumption of health care should be distributed according to need. Their distribution should not be affected by socioeconomic factors such as income, gender, race, etc. Comparison between countries can reveal insight in how the organisation of health care influences socioeconomic inequalities in health and medical consumption. The ECuity project, financed by BIOMED III, designed a common methodology to measure and compare existing socioeconomic inequalities in health and medical care consumption between European countries (+ the U.S.).

This report summarises empirical findings for Belgium and its regions. We set out by briefly describing the organisation of the Belgian health care system (§ 1) and the data used for the analysis (§ 2). Paragraph 3 focuses on equity in health. We consecutively discuss previous empirical evidence, ECuity methodology, empirical results for Belgium and comparison with the other European partners. The methodology and Belgian results for equity in medical consumption are in paragraph 4. Paragraph 5 concludes.

1. The Belgian Health Care System

According to 1995 OECD figures, Belgium spent about 8% of its GDP on health care, 88% of which is collectively financed. Detailed information on the sources of government financing and on the types of care financed are not available, however. Historically, the organisation of health care has become diffused. The different institutions can provide details on the type of care under their mandate, but there is no data centralization.

The most important financing organism is the National Institute for Sickness and Invalidity Insurance (RIZIV). Nearly all citizens (99% in 1995) are covered by its compulsory health insurance. It is part of the social security system and is organised at the federal level. The system is financed on the basis of contributions paid by the employer, the insured and government. For the active population premiums are wage-related (no income ceiling). For the inactive population they are (where applicable) pension-related, if that pension is above a ceiling. There are two main insurance schemes: one for the self-employed (the active, their dependants and the inactive) and one for the (private and public) white and blue collar workers (the active, their dependants and the inactive). We will name the former the 'SE scheme' and the latter the 'general scheme'. The general scheme is the most important scheme, covering 88.2% of the insured in 1995.

The health insurance scheme is responsible for the reimbursement of health care services. All health care services qualifying for reimbursement are described in the *nomenclature*. This is a list of more than 10 000 acts, describing every act in detail and listing its price and possible reimbursement conditions. Benefits are quite comprehensive in the general scheme, covering most health services (GP and specialist care, certain drugs, hospital treatment, dental care, nursing care, ...). The SE scheme only covers large catastrophic risks excluding treatment requiring drugs, physician consultation, paramedical care, dental care, a number of protheses and minor surgery.

Remuneration is mostly on the basis of fee-for-service, with patient copayments. Patient reimbursement amounts are always fixed. Physician fees, however, can vary. Fees, as fixed in the nomenclature, are yearly established after negotiations between sickness funds and medical professional organisations. Affiliated physicians are physicians who officially agree to respect negotiated fees. As an incentive to affiliate, government offers them invalidity, life and pension insurance. Unaffiliated physicians are free to set fees. Sheer competition, however, forces most physicians to abide by negotiated fees in the ambulatory sector. This is less true for inpatient care.

The reimbursement amount differs according to both the status of the insured and the type of health care service. The so-called *WOPIs 100* (Widows, Orphans, Pensioners and

Invalids, having incomes below a ceiling) benefit from higher reimbursement. In 1995, on the basis of official fees, copayments for consultations varied between 8% and 14% for *WOPIs 100* and between 30% and 40% for those insured under the general scheme. Technical acts (lab analyses, RX, ...) and inpatient care have lower copayment levels (if seen as a percentage). For some types of services (notably lab analyses and drugs for inpatients) copayment is on the basis of a lump sum instead of real usage.

In order to guarantee access, the total amount of copayments is limited. The maximum amount of copayments (drugs excluded) per household depends on taxable income (fiscale franchise). For the lowest income group, this maximum amount is fixed at 15,000 Bef a year. In addition, there is a sociale franchise, a copayment ceiling for certain weaker social groups, such as the *WOPIs 100*.

The provision of medical care is predominantly privately organised, in a government regulated environment. The system is quite liberal. The patient has free choice of GP, free choice and direct access to specialist care and even to hospital care. Most physicians are self-employed and work in private practice. Specialists usually have hospital facilities. Physicians have nearly complete therapeutic freedom. The national health insurance keeps practice profiles per physician (for example on lab prescribing), but it is only exceptional that high prescribers would receive a warning. Medical densities are very high compared to neighbouring countries. In 1995, there were only 290 inhabitants per practising physician, or 660 per GP and 630 per specialist. Belgium has 76.4 beds (general as well as psychiatric, 1993 figures) and 5.2 pharmacies (excluding hospital pharmacies; 1995 figures) per 10,000 inhabitants. Patient queues are virtually non-existent.

2. Data

All data used in the study are derived from the Panel Study on Belgian Households (PSBH), a sample representing the non-institutionalised population in Belgium. This panel

started in 1992 and is still on-going. Initially 4439 households, including more than 11,000 individuals (children as well as adults) completed the survey. The sample size and composition was chosen as to guarantee a representative picture of Flanders, Brussels and the Walloon region.

The survey is a general household survey, treating topics such as demographics, household composition, education, professional activity, household income, social participation and health. Since 1994, the PSBH team collaborates with Eurostat. This led to the inclusion of questions on medical care consumption at a very general level in the 1994 survey and at a more detailed level in 1995. For the underlying research, the 1995 survey results have been used.

The analysis in our study is restricted to individuals over 18 years of age, with non-missing data on income, health status and medical care consumption. This leaves a total sample size of 5636 individuals, 700 for Brussels, 2572 for Flanders and 2364 for Wallonia. The relative oversampling of Brussels and Wallonia, is corrected for by weighting the sample for any analyses at the country level. No weighting has been performed for possible selective drop-out of individuals over the different sample waves. A description of the questions, relating to all variables used in the underlying analysis, is given in appendix together with descriptive statistics for Belgium, Brussels, Flanders and Wallonia.

3. Equity in Health

When evaluating the equity of a health care system, attention focuses on equity in the delivery and financing of health care. Still, one cannot oversee that the ultimate goal of any health care system is health itself. So, although health is influenced by a lot of factors other than the health care system, i.e. genetics, lifestyle, environment, education, etc., it constitutes a natural start and its comparison among regions and nations might reveal insights into possible causes of inequalities. The equity principle we adhere to is that health should be distributed evenly among the population and should not be affected by socioeconomic factors such as income.

3.1 Previous Evidence for Belgium

For Belgium, socioeconomic differences in the distribution of health have been studied before but only fragmentary empirical evidence is available. Deleeck (1982) first focused attention at socioeconomic inequalities in health in Flanders. He empirically analysed health inequalities for household-heads of a representative sample for the year 1976. He found that the percentage of respondents reporting a good to very good health status increases as income increases, from 68% for the lowest income group, to 83% for the middle group and to 90% for the highest income group. Since then socioeconomic inequalities in health have retained scientific interest, however, without (large-scale) empirical verification. Two studies, Wunsch (1979) and Humblet et.al. (1987), find evidence of regional (North-South or Flanders-Wallonia) differences in mortality and relate these to socioeconomic regional differences (income). This finding is being confirmed in Lagasse et. al. (1990). Dooghe et. al. (1984) report a decrease in health complaints with increasing level of schooling, but these results are in contrast with an earlier report (N.O.S.W., 1978) that finds increasing health complaints with increasing socioeconomic status. Polus and Louckx (1991) attribute this difference to the wording of the questions. The N.O.S.W. study used open-ended questions, making the answers dependent on knowledge about health problems. In a detailed study on peri-natal morbidity in three regions in Wallonia, Lagasse (1985) noted that pregnant women with lower socioeconomic status have 2.5 times more chance of being hospitalised than women with higher socioeconomic status. These mothers also report 2.5 times more baby-illness during the first weeks of life. On an even more local level, i.e. the city of Ghent, De Henauw (1990) reports evidence of higher cardiac mortality in neighbourhoods with lower socioeconomic profile. More recently, Masuy-Stroobant (1992) analysed socioeconomic differences in peri-natal mortality and found persisting and strong differences. For 1985-86 the peri-natal mortality rate per 1000 births is 7.5 for the highest socioeconomic group (professional occupations, medical and paramedical jobs) but nearly 14 for the lowest socioeconomic group (blue collar workers). Recently, Deliège (1994) showed that blue-collar workers and unemployed report higher rates of absenteeism (primary disability).

To summarise: socioeconomic inequality in health has been documented before for Belgium but only limited and fragmented empirical information is available. Moreover, findings have never been standardised (for example for age and sex). In an extensive literature survey, Polus and Louckx (1991) complain about the lack of general evidence on this research question for Belgium.

The remainder of paragraph three will measure and discuss socioeconomic inequalities in health in Belgium. After discussing methodology, inequalities will be analysed empirically and will be compared across regions within Belgium as well as internationally.

3.2 Measurement[1]

When addressing existing socioeconomic (in)equality in health in Belgium, we can learn a great deal from simple descriptive statistics. Cross-tabulations of health variables versus socioeconomic variables (such as household income) will demonstrate whether correlations exist.

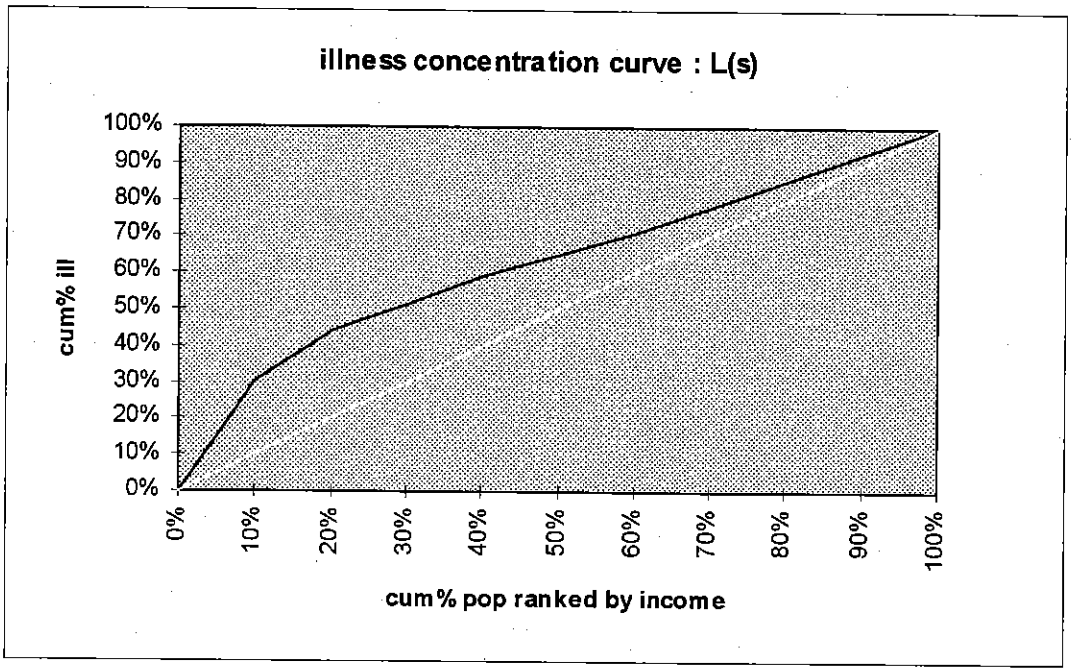
When comparing health inequalities between different countries, we need a measure or index that enables us to quantify equity. A new approach to the measurement of health inequality was developed for the ECuity project. This method entails constructing an illness concentration curve and calculating an illness concentration index. The latter can be considered as a relative socioeconomic measure of inequality. Relative, since it is independent on the mean level of health or income in the sample, and socioeconomic, since individuals are ranked by income. Let us briefly explain the methodology.

First, individuals are ranked by socioeconomic status (here household equivalent income) beginning with poor. The illness concentration curve, L(s), then plots the cumulative percentage of the population ranked by income against their cumulative percentage of ill health. If there is no inequality, L(s) will coincide with the diagonal. If ill health is

[1] What follows is a brief discussion of the methods used, formal details of which can be found in the methodological papers of Van Doorslaer, Wagstaff et. al. (1997), Kakwani, Wagstaff & Van Doorslaer (1997) and in Wagstaff & Van Doorslaer (1994).

concentrated in the lower income groups, L(s) will lie above the diagonal as in the example below.

Figure 1: Illness concentration curve



The illness concentration index (CI) [1] is then defined as one minus twice the area between L(s) and the diagonal : $CI = 1 - 2\int_0^1 L(s)ds$

[1] On grouped data, assuming L(s) is piece-wise linear, Kakwani, Wagstaff & Van Doorslaer (1997) showed that CI can be calculated as : $CI = \frac{2}{\mu}\sum_{t=1}^{T} f_t \mu_t R_t - 1$ with $\mu = \sum_{t=1}^{T} f_t \mu_t$

where μ_t = the morbidity rate among individuals in socio-economic group t, f_t = the proportion of the sample in socio-economic group t and R_t = the relative rank of the socio-economic group t. The authors further show that CI can also be interpreted as the slope coefficient of a convenience regression and use this result to develop an estimator of the standard error of CI. The variance of CI can be calculated as : $var(CI) = \frac{1}{n}\left[\frac{1}{n}\sum_{t=1}^{n} a_t^2 - (1+CI)^2\right]$ where n = the sample size and $a_t = \frac{\mu_t}{\mu}(2R_t - 1 - CI) + 2 - q_{t-1} - q_t$ with $q_t = \frac{1}{\mu}\sum_{\gamma=1}^{t} \mu_\gamma f_\gamma$. The standard error estimates will allow testing for significance of differences in inequity between countries.

The index thus ranges from -1 (only the poorest person is sick) over 0 (no inequalities) to +1 (only the richest person is sick). So a negative (positive) index points to health inequalities favouring the rich (poor). We should note that the index is also equal to zero when the concentration curve crosses the diagonal such that the two areas on either side of the diagonal cancel each other out (this is the case when inequalities favouring the rich exactly offset inequalities favouring the poor).

We need to point at two important adjustments that have been made. First, the health variable has been standardised for age-sex differences to eliminate unavoidable demographic effects (see Kakwani, Wagstaff & Van Doorslaer, 1997). This way, we calculated as if all income groups had the same age/sex structure, so that remaining inequalities are solely due to (avoidable) differences in socioeconomic status.
The second adjustment has to do with the ill health variable. Health is measured by a categorical variable (How is your health in general : very good, good, fair, poor, very poor). Ill health could then be measured by dichotomising this variable. However, apart from a loss of information, Wagstaff and Van Doorslaer (1994) also show that the measured inequality can be sensitive to the arbitrary cut-off point used for dichotomisation. For this reason, the categorical health variable is converted into a continuous latent health variable, increasing when health is deteriorating[1]. It is this variable that is then used to construct L(s) and calculate CI.

3.3 Empirical Results for Belgium

We investigate two health indicators in the data-set: self-rated health status [on a scale ranging from 1 (very good) to 5 (very bad)] and chronic health. The distribution of these variables in the sample is presented in appendix 3. The distributions are typically skewed as there are more people reporting good than bad health. On average people report good

[1] See appendix one.

health (scale 2) and no chronic health problem. There is no significant difference between the regions in the mean value of these variables.

A simple cross-tabulation of the two health variables with net household-equivalent income, illustrates the presence of socioeconomic inequality in health in Belgium. Self-reported health status deteriorates and more chronic health problems are reported as income decreases. Tables one and two illustrate this statement.

Table 1: Cross-tabulation of self-assessed health with net equivalent household income
(column percentages and number of observations (in brackets))

How is your health in general?	Net equivalent household income per month (in Bef)					
	30 000	30 001 - 40 000	40 001 - 52 000	52 001 - 64 000	64 001	all classes
very good	17.2 (199)	19.1 (192)	24.5 (348)	30.6 (306)	31.9 (337)	24.5 (1381)
good	42.5 (492)	47.2 (474)	53.9 (765)	52.0 (518)	52.6 (556)	49.8 (2805)
fair	31.3 (362)	25.9 (260)	18.7 (265)	15.4 (154)	13.9 (147)	21.1 (1189)
bad	7.3 (84)	6.5 (65)	2.6 (37)	1.8 (18)	1.2 (13)	3.8 (217)
very bad	1.7 (20)	1.3 (13)	0.4 (5)	0.2 (2)	0.4 (4)	0.8 (44)

Of individuals with incomes under 30 000 Bef per month, 60% report their health to be very good or good. This percentage increases continuously with increasing income: it climbs to 66% for income between 30 001 and 40 000 Bef, jumps to 78% for income between 40 001 and 52 000 Bef, to 83% for income between 52 001 and 64 000 Bef and even to 85% for income above 64 000 Bef. Kendall's Tau-b indicates that the negative association between income and self-assessed health is statistically significant (Kendall's Tau-b= -.18, T-value = -16.5).

Table 2: Cross-tabulation of chronic health with net equivalent household income (column percentages and number of observations (in brackets))						
Do you have a chronic health problem?	Net equivalent household income per month (in Bef)					
	30 000	30 001 - 40 000	40 001 - 52 000	52 001 - 64 000	64 001	all classes
Yes	28.1 (318)	21.1 (216)	15.6 (218)	12.0 (120)	11.7 (126)	17.7 (998)
No	71.9 (815)	78.9 (809)	84.4 (1183)	88.0 (876)	88.3 (955)	82.3 (4638)

As income decreases, more individuals in the income group report a chronic health problem. In the highest income bracket (+64 000 Bef) only 11.7% has a chronic health problem. This percentage increases continuously as income decreases: to 12% for the 52 001 - 64 000 Bef income group, to 15.6% for the 40 001 - 52 000 Bef group and to 21.1% for the 30 001 - 40 000 Bef group. In the lowest income group (≤ 30 000 Bef) nearly 3 out of 10 people (28%) report a chronic illness.

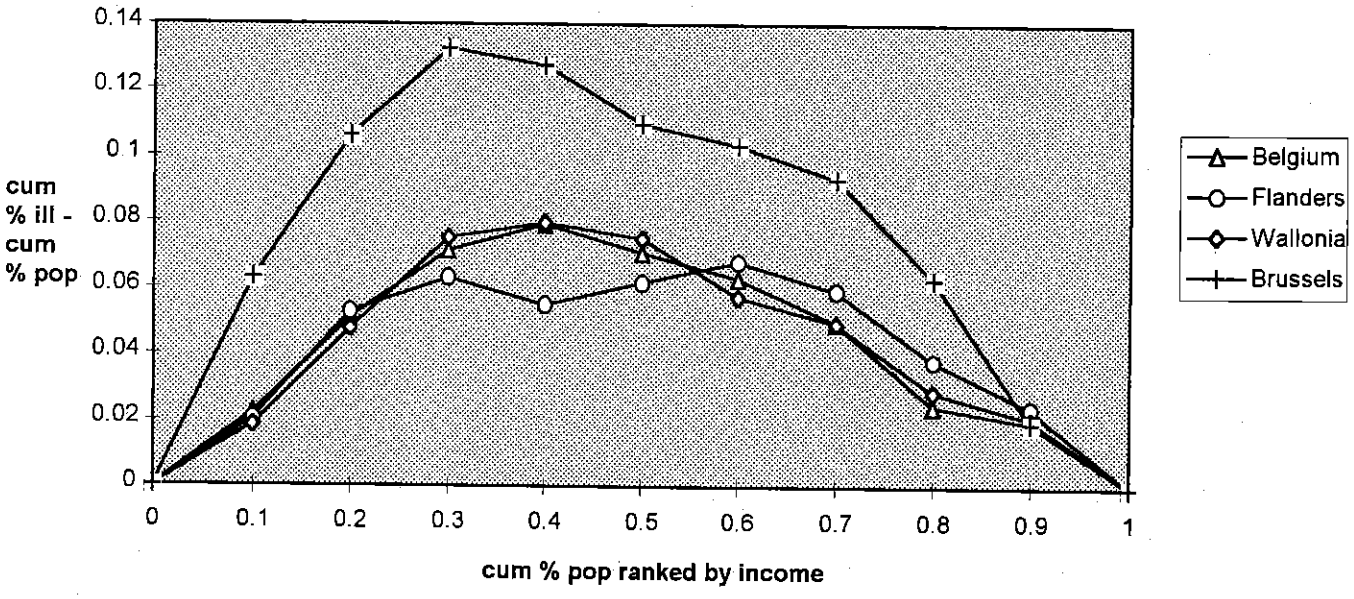
As a global quantification of health inequality, standardised concentration indices and their standard errors have been calculated for Belgium and its different regions. The values are reported in table 3. All concentration indices are negative and significantly different from zero, indicating that significant health inequalities exist and that they favour higher income groups. Pairwise comparison of the indices (using Student's t-test) shows that there is significantly more health related inequality in Brussels than in the other regions. The differences between the CI values for Flanders, Wallonia or Belgium are not significant.

Table 3: Concentration Indices for Belgium and its regions			
Region	**Concentration Index**	**Standard Error**	**significance of inequity**
Flanders	-0.0906	0.0162	**
Wallonia	-0.0886	0.0151	**
Brussels	-0.162	0.0313	**
Belgium	**-0.0900**	**0.0098**	**

** significant at a 1% significance level

The concentration curves provide a means to visually compare inequality. As the concentration curves are quite flat, we plot them in terms of deviations from the diagonal (figure 1).

fig 2 : illness concentration curves for Belgium (deviations from diagonal)



All curves lie above the diagonal, confirming that health inequalities favour the rich as the CI already indicated. The concentration curve for Brussels strictly dominates the other curves, again showing that there is more health inequality in the capital region than in the other regions. The 10% poorest inhabitants of Brussels endure more than 16% of ill-health. More than 30% of ill-health is concentrated in the 20% lowest income-earners.
For the other regions, concentration curves lie closely together and cross-over. Concentration curves virtually coincide for the two lowest income deciles. In Flanders as in Wallonia, 12% of illness is concentrated in the 10% lowest income-group and 25% in the 20% lowest income-earners. In the third to fifth income deciles, Wallonia has slightly more illness concentration than Flanders, while the opposite can be said for the sixth to ninth income deciles.

3.4 International Comparison

The ECuity project ensured all participating countries calculated concentration indices along the same methodology using similar data[1]. Thus, table 4 provides a direct comparison of health inequality measures across countries. Countries have been sorted by increasing CI values, i.e. by increasing inequality.

Table 4: Illness Concentration Indices and confidence intervals

Country		Concentration Index	limits of 95% confidence interval	significance of inequity
Sweden	S	-0.035	-0.059; -0.011	**
E. Germany	EG	-0.044	-0.056; -0.031	**
Finland	SF	-0.057	-0.082; -0.032	**
W. Germany	WG	-0.057	-0.083; -0.031	**
Netherlands	NL	-0.066	-0.096; -0.036	**
Switzerland	CH	-0.070	-0.088; -0.051	**
Spain	E	-0.073	-0.102; -0.044	**
Belgium	B	-0.090	-0.109; -0.070	**
United Kingdom	UK	-0.115	-0.145; -0.085	**
United States	US	-0.136	-0.182; -0.090	**

** = significant at a 1% significance level

[1] A description of the data-sets used in each country can be found in Van Doorslaer, Wagstaff et.al. (1997).

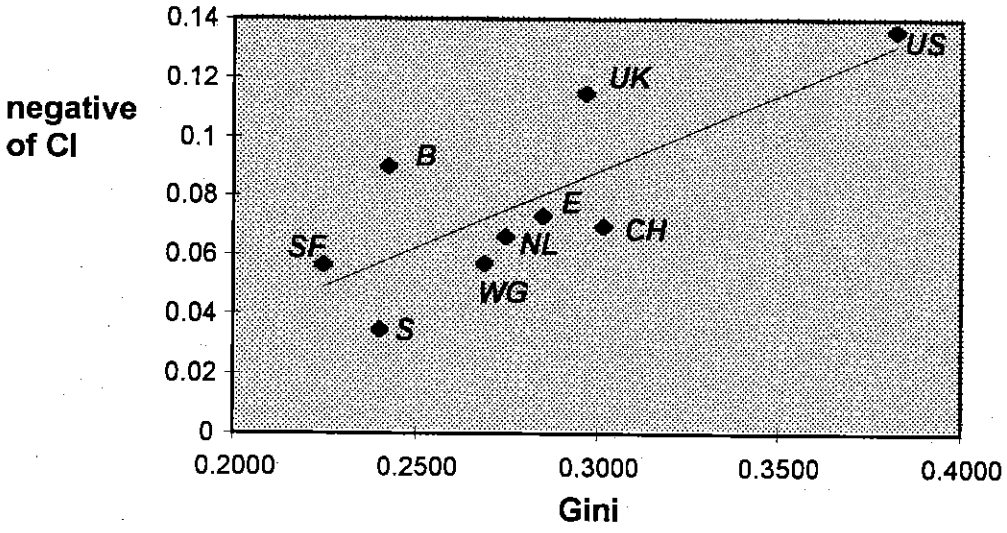
All indices are negative and significantly different from zero, indicating that significant income-related inequalities in health exist in all countries and, without exception, favour the better-off. There is, however, substantial variation in index values between countries. The largest inequalities are observed in the US (with a concentration index of -0.14) and in the UK (with an index of -0.11). The largest cluster of countries (Spain, Switzerland, the Netherlands, West-Germany and Finland) have index values around -0.07 or -0.06. Countries with lowest inequality indices are East-Germany (-0.04) and Sweden (-0.03). The Belgian results are rather disappointing in comparison with these international figures. With the exception of the US and the UK, Belgium has the highest income related inequalities.

Are the apparent differences in health inequality between countries significant? A pairwise comparison between countries (using Student's t-test), reveals that there are largely two clusters of countries (Appendix 4). The first cluster contains the US and the UK, with significantly larger inequalities, and the second cluster contains the remaining countries, whose indices do not significantly differ (with some exception for Switzerland). Belgium is somewhat in the middle. Its result is not significantly different from the US or UK, but neither is it different from the highest indices in the second group (The Netherlands, Switzerland or Spain).

It is not obvious why Belgium performs so badly in the international context. Empirical analysis of the determinants of health inequality in the above mentioned countries (excluding Belgium) could only detect one statistically significant factor: the degree of income inequality (measured by the Gini coefficient). A simple linear regression, explaining differences in health inequalities by differences in income inequalities, resulted in an adjusted R^2 for the model of 0.71 (Van Doorslaer, Wagstaff et. al., 1997). The Belgian situation, however, does not fit the regression well. When adding the Belgian results in the regression, the adjusted R^2 drops to 0.55.

Figure 3 plots the relationship between the gini-coefficient of net equivalent household income and the (negative of the) concentration index for self-assessed health.

Figure 3: Health and Income inequality



As is the case for the UK, Belgium has a higher level of health inequality than one would expect on the basis of income inequality. The opposite can be said for Sweden and to a lesser extent for Switzerland. The other countries are quite close to the regression line.
Since income inequality alone does not seem to explain health inequalities very well, one can question what other factors might explain cross-country differences. In previous work, Le Grand (1987) found positive impact of per capita health care spending and of the share of health expenditure financed publicly, while per capita national income influenced the regression negatively. In Van Doorslaer, Wagstaff et. al. (1997), however, adding these variables did not ameliorate the regression analysis: the variables were jointly insignificant. These findings suggest that there is only a weak link between health care spending and health. Similar findings are reported in Auster et.al. (1969) and in Grossman (1972).

To summarise : it is not clear then what factors, other than income inequality, account for health inequalities. The outliers in the regression plot above remain interesting puzzles for further research. The need to move the research focus away from spendings on health care, had already been suggested by Lalonde in 1974, who sparked off international

support by putting forward that lifestyle and environment determine health more than health care expenditure. Along this line, we can learn a great deal from the sociological literature (Ranchor, Sanderman et. al., 1990 or Lundberg, 1991) where research models point at the importance of 'cultural factors' (such as attitude, lifestyle, knowledge, behaviour) next to 'material factors' (such as living and working conditions) in explaining differences in health outcomes. At the same time, they point out that the causal relationship might well reverse : an individual's health will determine her social mobility and hence her socioeconomic position. As if by definition, the cross-roads between economics and sociology seems particularly fruitful for the continuation of research on socioeconomic differences in health.

4. Equity in Medical Care Consumption

Equity in the delivery and consumption of health care is generally thought of as one of the policy objectives for a health care system. Van Doorslaer, Wagstaff & Rutten (1993) indicate that there appears to be broad agreement among policy-makers that the delivery of care should be distributed according to need, and not influenced by ability to pay, gender, race, etc. The authors further distinguish vertical equity (where people in different need be treated in an appropriately different way) and horizontal equity (where people in equal need receive equal treatment). The notion of vertical equity is rarely addressed in the health economics literature and will not be looked at in this study. Instead, we focus on horizontal equity and, more specifically, investigate whether possible inequality is related to an individual's ability to pay. Do individuals in equal need of care end up receiving the same amount of care? Or do the rich receive more care than their need characteristics would predict? Observed differences in equity between health care systems might then reveal insight into what features of a health care system lead to more equity in delivery of care.

4.1 Previous evidence for Belgium

The design of the Belgian health care system does not lead one to expect great socioeconomic inequalities in access to medical care. The supply of medical care is extremely dense all over the country. There is free choice of provider and free access to second and third line medical care. Provider payment is uniform. In general, there are no supply-side incentives leading to a differential treatment of low-income groups. At the demand side, special measures have been taken to avoid that people in general, and low-income groups in particular, would be unable to finance medical expenditures. There is compulsory health insurance covering almost the entire population. Except for the self-employed, a uniform basket of services is covered. Reimbursement is more generous however for the poor. First, widows, orphans, pensioners and invalids beneath a certain income level (*WOPIs 100*) face lower copayments in general. Second, since 1995 a copayment ceiling level (social franchise) exists for certain weaker socioeconomic groups, such as the *WOPIs100*. Third, also since 1995 the total amount of copayments per household and per year is limited and dependent on household income (fiscal franchise). These measures should prevent inequity in the delivery of medical care favouring the rich, and possibly induce inequity favouring the poor. However, as yet, no empirical evidence is available.

To date, most empirical studies have addressed the impact of income on the consumption of medical care without correcting for need (morbidity). When analysing inequalities in health, Deleeck (1982) also pointed to inequity in medical care consumption but without original empirical validation. He stated that lower socioeconomic groups use more GP care and more hospital care, while higher socioeconomic groups use more specialist, dental and preventive care. This was previously demonstrated (NOSW, 1978), and has been confirmed in further research (Berghman et al, 1985).

Recent empirical verification of the correlation between education and medical consumption was presented in a study by the Socialist Sickness Fund (cited in Avalosse, 1996). The authors interviewed a representative sample of approximately 1000 individuals, aged 15-69. The study revealed that the highly educated contact a specialist more

frequently, especially for middle-sized risks. Lower educated contact a GP more easily, especially for small inconveniences. The researchers attribute this to the fact that access to GP care is financially more favourable. Another important finding is that, for similar problems, lower socioeconomic groups use medical care more frequently. Lower income groups have 40% more chance to need medical advise for an attack of fever, wound stitching or ear stones than higher socioeconomic groups. The authors conclude that lower socioeconomic groups use more GP care because of greater accessibility and because of more positive evaluation of GP expertise. Apart from ambulatory care, the study claims that lower socioeconomic groups use more hospital care because they often use less preventive medicine, let their problems aggravate and start treatment in a later stage (although the latter is in contradiction with the fact that they contact a GP more easily for small inconveniences). Finally, based on a family budget interview, the authors show hat expenditure shares for health care decrease as total consumption increases. The lowest consumption quartile spends 40% of total personal expenditures on health care, the second quartile spends 28% and the third and fourth quartiles respectively spend 5% and 27% (Avalosse, 1996).

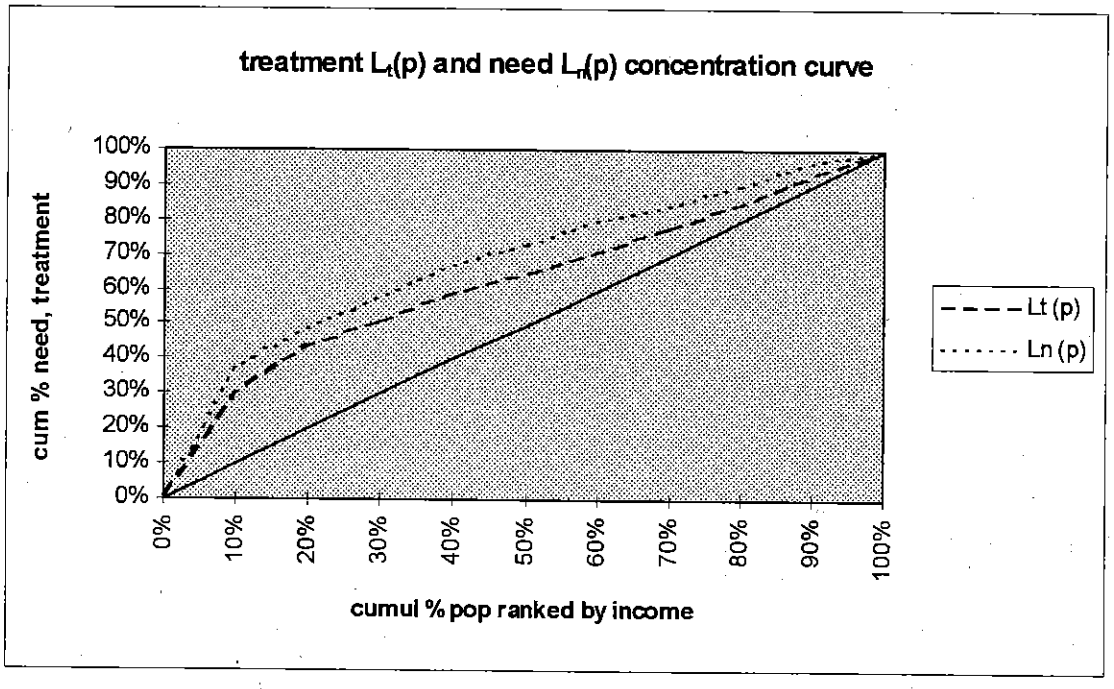
Only one empirical study has addressed the impact of socioeconomic status on the consumption of medical care after correction for health status. Peersman and De Maeseneer (1995) analyse the above relationship for a sample of 1000 individuals between ages 40 and 50 in the city of Ghent. Socioeconomic status is determined on the basis of household equivalent income and profession. Health status on the basis of chronic problems, pain and physical functioning. The researchers cannot detect a link between socioeconomic status and use of GP and specialist care, after correction for health status.

4.2 Measurement[1]

As we did for the measurement of inequalities in health, we can gain insight in the matter by investigating simple cross-tabulations that relate consumption of health care to socioeconomic variables.

When we, in addition, want to compare matters across regions or countries, there is need for an index of (in)equity. To measure equity in the delivery of health care, we construct a treatment concentration curve and a need concentration curve, much along the lines of the health concentration index in paragraph three. From these, we then calculate an inequity index. Figure 4 plots a hypothetical example to illustrate the methodology.

Fig 4 : Treatment and need concentration curves



[1] More details of this brief discussion of methodology can be found in Van Doorslaer & Wagstaff (1992), Wagstaff & Van Doorslaer (1994) and Kakwani, Wafgstaff & Van Doorslaer (1997).

As before, individuals are ranked by socioeconomic status (here household equivalent income) beginning with poor. The treatment concentration curve, L_t (p), then plots the cumulative percentage of the population ranked by income against their cumulative percentage of treatment costs. If treatment is concentrated in the lower income groups, L_t (p) will lie above the diagonal. Treatment costs include the number of GP and specialist visits plus the number of nights in hospital, weighted by their respective average cost.
As in paragraph three, the treatment concentration index (CI_t) is defined as one minus twice the area between L_t (p) and the diagonal. However, this in itself does not give an indication as to what extent the equity objective is being achieved. As shown in paragraph three, lower income groups tend to be less healthy. If we would find unequal treatment favouring the poor ($CI_t < 0$), it tells us lower income groups receive more treatment but they might also have more need for it. So, in order to investigate the equity objective (equal treatment for equal need) we will have to relate the concentration of treatment to the concentration of need.

To do this, we construct a need concentration curve, L_n (p), by plotting the cumulative percentage of the population ranked by income against their cumulative percentage of need. Again, if need is concentrated in lower income groups, L_n (p) will lie above the diagonal. Need is calculated as the treatment costs one would expect for an individual, given his need characteristics (morbidity, age, sex), if this individual was treated along the population treatment cost figures. Say for simplicity that we define need only in terms of illness. Then the need of each person, n_i, can be calculated by running a simple regression on the full sample : $n_i = \alpha + \beta * ILL_i + \varepsilon_i$
where ILL is a dummy variable, being 1 when a person is ill and 0 when a person is healthy. This implies that need will be calculated as :

$E[n_i \mid ILL_i = 0] = \alpha = n^{healthy}$ for a healthy person

$E[n_i \mid ILL_i = 1] = \alpha + \beta = n^{sick}$ for a sick person

Of course, this can be refined by incorporating more need categories. In our empirical analysis we assumed that a person's need for health care was determined by age and sex as well as morbidity, so that we estimated :

$n_i = \alpha + \beta_0 * HEALTH_i + \beta_1 * AGE_i + \beta_2 * SEX_i + \varepsilon_i$

Each person's need (n_i), according to his need indicators, was then simply obtained by retaining the predicted value of the regression.

As before, the need concentration index (CI_n) is defined as one minus twice the area between $L_n(p)$ and the diagonal. This implies that a negative CI_n occurs when need is concentrated in lower income groups.

Socioeconomic inequality in the delivery of health care can now be addressed by comparing the treatment with the need concentration curve. If $L_n(p)$ lies above $L_t(p)$, as in the example above, the poor receive less treatment then they need and there is inequity favouring the rich. The inequality index, HI_{wv}, is defined as twice the area between the treatment and need concentration curves :

$$HI_{wv} = 2 \int [\, L_n(p) - L_t(p) \,]\, dp \quad \text{or also} \quad HI_{wv} = CI_t - CI_n$$

such that positive values point at inequity favouring the rich[1].

4.3 Empirical results for Belgium

We investigate medical care consumption of three different kinds of medical acts: GP consultations, specialist consultations and hospitalisation. In the survey, medical care consumption had to be reported for the last twelve months. Summary statistics of these variables are presented in appendix 3. Eighteen percent of all individuals in the sample did not see a GP during the last twelve months. On average, a GP is contacted five times a year. The distribution is skewed with a median contact frequency of 3. Specialist consultations are less frequent. Only one out of two individuals contacted a specialist during the last twelve months and average contact frequency is 2. Nearly 12 % of all individuals in the sample have been hospitalised once or more during the last twelve

[1] Using individual data, CI_t and CI_n can be calculated in the same way as the CI for health (see footnote on page 7). Kakwani, Wagstaff and Van Doorslaer (1997) show that the variance of HI_{wv} can be calculated as :

$$\text{var}(HI_{wv}) = \frac{1}{n}\left[\frac{1}{n}\sum_{i=1}^{n}(a_{it} - a_{in}) - HI_{wv}^{\,2}\right]$$ with a_{it} and a_{in} calculated as in the footnote on page 7.

months. For the individuals who have been hospitalised, 4 % used day hospitalisation. The others spent on average 13 nights in hospital.

In order to convert these consumption figures into expenditures, mean prices of a GP and specialist consultation and of a hospital night are derived from national data. The (weighted) average prices of a GP and specialist consultation (excluding drugs or other interventions) were found to be 593 Bef and 647 Bef respectively. A night spent in hospital costs on average 10 000 Bef (including all interventions). Imputing these prices to the consumption data in our sample, and summing over the types of care, gives us an average yearly total care expenditure of almost 18 000 Bef per individual. Hospital expenditures drive this result, constituting 76.4% (13 640 Bef) of total expenditures. GP and specialist care account for 16.7 % (2 981 Bef) and 6.8% (1 230 Bef) of total expenditures respectively.

We first investigate some simple cross-tabulations. Tables five and six relate total care expenditures to income and need (morbidity).

Table 5: Total Care Expenditures per income/self-assessed health class
mean values and standard error (between brackets)

		net equivalent household income (in Bef)					
		30 000	30 001 - 40 000	40 001 - 52 000	52 001 - 64 000	> 64 000	all classes
self-	very good	2703 (565)	16 831 (9 165)	6 100 (1 181)	3 501 (769)	3 114 (469)	5 801 (1 331)
	good	17 024 (4 526)	10 034 (2 219)	7 079 (923)	6 207 (873)	6 647 (957)	9 076 (949)
assessed	fair	39 153 (6 523)	34 197 (6 747)	32 151 (5 358)	20 212 (3 238)	15 138 (2 922)	31 078 (2 811)
	bad	81 435 (19 099)	124 946 (38 426)	114 146 (46 149)	45 426 (14 391)	58 863 (30 426)	95 585 (15 876)
health	very bad	167 534 (56 607)	350 298 (210 849)	90 651 (69 778)	431 497 1 indiv.	78 234 (85 105)	215 611 (70 742)
	all classes	28 777 (3 366)	29 531 (4 764)	14 578 1 738)	8 921 (1 043)	7 604 (838)	17 848 (1 209)

Table 6: Expenditures per income/chronic illness class
mean values and standard errors (between brackets)

		net equivalent household income (in Bef)					
		30 000	30 001 - 40 000	40 001 - 52 000	52 001 - 64 000	> 64 000	all classes
chronic illness	no	13 572 (1 646)	12 905 (2 399)	9 454 (1 208)	6 900 (804)	5 482 (499)	9 499 (623)
	yes	66 185 (10 659)	90 979 (20 023)	41 249 (8 561)	23 135 (6 060)	24 035 (6 040)	55 570 (5 907)
	all class	28 777 (3 366)	29 531 (4 764)	14 578 (1 738)	8 921 (1 043)	7 604 (838)	17 848 (1 209)

We can see from the last column of table 5 that mean expenditures for health care increase as self-assessed health deteriorates. People in very good health, for example, only spend 5 800 Bef on GP, specialist and hospital care whereas this amount jumps to 31 000 Bef for people in fair health and to 215 600 Bef for people in very bad health. This is a desirable result: people who need more health care, also consume more health care. However, when we look along the different rows, we can see a tendency for medical consumption to increase, as income decreases. This is true for all but the lowest income group. The figures thus point to some evidence of horizontal inequity favouring the poor (with the exception of the very lowest income group).

The same picture emerges from table 6, where we use the presence of chronic illness as a health indicator. People with chronic illness have more health care expenditures than people without a chronic illness. Within a given health category, however, the poor spend more than the rich. For people with no chronic illness, this is true without exception. It is also true for people with chronic illness, with the exception of the lowest income group.

When we make the same analysis for the different subcomponents of medical care (GP and specialist consultations, hospital care : tables are in appendix 5), we can see that expenditures for hospital care follow the same pattern as overall expenditures. This was to be expected, since hospital expenditures constitute the bulk of total expenditures. For GP care and specialist care too there is more consumption among the sickest. The income pattern however is less clear. For specialist care, there is some concentration of

expenditures in the middle income groups and for GP care in the lower income groups. But clearly the differences are less pronounced and firm conclusions cannot be drawn.

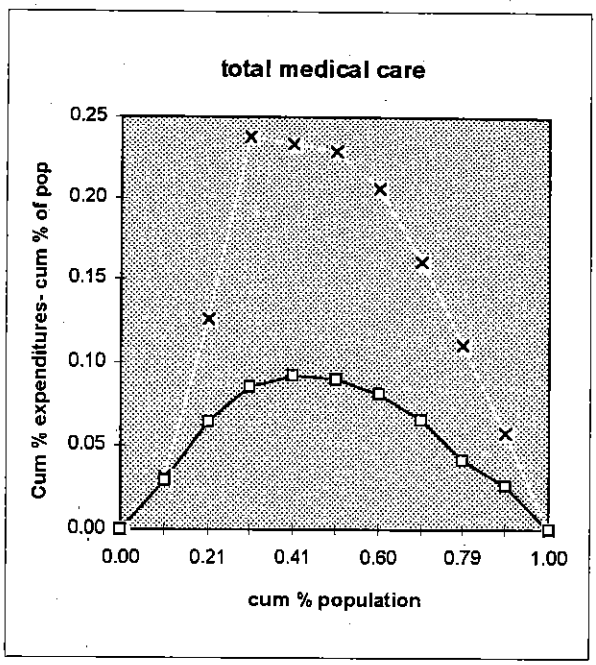
A more precise picture of the distribution of medical care expenditures over income groups and in relation to need, can be obtained from the analysis of treatment versus need concentration curves. The results for Belgium are presented in figure 5. Again, concentration curves are drawn in terms of deviations from the diagonal.

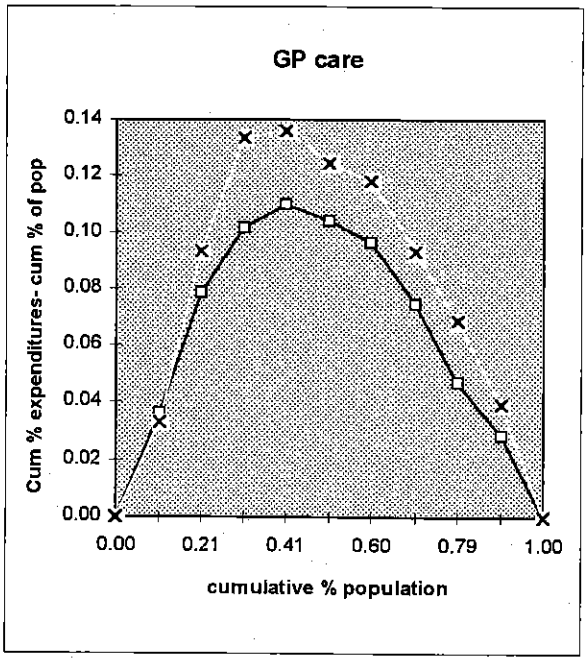
The concentration curve for total expenditures is always above the diagonal. This implies that expenditures are concentrated among lower income groups. We see, for example, that 54 % of total medical expenditures are caused by the 30 % lowest income earners. Since lower income groups are also in worse health (see paragraph three), this result was to be expected and we need to proceed by relating this treatment concentration curve with an estimated need concentration curve. The need concentration curve is here determined on the basis of age (4 groups), sex, self-assessed health (5 categories) and presence of chronic illness.

Except for the very lowest income decile, the need concentration curve is always below the treatment concentration curve. This indicates that the poor receive relatively more treatment than would be expected on the basis of health status (or need). The three lowest income deciles, for example, account for 54% of all medical expenditures whereas one would expect 39% on the basis of their health status. In the lowest income decile there is a cross-over of treatment and need concentration curves; the very poorest people spend somewhat less than expected.

The upper right graph of figure 5 plots treatment and need concentration curves for GP care. As was the case for overall expenditures, the treatment concentration curve is dominating the need concentration curve, indicating that there is inequity in the consumption of GP care in favour of the poor. Again, curves cross in the lowest income decile. The difference between the two curves is much smaller than in the previous figure.

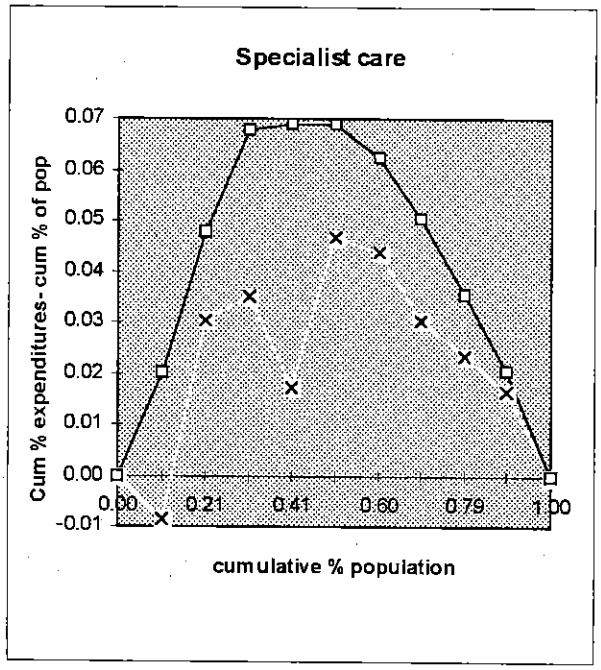
Fig. 5 : Treatment versus need concentration curves for different types of medical care in Belgium

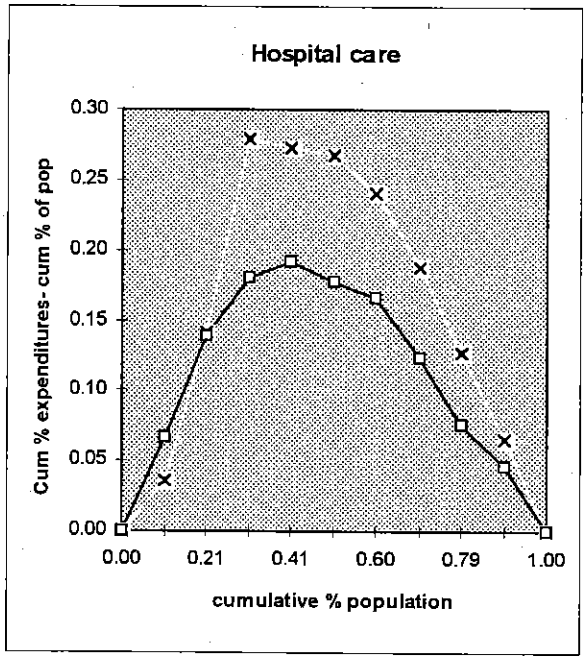




-x- treatment concentration curve (cum % actual expenditures - cum % pop)

-□- need concentration curve (cum % expected expenditures - cum % pop)





For specialist care the treatment concentration curve is lying below the need concentration curve. In contrast with the other types of care, specialist care is concentrated more among the upper income groups. As with GP care, however, the differences are quite small.

For hospital care the pattern of concentration curves is very similar to that for total care, given the large share of hospital expenditures in total expenditures. Note, however, that the cross-over of the treatment and need curve now occurs in the second income decile and not in the first. Overall, we will still find inequity favouring the poor, but here with the exception of a larger share of very poor.

As an overall measure of inequity HI_{wv} index values and their standard errors are reported in table 7. Different specifications were used to estimate need. As we visually learned from the graphs, the indices for GP care, hospital care and total treatment are all negative, indicating the poor use more care than one would expect given their need. The index for specialist care is positive, pointing to inequality favouring the rich. Standard errors indicate that most values are significantly different from zero.

Table 7: HI_{wv} indices and standard errors for different specifications of need and different treatment categories

Total expenditures Belgium	**HI_{wv}**	**SE**	**significance of inequity**
standardisation for sex, 4 age categories and:			
health not good dummy	-.1085	.0291	**
self assessed health	-.0795	.0285	**
chronic illness dummy	-.1191	.0291	**
self-assessed health and chronic illness dummy	- .0716	.0284	*
standardisation for sex, 5 age categories and:			
health not good dummy	-.1079	.0291	**
self assessed health	-.0790	.0285	**
chronic illness dummy	-.1186	.0291	**
self-assessed health and chronic illness dummy	-.0714	.0285	*

GP services Belgium	HI_{wv}	SE	significance of inequity
standardisation for sex, 4 age categories and:			
health not good dummy	-.0529	.0142	**
self assessed health	-.0371	.0138	**
chronic illness dummy	-.0686	.0145	**
self-assessed health and chronic illness dummy	- .0333	.0137	*
standardisation for sex, 5 age categories and:			
health not good dummy	-.0524	.0142	**
self assessed health	-.0366	.0138	**
chronic illness dummy	-.0680	.0145	**
self-assessed health and chronic illness dummy	-.0329	.0138	*

Specialist services Belgium	HI_{wv}	SE	significance of inequity
standardisation for sex, 4 age categories and:			
health not good dummy	.0206	.0184	
self assessed health	.0363	.0181	*
chronic illness dummy	.0002	.0186	
self-assessed health and chronic illness dummy	.0398	.0181	*
standardisation for sex, 5 age categories and:			
health not good dummy	.0198	.0184	
self assessed health	.0355	.0181	*
chronic illness dummy	-.0007	.0186	
self-assessed health and chronic illness dummy	.0389	.0180	*

Hospital services Belgium	HI_{wv}	SE	significance of inequity
standardisation for sex, 4 age categories and:			
health not good dummy	-.1323	.0349	**
self assessed health	-.0992	.0342	**
chronic illness dummy	-.1408	.0349	**
self-assessed health and chronic illness dummy	-.0900	.0341	**
standardisation for sex, 5 age categories and:			
health not good dummy	-.1316	.0349	**
self assessed health	- .0986	.0342	**
chronic illness dummy	-.1403	.0349	**
self-assessed health and chronic illness dummy	-.0898	.0 342	**

** = significant at a 1% significance level * = significant at the 5% level

Results are also relatively robust. Conclusions do not change when alternative definitions for need are specified (see table). This is also true for different specifications of household equivalent income (not reported). In general, there is also a tendency for the pro-poor inequality to diminish, when more health indicators are used for standardisation.

The patterns found at national level are confirmed when taking the regions separately. Table 8 reports regional HI_{wv} values for total medical expenditures and one need specification (adjustment for sex, 4 age groups, SAH and chronic illness). HI_{wv} indices are negative for all regions, providing evidence of inequality favouring the poor. In other words, lower income groups are using more care than one would expect on the basis of their estimated need. All indices are significant, indicating that inequalities are significant. We performed a pair-wise t-test to check whether there are significant differences in inequality measures between the regions but could detect no significant regional differences.

Table 8: HI_{wv} indices (and standard errors) for Belgium and its regions Pair-wise comparison of differences in inequity				
Region	Flanders	Wallonia	Brussels	**Belgium**
Flanders	-0.0830 (0.0426)	ns	ns	ns
Wallonia		-0.0978 (0.0359)	ns	ns
Brussels			-0.0677 (0.0646)	ns
Belgium				-0.0716 (0.0284)

ns : difference in HI_{wv} is not significant

5. Conclusions

This paper explores whether income related inequalities in health and in the consumption of medical care (after correcting for need) can be found in Belgium. Analyses are performed on the basis of a general household survey of about 6000 non-institutionalized individuals older than 18 years.

With relatively crude measures of health, such as self-assessed health and the presence of a chronic condition, significant inequalities in health are found between income groups in Belgium overall and also in the different regions (Brussels, Flanders and Wallonia). People in lower income groups endure more illness than people in higher income groups. This can be derived from simple cross tabulations and is confirmed in illness concentration curves and indices, after standardization for age and sex. Health inequalities are significantly higher in Brussels. The comparison of concentration indices between countries, calculated along a common methodology, reveals that Belgium does not occupy a very favorable position. In all countries (European + US), health inequalities are significant and favor the rich. Belgium however, is positioned at the higher end of the inequality ladder, just below the US and the UK. The reason is not clear. In a simple

explanatory model, Belgium's health inequality seems to be much higher than one would expect on the basis of income inequality. Why Belgium is an outlier remains to be investigated.

Access to medical services does not seem to be the driving force for these health inequalities. Previous findings, that lower income groups consume more GP care and more hospital care, are confirmed even after standardization for need. Pro-poor inequalities are statistically significant. For specialist care, however, higher income groups consume relatively more than they need. Aggregation over the different types of care reveals statistically significant pro-poor inequalities in the use of total medical care. That is, lower income groups use more care than one would expect on the basis of morbidity. These pro-poor inequalities in the consumption of medical care are confirmed at the regional level.

The results need to be interpreted carefully, however. First, the health measures used are quite crude, especially when they are used to predict hospital utilization. In addition, the analysis of different need specifications showed that there is a tendency for pro-poor inequality to diminish when more (detailed) health indicators are used for prediction. Second, there is evidence that lower income groups tend to underestimate their health problems. This implies that need will be underestimated for this group and evidence of pro-poor inequality might be overstated. Third, concentration curves show that there can be a problem of access for the lowest income decile(s). Better access for the lowest income groups, however, will not resolve much of the remaining inequalities in health. To change this, other factors such as environment and life style will need to be addressed.

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Appendix

App. 1 : From a categorical to a continuous latent health variable

Say y is the self-assessed health variable with five categories from 1 (best) to 5 (worst). Assume that there is a continuous variable y* with a lognormal distribution, that is underlying this categorical health variable y, such that :

if	$y = 5$	then	$-\infty < y^* \leq \alpha_1$
	$y = 4$		$\alpha_1 < y^* \leq \alpha_2$
	$y = 3$		$\alpha_2 < y^* \leq \alpha_3$
	$y = 2$		$\alpha_3 < y^* \leq \alpha_4$
	$y = 1$		$\alpha_4 < y^* \leq +\infty$

where the α_i are threshholds. Lognormality is assumed to allow for skewness in response; typically there are more people reporting good health than bad health.
The thresholds are estimated so that the area under the standard normal distribution is divided up into 5 portions, corresponding the numbers in the sample falling into each health category.

$$\alpha_i = \Phi^{-1}\left(\sum_{i=1}^{5} n_i / N\right)$$

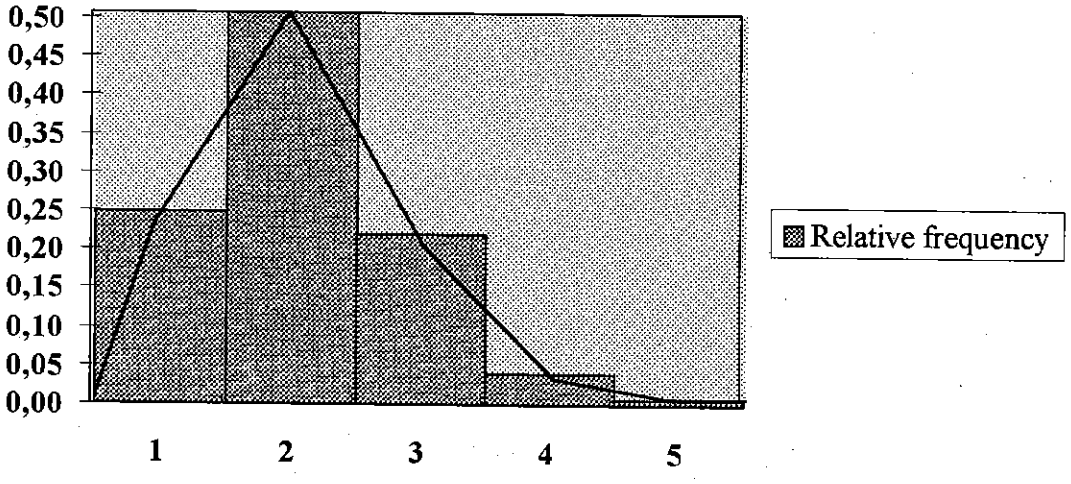
where Φ^{-1} is the inverse standard normal cumulative density function, n_i is the number of cases in category i and N is the total number of cases.
Then the mean value of y* in each interval was estimated as the log of the normal scores :

$$z_i = (N / n_i) * \left[\Phi(\alpha_{i-1}) - \Phi(\alpha_i)\right] \quad \text{and}$$

$$y^* = -e^z$$

where z_i are the normal scores and $\Phi()$ is the standard normal density function.
The following figure visualizes the transformation :

From a categorical to a continuous latent health variable



α		-0.698	-0.636	1.680	2.406	5.61
y*	0.276	0.973	2.88	7.079	15.44	

Each individual now gets assigned a latent health score y* according to his response category. The continuous latent health variable y* is always positive and increasing when health is deteriorating. The resulting distribution over the income groups (starting with poor) is as follows :

Income group	*y**
1	1,917
2	1,919
3	1,987
4	1,552
5	1,602
6	1,429
7	1,421
8	1,256
9	1,345
10	1,258
Total	**1,568**

It is clear from this distribution that health improves as income increases.

App. 2 : Variable definitions

Variable	Question/ Definition
Born	In which year were you born?
Sex	Your sex: 1 = male; 2 = female
Members	Number of individuals in the household
Income	How much is your current total disposable net income, everything included, per month? In Bef.
Heqinceddy	Household equivalent income : weighting factor: (number of adults + 0.5 number of children)$^{0.5}$ (in Bef)
Healthassessed	How is your health in general? 1 = very good; 2 = good; 3 = not good, not bad; 4 = bad; 5 = very bad
Chronic Health	Do you have a chronic health problem (psychological or physical), an illness or handicap? 1 = yes; 2 = no
Timesgp	How many times during the last twelve months, did you consult a GP?
Timesspec	How many times during the last twelve months did you consult a specialist (in hospital included unless hospitalized)?
Admhospital	Have you been hospitalized during the last twelve months? 1 = yes; 2 = no
Nightshospital	How many nights did you spend in hospital? (If admhospital = 1)
ExpGP	Imputed expenditures for Gp care, in Bef.
Expspec	Imputed expenditures for specialist care, in Bef.
Expamb	ExpGP + Expspec
Exphosp	Imputed expenditures for hospital care, in Bef.
Exptot	Expamb + Exphosp

App. 3 : Mean and standard deviation (between brackets) of variables

Variable	Belgium	Brussels	Flanders	Wallonia
Born	1949	1948	1949	1949
	(17.6)	(18.0)	(17.7)	(1.53)
Sex	1.52	1.53	1.52	1.53
	(0.5)	(0.5)	(0.5)	(0.5)
Members	3.05	2.84	3.13	2.96
	(1.37)	(1.49)	(1.37)	(1.33)
Income	80 420	85 736	80 007	79 624
	(42 374)	(51 616)	(39 515)	(44 197)
Heqinceddy	49 521	54 648	48 577	49 718
	(23 400)	(28 539)	(21 803)	(24 289)
Healthassessed	2.07	2.14	1.97	2.21
	(0.82)	(0.94)	(0.76)	(0.87)
Chronic Health	1.82	1.89	1.80	1.82
	(0.39)	(0.32)	(0.40)	(0.38)
Timesgp	5.03	4.39	4.92	5.39
	(8.44)	(7.56)	(8.39)	(8.76)
Timesspec	1.90	2.41	1.55	2.37
	(5.68)	(5.87)	(4.09)	(7.65)
Admhospital	1.89	1.92	1.89	1.87
	(0.32)	(0.28)	(0.31)	(0.34)
Nightshospital	12.39	15.67	12.04	12.29
	(23.98)	(27.61)	(25.80)	(20.18)
ExpGP	2 981	2 602	2 918	3 199
	(5005)	(4 481)	(4 973)	(5 195)
Expspec	1 230	1 559	1 003	1 536
	(3 675)	(3 795)	(2 649)	(4 951)
Expamb	4 210	4 162	3 922	4 735
	(7 095)	(7 231)	(6 507)	(7 972)
Exphosp	13 638	12 771	12 795	15 376
	(88 313)	(89 140)	(91 582)	(81 973)
Exptot	17 848	16 933	16 717	20 112
	(90 795)	(90 871)	(94 216)	(84 384)
sample size	5 636	700	2 572	2 364

App. 4 : Pairwise comparison of differences in concentration indices

(countries are ranked by concentration index)

	Sweden	E Germany	Finland	W Germany	Netherlands	Switzerland	Spain	Belgium	UK	US
Sweden	-	ns	ns	ns	ns	*	ns	**	**	**
E Germany		-	ns	ns	ns	*	ns	**	**	**
Finland			-	ns	ns	ns	ns	*	**	**
W Germany				-	ns	ns	ns	*	**	*
Netherlands					-	ns	ns	ns	*	*
Switzerland						-	ns	ns	*	ns
Spain							-	ns	*	*
Belgium								-	ns	ns
UK									-	ns
US										-

App 5: Mean expenditures for GP care per income/health class (standard errors between brackets)

Health		net equivalent household income (in bef)					
		30 000	30 001 - 40 000	40 001 - 52 000	52 001 - 64 000	> 64 000	all classes
self-	very good	1074 (94)	1285 (135)	1067 (68)	1090 (75)	993 (73)	1085 (37)
	good	2820 (164)	2371 (121)	1872 (74)	(2039) (123)	1747 (100)	2129 (51)
assessed	fair	5803 (353)	5663 (388)	4974 (402)	4607 (394)	4120 (349)	5224 (177)
	bad	12901 (1513)	11782 (1390)	10218 (1465)	10604 (2448)	5202 (1223)	11463 (797)
health	very bad	11305 (1647)	16849 (4396)	21969 (10842)	10674 (1 ind.)	13721 (13639)	14434 (2236)
	all classes	4334 (196)	3815 (186)	2542 (116)	2315 (113)	1924 (96)	2981 (67)

Health		net equivalent household income (in bef)					
		30 000	30 001 - 40 000	40 001 - 52 000	52 001 - 64 000	> 64 000	all classes
chronic	no	2978 (169)	2617 (117)	1928 (86)	1869 (92)	1564 (63)	2148 (48)
illness	yes	7671 (490)	8246 (677)	5735 (515)	5446 (571)	4710 (631)	6737 (266)
	all classes	4334 (196)	3815 (186)	2542 (116)	2315 (113)	1924 (96)	2981 (67)

Mean expenditures for specialist care per income/health class (standard errors between brackets)

Health		net equivalent household income (in Bef)					
		30 000	30 001 - 40 000	40 001 - 52 000	52 001 - 64 000	> 64 000	all classes
self-	very good	391 (86)	688 (152)	606 (107)	654 (79)	676 (96)	614 (47)
	good	760 (90)	694 (64)	777 (55)	1064 (102)	947 (80)	847 (35)
assessed	fair	2034 (215)	1798 (155)	2290 (377)	2204 (219)	1936 (253)	2049 (120)
	bad	4187 (831)	3667 (729)	9391 (4625)	3581 (662)	4075 (791)	4850 (876)
health	very bad	4630 (1084)	4573 (1504)	8043 (3646)	5823 (1 ind.)	4154 (1010)	5013 (790)
	all classes	1412 (106)	1222 (82)	1265 (148)	1168 (71)	1048 (66)	1230 (49)

Health		net equivalent household income (in bef)					
		30 000	30 001 - 40 000	40 001 - 52 000	52 001 - 64 000	> 64 000	all classes
chronic	no	818 (69)	898 (69)	1000 (165)	1018 (71)	894 (64)	932 (50)
illness	yes	2873 (311)	2421 (274)	2648 (321)	2225 (254)	2246 (270)	2575 (144)
	all classes	1412 (106)	1222 (82)	1265 (148)	1168 (71)	1048 (66)	1230 (49)

Mean expenditures for hospital care per income/health class (standard errors between brackets)

Health		net equivalent household income (in bef)					
		30 000	30 001 - 40 000	40 001 - 52 000	52 001 - 64 000	> 64 000	all classes
self-	very good	1238 (530)	14857 (9123)	4427 (1146)	1757 (748)	1444 (446)	4102 (1322)
	good	13444 (4485)	6970 (2193)	4430 (891)	3103 (817)	3953 (890)	6100 (934)
assessed	fair	31316 (6341)	26737 (6596)	24886 (5159)	13402 (3098)	9083 (2773)	23805 (2730)
	bad	64347 (18299)	109496 (38068)	94537 (45943)	31241 (14192)	49586 (30172)	79271 (15631)
health	very bad	151599 (55797)	328877 (205917)	60639 (70459)	415000 (1 ind.)	60359 (70908)	196164 (69236)
	all classes	23031 (3269)	24494 (4664)	10772 (1682)	5438 (996)	4632 (777)	13638 (1176)

Health		net equivalent household income (in Bef)					
		30 000	30 001 - 40 000	40 001 - 52 000	52 001 - 64 000	> 64 000	all classes
chronic	no	9775 (1582)	9391 (2370)	6526 (1155)	4013 (759)	3024 (466)	6410 (603)
illness	yes	55642 (10420)	80312 (19644)	32866 (8391)	15465 (5900)	17079 (5645)	46258 (5780)
	all classes	23031 (3269)	24494 (4664)	10772 (1682)	5438 (996)	4632 (777)	13638 (1176)

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