Università degli Studi di Modena e Reggio Emilia
Dipartimento di Economia Politica

Materiali di discussione

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Long Run and Short Run Constraints in the Access to Private Health Care Services: Evidence from Selected European Countries

by

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November 2006

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LONG-RUN AND SHORT-RUN CONSTRAINTS IN THE ACCESS TO PRIVATE HEALTH CARE SERVICES: EVIDENCE FROM SELECTED EUROPEAN COUNTRIES[#]

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This version: 10 November 2006

Abstract

This paper aims at distinguishing long-run and short-run constraints in the access to private health care services. To this end, we apply the methodology proposed by Carneiro and Heckman (2003) to the SHARE database, a survey conducted in a number of European countries, involving some 22,000 individuals over the age of 50. Micro-data includes information on health and health consumption, and socioeconomic variables (like income and wealth). Our results show that the problem of short-run constraints in the access to private health care services could be real, especially in Italy, Greece, and to some extent Spain. Moreover, there appear to be differences in the role of credit constraints, both considering more specific services, and gender differences.

Keywords: health inequalities, private health care services, credit constraints, family background

JEL codes: D31, I10, I31

[#] We wish to thank M. Lippi Bruni and all seminar participants at the SIEP 2006 Conference (Università di Pavia) for insightful comments. Usual disclaimer applies.

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1. Introduction

The presence of extensive and persistent health inequalities (i.e. the fact that individuals in equal need but different in terms of socio-economic characteristics are not treated as equal) has been emphasised by a strand of the health economics literature since long ago, both considering self-perceived health status and access to care (see e.g. Gwatkin, 2000, or Anand *et al.*, 2006). Started by investigating inequality in Europe and the U.S., the evidence is now becoming available also for developing countries and for countries in transition. From a policy point of view - given these persistent health inequalities, and a commonly agreed ethical concept that individuals in equal need ought to be treated equally – it is crucial to move beyond, and ask about the role different determinants may play in influencing the health status or the access to care. Taking this view, the literature has identified the key role played by income and, more generally, socio-economic conditions (in this sense, e.g. Wagstaff, 2002). In particular, there seems to be a close relationship *at the individual level* between income inequality and health inequality, well known in the literature as the "income (or social) health gradient" (e.g. van Doorslaer *et al.*, 1997; Marmot, 2006; Daniels *et al.*, 2006). However, as pointed out e.g. by Deaton (2003) or Wilkinson and Marmot (2003), personal income and socio-economic status could be a proxy for many other factors, such as the lack of minimal health care knowledge or a disadvantaged social environment, that – in turn – may be the underlying "true" causes of the inadequate access to health care services, or of the adoption of unhealthy lifestyles, both conducive to poorer health conditions. But while income may constrain the access to services in the short-run, because poorer individuals may not have enough funds to access services - both for indirect costs (such as transportation), as well as direct costs (also in the form of co-payment to publicly provided services) - all the other factors just mentioned can be labelled as "long-run constraints" in the access to medical care, since they cannot be removed by a simple policy of cash transfers to poor individuals. Indeed, the policy suggestions to tackle the problems raised by health inequalities will differ in the two cases, so that it is important to understand which are the prevailing constraints in impeding poorer individuals to get access to health care services in order to design *effective* policy actions.

This paper aims at distinguishing and quantifying the role of long-run and short-run credit constraints in the access to *private* health care services. The importance of credit constraints for this particular type of services has been recently emphasised e.g. by Decker and Remler (2004), who study how the size of the income gradient between Canada and US varies with age, pointing out the role of universal health insurance provided by Medicare in reducing the gap after the age of 65. Here we concentrate on a group of selected European countries, where most of the health services are publicly provided almost free of charge, and the problem of credit constraints should be – in principle – just minimal. We depart from methodologies applied in the analysis of the causes of health inequalities so far (e.g. Marmot *et al.*, 2001; Wagstaff *et al.*, 2003), borrowing from a paper by Carneiro and Heckman (2003) (CH from now on) centred on the choice of getting on to college. The basic idea is to split the whole population in healthy people and those who are ill and, for each sub-group, study the access to private health services in each income quartile. The identifying assumption is that people belonging to the highest income quartile are – by definition - not facing any short-run constraints. Hence, we can measure the proportion of constrained individuals with respect to this benchmark. We can differentiate log-run and short-run constrained individuals by controlling for other determinants of the demand for private services, like age, the level of education, lifestyles and habits, the type of job, and so on. This methodology is applied to the SHARE database, a *Survey of Health, Ageing and Retirement in Europe* conducted in a number of selected European countries (ranging from Scandinavia to the Mediterranean), involving some 22,000 individuals over the age of 50 (see Börsch- Supan and Jürges, 2005, for more information). Micro-data includes information on health and health consumption, and socioeconomic variables (like income and wealth).

Contrary to expectations, our results show that the problem of short-run constraints in the access to private health care services could be real also in countries with a universal coverage publicly provided, like Italy, where at least some 10% of all consumers of health services can be constrained in some way, and 50% of these "constrained" individuals (both in the long- and the short-run) can be "credit constrained". Moreover, the role of the long- and the short-run factors seems to be

different for the various services we consider here. In particular, short-run constraints seem to play a larger role in the case of dental care and visits at specialist physicians. All main results are robust to different definitions of income and the inclusion of additional regressors in the model.

The remainder of the paper is organised as follows: in the next section, we review the available evidence on health inequalities and on their origins, discussing the methodologies proposed so far in the applied health economics literature, and then presenting the methodology employed by CH. Our empirical exercise on SHARE data follows. A section of concluding remarks and policy suggestions ends the paper.

2. Health inequalities and their causes

The available evidence. Health inequalities have been shown to exist in many different dimensions, and specifically: a) in different countries (developed and less developed countries, countries in transition); b) using different concepts and measures for health (self-assessed health status and more objective measures of health); c) different categories of health consumption (General Practitioner visits, outpatient and inpatient care utilisation, dental care visits); and d) considering individuals at different ages. Inequalities are generally identified by ranking people by an indicator of socio-economic status (for instance, income, wealth, or consumption), and by showing that poorer individuals are also disadvantaged in terms of health (i.e. they report worst health conditions than better off individuals) or health care consumption (i.e. they are less prone to access to services than better off individuals). All the comparisons are generally conducted by controlling for most of the factors that are likely to influence individuals' need (such as age, gender, level of education, lifestyles or habits), so that measured inequalities are computed by equalising needs across the whole population[1].

Wagstaff (2002), in his review of the literature on poverty and health sector inequalities, suggests four main conclusions: a) inequalities are almost always to the disadvantage of the poor; b) inequalities are more pronounced for objective indicators of

[1] On this point, see below the discussion about methodological issues.

health, than for self-assessed measures; c) measured inequalities show large variations across countries, depending on the indicators of health and socioeconomic status used; d) inequalities seem to be widening in the last years. That inequalities are almost always to the disadvantage of the poor is of course worrisome for policy makers, since poorer people are already disadvantaged by their economic situation; and, most probably - as suggested by Wagstaff (2002) - the causality between poverty and ill-health is running in both directions. In fact, e.g. Van Doorslaer *et al.* (1997) suggest that there is a close relationship between income inequality and health inequality, in a sample of European countries and the U.S. And this – in turn – can help explain why both income and health inequalities are widening in the last years.

That health inequalities are favouring the rich is however a very simple statement that necessitate some specifications. For instance, considering the self-assessed health status, in a huge effort to compare different countries, Van Doorslaer *et al.* (1997) show that there are substantial variations in inequalities across a number of developed countries, with the largest levels of inequality observed in the U.S. and U.K., and the smallest reported for East Germany, Finland, and Sweden. In a companion paper, Van Doorslaer *et al.* (2000) analyse inequality in the access to care, by considering the imputed value of the actual reported utilisation of three different types of care (GP visits, outpatient visits and inpatient care, while dental care was excluded since the available indicators of need were not able to identify those for this particular type of services). Findings show a different pattern of inequalities for the three different services, with little or no inequalities in visiting a GP, inequalities favouring the better off in the use of outpatient care, and inequalities favouring the lower-income groups as for inpatient care. Almost all these results are confirmed by Van Doorslaer and Masseria (2004), considering a wider set of OECD countries - ranging from Europe to U.S., from Australia to Mexico - and analysing both the probability and the frequency of usage. In fact, while findings for GP and specialists closely mirror those by Van Doorslaer *et al.* (2000), more equivocal evidence is found for inpatient care utilisation; moreover, for dental care a pro-rich distribution is uncovered. Similar patterns - for the cross-country differences and the different services usage - emerge also for a group of developing

countries and countries in transition (for a very simple analysis, Makinen *et al.*, 2000); but the analyses suffer for the low quality of the data available.

An additional specification about the studies on health inequalities needs to be made for the life-cycle component of the observed inequities. As Deaton and Paxson (1998) has pointed out, the correlation between income and health status varies with age, being small early in life, then becoming steadily larger up to late middle age, to weaken again after the age of 60[2]. One possible interpretation - pointed out by authors – is based on the causality running from health to income: health shocks after retirement do not affect earnings, since most of those incomes come from pensions; on the contrary, health shocks can heavily affect earnings before retirement.

Unravelling the causes of health inequalities. Given the substantial evidence on the existence of health inequalities to the disadvantage of the poor, in a policy perspective it is important to move one step forward, asking about the causes of such inequities. One can think of several different factors affecting individual health status or individual access to care. One such determinants is of course current socioeconomic status (SES), proxied by income, consumption or employment. A lower SES could be associated to a lower access to care (because of both direct and indirect costs) and this, in turn, could be the cause of a worst health status with respect to richer individuals. But there might be other determinants, such as for example the level of education, the family background and early life circumstances, current lifestyles and habits, stressful working and social conditions, or the availability of good quality health care facilities at the local level. All these causes have become known as the "social determinants" of health, and there already is evidence that they do play a role in influencing health inequalities (see Wilkinson and Marmot, 2003 about the "solid facts" on the social determinants of health). Following CH, in this paper we classify these determinants in short-run and long-run factors affecting health inequities. In particular, we define short-run constraints as those that can be removed by a simple policy of cash transfers; on the contrary, long-run constraints remain unaffected by such a policy, and need different policy actions to

[2] Deaton and Paxson (1998) also suggest the existence of a temporal component of the relationship between socioeconomic status and health status. Taking this view, inequalities has been raising in recent years.

be taken. In this perspective, current SES/income seems to be the only factor affecting health inequalities in the short-run, being itself a proxy for short-run credit constraints; all the other factors appear to be instead "long-run constraints" in influencing health equalities[3].

While the literature on the existence of health inequalities is abundant, however, results on the relative importance of the causes of such inequalities are not easily available, and generally do not distinguish between short- and long-run effects. For instance, in a paper aimed at establishing causal links between SES and health status, using a sample of elderly aged 70 and older in the U.S., Adams *et al.* (2003) find some evidence on the role of ability-to-pay in influencing access to treatment only for mental and chronic illnesses. Their interpretation is that only for procedures not covered by Medicare, there is some scope for short-run constraints. But this reading has been challenged by Adda *et al.* (2003), applying the same causality test to Sweden and the UK Whitehall II study, two countries with universal coverage. In a paper concentrating exactly on the Whitehall II study, a sample of British civil servants originally located in London, Marmot *et al.* (2001) try instead to understand whether current SES is more important than other measures of social status earlier in life in explaining morbidity attributable to three types of disease: coronary disease, chronic bronchitis, and depression. Authors' findings imply that current SES in adulthood is more important than father's social class to predict adult morbidity (i.e. short-run constraints seem to prevail on long-run ones). They also suggest that these results are consistent with a "pathway" model in which early life disadvantages affect adult circumstances, rather than disease risk directly. Similar evidence is found also by Currie and Hyson (1999), studying the impact of Low Birthweight (LBW) on SES. LBW impacts well into adulthood, affecting educational attainments, self-assessed health status and employment. Moreover, children from households with a low SES suffer both from the effects of their social status and the effects of LBW. In a more technically oriented

[3] One can notice that also current behaviours (e.g. smoking or heavy alcohol use) affects health in the short-run, because bad consequences on health can simply be removed by eliminating the unhealthy behaviours. However, lifestyles are highly correlated with education, and should then be classified among the long-run causes of health inequalities. In a similar vein, see the discussion in Daniels *et al.* (2006), in particular section 4.3.

paper, Wagstaff *et al.* (2003) study the determinants of inequalities in child malnutrition in Vietnam. Their results suggest that the main causes of inequities are household consumption, and regional fixed effects (gauging differences among regions in terms e.g. of resources for health care, hospitals, and other health infrastructures and technologies). Other factors found to contribute to inequalities are drinking water, sanitation and parental schooling, but their effects appear to be fairly small. Applying the same methodology as in Wagstaff *et al.* (2003), Van Doorslaer and Masseria (2004) found that needs (i.e. all morbidity and demographic variables), income, education and activity status, as well as regional disparities and the private health insurance coverage, are all playing a role in explaining the observed inequalities in health services usage of three different types of services in different OECD countries. In particular, income in itself is not the single most important factor, since education appear to be a key determinant of a pro-rich distribution in many instances, whereas work-activity status contributes to a pro-poor distribution. However, the author emphasise that these findings are not common to all countries considered in the study, and the characteristics of the national health system are important for a proper understanding.

Methodological issues. Before moving to the empirical section of the paper and presenting the method proposed by CH, in this section we discuss some methodological issues, and develop an unifying framework in the spirit of Wagstaff and Van Doorslaer (2000). We analyse the main methodologies proposed in the literature in order to solve two distinct problems, i.e. how to properly measure health inequalities, and how to decompose the observed inequalities in their underlying causes. The problem of a proper measurement of health inequalities originate from the stylised facts that poor people are both more likely to report a worst health status and more likely to report a higher consumption of health care services, so that studying health inequalities without "equalising" needs across individuals may end up with unequal distributions *favouring* the poor. Wagstaff and Van Doorslaer (2000) discuss two methodologies to compute need-standardised medical care figures: the direct standardisation approach and the indirect standardisation approach. To simplify the discussion, let consider a very simple economy, in which the total population of N individuals can be divided into two sub-

groups by income (*Y*) - the poor (*P*) and the rich (*R*) – and two sub-groups by health status (*S*) – the healthy (*H*) and the ill (*I*). The *direct* standardisation approach is based on the computation of need-standardised medical care figures m^+ for each income group, according to the following Eq. (1):

$$m_P^+ = (H/N)m_P^H + (I/N)m_P^I \qquad (1)$$
$$m_R^+ = (H/N)m_R^H + (I/N)m_R^I$$

where $m^S{}_Y$ represents the mean quantities of care received in income group *Y=(P,R)* by persons in need category *S=(H,I)*. Of course, in the presence of horizontal equity (i.e. people in equal need are treated equally, irrespective of their income), it must be true that $m^+{}_P = m^+{}_R$. To assess the degree of health inequalities, one can compare - for each income sub-group - the share of standardised medical care with its population share, and refer to standard tools as concentration curves and indices. While the direct approach considers income groups, the *indirect* standardisation approach works out a figure for each individual in the economy indicating the amount of medical care she would have received if she had been treated like others in the same health need category. In other words, we need to compute *m** for each income group, according to the following Eq. (2):

$$m_P^* = (H \cap P/P)m^H + (I \cap P/P)m^I \qquad (2)$$
$$m_R^* = (H \cap R/R)m^H + (I \cap R/R)m^I$$

where m^S represents the mean quantities of care received by persons in need category *S=(H,I)* on the whole sample. Horizontal equity implies the following equalities to hold: $m^H{}_P = m^H{}_R = m^H$ and $m^I{}_P = m^I{}_R = m^I$; i.e., it must be true that healthy (ill) poor and healthy (ill) rich are treated like every other healthy (ill) individual in the economy. Wagstaff and Van Doorslaer (2000) has shown that computation of m^+ and *m** can be easily arranged by regressing for each income sub-group the actual demand for care *m* on a set of regressors **x**, to be chosen as the best proxies for the individual's need for medical care; hence, these regressions are not to be interpreted as behavioural models, rather as simple devices to compute our variables of interest, and endogeneity is not an

issue here. Just to illustrate, consider for example the direct standardization approach[4]; we need to estimate the following regression model for each income sub-group *Y=(P,R)*:

$$m_i = \alpha_Y + \sum \beta_Y x + \delta DHS + u_i \tag{3}$$

where *DHS* is a dummy variable indicating the health status *S* (equal to 1 when the *i-th* individual is ill). Predicted values from Eq. (3) can be easily interpreted as the mean quantities of care $m^S{}_Y$ received by each income sub-group (evaluated at the sample means of the vector **x**):

$$E[m_i \mid DHS = 0] = \hat{\alpha}_Y + \sum \hat{\beta}_Y \bar{x} = m_Y^H \tag{4}$$

$$E[m_i \mid DHS = 1] = \hat{\alpha}_Y + \sum \hat{\beta}_Y \bar{x} + \hat{\delta} = m_Y^I$$

Results of Eq. (4) form the basis for calculating concentration curves and concentration indices.

Having measured properly health inequalities, a second problem to be solved is how to decompose the observed inequities into their determinants, a point particularly interesting for policy making purposes. One simple methodology used e.g. by Marmot *et al.* (2001) and Kunst *et al.* (2005) relies on computing odds ratios using logistic regressions, and comparing results for different population sub-groups. For instance, in their study on the causes of inequalities in adult morbidity for three types of disease using the Whitehall II data, Marmot *et al.* (2001) adjust observed probabilities by considering both age and current employment grade in a logistic regression model, and then compute odds ratios for different population sub-groups identified by father's social class, height, and age at leaving full time education (the potential determinants of observed inequities). The importance of each one of these determinants is assessed by looking at how odds vary within the relevant sub-group. A more sophisticated approach has been proposed by Wagstaff *et al.* (2003), and is based on the decomposition of a concentration index *C*, computed on the observed distribution of a measure of health status or health care use, into two components: a deterministic one and a residual. For simplicity, we consider again the previous framework, where *m* measure access to care.

[4] For more details on the indirect standardization approach, see the original work by Wagstaff and Van Doorslaer (2000).

Wagstaff *et al.* (2003) suggest to run a regression of the type of Eq. (3) above on the whole sample, in order to obtain estimates of the relevant β'*s*, measuring the marginal effect on the access to care for each of the determinants included in vector **x**. Concentration index *C* can then be decomposed as follows:

$$C = \sum_k \left(\frac{\beta_k \bar{x}_k}{\bar{m}} \right) C_k + \frac{GC_\varepsilon}{\bar{m}} \tag{5}$$

where C_k is a concentration index computed on the *k-th* regressor *x*, GC_ε is a generalised concentration index for ε[5], and all other variables are defined as before. The first part of the RHS in Eq. (5) represents the deterministic component, whilst the last part is the residual one, i.e. the part of health inequalities that cannot be accounted for by systematic variations in the *x'*s. Notice that the importance of a given regressor in influencing inequalities depends on three different factors: a) the importance of the variable, measured by its mean; b) its distribution with respect to SES, measured by the regressor-specific concentration index; c) its marginal effect on the access to care. To illustrate the differences with the approach proposed by CH, we now turn to the empirical section of the paper.

3. The empirical analysis

In this section we discuss our empirical analysis, aimed at identifying long-run and short-run constraints in the access to private health care services in a sample of European countries. We first describe the methodology, and then present our empirical exercise.

[5] In particular, GC_ε is analogous to the Gini coefficient corresponding to a generalised Lorenz curve, and can be written as $GC_\varepsilon = \frac{2}{n} \sum_{i=1}^{n} \varepsilon_i R_i$, where R_i reflects the fractional rank of the i-th individual in the income distribution. We refer to the original paper for more details.

3.1. The methodology

The methodology used in this paper is borrowed from CH, who studied the role of credit constraint in influencing the choice of attending a college, that together with health services contributes building human capital. It has been widely applied in the literature on schooling, since understanding college gaps across income quintiles is a key factor in defining efficient and effective policies for human capital formation, hence for long-term economic growth (see e.g. Aakvik *et al.*, 2005 for Norway; Dearden *et al.*, 2004 for UK). On the contrary, to the best of our knowledge, it has never been considered before in the case of health services, even though also health care is a long-run factor affecting growth.

Consider again the framework sketched above, where *m* denote now access to *private* health care services. For each population sub-group defined by health status *S=(H,I)*, we run the following regression:

$$m_i = \alpha_S + \sum \beta_S x + \sum \delta Q^Y + u_i \qquad (6)$$

where the *x's* identify as before a vector of relevant variables to explain demand for private health care services, and Q^Y are dummy variables for the first three income quartiles *Y=1,2,3*. Notice that Eq. (6) is quite close to the regression used in the direct standardisation approach proposed by Wagstaff and Van Doorslaer (2000), where population sub-groups where instead defined on income. Predicted values from Eq. (6) can be interpreted as demands for private care "adjusted" for long-term factors in each income quartile for all population sub-groups by health status:

$$E\left[m_i \mid Q^Y = 0\right] = \hat{\alpha}_S + \sum \hat{\beta}_S \bar{x} = \hat{m}_S^4 \qquad (7)$$

$$E\left[m_i \mid Q^Y = 1\right] = \hat{\alpha}_S + \sum \hat{\beta}_S \bar{x} + \hat{\delta} = \hat{m}_S^Y$$

To identify "credit-constrained" individuals we then assume that people belonging to the fourth income quartile are not constrained by definition. Hence, we can measure differences in means with respect to the "reference" quartile (the fourth quartile), and interpret these "gaps" as proxies for the share of people constrained. Clearly, we expect all the δ*'s* to be negative. For each population sub-group of healthy and ill people, we compute two types of "gaps", both using "adjusted" and "unadjusted" means:

$$\hat{Gap}_{4,Y} = \hat{m}_S^4 - \hat{m}_S^Y \qquad (8)$$

$$Gap_{4,Y} = \overline{m}_S^4 - \overline{m}_S^Y$$

The total shares of constrained individuals can be easily obtained by summing up "gaps" across income quartiles. The share of short-run (credit) constrained individuals in the access to private care is represented by the total share computed using "adjusted" means, i.e. after controlling for all factors affecting the demand for private care like education or lifestyles. The share of long-run constrained individuals is represented by what is left after removing short-run constrained individuals from the total share computed using "unadjusted" means.

3.2. The exercise

Data and variables definition. The data we use come from the *Survey of health, ageing and retirement in Europe* (SHARE), conducted in 2003 on about 15,000 households and 22,000 individuals of ten European countries: Italy, France, Germany, Austria, Switzerland, Netherlands, Denmark, Spain, Greece, Sweden (see Börsch- Supan and Jürges, 2005). In order to participate to the survey, at least one member of each household had to be aged 50 or older. The survey is particularly useful for our purposes, since it contains for almost all countries detailed information on income, wealth, socio-economic characteristics, health conditions and utilisation of health services. We do not consider the data for Germany and Austria since the information on the use of private health services is missing. We exclude also Switzerland, given the high number of missing data for the same variable.

The main variable of interest *m* we study here is a dummy indicating whether a person purchased private health services during the last twelve months. In particular, the questionnaire asks individuals whether they received any types of care from private providers that they paid out of pocket or through a private insurance *because they would have waited too long or they could not get as much as they needed in the National Health System*. Notice that the variable *m* does not include private providers producing for the National Health System, but only services for which patients are not reimbursed

by the public insurance scheme. Moreover, it already takes into account the possibility that the choice of opting out for private services could depend on the presence of waiting lists in the public service. Types of services include: surgery, care from a general practitioner, care from a specialist physician, drugs, dental care, hospital and ambulatory rehabilitation, home care, care in a nursing home.

People are divided into two health status groups *S* on the basis of a question on self-assessed health status: the "healthy" (*H*) are those who answered that their perceived health status is good or very good, while the "ill" (*I*) are those who stated that their conditions are less than good. The distinction between healthy and non healthy persons is important since these two groups may be led by very different motivations in their demand for health services. The vector **x** in Equation (6) is defined in accordance with the literature on the demand for private health care (see e.g. Propper, 2000; Harmon and Nolan, 2001). In particular, we included a set of family and structural variables that may influence the demand for private health services over the long-run, like age, education, gender, current and past occupation, the presence of a private insurance, possibly dangerous lifestyles as drinking or smoking, and family size. We also consider among our regressors variables measuring the time an individual had to wait before obtaining the service consumed.

The demand for private health services. We take a gradual approach for disentangling long-run and short-run constraints. We start by asking: a) whether healthy people purchase more or less private health services than those in bad health conditions, irrespective of their income or wealth; b) if there is a differential access to private health services according to the household economic resources, irrespective of self-rated health status. We then proceed by implementing the CH approach asking, in the case there is a share of the population that does not purchase private health services, whether this depends on short-run liquidity constraints or on structural long-run behavioural characteristics of the household.

Table 1 shows the "unadjusted" percentage of people that purchased private health services in the various countries, distinguishing between healthy and ill individuals. In almost all countries the probability of using private health services is

greater for those in bad health conditions. But while in some countries the percentage difference among the two groups of people is very low (Sweden, Italy, France), in others (Netherlands, Denmark, Greece) the difference is much bigger. Notice that these percentages refer to the use of private services *during the last twelve months* before the interview. Of course, had we considered a greater time span, we would have obtained higher values, since the probability of becoming ill and needing a doctor tends to increase with the length of the time period considered. At the limit, if we consider private and public services together, it is clear that the probability of using at least one health service is 100% for every person. If we restrict the attention only to private services it is not certain that this probability will tend to 100% for everyone, but it is surely positively correlated with the length of the period examined. This means that, since we are working on a cross-section, our estimates provide a *lower* bound for the share of constrained individuals. Taking into account all countries, the sample share of individuals accessing private services (both healthy and ill) is about one fourth of the total number of individuals, reflecting the fact that most services in European countries are publicly financed. Highest fractions are found in Greece and the Netherlands (respectively 38,2% and 37,1%); the lowest numbers are recorded for Italy, Spain and France (respectively 23,7%, 22,8% and 24,2%).

Tab. 1 Proportion of people using private health services during last 12 months, by stated health conditions

	Ill	***Healthy***	***All***
Sweden	15.9%	15.8%	15.8%
Denmark	20.7%	11.6%	14.4%
Netherlands	22.7%	14.4%	17.1%
France	13.0%	11.2%	11.9%
Spain	12.2%	10.6%	11.4%
Italy	12.2%	11.5%	11.9%
Greece	21.7%	16.5%	18.5%
All countries	*13.8%*	*12.0%*	*12.8%*

A preliminary condition that need to be verified before analysing the possible determinants of liquidity constraints is the actual presence of some households constrained in their access to private services, by looking at “unadjusted” means in the different income quartiles. Tab. 2 shows the percentage of people (both healthy and ill)

that bought private health services in the twelve months prior to the interview in each of the four quartiles of the distribution by gross household income. Contrary to what one could expect, only in two countries, Italy and Spain, is this percentage clearly increasing from the poorest to the richest quartile. In some countries, in particular Denmark and Greece, the share of persons purchasing private services is actually *negatively* correlated with family income, probably because most of the individuals in bad health are also poor. These sample means are confirmed by considering the distribution of wealth, a *proxy* for the available resources to households that can be run down by sick people to pay for care (see e.g. Deaton and Paxson, 1998)[6]. The only exception is the case of Netherlands, for which we now observe a gradient in the access to private health services (Tab. 3).

Tab. 2 Percentage of people using private health services during previous 12 months, by non equivalent income quartiles

	Sweden	**Denmark**	**Netherlands**	**France**	**Spain**	**Italy**	**Greece**
1	14.1	16.4	17.9	13.5	7.9	7.5	21.0
2	17.6	14.1	15.9	11.7	10.3	9.0	18.2
3	14.8	13.2	19.3	11.2	11.9	12.6	16.1
4	16.8	13.9	15.2	11.1	15.3	18.5	18.7
Total	*15.8*	*14.4*	*17.1*	*11.9*	*11.4*	*11.9*	*18.5*

Tab. 3 Percentage of people using private health services during previous 12 months, by non equivalent wealth quartiles

	Sweden	**Denmark**	**Netherlands**	**France**	**Spain**	**Italy**	**Greece**
1	13.4	14.0	15.3	14.6	9.4	7.6	16.1
2	15.5	17.1	16.2	10.0	8.7	9.6	20.8
3	16.5	12.9	17.1	12.2	14.7	12.1	18.6
4	17.4	14.7	20.3	11.4	15.5	20.9	18.9
Total	*15.8*	*14.4*	*17.1*	*11.9*	*11.4*	*11.9*	*18.5*

Two conclusions arise from this evidence. First, the pattern of private health service use is very much differentiated across European countries. The view that private service are mainly consumed by rich people is, in general, *not* supported by these data. In some countries, however, private services actually seem to be purchased particularly by the rich: in Italy and Spain, the share of the first income quartile purchasing these

[6] Accordingly, the definition of wealth considered here excludes the market value of the house owned by the respondents, since it could be difficult to sell.

services is less than half the share of the richest quartile. It follows that Italy and Spain may be the two ideal countries to consider for applying the CH methodology. Since the results obtained using non equivalent income are very similar to those computed by using wealth, in the remainder of the section we discuss only the former.

Long-run and short-run constraints. In order to separate the effects of short-run and long-run constraints on the demand for private services, we apply the methodology described in section 3.1. In particular, we run Eq. (6) on each sub-sample of healthy and ill individuals for all the countries considered here. Overall, regression results seem to show a reasonable fit to the data, and regressors are always jointly statistically significant[7]. As expected, the presence of a private insurance is almost always significantly and positively associated to the demand of private services across countries. Also the unavailability of services (because of distance and opening hours) is another significant determinant of demand. But apart from these two variables, no clear patterns emerge across countries: for instance, in Italy, age, gender, past employment and smoking behaviour are all significant factors in influencing demand (confirming previous findings by Propper, 2000); but the same is not true e.g. in Denmark, where only age is relevant. More importantly, dummies for income quartiles are significant only in few countries, suggesting that the role of credit constraints is not probably common across Europe.

< Figure 1 about here >

Figure 1 shows, for all countries, the estimates of the share of "constrained" individuals obtained by applying the CH method. For the two groups of ill and healthy persons, further divided into quartiles of gross household income, the figure contains the proportions of people purchasing private health services, both "unadjusted" (like the percentages reported in Tab. 1 and 2) and "adjusted" (i.e. using predicted values of regressions described in section 3.1). For Italy, the unadjusted data show that the share

[7] Regressions results are not reported here for brevity, but are available upon request from the authors. P-values of the F-tests associated to the regressions are included in the Appendix.

of people from the richest quartile purchasing private health services is, for the ill group, 14 percentage points higher than for those in the first quartile, while for the healthy groups this difference amounts to 9 percentage points. After controlling for family characteristics, these differences drop to about 5 percentage points in both cases. This is a strong evidence in favour of the presence of both short-run and long-run constraints: the short-run constraints are evident from the differences between the adjusted means. For Italy, therefore, it seems that both short-run and long-run constraints are playing a role in determining the access to private health services. Morevoer, long-run family characteristics seem to explain a significant part of the gap in participation rates across income quartiles. The results for Spain are very similar to the Italian ones. In the Spanish case the gap in participation rates between the first and the richest quartile is 5 points for the ill and almost 10 points for the healthy. These percentages, after the adjustment for structural family and environmental differences, reduce respectively to 1.7 and 3.3 percentage points.

Tab. 4 Proportion of individuals constrained and share of short-run constrained

(All private services, 2003)

	LR & SR constrained individuals			**SR constrained**	
	% on all individuals	***% on all users***	***% SR/(SR+LR)***	***% on all users (estimated)***	***% on all individuals (self-perceived)***
Sweden	1.08	1.27	22.45	0.29	3.24
Denmark	1.64	1.95	38.00	0.74	1.64
Netherlands	0.35	0.44	100.00	0.44	2.18
France	0.67	0.95	41.76	0.40	5.74
Spain	3.92	6.75	21.65	1.46	3.08
Italy	6.85	10.71	52.45	5.62	5.08
Greece	1.48	2.38	74.38	1.77	5.67

To give a more precise account of the role of constraints, in Table 4 we report for all countries the percentage of constrained people, and - among them - the share of short-run constrained individuals, considering all private services. As anticipated, Italy and Spain seem to be the two countries where the share of constrained individuals, either in the long-run or the short-run, is significantly higher than in all the others. Also in Greece and Denmark some individuals are constrained, but to a lower degree. On the

contrary, the Netherlands appear the country with the lowest level of constrained individuals. Italy and Spain rank first for the role of constraints also when one considers the percentages of constrained individuals only on users of public or private health services. The percentage for Spain almost doubles, from 3.92 to 6.75, whilst for Italy, the percentage raises from 6.85 to 10.71. The impact of constraints is again the lowest in the Netherlands. The shares of short-run and log-run constrained individuals are different across countries. Combining the percentage of constrained individuals with this share, short-run constraints are more important in Italy and Greece, where respectively 5.62% and 1.77% of all users in the sample suffer from credit constraint according to the CH procedure. Notice that this ranking emerges also by considering the percentage of people who declared in the questionnaire to give up any types of care, because of the costs they would have to pay. This information is contained in the last column in Tab. 4. By comparing the number of estimated and self-perceived constrained individuals, the CH procedure seems to underestimate the role of constraints in the access to private care. The degree of underestimation is particularly strong for France, where 5.74% of individuals declared to be constrained, while our estimate was a mere 0.28%.

Extensions. Table 4 refers to results obtained by considering all private services and all individuals. We now extend these baseline results in two different ways: on the one hand by distinguishing different kinds of services, in particular considering dental care and care from a specialist physician, since we expect that short-run credit constraints may play a more relevant role in these particular sectors than on the whole set of private health services. There is ample evidence for instance that inequalities in oral health are marked by social class inequalities (e.g. Watt and Sheiham, 1999). On the other hand, we extend the analysis by looking at differences in gender, since the role of long-run and short-run constraints should be expected to be different for men and women, given the observed different access to care services between genders.

As for the first route, by looking at dental care we obtain almost the same results as by considering all private health care services. Table 5 shows that the presence of constrained individuals (both in the short and the long-run) is the highest in Greece and

Italy (respectively 3.41% and 2.76%) and the lowest in Sweden (0.15%). These percentages worsen when one considers the number of users of dental care services (both public and private): in Greece and Italy, the percentage is well above 8%; in Spain, it reaches 7.26%. The importance of short-run constraints is larger in the three Mediterranean countries: in Italy, 6.02% of users are credit constrained in the access to private health care services. This percentage is 5.55% in Greece, and 3.28% in Spain; while for all the other countries the share of short-run constrained users is below 1%. As before, the share of constrained individuals is underestimated by the CH procedure. France and Sweden are the two countries where the differences appear to be the largest.

Tab. 5 Proportion of individuals constrained and share of short-run constrained

(Dental services, 2003)

	LR & SR constrained individuals			**SR constrained**	
	% on all individuals	***% on all users***	***% SR/(SR+LR)***	***% on all users (estimated)***	***% on all individuals (self-perceived)***
Sweden	0.15	0.20	100.00	0.20	2.26
Denmark	1.33	1.77	52.41	0.93	0.63
Netherlands	0.26	0.43	0.00	0.00	0.47
France	0.63	1.47	20.86	0.31	2.97
Spain	1.82	7.26	45.12	3.28	1.14
Italy	2.76	8.63	69.78	6.02	1.42
Greece	3.41	8.98	61.83	5.55	2.28

A partially different picture emerges by considering visits at a specialist private physician. Table 6 shows that Italy and Spain rank again in the top positions when one look at all individuals. But taking into account only users, i.e. those persons that during the previous twelve month received care from a private or public specialist physician, also in Denmark and Sweden the share of constrained individuals is worrisome (8.54% and 4.76% respectively). The relatively high percentage of constrained individuals on private services users estimated for Denmark seems to be the result of the very low incidence of consumers for this type of services in the sample, both from public and private providers (17% against an overall mean of 43%). One possible interpretation relies on the institutional role assigned to General Practitioners in Denmark, who act as gatekeepers to the specialist services, even though in almost all countries people are

supposed to refer to a GP before consulting a specialist (e.g. Halldorsson *et al.*, 2002). Notice also that for Denmark, as for most of the countries, all constrained individuals are short-run constrained, confirming worries about the role of age pension policies in eradicating inequalities in social democratic Welfare States (e.g. Dahl and Birkelund, 1997). On the contrary, only in Italy and Spain most of constrained individuals are long-run constrained. Finally, contrary to the case of all private services and dental care, now the CH procedure slightly overestimates the share of short-run constrained individuals for almost all countries.

Tab. 6 Proportion of individuals constrained and share of short-run constrained

(Care from specialist physician, 2003)

	LR & SR constrained individuals			**SR constrained**	
	% on all individuals	***% on all users***	***% SR/(SR+LR)***	***% on all users (estimated)***	***% on all individuals (self-perceived)***
Sweden	1.52	4.76	71.99	3.42	0.43
Denmark	1.48	8.54	100	8.54	0.23
Netherlands	0.24	0.67	100	0.67	0
France	0.7	1.54	100	1.54	1.24
Spain	1.89	4.92	11.6	0.57	0.94
Italy	3.67	9.23	28.7	2.65	1.35
Greece	0.75	2.20	100	2.20	1.49

The second route we take extends our previous results by looking at gender differences. Separate results for women and men are collected in Table 7. Differences are significant. Consider Italy and Spain, the two countries where the percentages of constrained individuals are the highest: as for Italy, by looking at all individuals, the percentage of constrained women is 5.92 and the percentage of constrained men 7.23; in Spain, 1.34% of women and 4.39% of men are constrained. The situation in other countries is very similar: with the only exception of Greece, the percentage of constrained individuals is higher for men than for women. As for the role of long-run and short-run constraints, notice that both for Spain and Italy (the two countries where the problem is most severe), women are more likely to be long-run constrained, while men are more likely to be credit constrained. One possible interpretation of these findings relies on the biological role of women, that helps explain their higher usage of

health care services. Other gender specific factors influencing the access to services - and probably connected with reproductive biology - are related to different health perceptions and reporting of symptoms and illnesses, and to different probabilities of seeking help for prevention (see e.g. Bertakis *et al.*, 2000). Indirect evidence on this point can be gauged also by looking at the role of mother's education in explaining access to care of their children: low educated mothers have been shown to consistently reduce their children's use of physician services (e.g. Halldorsson *et al.*, 2002), suggesting that long-run constraints should be more important than credit constraints for women.

Tab. 7 Proportion of individuals constrained and share of short-run constrained

(All services by gender, 2003)

	LR & SR constrained individuals		
	% on all individuals	***% on all users***	***% SR/(SR+LR)***
Sweden - women	0.24	0.31	100.00
Sweden - men	1.43	1.81	36.00
Denmark - women	0.29	0.37	100.00
Denmark - men	4.29	5.43	77.00
Netherlands - women	0.29	0.37	100.00
Netherlands -men	0.8	1.01	88.00
France - women	0.13	0.17	100.00
France - men	2.09	2.64	58.00
Spain - women	1.34	2.32	23.40
Spain - men	4.39	7.56	55.19
Italy – women	5.92	9.24	45.91
Italy – men	7.23	12.83	52.53
Greece - women	5.53	7.00	92.00
Greece - men	1.01	1.27	29.00

4. Concluding remarks

This paper aims at distinguishing long-run and short-run constraints in the access to private health care services, concentrating on a group of selected European countries. We depart from standard methodologies applied in the analysis of the causes of health inequalities, using instead the methodology proposed by CH to analyse the role of

family background and credit constraint in educational choices. This methodology is applied to the SHARE database, a survey conducted in a number of European countries (ranging from Scandinavia to the Mediterranean), involving some 22,000 individuals over the age of 50. Our results show that, contrary to what one could expect in the presence of a universal coverage publicly provided, there is evidence of constrained individuals in the access to private health care services, and the problem of short-run constraints could be real. This appears to be especially true in Italy, Greece, and to some extent Spain. Moreover, there appear to be differences in the role of credit constraints, both considering more specific services (e.g. dental care or specialist visits), and gender differences.

That credit constraints appear to be important in Mediterranean-style Welfare States is a finding that deserves further investigation, and suggests the potential role of wide quality differences in the publicly provided services between different geographical areas of a country. Indeed, people living in areas where the quality of public care is inadequate should have one more reason to opt out for private care, but their access could be limited by the presence of liquidity constraints. Indirect evidence on this is available for Italy, where huge territorial differences exist in the quality of services produced by the NHS, and where the low quality of care has been shown to increase health inequalities at the local level (Jappelli *et al.*, 2004).

In a policy perspective, the presence of both long-run and short-run credit constraints calls for multi-faceted programs, aimed on the one hand at removing cash constraints, and on the other hand at addressing long-run factors affecting health. This conclusion is much in the vein of proposals advanced e.g. by two well known policy reports on inequalities in health in the UK (Department of Health and Social Security, 1980; Department of Health, 1998), or by advocates of the "social determinants" of health (e.g. Wilkinson and Marmot, 2003). In other words, there seems to be a scope for simple cash transfers (or vouchers programs) in the countries where the problem of credit constraints appear to be most severe; but these transfers should be targeted toward the poorest individuals, integrating public pensions programs in the case of old age persons. Morevoer, beside these transfers, government need to implement preventive policies aimed at removing long-run constraints, such as those deriving from a poor

education or a poor family background. This calls for the interplay between health policies and other social policies, and the need to re-think a comprehensive strategy for a more effective Welfare State.

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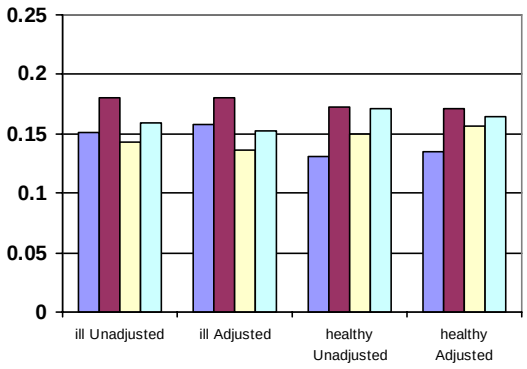
Appendix

Tab. A1. P values of the F test for the country-level regressions, used to compute the values reported in Fig. 1 and Tab. 3

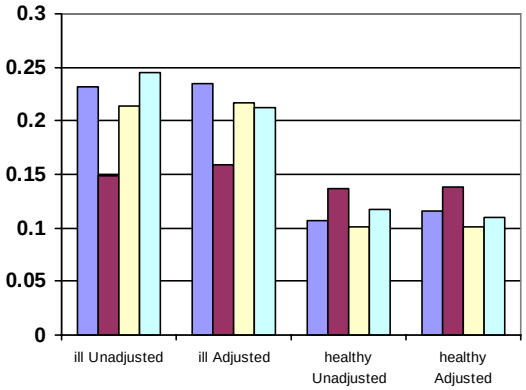
Prob > F =	**Ill**	**Healthy**
Sweden	0.0068	0.0000
Denmark	0.0031	0.0458
Netherlands	0.0001	0.0004
France	0.0006	0.0089
Spain	0.0000	0.0000
Italy	0.0000	0.0000
Greece	0.0001	0.0000

Fig. 1 Proportion purchasing private health services by health status and income quartile

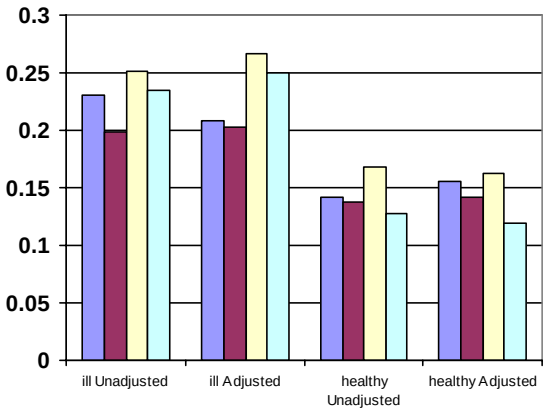
a) SWEDEN



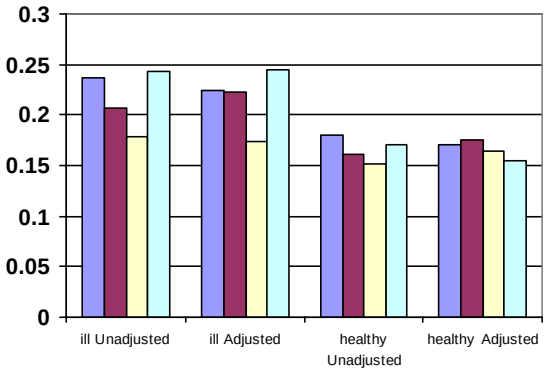
b) DENMARK



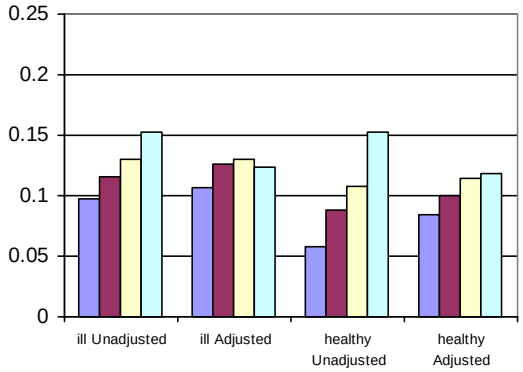
c) NETHERLANDS



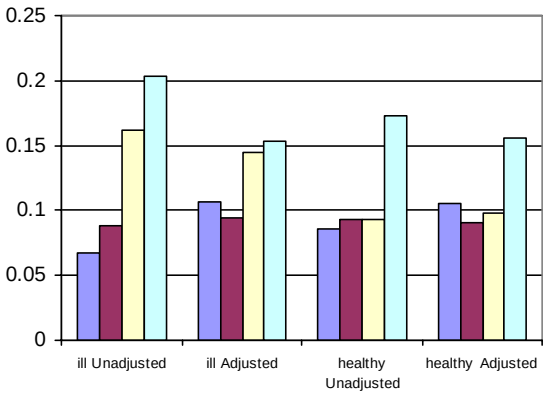
d) FRANCE



e) SPAIN



f) ITALY



g) GREECE