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THE ROLE OF PERCEIVED QUALITY OF PUBLIC SERVICES IN DETERMINING LIQUIDITY CONSTRAINTS TO ACCESS PRIVATE SPECIALIST CARE[⊗]

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Abstract In this paper we offer direct evidence on the role of perceived quality differences in publicly provided health care services, in determining the incentive to opt out for private services and, for poor individuals, short-run credit constraints in the access to these services. We build on Baldini and Turati (2006), concentrating on private specialist care, a category of services for which disparities in the access are the highest. We use the 1993 Bank of Italy - SHIW data to first study the determinants of demand for private specialist care. We then apply the Carneiro-Heckman procedure to identify the share of people constrained and study how perceived quality of public services affects the percentage of people short run constrained, and their expenditure. Our estimates suggest that short run constrained individuals are those judging (on average) more of inferior quality public services, hence with a greater incentive to opt out. Moreover, our findings suggest that these are mostly healthy people, who are looking for diagnostic and preventive care.

JEL Codes: D31, I10, I31

Keywords: health inequality, private specialist care, credit constraints, family background

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1. Introduction

A large body of literature has emphasised the presence of large and persistent health inequalities within all world countries. It is then not coming as a surprise that – in the last decades - health disparities favouring the better off are at the top positions in the agenda of the policy problems facing at least European governments[1]. Indeed, one intriguing unresolved question is that these inequalities are present also in countries with universal health care system, which – at least in principle – are designed to guarantee equality of access to every citizen. There are different explanations for these inequalities to hold: one can broadly think to long-run constraints to access services, referring for instance to poor education or poor family background, so that a simple program of cash transfers targeting the poor is not able to remove such constraint; and to short-run constraints in accessing services, principally thought as liquidity constraints, that can be removed with a transfer program favouring the worst off. The prevalence of one type of constraint over the other leads to very different policy suggestions, so that it is becoming increasingly urgent – if one want to properly address health disparities – to understand which is prevailing and what role – if any – are they playing.

In a previous work (Baldini and Turati, 2006), we attempt at distinguishing long-run and short-run constraints in the access to *private* health care services, applying the procedure proposed by Carneiro and Heckman (2003) in the context of the demand for higher education. We applied this methodology to the SHARE database, a survey conducted in a number of European countries (ranging from Scandinavia to the Mediterranean), where State intervention in health care is widespread, involving some 22,000 individuals over the age of 50, i.e. the one most in need according to most research. Results show that - contrary to what one could expect - the presence of a universal and publicly provided coverage is not enough to guarantee equality of access to all citizens. There is evidence of constrained individuals in the access to private health care services, both in the short- and in the long-run, which is an indirect signal of

[1] In Italy, where regional governments are deeply involved in managing health care systems, also Regions are starting tackling the problem. See e.g. Cocchi et al. (2007) as an example of policy report for Emilia Romagna, one of the Region at the forefront of management innovations in health care.

the presence of inequalities even in the access to public services. The problem of short-run constraints appear to be real in countries like Italy, Greece, and to some extent Spain. Moreover, there appear to be differences in the role of liquidity constraints, both considering more specific services (e.g. dental care or specialist visits), and gender differences.

That liquidity constraints appear to be important in Mediterranean-style Welfare States is a finding that poses captivating questions and deserves further investigation. It 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 to these services could be limited by the presence of liquidity constraints. Indirect evidence on this is already 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 and Padula, 2003; Jappelli *et al.*, 2007).

In this paper we aim at providing direct evidence on the role of quality differences in publicly provided health care services in determining short run constraints in the access to *private specialist care*, a group of services for which disparities in the access are the highest according to the available evidence. We consider the 1993 Bank of Italy - SHIW data, exploiting a particular issue surveyed in the questionnaire on the quality of public and private services. We first study the determinants of demand for private specialist care services. We then apply the Carneiro and Heckman methodology to identify short- and long-run constraints in the access to private health care services. We finally study how perceived quality of public services affects the percentage of people short run constrained. Our estimates suggest that short run constrained individuals are those judging (on average) more of inferior quality public services, hence with a greater incentive to opt out.

The paper is organised as follows. In Section 2, we briefly survey the scant literature on health disparities in Italy. Section 3 is devoted to present the empirical exercise: we first estimate demand equations for private services by using different econometric techniques; we then discuss the Carneiro-Heckman approach, and

introduce our results. Section 4 discusses our findings and identify avenues for further research.

2. Health disparities in Italy

The evidence. The literature on health disparities has delivered so far important results, especially for the existence of such inequalities across a whole range of dimensions. From a methodological point of view, different individuals are generally compared by equalising needs across the whole population, i.e. by standardising demand or access to services taking into account most of the factors that are likely to influence individuals' needs (like age, gender, level of education, lifestyles or habits). Inequalities are then generally identified by ranking people according to an indicator of socio-economic status (SES from now on) as, for instance, income, wealth, or consumption, and by showing that poorer individuals are disadvantaged also in terms of either *health* - because they report worst health conditions than better off individuals - or *health care services consumption* - because they access and consume services less than better off individuals. Moving from these methodological premises, health inequalities have been shown to exist in many different dimensions - including different geographical areas, different concepts of health status, different types of care services, and different ages during the life-cycle (e.g., Gwatkin, 2000) – and to be persistent over time (e.g., Kunst *et al.*, 2005).

Compared with this burgeoning evidence, results for Italy are rather scarce and mostly to be attributed to non economist. Early international research studies aimed at comparing different countries typically excluded Italy (e.g., Van Doorslaer *et al.*, 1997; 2000), whilst the country has been included in second generation studies like Van Doorslaer and Masseria (2004) and Van Doorslaer and Koolman (2004). The first of these works considers inequities in the use of health care services, computing horizontal inequality indices (HI) for access to General Practitioner services, specialist care, inpatient care, and dental care. Results suggest that Italy fares among the countries where access is more unequally distributed, especially for specialist care and dental

care. As for the former type of care, computed HI for Italy is 0.112; Portugal is the country where inequities are estimated to be higher (HI=0.208), followed by Finland (0.136) and Ireland (0.129). As for the latter, estimated HI for Italy is 0.105; among the European countries, Portugal is again the nation where inequalities in access are higher (HI=0.196), followed by Spain (0.137) and Ireland (0.130); crossing the Atlantic, estimated HI is respectively 0.173 for U.S. and 0.126 for Canada. Also inequalities in the access to inpatient care set Italy in top positions, after Mexico and France; but estimated inequities are of a much lower degree, with HI being 0.033 for Italy, 0.078 for Mexico, and 0.035 for France. Decomposition of computed inequality index to its sources – according to a by now standard procedure introduced in the literature by Wagstaff et al. (2003) – suggests that income is particularly important in both Portugal and Finland in explaining health inequalities; moreover, income is particularly important in explaining disparities in specialist care.

Van Doorslaer and Koolman (2004) add to these results by considering a self-reported measure of health. They present three main findings: first, they suggest that health inequalities are not a mere indication of income disparities; Italy fares better than Portugal, a country where health inequalities are particularly higher, but also than UK and Denmark, that is countries with very different income distributions. Second, they also found – primarily in Southern European countries – regional health disparities to heavily contribute to explain disparities in health[2]. Finally, a great portion of inequities can be attributed to relative health and income positions of non-working European, like the retired or the disabled. According to the authors, Denmark stands as a vivid example of this problem: health inequalities are higher not because of income inequality, but for the fact that early retired individuals are characterised by a relatively worst health status and fall into lower income deciles. Evidence of this mechanism being at work is provided by Cardano *et al.* (2004) also for Italy. Using the Turin Longitudinal Study Database – which includes data on all individuals resident in Turin who were living there at one or more of the Censuses of 1971, 1981, and 1991 – authors find that health status is more important in influencing exit toward early retirement or unemployment

[2] This result on the role of regional disparities is confirmed also by Masseria and Paolucci (2005), as far as inequalities in inpatient services are considered.

than in influencing social mobility. Exit from the labour market implies these individuals to be characterised by a worst SES than before the health shock has occurred, which matches with the bad health status that caused their SES to fall.

The role of quality. Overall, evidence on health disparities in Italy bring us to these conclusions: a) Italy is characterised as one of the country in which health inequalities are higher, especially for services like specialist care and dental care; b) as in other Southern European Welfare States, regional disparities profoundly contribute to these inequalities; c) from an individual point of view, a mechanism particularly important in explaining inequalities is the arrival of health shocks, causing exit from the labour market, which depresses income for individuals who remains most presumably in bad health after the shock has occurred. In this paper, we investigate further on regional disparities, in particular in terms of quality of the services provided across Regions. Indeed, regional disparities make Italy an interesting laboratory, given the wide differences between the Northern and the Southern part of the country. If one looks for instance at data on patient-assessed quality of health services, as represented in Table 1, differences are striking across all the three items surveyed (medical and nurses care, and hygiene of sanitary fittings), with no significant gender differences. For medical care, the percentage of people very satisfied in Northern regions is almost twice as high as the same percentage in Southern regions. Differences are even wider when looking at nurses care and hygiene of sanitary fittings. Regions with the worst performance across the country and for all the three items are all in the South: Puglia scores as the region with the lowest percentage of people very satisfied for medical care, with a mere 19.2% (against a national average of 35.8%); Molise is the worst for nursing care (15.3% against 33%); Sicilia scores only a 10.9% of people very satisfied for hygiene of sanitary facilities, against a national average of 25.9%.

This "inequality in quality" has been already emphasised, among others, also by Jappelli and Padula (2003) and Jappelli *et al.* (2007). The former shows that - even controlling for regional fixed effects - the quality of care affects health outcomes, i.e. that higher (self-reported) quality of care is associated with better health outcomes. The latter demonstrates on the one hand a negative relationship between income inequality

and the quality of health care, and on the other hand a negative association between health inequality and the quality of health care. For the purposes of the present paper, the wide differences in quality are important as potential determinants of a demand for private services which is left unexpressed. Southern regions are not only characterised by the lowest percentages of people satisfied for the quality of health services, but also by a high concentration of people with a poor SES.

Table 1. People very satisfied with hospital services by sex and regions (%, 2000)

Regions	**Males**			**Females**			**Total**		
	Medical care	*Nursing care*	*Hygiene of sanitary fittings*	*Medical care*	*Nursing care*	*Hygiene of sanitary fittings*	*Medical care*	*Nursing care*	*Hygiene of sanitary fittings*
Piemonte	45,3	46,5	42,2	51,5	47,8	45,0	48,6	47,2	43,7
Valle d'Aosta	60,6	54,2	45,7	24,0	24,0	52,5	39,0	36,4	49,7
Lombardia	37,2	39,5	32,7	47,3	45,8	34,1	42,6	42,9	33,4
Trentino-AA	64,5	62,1	68,1	58,7	65,0	59,6	61,8	63,5	64,1
Bolzano-Bozen	*67,0*	*65,0*	*69,9*	*51,1*	*63,3*	*67,6*	*60,9*	*64,3*	*69,0*
Trento	*59,0*	*55,8*	*64,1*	*66,3*	*66,8*	*51,6*	*63,2*	*62,2*	*56,9*
Veneto	50,7	33,0	27,7	36,0	37,4	33,0	42,0	35,5	30,8
Friuli-VG	63,8	63,8	49,4	56,1	58,2	54,7	58,2	59,8	53,2
Liguria	43,7	44,4	26,7	30,7	32,6	23,0	38,2	39,4	25,1
Emilia-R.	59,1	61,0	40,5	42,4	40,8	36,6	50,8	50,9	38,6
Toscana	41,9	39,5	33,4	47,0	41,9	33,3	44,6	40,7	33,3
Umbria	32,0	38,3	25,8	38,3	49,8	37,2	34,7	43,2	30,7
Marche	27,1	29,9	19,1	32,5	31,6	20,9	29,3	30,6	19,9
Lazio	34,6	22,9	12,4	30,2	19,1	18,2	32,1	20,7	15,8
Abruzzo	17,8	19,8	13,5	25,7	30,2	15,1	22,2	25,5	14,4
Molise	23,8	9,3	9,3	29,9	20,1	26,6	27,2	15,3	18,9
Campania	22,0	21,4	10,8	32,5	21,1	18,2	26,9	21,2	14,2
Puglia	15,5	15,6	10,5	22,1	19,7	17,2	19,2	17,9	14,3
Basilicata	29,6	24,7	13,3	19,9	18,0	18,0	24,2	21,0	15,9
Calabria	29,7	21,5	23,0	22,3	17,6	12,7	25,7	19,4	17,5
Sicilia	17,7	16,9	7,9	30,0	19,6	14,9	23,1	18,1	10,9
Sardegna	35,0	33,7	22,3	26,6	34,1	24,4	30,7	33,9	23,4
North-West	*40,3*	*42,1*	*34,1*	*46,3*	*44,7*	*35,7*	*43,4*	*43,4*	*34,9*
North-East	*57,0*	*51,1*	*40,0*	*42,8*	*43,6*	*39,3*	*49,2*	*47,0*	*39,6*
North	**46,9**	**45,6**	**36,4**	**44,8**	**44,2**	**37,2**	**45,8**	**44,9**	**36,8**
Centre	**35,2**	**30,4**	**21,0**	**35,8**	**28,8**	**23,9**	**35,5**	**29,5**	**22,5**
South	*21,1*	*19,4*	*12,9*	*25,9*	*21,1*	*16,8*	*23,6*	*20,3*	*15,0*
Islands	*21,1*	*20,2*	*10,7*	*29,2*	*23,2*	*17,3*	*24,8*	*21,6*	*13,7*
South & Islands	**21,1**	**19,6**	**12,2**	**26,7**	**21,6**	**16,9**	**23,9**	**20,6**	**14,6**
ITALY	**34,9**	**32,9**	**24,3**	**36,6**	**33,2**	**27,4**	**35,8**	**33,0**	**25,9**

Source: ISTAT

An interesting hypothesis is that the low quality of publicly provided health services can induce people to opt out for private producers, but income level is not enough to guarantee access, leaving people liquidity constrained. This is the hypothesis we test in the empirical part of the paper, to which we now turn.

3. The empirical analysis

In this section we first describe our data, and discuss our estimates of demand for private services. We then explore the role of quality in determining liquidity constraints: we present our adaptation of the approach proposed by Carneiro and Heckman (2003) to estimate long- and short-run constrained individuals in the access to private specialist care (CH from now on), and then discuss our results.

3.1. The data

Since our main interest here is on the role of quality, we use the 1993 wave of the Bank of Italy – SHIW, which contains an entire section devoted to public services and the quality of life, plus the usual information on income, wealth, and personal characteristics of households and individuals. Public and private services surveyed include transportation, health care, child care, schools, and universities. For each of these, each household is asked whether they did use the service, for how many times, and how much did they spend for it. We measure access (consumption) of *private specialist care* by both considering a binary variable m (equal to 1 when the household actually consume the service), and a continuous variable M (measuring the number of times private specialist care services are consumed).

People were asked - using a scale going from 1 (worst mark) to 10 (best mark) - to assess the quality of public services, plus to indicate the availability of parks, shops, museums, but also the presence of micro-criminality (broadly defining an indicator of the quality of life). Following Costa and Garcìa (2003) – which is the only study so far

to study the role of perceived quality in accessing private services - we use the assessment about the quality of publicly provided health care services as a measure for quality (*QUAL*). We also compute an *environmental quality index (EQI)*, by summing up self-evaluations of the following items: quality of tap water, quality of air, availability of green areas, traffic conditions, noisiness and street cleaning (the higher the score, the better the quality of the local environment).

A drawback of using the 1993 SHIW data is that information on self-assessed health status of all interviewed individuals are not available. One possibility is to match the 1993 data with the 1995 SHIW wave, like in Jappelli and Padula (2003), as information on individual health status is available in the 1995 wave. Here we take however a different route, by limiting our sample to households of employees only; we define households of employees as those where *both* partners are employees. According to this definition (which may be restrictive, but avoid additional bias) we are left with 1046 observations. For this particular sample, we have information on the number of working days missed for illness (excluding pregnancy). We then partition the households according to the following rule: health status is ill (*I*) for all households for which *at least one* employee has missed no less than 10 working days; we define healthy (*H*) all the remaining households.

According to the literature on the demand for private care (e.g., Propper, 2000; Atella et al., 2004; Atella and Deb, 2008), we also selected as main determinants of accessing private specialist care a number of other variables including: age of both partners (*AGE*, *AGE_P*); a dummy for the household head gender (*H_MAN*); the number of children (*NCHIL*); education, measured by a dummy for having obtained a BA degree (*EDU, EDU_P*); the type of job - identified by a dummy for being an unskilled worker - for both partners (*UNSK*, *UNSK_P*); household equivalent income (*Y*); a dummy variable identifying the subscription of a private health insurance (*INS*); a *deprivation index*, defined as home square metres per each component of the household, i.e. a measure of overcrowding in dwelling (*DEPR*). We also provide a rough control for differences across the different geographical areas of the country, by considering a set of area dummies. Descriptive statistics and definition of all the variables considered in the empirical work are collected in table A.1 in the Appendix.

3.2. The demand for private services

In this section we present our demand models for private services and their estimates. We begin by considering a straightforward probit model:

$$\Pr(M_i > 0 | z_i) = \Pr(m_i = 1 | z_i) = F(z_i, \beta) \quad (1)$$

where the probability to access private specialist care services *m* is a function of the set of covariates *z* defined above, and a corresponding set of parameters β to be estimated; *F(.)* is the standard normal CDF. Estimates of Eq. (1) are reported in Table 1, and largely confirm results available in the empirical literature. Bad health status increases the probability to access private services, while having a man as a household head reduce this probability. As largely expected, coefficient on income is positive and significant: richer households purchase more private services than poorer ones. Coefficient on the index of environmental quality is negative, suggesting that private demand is higher where the quality of local environment is worst. Also the coefficient on *QUAL* is negative, suggesting that – controlling for other covariates - probability to access private services is higher where the perceived quality of public health care services is lower. An explanation for both these finding is that public expenditures contribute to define standard of living at the local level: where government intervention is effective in providing good quality services, room for private providers is reduced. We also experimented by interacting *QUAL* with income, but rejected this specification by using a LR test (LR = 0,0198; LR ~ $\chi_{(1)}$).

One possible critique to these results is that they are obtained with a too naive model. As suggested by the literature (e.g., Atella et al., 2004; Atella and Deb, 2008), the choice of a private provider of health services is a process reflecting the presence of public alternatives (or complements). To answer this consideration, we then estimate the following bivariate probit model:

$$\Pr(M_i > 0 | z_i) = \Pr(m_i = 1 | z_i) = F(z_i, \beta) \quad (2)$$

$$\Pr(M^{pu}{}_i > 0 | z_i) = \Pr(m^{pu}{}_i = 1 | z_i) = F(z_i, \alpha)$$

where we augment Eq. (1) with a second equation for the probability to access public health care services m^{pu}; we hold constant the set of covariates z. Eq. (2) allows us to control for the presence of bias, by allowing unobservables of the two equations to be jointly distributed as a bivariate normal with free correlation. Indeed, correlation between unobservables is negative, suggesting a certain degree of substitution between the two type of specialist care (as in Atella and Deb, 2008); but the correlation is significant only at the 3% level of confidence. Looking at the coefficients, previous results obtained with the probit model are confirmed for private specialist services. As for public services, income does not play any role, while it is confirmed that people in bad health status consume more services regardless of the type of provider. An interesting result is obtained by looking at the role of quality: coefficient on *QUAL* is negative, hence consumption of public specialist services is lower where the overall perceived quality of public services is higher. But coefficient on the interaction term *(QUAL×Y)* is positive; hence the negative impact of *QUAL* is stronger the lower the income *Y*.

A final robustness check of results obtained with the univariate probit model is provided by a Zero Inflated Poisson (ZIP) model, which is a combination of a splitting model and a count data model:

$$\Pr(m_i = 0) = F(z_i, \delta) \tag{3}$$

$$\Pr(m_i = n > 0 | m_i = 1) = \frac{e^{-\lambda}\lambda_i^n}{n!}$$

The splitting model is a standard probit model defining the probability to observe a regime where access to private services m is never observed. The count data model explains the number of occurrences by means of a Poisson distribution characterised by a parameter λ, which is a linear combination of variables z and coefficients to be estimated. Besides confirming previous findings, results obtained with the ZIP model are interesting on their own. First, they suggest that health status, gender, income, and the environmental quality index *EQI* have an impact on the regime choice, but not on the number of visits at private specialists. Second, they show that age, education, the type of job, the number of children, the deprivation index, and quality of publicly provided services are all variables affecting the number of visits, given a regime where

access to private specialists can be observed. As for quality, we observe here the same pattern observed for public specialists: first order coefficient on *QUAL* is negative, but coefficient on the interaction term *(QUAL×Y)* is positive. As before, this suggests that the negative impact of *QUAL* is stronger the lower income *Y*.

Overall, these results emphasise the role of both self-assessed quality of public services and income in influencing the choice of consuming private specialist services. A higher income is associated with a higher probability of consuming the services, as it is a lower quality of public services. There emerge also interesting interactions among the two variables: for a given level of quality, the negative impact is stronger the lower is the income. The importance of both income and quality suggest to explore their role in constraining individuals to access private services. This is our aim in the remainder of the paper.

[Table 1 here]

3.3. The role of quality in determining liquidity constraints

3.3.1. The Carneiro and Heckman approach

In order to identify the role of income and quality in constraining individuals to access private services, we slightly modify the methodology proposed by Carneiro and Heckman (2003). To present the CH approach we consider a very simple economy, in which the total population of N individuals can be partitioned into sub-groups by health status *S* (the healthy *H* and the ill *I*, that can be driven by very different motivations in purchasing private health care services), and by income *Y* (individuals belonging to income quartiles *Y=1, 2, 3, 4*). Let *m* denote access to *private specialist care*, and assume that people belonging to the fourth income quartile are not constrained *by definition*; this is our key identifying assumption. For each population sub-group of healthy and ill people, we compute "unadjusted gaps", using "unadjusted" (sample) means of our variable of interest *m* in each income quartile:

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

In other words, we compare average access to private services of people belonging to the 4th income quartile with average access of people belonging to the other lowest quartiles; we clearly expect all gaps to be positive. According to the CH methodology, we assume these gaps as measures of constrained individuals, both for long- and short-run factors. The total shares of constrained individuals can be easily obtained by summing up "gaps" across income quartiles.

For each population sub-group defined by health status *S=(H,I)*, we then estimate by OLS the regression represented in Eq. (2):

$$m_i = \alpha_S + \sum \beta_S x + \sum \delta Q^Y + u_i \tag{5}$$

where the *x's* identify the vector of relevant variables to explain demand for private health care services (like age, gender, education, lifestyles, …), and Q^Y are dummy variables for the first three income quartiles *Y=1,2,3*. Predicted values from Eq. (5) 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:

$$E\left[m_i \mid Q^Y = 0\right] = \hat{\alpha}_S + \sum \hat{\beta}_S \overline{x} = \hat{m}_S^4 \tag{6}$$

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

To identify "liquidity-constrained" individuals we then measure differences in "adjusted" means with respect to the "reference" quartile (the fourth quartile), and interpret these "gaps" as proxies for the share of people constrained in the short run. Clearly, we now expect all the δ*'s* to be negative. For each population sub-group of healthy and ill people, we hence compute "adjusted gaps", using "adjusted" means:

$$\hat{Gap}_{4,Y} = \hat{m}_S^4 - \hat{m}_S^Y \tag{7}$$

As before, the total shares of constrained individuals can be easily obtained by summing up "gaps" across income quartiles. The share of short-run (liquidity) constrained individuals is finally used to compute the share of long-run constrained individuals. In particular, this share is represented by what is left after removing short-run constrained individuals from the total share computed using "unadjusted" means according to previous Eq. (4).

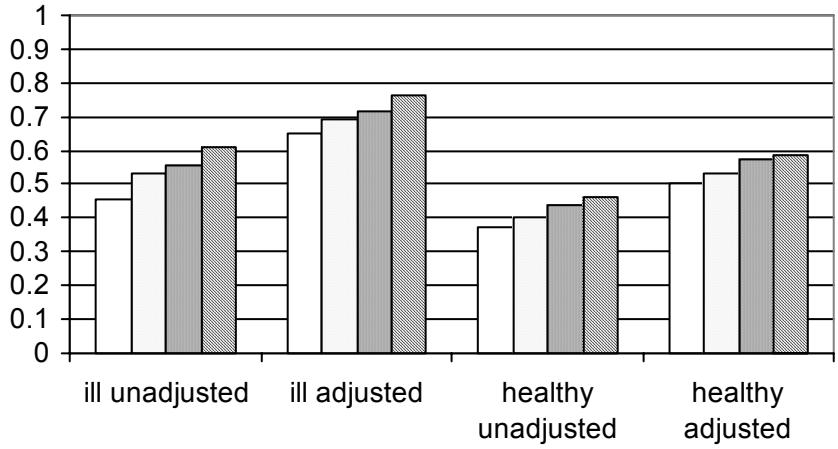
In this paper, given our data, we also reinterpret *m* as the *expenditure* for private specialist care, and extend the CH approach to this case. The procedure is analogous to the one just described: we compute "unadjusted" and "adjusted" gaps according to Eq. (4) and (7) respectively, after considering all potential factors affecting expenditure, that can be interpreted as long-run constraints. Notice that, as long as we consider a cross-section of individuals, the share of constrained individuals should be considered as a "lower bound" estimate[3]. Had we considered a panel data, the probability to access private services would have been larger for all individuals included in the sample, since it is increasing with the length of period considered.

3.3.2. The results

Access to care. Figure 1 shows the estimates of the share of constrained individuals obtained by applying the CH method. For the two groups of ill and healthy households, further divided into quartiles of equivalent disposable household income[4], the figure contains the proportions purchasing private health services, both "unadjusted" (simple averages) and "adjusted" (i.e., computed using the predicted values from the regressions described in the previous section). The unadjusted data show that the share of households from the richest quartile purchasing private health services is, for the ill group, 15 percentage points higher than for those in the first quartile, while for the healthy groups this difference amounts to 8 percentage points. After controlling for family characteristics, these differences do not change significantly. This is evidence in favour of the presence of short-run constraints, and against the presence of long-run constraints: the short-run constraints are evident from the differences between the adjusted means. Therefore, it seems that only short-run constraints are playing a role: overall (table 2), almost 5% of the population do not purchase private health services due to the lack of sufficient income.

[3] On this point, see also the discussion in Atella and Deb (2008), that consider data with a 4-week window for the reporting period.
[4] The equivalence scale is the square root of the number of family members.

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

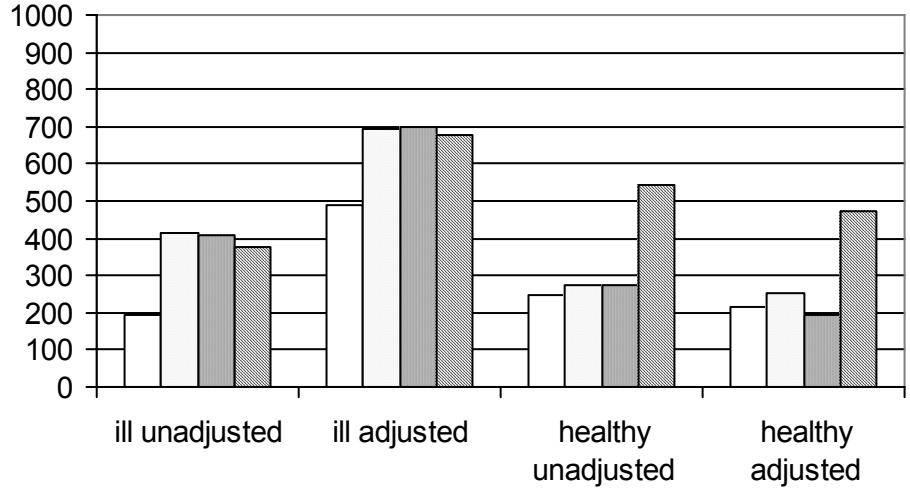


Tab. 2 Proportion of households constrained in the access to private health care

	% not constrained	% LR and SR constrained	% SR constrained	% LR constrained
Ill	93%	7%	6%	1%
Healthy	95.5%	4.5%	4%	0.5%
Total population	94.8%	5.2%	4.5%	0.7%

Expenditure for specialist care. We have also repeated the same procedure using as a dependent variable the total sum of money spent on these services. Fig. 2 presents, by quartiles and health status, the average sums spent; as before, we display both the sample averages, and the "adjusted" means by households' characteristics. As for the ill sub-group of individuals, short run constraints seem to persist only among the poorest quartile, which has significantly lower adjusted values than the other quartiles. For the healthy sub-group, however, short run constraints seem to be more widespread, including people in the 2nd and 3rd quartiles. Tab. 3 shows that more than 40% of total private expenditure is somewhat "constrained", mostly because of short run income constraints. In other words, this is expenditure that is left unexpressed, because individuals lack the necessary income to purchase private services.

Fig. 2 Average yearly expenditure on private health services by health status and income quartile (in euro 2007)



Tab. 3 Proportion of constrained households' expenditures in the access to private health care

	% not constrained	% LR and SR constrained	% SR constrained	% LR constrained
Ill	91.6%	8.4%	8.4%	0%
Healthy	39.4%	60.6%	54.8%	5.9%
Total population	58.4%	41.6%	38.0%	3.6%

The role of public services quality. The application of the CH methodology suggest two main findings: first, by looking both at the access to private specialist care and to expenditures for this item, it is clear that most individuals are short-run constrained; second, considering in particular expenditures, most of the people constrained appear to be healthy individuals, who probably need to purchase preventive and diagnostic care. In this section we look at how individuals in different income quartiles judged the quality of publicly provided health care services. Our hypothesis is that individuals in the lowest income quartiles will judge (on average) of the lowest quality the services publicly provided.

Indeed, Table 4 provides no evidence for this hypothesis to be rejected. The table considers the *conditional* means in self-assessed quality of public health care

services by income quartiles, health status, and geographical areas. Means are conditioned on the use of publicly provided services. Many different conclusions emerge from the table. First, there is a confirmation of the "inequality in quality" hypothesis: considering the whole sample, mean evaluation is 5.6 for the Centre-North area, only 4.1 for Southern regions. Second, by looking at the sub-group of ill households, we do not observe a striking difference in the self-evaluation across income quartiles, both in the Centre-North and in the South. Third, wide differences emerge considering the healthy sub-group: as for the Centre-North, mean evaluation for the 4th quartile is 6.2, while for the first is 4.7; as for the South, the gradient is even steeper, with mean evaluations of 4.0 in the 4th quartile, 4.9 in the 3rd quartile, and a mere 2.5 in the first quartile.

These findings support the idea that people in the lowest income quartiles are those judging public services more of low quality; this evaluation induce this people to opt-out for private provisions, but their SES originate short-run constraints to access services. The important point to be stressed is that most of constrained individuals are healthy, hence probably looking for preventive care.

Tab. 4 Average evaluation of the quality of public health services by health status and income quartile (1 = extremely bad; 10 = extremely good)

	Centre-North Ill	Centre-North Healthy	Centre-North Total	South Ill	South Healthy	South Total
1	5.8	4.7	5.1	4.1	2.5	3.3
2	5.5	5.4	5.4	4.0	3.8	3.9
3	4.9	6.4	5.8	4.5	4.9	4.7
4	5.6	6.2	6.0	5.5	4.0	4.7
Total	*5.4*	*5.7*	*5.6*	*4.4*	*3.7*	*4.1*

4. Conclusions

In this paper we offer direct evidence on the role of perceived quality differences in publicly provided health care services, in determining both the incentive to opt out for private services and, for poor individuals, short-run liquidity constraints in the access to these services. We build on our previous work (Baldini and Turati, 2006), where –

applying the procedure proposed by Carneiro and Heckman – we show that Mediterranean-style Welfare States are characterised by the highest shares of individuals short- and long-run constrained. Here we concentrate on private specialist care, a category of services for which disparities in the access are the highest according to the available evidence. We use the 1993 wave of the Bank of Italy - SHIW data, which contains information on perceived quality concerning a group of public and private services, besides information on income, wealth, and personal characteristics of a representative sample of Italian households. We apply the Carneiro-Heckman procedure, and study how perceived quality of public services affects the percentage of people short run constrained. Our estimates suggest that short run constrained individuals are those judging (on average) more of inferior quality public services, hence with a greater incentive to opt out. Moreover, our findings hint that these are mostly healthy people, who are looking for diagnostic and preventive care.

These findings raise intriguing questions for the dynamics of health inequalities. If poor healthy individuals are not receiving adequate preventive care (in terms of quality) from public providers, and they are short-run constrained in the use of private services, because of their SES, it can be possible that they will be diagnosed illnesses too late, causing more severe health disparities to appear in the future. This asks for a deeper understanding of health status inequalities stemming from prevention: besides the role of a poor family background (which can limit in itself the access to diagnostic care, because of the lack of a minimal knowledge), one must also consider the role of liquidity constraints, that can arise in the presence of a low quality of publicly provided health care services even in universal health care systems like the Italian NHS.

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Appendix

Table A.1. Descriptive statistics

Variables	Definition	MEAN	SD	MIN	MAX
I	1 if at least one person has missed no less than 10 working days	0.382	0.486	0	1
H_MAN	1 if reference person is male	0.911	0.285	0	1
AGE	Age of reference person	41.83	7.85	22	65
AGE_P	Age of partner	39.13	7.61	18	73
EDU	1 if reference person has degree	0.167	0.373	0	1
EDU_P	1 if partner has degree	0.174	0.379	0	1
UNSK	1 if reference person is unskilled manual worker	0.343	0.475	0	1
UNSK_P	1 if partner is unskilled manual worker	0.327	0.469	0	1
INS	1 if household has a private health insurance	0.205	0.404	0	1
DEPR	Home squared meters per person	31.93	16.02	7.5	160
NORTH	1 if resident in nothern Italy	0.504	0.5	0	1
CENTRE	1 if resident in central Italy	0.233	0.423	0	1
SOUTH	1 if resident in southern Italy	0.263	0.44	0	1
QUAL	Self-assessment of the quality of public health services	5.25	2.26	1	10
EQI	Self-evaluation of environmental quality	31.26	9.49	6	58
Y	Equivalent disposable income (in lire 1993)	32451.75	13318.84	0	1
m	1 if consumed private specialist care	0.49	0.5	0	1
m^{pu}	1 if consumed public health services	0.377	0.485	0	1
M	number of visits, private	2.733	5.31	0	80
M^{pu}	number of visits, public	1.53	4.151	0	25

Table 1. Demand for private specialist health care services

	Probit Private		Biv. Probit: Private		Biv. Probit: Public		ZIP: Splitting Private		ZIP: Poisson Private	
	Coeff.	*Z*	*Coeff.*	*Z*	*Coeff.*	*Z*	*Coeff.*	*Z*	*Coeff.*	*Z*
I	0.180	2.170	0.180	2.170	0.276	3.310	-0.263	-1.920	-0.004	-0.090
AGE	-0.005	-0.460	-0.005	-0.460	0.005	0.450	0.014	0.690	0.004	0.690
AGE_P	-0.004	-0.340	-0.004	-0.340	-0.006	-0.530	0.002	0.080	-0.011	-1.840
H_MAN	-0.419	-2.620	-0.418	-2.620	0.237	1.460	0.658	2.440	-0.081	-1.200
UNSK	-0.174	-1.600	-0.174	-1.600	-0.060	-0.550	0.272	1.530	-0.168	-3.120
UNSK_P	0.043	0.390	0.043	0.390	-0.061	-0.550	-0.083	-0.460	-0.034	-0.640
EDU_P	0.112	0.880	0.112	0.880	0.057	0.440	-0.133	-0.620	-0.089	-1.500
EDU	-0.159	-1.200	-0.158	-1.200	-0.150	-1.110	0.154	0.690	-0.193	-2.980
EQI	-0.009	-1.970	-0.009	-1.960	-0.001	-0.210	0.014	1.770	-0.003	-1.160
Y	0.421	3.240	0.452	1.790	-0.406	-1.580	-0.984	-2.190	-0.187	-1.260
NCHIL	0.051	0.960	0.052	0.970	0.058	1.060	-0.104	-1.180	0.066	2.320
DEPR	0.001	0.510	0.001	0.510	0.000	-0.030	-0.005	-1.020	-0.009	-5.940
INS	-0.049	-0.480	-0.049	-0.480	-0.016	-0.160	0.084	0.510	0.041	0.870
QUAL	-0.037	-1.870	0.035	0.070	-1.137	-2.280	-0.510	-0.600	-1.134	-4.100
QUALxY	-	-	-0.007	-0.150	0.105	2.290	0.053	0.680	0.108	4.280
D_Center	0.113	1.100	0.110	1.070	0.011	0.110	-0.190	-1.120	0.034	0.730
D_South	-0.249	-2.190	-0.249	-2.190	-0.454	-3.880	0.397	2.120	-0.213	-3.580
Constant	-3.459	-2.550	-3.799	-1.380	3.886	1.390	8.966	1.840	4.226	2.590
Corr.	-	-	-0.111	-2.150	-	-	-	-	-	-
Obs.	1015	-	1015	-	-	-	997	-	-	-
Log-L	-676.240	-	-1326.485	-	-	-	-2505.735	-	-	-
LR test	54.240	-	-	-	-	-	198.710	-	-	-
Prob > chi2	0.000	-	-	-	-	-	0.000	-	-	-
Pseudo R2	0.0386	-	-	-	-	-	-	-	-	-
Wald test	-	-	95.150	-	-	-	-	-	-	-
Prob > chi2	-	-	0.000	-	-	-	-	-	-	-