Fair or unfair? Disentangling inequalities in health care access for young adults in France

Doriane Mignon^{*,1} and Florence Jusot^{1,2}

 1 Université Paris-Dauphine, PSL, LEDa, LEGOS, Paris, France $^2 \mathrm{IRDES}$

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Abstract

While young adults health is recognized as a public health issue in France, little attention is given to their health care access. The purpose of this article is to examine the existence of inequality of opportunity in access to care for young adults and the relative contribution of circumstances and efforts to this inequality based on the data from the National Survey on Youth Resources (2014). Using concentration indices, we show inequalities in access to care related to parents' income. Linear probability models show the association of parental circumstances (diploma, marital status) and efforts (education, occupation, living with parents) with the probabilities of non-use of care and unmet care need. This reflects inequalities of opportunity as well as fair inequalities. The variance decomposition shows that the contribution of efforts is more important than those of circumstances, however this result is sensitive to the normative approach considered and to the type of indicators used.

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^{*}Corresponding author: doriane.mignon@dauphine.fr

1 Introduction

According to the BVA barometer conducted by the French Minister of Health in 2017, slightly more than one in four French people believe that access to healthcare is the least acceptable inequality (27%), ahead of housing and income inequality (Antunez and Papuchon, 2018). However, many studies attest the existence of inequalities in access to health care in France (D'Uva and Jones, 2009; Devaux, 2015). The concern of the population and the proven existence of unequal access to health care justify to study this in France. Among the populations identified as being at risk in health matters, there are young people in particular. Thus, the health of young adults (18-24 years old) has been recognized as a public health issue through the 2016 "Youth Well-being and Health" plan. But little attention is paid in this plan to their difficulties in accessing health care. Moreover, while many studies have examined inequalities in access to care in the general population, the study of access to care for the specific population of young adults in France has so far been quite limited, particularly because young people living in students residences and boarding schools are outside the scope of surveys conducted in ordinary households and students of surveys conducted among the insured of the three major schemes (CNAMTS, RSI, MSA).

The few studies that have been carried out on the youth population in France, and in particular on students, have highlighted unmet care needs. This is despite disparities in survey sampling methods and the variability of the questions used to collect unmet care needs, even though sensitivity to the wording of this question has been demonstrated (Legal and Vicard, 2015). In the 2010 survey conducted by the Observatoire de la Vie Etudiante (OVE), 32%of students reported that they gave up to see a doctor, including 13% for financial reasons. 35% of students surveyed in the National Student Health Survey conducted by LMDE in 2014 said they gave up on care and 27% for financial reasons. These figures vary according to the surveys, as shown by the figures obtained in the Student Health Survey carried out by the EmeVia student mutual network: 17.4% in 2013 and 15.6% in 2015. In addition to student surveys, the 2010 Health Barometer shows that among 15-30 year-old, the number of people giving up care for financial reasons is 8.7% compared to 10.5% for 31-75 year-old (Beck and Richard, 2013). More recently, the National Survey on Youth Resources (ENRJ, DREES-INSEE, 2014) has set the financial renunciation for consultations or medical care at 3.8% for 18-24 year old, while the 2014 Statistical Survey on Resources and Living Conditions (SRCV), which uses a comparable questioning, puts it at 1.8% in the general population. Although this work suggests that these renunciations are linked to the financial difficulties of young adults, knowledge about the social economic determinants of access to care for

young people in France remains fragmented. Castry and Wittwer (2017) studied the determinants of financial renunciation on the I-share student cohort, which is not representative of the French student population. Their results are in line with those of the literature on financial renunciation in the general population and highlight the role of variables specific to students, such as scholarship on economic criteria, decohabitation, or having a paid activity in addition to studies. Ménard and Guignard in Beck and Richard (2013) showed on the 15-30 year-old in the 2010 Health Barometer data that the less educated have less frequent use of general practitioners and gynecologists and the unemployed more renunciations for financial reasons. But to our knowledge the influence of parental characteristics on their use of care has never been studied in France.

However, many studies have shown an influence of childhood living conditions and background on long-term health (Burkhauser et al., 2016; Case et al., 2005; Currie and Stabile, 2003; Lindeboom et al., 2009). At the same time, particular attention has been paid to inequalities in health opportunities and care use (e.g. Fleurbaey and Schokkaert (2009); Roemer (2013); Sen (2002); Jusot and Tubeuf (2018)).

Within the philosophy of responsibility framework, inequalities explained by sources of individual responsibility are considered legitimate (Arneson, 1989; Cohen, 1989; Dworkin, 1981; Roemer, 1998), while inequalities explained by sources independent of individual responsibility are considered unfair and qualified as inequalities of opportunity. According to Roemer's terminology (1998), the determinants of a variable of interest can be distinguished into two groups. On the one hand, circumstances, such as the background of origin, correspond to determinants that are beyond the individual's control and therefore for which the individual cannot be held responsible. On the other hand, efforts are determinants for which the individual can be held responsible because they are considered under his control. Efforts then correspond to freely chosen behaviors, but also to preferences, insofar as they must be respected even if they are not really chosen by individuals (Dworkin, 1981). Inequalities related to circumstances are therefore considered illegitimate, and are recognized as inequalities of opportunity. One of the difficulties in measuring inequality of opportunity is that efforts are not always independent of circumstances (Roemer and Trannoy, 2016). Indeed, circumstances can have a direct effect on health or care use (through parental income for example) or an indirect effect by influencing the individual's preferences and therefore the behaviors he or she will have. We adopt here the analytical framework proposed by Roemer (1998), considering that all inequalities due to circumstances, whether directly or indirectly, are illegitimate. This indirect influence of circumstances through preferences and behaviors must be taken into account in understanding the formation of inequalities and cannot be considered as an individual responsibility. If this indirect influence is not taken into account in inequality of opportunity, it refers to Barry's vision (Barry, 2005).

Some empirical work sought to identify and measure inequalities in opportunities in health (Jusot et al., 2012; Rosa Dias, 2009; Tubeuf et al., 2008) and in the area of care consumption (Barbosa, 2016). On the other hand, little attention has been paid to the effect of family background on young people's use of care and the resulting inequalities in opportunities in access to care. Mosquera et al. (2017) showed inequality in the use of care as a function of disposable income for young people aged 16 to 25 in Northern Sweden without introducing the concept of inequality of opportunity. Although there has been evidence of intergenerational transmission of care behaviors (Bricard, 2013), the influence of family background on use of health care and unmet care need has not been studied, particularly among youth.

Understanding access to care for young adults is all the more important as it is a period of transition to adulthood (Galland, 1996) during which behaviors are adopted away from the family environment. Within the philosophy of responsibility, there is an age - referred to as the age of consent - below which individuals cannot be held responsible for their choices (Arneson, 1989). It is considered that their choices reflect their own efforts only beyond this age. Young adults are therefore at the age when, after reaching majority, their behavior are freely chosen and thus reveal their preferences. However, it is questionable whether their behavior does not remain influenced by their circumstances and in particular by their family background.

The purpose of this article is to identify the social inequalities related to parental income in the use of care for young adults. We also question the existence of inequalities of opportunity and the relative contribution of circumstances and efforts to this inequality.

We address these issues using the National Survey on Youth Resources (ENRJ, 2014) which provides us with the opportunity to study health care access for youth and also to have reliable information on the determinants through the level of parental resources and the different youth resources. ENRJ allows us to understand access to care objectively with non-use, defined as non-use of health services, and more subjectively with unmet care needs. The different reasons for unmet care need allow us to identify whether this choice was mostly the result of constraints or of preferences and to assess the fairness or unfairness of inequalities in access to care.

First, we develop more precisely our analytic framework and detail what we mean by legitimate inequalities or not. Then we present our data and the method we use to study inequalities of opportunity. Finally we present the results and conclude.

2 Framework

Individual demand for health care, as a rational economic decision, depends on comparing the additional marginal utility of the act of care with its cost (Grossman, 1972). This depends on the individual's level of health (her need for care), preferences (including preference for health, i.e. the value of having extra health), incentives to be healthy in the labor market and budget constraints. The need for care can approach in two ways: objective and subjective. The objective need for care is assessed with indicators on the individual's level of health. Subjective need is a perceived need that depends on the individual's sensitivity to variations in her health status. For example, for some people having a cold will require care and will therefore be associated with a need for care. For others, a cold does not require care and will therefore not be considered as need for care. The budget constraint depends on income, the cost of care, health insurance if the individual has one, and the opportunity cost of health investment time. A need for care does not always lead to a health care demand if the individual's income does not allow her to pay for the care or if the out of pocket payment is too high, due to the low coverage provided by her health insurance. This encourages her to renounce to the care available on the market and invest in her health by devoting time to it. The demand for care also depends on a trade-off between care and the consumption of other goods (food, outings, etc.) under budget constraints. She cannot afford to buy everything and does not have time for everything. She must therefore choose according to what she values most. The trade-off is in favor of the demand for care if the marginal utility removed from additional care is greater than the marginal utility removed from the consumption of other goods. Following a need for care, if the constraint does not prevent health care demand and the trade-off is favorable to it, it is said that the health care demand is expressed. If the demand for care is expressed, it then meets the supply of care which is provided by the health system services. If the supply of care is able to satisfy the demand, it is called satisfied demand for care. On the contrary, if the supply of care does not match the demand, the demand is not satisfied. Dissatisfaction may be due to supply-side constraints (long waiting

time, lack of information on available supply, geographical distance). The satisfaction of the demand leads to care consumption (health care use). Non-fulfillment due to individual and/or supply-side constraints results in unmet care need (when there was a perceived need for care). Non-use, i.e., no use of care, does not mean that there is unmet care need, there may not have been any needs or that the individual prefers not to seek care despite the identification of health problems. In order to identify access to care, we therefore use two types of variables: non-use and unmet care need. Non-use refers to the non-use of health services and unmet care need having perceived a need for care but not having used care.

Determinants of care use differ among individuals. It introduces heterogeneity in the consumption of care. This inequality can be qualified as fair or not depending on its causes. In order to determine the legitimacy (or fairness) of inequality, we follow the theory of responsibility (Arneson, 1989; Cohen, 1989; Dworkin, 1981; Roemer, 1998). According to this, individuals must be held responsible for what is within their control, which is called efforts. On the contrary, they must not be held responsible when it is beyond their control, which is called circumstances. Fair (or legitimate) inequalities are those for which the individual is responsible, and therefore linked to efforts. The inequalities related to the circumstances are unfair (or illegitimate). Equality of opportunity is only achieved when circumstances do not affect the use of care and inequalities result only from the part of the effort that is not due to the circumstances.

In the following, we analyze the different determinants of care use and develop whether the inequalities associated with it can be characterized as fair or not. Our approach is broadly in line with the one of "equality of informed access" (Fleurbaey and Schokkaert, 2009). The equality of informed access considered that fair inequality is reach when the sources of variation for health care access are only due to individual's preferences. Individuals are responsible of their choices, conditional to be informed. Let us first consider the need for care. This includes the variables that will generate the young adult need for care and therefore reflects her health status. In general, when an individual's health status deteriorates, it increases her need for care and thus her use of care services. Needs-based use of care services leads to inequality in care use when comparing individuals with a high need for care and those with a low need for care. An individual in poor health will need to be treated and will therefore use less care. This inequality in the use of health care between populations according to their health status is considered legitimate since it is a question of favoring those with the most deteriorated health status (Fleurbaey and Schokkaert, 2009).

Constraints contribute to reduce health care use. Depending on the type of constraint, the resulting inequality may or may not be considered legitimate. The reasons given by individuals for unmet care need can be used to distinguish the type of constraints they experienced. We can then distinguish financial, informational, geographical or waiting time constraints. If the stated reason for unmet care need refers to one of these constraints, we consider that unmet care need was constrained. We define this type of unmet care need as "barrier" unmet care need. The circumstances as well as the efforts of the young person can influence those constraints. For example, financial constraint depends both on the parents' income, which is considered as a circumstance since it is independent of the young adult's responsibility, but also on the young adult's own income. This depends on the young adult's decision to offer work, which is an effort since it is chosen by the young adult, but also on parental pressure and his or her social background, which are circumstances (Ferreira and Peragine, 2015). Similarly, the information available to the young adult may come from her own efforts to obtain it, or from the information provided by her parents. The information available to parents may depend on their level of education and income. These elements constitute circumstances. There is illegitimacy of inequalities due to constraints for the part that is related to circumstances, the part related to efforts is considered legitimate.

Preferences can contribute to increase or decrease inequality in health care use. We are able to identify "chosen" health care behaviors related to preferences thanks to the reason given for unmet care need. We consider that the reasons given for unmet care need, reflecting the fact that they did not take the time, that they were afraid, that they waited for it to pass, show a free and not constrained choice and express preferences. The individual did not use care because of constraints but because he had a preference not to use. We will then call this type of unmet care need, "preference" unmet care need. Preferences are individuals responsibility and therefore inequalities due to them can be considered legitimate. If two individuals, with same health care need, have differences in the use of care and this is due to the fact that one did not wish to use it because he preferred to treat himself, unlike the other who preferred to go to the doctor, this difference in use cannot be considered inequitable¹. However, in the case of health care use, Bricard (2013) showed that individuals' health care behaviors resulted from intergenerational transmission. Parental characteristics therefore influence care use preferences. Since parental characteristics are circumstances, the share of inequalities that is due to preferences arising from parental characteristics cannot be considered legitimate.

Whether the influence of circumstances on inequalities in health care access is direct or indirect through efforts, its action must be considered illegitimate. It is part of inequalities in access to care resulting from circumstances that are referred to as inequalities in opportunities in access to care.

 $^{^{1}}$ We do not judge are whether the individuals preferences are right or not, that is whether it was appropriate to wait for it to pass or to go to the doctor, we are arguing that it is fair to respect these preferences

3 Data and method

3.1 Data

We used the data from the National Survey on Youth Resources (ENRJ) conducted by the French Ministry of Health (DREES) and the National Institute of Statistics (INSEE). Young adults aged 18 to 24 living in France and their parents were interviewed separately from 1 October 2014 to 31 December of the same year. The survey consists of two subsamples. The first, of approximately 9,000 ordinary dwellings, is based on the 2013 national census, where is estimated to live at least one young adult aged 18 to 24. The second includes 198 communities where young adults lived and comes from the community census, religious and prison communities are excluded. This survey is nationally representative. It initially included 5,776 observations. For 5,197 young people, there is at least one parent questionnaire (there may be two if the parents are separated). Since we are interested in the circumstances, and in particular the family background, we want to have as many relevant parental variables as possible. We therefore use only the 5,197 observations for which we have the information from the parent questionnaire.

Health care access In order to understand access to care, we use two types of variables that provide us with a complementary view. First, we use non-use variables. The non-use variables correspond to a negative response to the question on visits to different types of physicians over the past 12 months. For non-use of the general practitioner, the question was: "In the past 12 months, have you seen a general practitioner at least once for yourself?". The phrase is the same for the specialist (excluding dentist and gynecologist), dentist and gynecologist for women. We therefore have three non-use variables (four for women). This variable reflects a distance from the care system but does not reveal to what extent this is imposed or chosen.

The second type of variable, unmet care need, allows us to go further in understanding access to care. This variable tells us that there was a need but it was not met. Unmet care need may come from various reasons, which may be considered as imposed or chosen. In the case where the reason for unmet care need can be considered as imposed, we will use the term of "barrier unmet care need". If it can be considered as chosen, we will refer to "preference unmet care need".

Variables	Frequency	%
Health care non-use		
General Practitioner (GP)	759	14.6
Specialist (except for dentist and gynecologist)	$2,\!497$	48.1
Dentist	$2,\!499$	48.1
Gynecologist ^a	$1,\!308$	53.7
Unmet care need		
At least one unmet care need	786	15.1
At least one barrier unmet care need ^b	405	7.8
At least one preference unmet care need ^b	435	8.4

Table 1: Health care access descriptive statistics

^a For 2,438 women

^b The same individual may have declared several unmet care need, which explains why the sum of at least one barrier unmet care need and at least one preference unmet care need is greater than the number of people who had at least one unmet care need (58 individuals declare both types of unmet care need).

Our first unmet care need variable is the combination of three questions: "Over the past 12 months, have you waived seeing a doctor for medical examinations or care/dentist, for dental care/glasses, lenses, frames, lenses you needed?". An affirmative answer to at least one of these questions is the first indicator of unmet care need. It indicates whether a person feels she has foregone seeing a doctor or medical care, dental care or optical equipment in the last 12 months. This indicator of having at least one unmet care need (whether for medical, dental or optical equipment) is then analyzed in sub-groups, according to the reason given for it. Possible reasons after answering positively to this question are "you couldn't afford it", "the time for the appointment was too long", "the doctor was too far away", "you didn't know a good doctor", "you didn't have time", "you feared going to see the doctor or doing tests", "you preferred to wait to see if things were going better on their own", "for other reasons". We class the first reasons (financial, waiting time, distance, lack of information) in barrier unmet care need and all others in preference unmet care need. When we study having at least one barrier unmet care need, we remove those who have at least one preference unmet care need in order to compare them to those who do not declare any unmet care need. We proceed in the same way when we study the preference unmet care need. Access to care for our study population is presented in Table 1. Unmet care need is fairly evenly distributed according to the reasons given as barrier or preference. The non-use rates for specialists and dentists are quite close to the non-use rates observed in the general population in France (15-64 years old): 45.1% for dentists and 51.4% for specialists (ESPS, 2014).

Health care needs Young adults health care needs are approximated by a series of variables that reflect the youth's level of health, such as gender, age, self-assessed health, Body Mass Index (BMI) category, whether or not they are limited in their activities due to a health problem and whether or not they report having a chronic disease. 12% of the sample report having a fairly good, poor or very poor health status, 8.4% of them report being limited in their daily activities and nearly 15% report having a chronic disease (Table 2). As expected, young people are in better health than the general population. Indeed, in the general population (aged 16 or over) (SRCV-SILC, 2014), nearly 32% of the population report a state of health worse than good, 37% a chronic disease and 25% are limited (Direction de la recherche des études de l'évaluation et des statistiques and Santé Publique France, 2017).

Variables	Frequency	%	Variables	Frequency	%
Needs			Efforts		
Sex			Occupation		
Women	$2,\!435$	46.9	Employed	1,277	24.6
Men	2,759	53.1	Apprentice	358	6.9
			Student	2,712	52.2
Age			Unemployed	661	12.7
18 years old	1,250	24.1	Other	189	3.6
19 years old	952	18.3			
20 years old	700	13.5	Health insurance		
21 years old	637	12.3	No	320	5.9
22 years old	632	12.2	Yes	5,079	94.1
23 years old	538	10.4			
24 years old	488	9.4			
			Living situation		
Self-assessed health			Not living with parents	981	18.9
${\rm Very}{\rm good}/{\rm Good}$	4,580	88.1	Living with parents	4,216	81.1
Fair/Poor/Very poor	617	11.9			
			Highest diploma		
Is limited			No diploma	310	6.0
Yes	435	8.4	Secondary education level	459	8.8
No	4,762	91.6	Vocational qualification	856	16.5
			High-school diploma	$2,\!637$	50.7
Has a chronic disease			Two-year degree	448	8.6
Yes	773	14.9	Three- and four-year degree	339	6.5
No	4,424	85.1	Master and beyond	148	2.9
BMI				Mean	$^{\mathrm{SD}}$
Normal $(18.5 \text{ to } 30)$	4,368	84.0	Equivalised income (in euros)	720.8	7.7
Underweight (under 18.5)	513	10.0			
Overweight (30 and more)	316	6.1			

Table 2: Health care needs and	efforts descriptive statis	tics
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Circumstances In order to highlight the existence of inequalities of opportunity, we use parental characteristics that can be considered as circumstances, as they are outside of the young adults' sphere of control. First, we use an indicator identifying the fact that "a parent has at least the level of a high school diploma". Then, we have a series of indicators on the employment situation of each parent distinguishing between being employed, unemployed, retired, inactive or unknown. The category "employed" is used as reference. We also consider the marital status of the young person's parents (together or separated), their vital status ("at least one of the parents is unknown or deceased") and their place of birth ("at least one of the parents was born abroad"). We also use the logarithm of the parents' equivalised income. The income comes from a match between the base with the tax revenues reported. The parents' equivalised income is calculated using the OECD equivalence scale, which weights the first adult in the household at 1; 0.5 for other persons aged 14 or over and 0.3 for children under 14. In the case where parents are separated, and with different tax incomes, we average the parents' living standards before assigning the parental living standard to the young adult.

Finally, we consider the size of the agglomeration where the young adult lives as a circumstance. Especially if the young person lives with her parents, it is not a choice of the young person, so it is imposed on her. This variable is decomposed as follows: less than 2,000 inhabitants (reference), from 2,000 to 4,999, from 5,000 to 9,999, from 10,000 to 19,999, from 20,000 to 49,999, from 50,000 to 99,999, from 100,000 to 199,999, from 200,000 to 1,999,999 and Paris agglomeration.

These elements are distributed according to Table 3 in our sample. The majority of youth have an employed parent, at least one parent with a high school diploma and living in an urban area with a population of 200,000 to 1,999,999. Just over a quarter of the sample has

separated parents and nearly 15% have at least one parent who was born abroad.

Variables		Frequency	%
	Yes	380	7.3
vital status: at least one of the parents is unknown or deceased	No	4,817	92.7
	Yes	779	15.0
Country of birth: at least one of the parents was born abroad	No	4,418	85.0
	Yes	1,404	27.0
Marital status: parents are separatea	No	3,793	73.0
Diplomer at least one of the periods has an high school diplome	Yes	2,729	52.5
Dipioma: at least one of the parents has an high school alpioma	No	2,468	47.5
	Employed	$3,\!472$	66.8
	Unemployed	274	5.3
Father's occupation	Retired	387	7.5
	Inactive	148	2.9
	Unknown	916	17.6
	Employed	$3,\!687$	70.9
	Unemployed	413	8.0
Mother's occupation	Retired	149	2.9
	Inactive	751	14.5
	Unknown	197	3.8
	Less 2,000 inhabitants	906	17.4
	2,000 to 4,999	228	4.4
	5,000 to $9,999$	310	6.0
	10,000 to 19,999	256	4.9
Size of agglomeration	20,000 to 49,999	467	9.0
	50,000 to 99,999	446	8.6
	$100,\!000$ to $199,\!999$	403	7.8
	200,000 to $1,999,999$	$1,\!537$	30.0
	Paris agglomeration	644	12.4
		Mean	SD
Parents' equivalised income		$1,\!984.3$	19.1

Table 3: Circumstances descriptive statistics

Efforts We use as measures for young adult's efforts variables that reflect her choices, for which she may be held responsible. These are variables such as an indicator of the posses-

sion of a complementary health coverage, a series of indicators identifying the occupation of the young adult during the week preceding the survey²: "being employed", "being an apprentice", "being a student", "being unemployed" and "other activity". The employed category is used as the reference category. The highest diploma obtained by the young person is used as a categorical variable: "Without diploma, CEP" (reference), "College diploma level", "CAP, BEP and equivalent level", "Baccalaureate level", "Bac+2 level", "Bac+3 and Bac+4 level", "Bac+5 and higher level". We use a categorical variable to capture the highest diploma obtained by the young person: "No diploma" (reference), "Secondary education level", "Vocational qualification", "High-school diploma", "Two-year degree", "Threeand four-year degree", "Master and beyond". We also use the cohabitation status with the parents and the young person's standard of living. The young adult's resources are built by adding the declared income from work, social aids and total parental financial aid (corresponding to the total amount of regular financial aid). The standard of living is then calculated by taking into account the number of children. We use the logarithm in regressions. It should be noted that 134 young adults do not report income from work, social aids or parental aid and therefore have a standard of living of zero. They are kept at zero. The young person's standard of living is more a reflection of effort when it comes mainly from work income. The part coming from the parents' financial help will be considered as a circumstance.

All our effort variables are far from being "pure" efforts, that is to say that they are entirely the responsibility of the individual. For example, the young person may be employed not because she choose it, but because her parents could not provide the resources necessary to pursue her education. This supports the approach proposed by Roemer (1998) and the need to take into account among the effect of circumstances, the indirect effect of circumstances through the efforts variables.

The majority of the youth in our sample are students, are living with their parents, are 18 years old and have a health insurance (Table 2).

3.2 Method

Measure of inequality of non-health care access related to parent's income

First, we show the existence of significant inequalities in access to care for young adults linked to parental income. To do so, we use the concentration indexes of access variables

 $^{^{2}}$ Youth is a period with lots of changes, we choose to retain this variable to capture the most recent occupation. This may not be the most representative variable over the past year.

indirectly standardized for needs, according to parents' income (Wagstaff and van Doorslaer, 2000). Indirect standardization allow us to control for needs and to identify the legitimate inequalities of health care use. The concentration index (CI) is defined as the area between the concentration curve and the 45 degrees line who stands for equality. Hence, for a discrete variable, the concentration index formula is the following:

$$CI = \frac{2}{N\mu} \sum_{i=1}^{n} ha_{i}r_{i} - 1 - \frac{1}{N}$$

with ha_i the health care access variable, μ being its mean. Individuals are ranked in an increasing order of wealth, i = 1 being the individual with the lowest wealth, i = N being the one with the highest health. From there is calculated a rank for each individual: $r_i = \frac{i}{N}$. The rank variable used is the parent's of the young adult standard of living.

The calculation of the concentration index is done using the "convenient covariance" formula (Jenkins, 1988; Kakwani, 1980; Lerman and Yitzhaki, 1989):

$$CI = \frac{2}{\mu} cov(ha; r)$$

If the concentration index is negative, we are in the situation where the inequality is propoor: the outcome is mainly concentrated among the poorest. It is the opposite if the concentration index is positive. In our case, we expect negative concentration index. As the variables of non-health care access show access problem, we expect more access problem among the young adults who have parent's with the lowest standard of living. It is then a pro-poor inequality. The standard error of the concentration indexes are calculated following Kakwani et al. (1997) and are robusts to heteroskedasticity and autocorrelation.

Analysis of inequalities of opportunities in the non-health care access

In order to analyze the legitimate and illegitimate inequalities in young adult's access to care, we consider that the variables of access to care (HA) are a function of a needs vector N, a circumstances vector C, an efforts vector E and a residual term u:

$$HA = f(N, C, E, u)$$

We then use linear probability models for which standard errors are corrected to take into account the heteroskedasticity related to the fact that our variables are binary. In order to identify the "total" association between access to care and circumstances, a first model is estimated by taking into account circumstances and the need for care but not controlling for efforts, as follows:

$$ha_i = \alpha + \sum_j \beta_j n_{j,i} + \sum_k \gamma_k c_{k,i} + \epsilon_i \tag{1}$$

Where ha_i corresponds to the different health care access variables for an individual *i* (health care non-use and unmet care need), the n_j variables to the needs variables of the young adult and the c_k variables to the circumstances variables. Our coefficients of interest are the estimations of γ_k noted $\hat{\gamma}_k$. If those coefficients are significant, it is enough to demonstration the existence of inequalities of opportunity in health care access.

Then, we compare the association between the health care access variables and the circumstances from model 1 to the association in another model which takes into account the efforts of the young adult as well:

$$ha_i = \alpha' + \sum_j \beta'_j n_{j,i} + \sum_k \gamma'_k c_{k,i} + \sum_l \delta'_l e_{l,i} + \eta_i$$
⁽²⁾

where e_l are the efforts variables. This model put forwards the existence of legitimate inequalities if the coefficients δ'_l are significantly different from zero. The comparison of $\hat{\gamma}_k$ and $\hat{\gamma}'_k$ show us to which extent the circumstances are correlated to the efforts. Hence if circumstances act directly or indirectly on health care access. We observe $\hat{\gamma}_k$ significantly different from zero and $\hat{\gamma}_k > \hat{\gamma}'_k$ if the inequalities of opportunities are due to a direct and indirect effect of circumstances.

Evaluation of contribution of circumstances to health care access inequality

In order to measure the respective contribution of needs, circumstances and efforts to inequality in access to care, we use the variance as a measure of inequality. Shorrocks (1982) demonstrates that variance is an indicator of inequality that can be decomposed by sources. We adapt the method proposed by Jusot et al. (2012); ? on health inequalities to our subject. In order to assess the contribution of circumstances to inequalities in access to care and to compare this contribution to that of efforts, we use the representation of access to care defined above:

$$HA = f(N, C, E, u)$$

We estimate this function using a linear probability model which is equivalent to model 2:

$$ha_i = \alpha + \beta N_i + \gamma C_i + \delta E_i + u_i$$

Where N_i stands for the needs variables (sexe, age, self-assessed health indicator, BMI category, chronic diseases, limitation), C_i for the circumstances variables (the parental variables and the size of the agglomeration) and E_i for the efforts of the young adults (occupation, living with her parents or not, health insurance, diploma level).

Using the estimated coefficients of this model $(\hat{\beta}, \hat{\gamma}, \hat{\delta})$, we predict the probability of not using health care for an individual *i*:

$$\hat{ha_i} = \hat{\beta}N_i + \hat{\gamma}C_i + \hat{\delta}E_i + u_i$$

Where $HA_N = \hat{\beta}N_i$ is the part explained by needs, $HA_C = \hat{\gamma}C_i$ the part explained by circumstances and $HA_E = \hat{\delta}E_i$ the part explained by efforts.

The variance of the estimated probability of not using health care $(\sigma^2(\hat{ha}))$ may be decomposed the following way:

$$\sigma^2(\hat{ha}) = cov(HA_N, \hat{ha}) + cov(HA_C, \hat{ha}) + cov(HA_E, \hat{ha})$$

Each covariance is the contribution of each source to health care access inequality. The covariance between health care access and the circumstances provide a measure of inequalities of opportunities in health care access. This analysis follow Barry's vision that the correlation between efforts and circumstances should not be considered as illegitimate. Hence, this scenario would be called "à la Barry" (Barry, 2005). This analysis only takes into account the direct influence of circumstances on access to care but does not take into account their indirect influence through the determination of efforts. If we want to adopt the vision of illegitimate inequalities proposed by Roemer (1998), we must take this second effect into account when measuring inequality of opportunity. This is formally reflected in the fact that the effort variables are correlated with the circumstances variables:

$$E_i = \alpha + \theta C_i + \varepsilon_i \tag{3}$$

The residual ε_i gives a measure of the relative effort actually chosen by the individual, i.e. regardless of the circumstances he has known and which Roemer considers to be a source of legitimate inequalities.

For the entire association of circumstances with access to care to be in the coefficient of circumstances, we must remove the proportion of effort related to circumstances to the extent of the covariance between effort and access to care. The portion of the effort not related to circumstances corresponds to the residues of model 3, which we will note $(\hat{\varepsilon}_i)$. Model 4 then allows a new estimation of model 2, this time substituting the effort variable by the residual estimated in model 3, as follows:

$$\hat{ha_i^R} = \hat{\beta^R} N_i + \hat{\gamma^R} C_i + \hat{\delta^R} \hat{\varepsilon}_i + \upsilon_i \tag{4}$$

According to the Frisch-Waugh-Lowell theorem: $\gamma^R = \gamma + \delta \times \theta$. The coefficient capture the effect of circumstances through the effort. Model 3 is estimated by a linear probability model for each effort variable (occupation, diploma level, living with her parents, young adults standard of living). Residuals are obtained directly and are then substituted to the efforts variables in model 4.

The procedure for decomposing the variance described above is then replicated. Comparing the two decompositions allows us to understand to what extent the circumstances are indirectly associated with access to care. This scenario following the logic described by Roemer (1998) will be called the "à la Roemer" scenario.

4 Results

4.1 Health care access inequalities related to parent's income

The aim here is to highlight, using concentration indexes, inequalities in access to care among young adults based on their parents' income. These indexes give a first measure of inequality of opportunity in access to care, since the parents' standard of living can be considered as a circumstance.

All standardized concentration indexes are negative, showing inequality in favor of the poor (Figure 1): individuals whose parents are at the bottom of the income distribution have the most difficulty accessing care. Overall, inequalities appear to be significant except for preference unmet care need and non-use of the dentist. The absence of inequality in preference unmet care need suggests that the heterogeneity of preferences and the resulting inequalities in care use are not correlated with income distribution. Concerning the non-use of the dentist, the result is surprising: in the general population, the use of the dentist symbolizes social inequalities, which is mainly due to the fact that non-conservative dental care



Figure 1: Standardized concentration indexes of healthcare access with 95% confidence intervals

From left to right: The first three indexes are for unmet care need, the last four for non-use. Abreviations : at least one : the individual had unmet medical or dental or optical device unmet need care in the last 12 months ; bar : barrier ; pref : preference

is accompanied by a high level of out-of-pocket payment. This lack of inequality can be explained by a lower out-of-pocket payment at the dentist among young adults compared to the general population. Indeed, dental care at this age is more generally conservative and does not involve the most expensive cares and the least well covered by Social Security (dental prostheses, etc.).

The level of inequalities is more important for barrier renunciation even if the difference does not appear to be significant from other inequalities since the confidence intervals overlap.

4.2 Analysis of inequalities of opportunities in the non-health care access

The analysis of the associations between lack of access to care and circumstances makes it possible to highlight the factors that influence the formation of inequalities of opportunity in young people's access to care. Regarding non-use(Table 4), the vast majority of significant circumstances in the model without taking into account efforts remain significant when efforts are introduced.

We note that the father's work situation is linked to the non-use of the general practitioner (GP) and the specialist. In the case of non-use of the GP, having an inactive father is positively related to non-use. In the case of non-use of the specialist, having a retired father is

negatively related to non-use, while having a retired mother is positively related. The parents' diploma appears to be negatively related to the non-use of the specialist, an association that decreases but remains significant in the model with efforts.

Having separated parents and an unknown or deceased parent is positively related to non-use of the dentist, but the effect is no longer significant for the parents' vital status when efforts are taken into account. The parents' equivalised income is only protective for the non-use of the gynecologist. The association is positive between the non-use of the gynecologist and the parents' place of birth. Young adults with at least one parent born abroad therefore appear more vulnerable to non-use of gynecologists than those with both parents born in France. Having an inactive mother is also strongly related to the non-use of the gynecologist. Overall, the effects of the circumstances persist when efforts are taken into account, even if the coefficients decrease, indicating the existence of inequalities of opportunity related to a direct effect of the circumstances on the use of care.

Among the effort variables, there is a negative link between the youth's level of education and the non-use of the GP and specialist. Not living with own's parents is significant for all non-use except for the GP variable. The meaning of association differs according to the type of non-use: it is positive for the non-use of the specialist and the dentist but negative for the non-use of the gynecologist. The young person's income is negatively related to non-use of the gynecologist and non-use of the dentist. Being unemployed is significantly and positively related to non-use of the GP and the specialist, a result that is also found in the general population. A final variable that we consider as an effort, the fact of having complementary health coverage, is negatively related to non-use. However, the association is not significant for non-use of the GP. The coefficient is highest in the case of non-use of the specialist. A result consistent with the literature in the general population: the complementary coverage protects against out-of-pocket expenses that are more frequent with specialists practicing balance billing.

		Non-use									
	G	GP C C+E		tialist	dentist		gynecologist				
	\mathbf{C}			$C \! + \! E$	C - E		\mathbf{C}	C + E			
Variables	coeff										
Needs											
Woman	-0.091^{***}	-0.088***	-0.102^{***}	-0.100***	-0.039***	-0.042^{***}					
	(0.010)	(0.010)	(0.014)	(0.014)	(0.014)	(0.014)					
Age ref: 18 years old											
						Continued on	next page				

Table 4: Linear probabilities models of non-use of health care

				Non	ı-use			
	G	P	spec	ialist	der	ntist	gynec	ologist
19 years old	0.004	0.006	0.017	0.013	0.123***	0.117***	-0.050	-0.042
	(0.014)	(0.015)	(0.021)	(0.021)	(0.021)	(0.022)	(0.031)	(0.032)
20 years old	0.014	0.017	0.085***	0.077***	0.182***	0.169^{***}	-0.033	-0.015
	(0.016)	(0.017)	(0.023)	(0.024)	(0.023)	(0.025)	(0.035)	(0.037)
21 years old	0.026	0.032*	0.024	0.019	0.168^{***}	0.151***	-0.161^{***}	-0.133***
	(0.017)	(0.019)	(0.024)	(0.026)	(0.024)	(0.027)	(0.035)	(0.039)
22 years old	0.038**	0.046**	0.062***	0.059**	0.147***	0.127***	-0.179***	-0.133***
	(0.017)	(0.020)	(0.024)	(0.027)	(0.024)	(0.028)	(0.036)	(0.040)
23 years old	0.055^{***}	0.065***	0.069^{***}	0.064 * *	0.138^{***}	0.115***	-0.150***	-0.088**
	(0.019)	(0.022)	(0.026)	(0.030)	(0.026)	(0.030)	(0.038)	(0.044)
24 years old	0.078^{***}	0.087***	0.071***	0.068**	0.165^{***}	0.139^{***}	-0.214***	-0.123***
	(0.021)	(0.025)	(0.027)	(0.032)	(0.027)	(0.032)	(0.038)	(0.047)
Self-assessed health(SAH) re	f. : Very poo	r/Poor/Fair						
SAH Very good/ Good	0.040***	0.042***	0.084^{***}	0.090***	-0.016	-0.013	0.005	-0.001
	(0.014)	(0.014)	(0.022)	(0.022)	(0.024)	(0.024)	(0.031)	(0.031)
Is limited	-0.014	-0.023	-0.125***	-0.132***	-0.006	-0.008	-0.042	-0.053
	(0.016)	(0.016)	(0.026)	(0.026)	(0.028)	(0.028)	(0.040)	(0.041)
 , , ,,	-0.063***	-0.062***	-0.140***	-0.135***	-0.024	-0.024	-0.009	-0.008
Has a chronic disease	(0.013)	(0.013)	(0.021)	(0.021)	(0.022)	(0.022)	(0.031)	(0.031)
BMI ref. : normal (18.5 to 3	0)							
Underweight	0.019	0.016	0.000	-0.002	-0.025	-0.025	0.001	-0.007
	(0.016)	(0.016)	(0.023)	(0.023)	(0.023)	(0.023)	(0.030)	(0.030)
Overweight	0.007	0.005	0.018**	0.017**	0.014^{**}	0.014**	0.011	0.012
	(0.005)	(0.005)	(0.007)	(0.007)	(0.007)	(0.007)	(0.010)	(0.010)
Circumstances								
Vital status	0.022	0.009	0.019	0.005	0.068*	0.059	0.028	0.021
	(0.028)	(0.027)	(0.037)	(0.037)	(0.037)	(0.037)	(0.054)	(0.054)
Country of birth	0.022	0.018	0.018	0.014	-0.008	-0.009	0.079^{***}	0.058^{**}
	(0.015)	(0.015)	(0.020)	(0.020)	(0.020)	(0.020)	(0.028)	(0.028)
Separated parents	0.000	-0.009	0.032	0.020	0.047**	0.041^{*}	-0.042	-0.044
	(0.015)	(0.015)	(0.021)	(0.021)	(0.022)	(0.022)	(0.033)	(0.033)
Parents equivalised income	-0.005	-0.001	-0.016	-0.011	-0.008	-0.004	-0.039**	-0.032*
	(0.009)	(0.009)	(0.011)	(0.011)	(0.011)	(0.012)	(0.019)	(0.018)
Parents diploma	-0.004	0.007	-0.046***	-0.026*	-0.016	-0.011	0.001	-0.011
	(0.011)	(0.011)	(0.015)	(0.016)	(0.015)	(0.016)	(0.022)	(0.023)
Father's occupation ref. : Er	nployed							
Unemployed	0.005	0.001	0.035	0.028	-0.021	-0.023	0.046	0.045
1 0	(0.022)	(0.022)	(0.032)	(0.032)	(0.032)	(0.032)	(0.044)	(0.044)
Retired	0.023	0.016	-0.043	-0.053*	0.004	-0.001	0.026	0.023
	(0.022)	(0.022)	(0.027)	(0.027)	(0.028)	(0.028)	(0.040)	(0.040)
Inactive	0.099***	0.093***	0.051	0.043	-0.018	-0.020	0.062	0.065
	(0.036)	(0.036)	(0.042)	(0.041)	(0.042)	(0.042)	(0.061)	(0.061)
Unknown	0.015	0.016	-0.006	-0.007	-0.043	-0.043	-0.023	-0.019
	(0.021)	(0.021)	(0.029)	(0.029)	(0.029)	(0.029)	(0.044)	(0.044)
Mother's occupation ref. : E	mploved	((=.)	(=0)	(20)	(()	()
Unemployed	-0.015	-0.026	0.043^{*}	0.028	-0.001	-0.008	-0.013	-0.006
r	(0.018)	(0.018)	(0.026)	(0.026)	(0.027)	(0.027)	(0.038)	(0.038)
Retired	0.023	0.020	0.074*	0.073*	-0.007	-0.008	-0.009	-0.003
	0.020	51020	51011	5101.0	51001	a	0.000	0.000

				Non	ı-use			
	G	Р	spec	cialist	den	tist	gyneo	cologist
	(0.034)	(0.034)	(0.042)	(0.042)	(0.043)	(0.043)	(0.062)	(0.062)
Inactive	0.026*	0.018	0.025	0.017	0.034	0.028	0.074**	0.078^{***}
	(0.015)	(0.016)	(0.020)	(0.020)	(0.021)	(0.021)	(0.029)	(0.029)
Unknown	0.001	0.004	0.055	0.053	-0.033	-0.033	-0.027	-0.014
	(0.031)	(0.031)	(0.042)	(0.042)	(0.043)	(0.043)	(0.061)	(0.062)
Size of agglomeration ref. : I	Less than 2.00	0 inhabitants						
2.000 to 4.999	-0.026	-0.026	0.007	0.006	-0.037	-0.037	-0.027	-0.021
	(0.025)	(0.025)	(0.036)	(0.036)	(0.036)	(0.036)	(0.055)	(0.055)
5.000 to 9.999	-0.036	-0.037*	-0.027	-0.025	-0.092***	-0.089***	0.033	0.040
	(0.022)	(0.022)	(0.032)	(0.032)	(0.032)	(0.032)	(0.050)	(0.050)
10.000 to 19.999	-0.035	-0.035	-0.068*	-0.064*	-0.032	-0.030	-0.087*	-0.082
	(0.024)	(0.024)	(0.035)	(0.035)	(0.035)	(0.035)	(0.052)	(0.052)
20.000 to 49.999	-0.019	-0.018	-0.020	-0.016	-0.024	-0.022	0.006	0.006
	(0.020)	(0.020)	(0.028)	(0.028)	(0.028)	(0.028)	(0.041)	(0.040)
50.000 to 99.999	-0.021	-0.023	-0.024	-0.025	-0.041	-0.042	0.031	0.031
	(0.020)	(0.020)	(0.028)	(0.028)	(0.029)	(0.029)	(0.042)	(0.041)
100.000 to 199.999	-0.052***	-0.053***	0.005	0.005	-0.039	-0.043	-0.002	0.001
	(0.019)	(0.020)	(0.029)	(0.030)	(0.029)	(0.030)	(0.044)	(0.044)
200.000 to 1.999.999	-0.018	-0.019	-0.033	-0.032	-0.014	-0.016	-0.021	-0.020
	(0.015)	(0.015)	(0.021)	(0.021)	(0.021)	(0.021)	(0.031)	(0.031)
Paris agglo.	0.012	0.010	0.009	0.010	0.022	0.017	-0.046	-0.058
00	(0.020)	(0.020)	(0.026)	(0.026)	(0.026)	(0.027)	(0.039)	(0.039)
	(0.020)	(01020)	(0.020)	(0.020)	(01020)	(0.021)	(01000)	(0.000)
Efforts								
Occupation ref.: Employed								
Apprentice		-0.014		-0.029		0.044		-0.011
11		(0.021)		(0.031)		(0.030)		(0.049)
Student		0.002		-0.016		-0.008		0.026
		(0.015)		(0.021)		(0.022)		(0.032)
Unemployed		0.040*		0.052*		0.041		-0.004
		(0.022)		(0.028)		(0.028)		(0.041)
Other		-0.004		-0.061		0.016		-0.166***
		(0.030)		(0.040)		(0.041)		(0.055)
		· · ·		· · ·		· · ·		()
Highest diploma ref. : No dip	oloma							
Secondary education		-0.082***		-0.060*		-0.013		-0.017
-		(0.030)		(0.036)		(0.037)		(0.058)
Vocational		-0.104***		-0.051		-0.037		-0.071
		(0.028)		(0.032)		(0.034)		(0.053)
High school		-0.095***		-0.043		0.003		-0.027
		(0.027)		(0.031)		(0.032)		(0.050)
Two-year degree		-0.143***		-0.115***		-0.006		-0.048
ine year degree		(0.030)		(0.038)		(0.039)		(0.060)
Three- and four-year degree		-0.111***		-0.090**		0.004		-0.016
, our abgroo		(0.034)		(0.042)		(0.043)		(0.063)
Master and beyond		-0.124***		-0.155***		-0.025		-0.122
		(0.040)		(0.052)		(0.054)		(0.074)
Not living with parents		0.010		0.050***		0.062***		-0.057**
0 F		(0.014)		(0.019)		(0.020)		(0.027)
		× /		· /	(Continued on	next page	· /
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	G	P	spec	pecialist dentist g			gynec	ologist
Equivalised income		-0.002		-0.005		-0.010*		-0.019**
		(0.004)		(0.006)		(0.006)		(0.009)
Has a health insurance (HI) ref. : No							
Has a HI		-0.034		-0.113***		-0.060*		-0.091^{**}
		(0.025)		(0.031)		(0.032)		(0.045)
Constant	0.180^{***}	0.275^{***}	0.577^{***}	0.724***	0.475***	0.571^{***}	0.914***	1.091^{***}
	(0.067)	(0.080)	(0.089)	(0.102)	(0.090)	(0.106)	(0.145)	(0.160)
Observations	5,197	5,197	$5,\!197$	5,197	5,197	5,197	2,435	2,435
\mathbb{R}^2	0.039	0.048	0.056	0.067	0.027	0.032	0.047	0.061

Note: at the top of the columns are indicated the variables of the model: C for circumstances, E for efforts

 ${\it ref.:}\ {\it reference}\ ;\ {\it agglo.:}\ {\it agglomeration}$

Robust standards errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Concerning unmet care needs (Table 5), the coefficients of the circumstances variables are more significant than in the case of non-use. Variables of parental marital status, parental place of birth are positively associated with having had at least one unmet care need. The variable of parent's country of birth is also positively correlated to barrier unmet care need. Having at least one parent born abroad seem to capture difficulties in access to care. Having an inactive father seem to be a factor of vulnerability as well, the coefficient being significant and positive for barrier unmet care need. Regarding the probability of having had at least one preference unmet care need, few variables appear to be significant in the model. The parent diploma variable is positive and significant only in the model with efforts. This association may be due to a intergenerational transmission of preferences in the choices linked to health behaviors.

Several factors also appear to be legitimate sources of inequality. Among the effort variables, we find again the protective effect of having a health insurance, except in the model explaining preference unmet care need. The variable indicating not living with own's parents is still positively associated. Being unemployed is positively related to the barrier unmet care need. While the level of diploma was significantly related to non-use, it is not the case for unmet care needs.

care well Ccare well Cunmet care well Cunmet care well Cunmet care Ccare CCCCCVariablescoeff
C C+E C C+E C C+E C Variables coeff coeff coeff coeff coeff coeff Neads
VariablescoeffcoeffcoeffcoeffcoeffcoeffNeedsWoman 0.019^* 0.016 0.033^{***} 0.029^{**} 0.010 -0.009 Age ref: 18 years old 0.025^* 0.028^{***} 0.028^{***} 0.000 0.000 20 years old 0.042^* 0.025^* 0.028^{***} 0.0009 0.012 0.0101 20 years old 0.044^{***} 0.035^* 0.028^{***} 0.0009 0.012 0.0101 21 years old 0.074^{***} 0.057^{***} 0.071^{***} 0.002 -0.008 22 years old 0.074^{***} 0.657^{***} 0.071^{***} 0.002 -0.008 22 years old 0.074^{***} 0.657^{***} 0.071^{***} 0.021 0.004 23 years old 0.098^{***} 0.666^{***} 0.071^{***} 0.012 -0.008 24 years old 0.098^{***} 0.666^{***} 0.018 (0.013) (0.014) (0.015) 24 years old 0.056^{***} 0.022 (0.016) (0.018) (0.016) (0.017) 24 years old 0.056^{***} 0.021 0.068^{***} -0.058^{***} -0.056^{***} 25 Hassessed health (SAH) ref. : Very poor/FairSAH very good/ Good $(0.18)^{*}$ (0.018) (0.017) (0.017) 26 horas disease (0.018) (0.017) (0.013) (0.014) (0.014) BMI ref. : normal (18.5 to 30) (0.016) (0.013) (0.014) (0.014) 27
Needs
Woman 0.019* 0.016 0.033*** 0.029*** -0.010 -0.009 Age ref: 18 years old
(0.010) (0.017) (0.077) (0.008) (0.008) Age ref: 18 years old 19 years old 0.025* 0.028*** 0.028*** 0.0010) (0.010) (0.014) (0.019) (0.009) (0.009) (0.012) (0.012) (0.014) (0.016) (0.011) (0.012) (0.013) (0.013) (1) years old (0.016) (0.011) (0.014) (0.013) (0.013) (1) years old (0.074*** 0.077*** 0.071*** 0.002 -0.008 (1) years old (0.018) (0.012) (0.014) (0.015) (0.016) (2) years old 0.087*** 0.066*** 0.07*** 0.065** 0.012 -0.008 (2) years old 0.087*** 0.066*** 0.018) (0.016) (0.017) (2) years old 0.098*** 0.066*** 0.028*** 0.017 (0.017) (0.017) (2) years old 0.028*** 0.021 (0.018) (0.017) (0.018) (0.017) (0.018) 2
Age ref: 18 years old 19 years old 0.025* 0.025* 0.028*** 0.000 0.000 20 years old 0.044*** 0.035** 0.028*** 0.000 0.012 20 years old 0.044*** 0.055*** 0.022*** 0.048*** -0.000 0.012 21 years old 0.0161 (0.016) (0.011) (0.012) (0.013) (0.013) 21 years old 0.074*** 0.057*** 0.077*** 0.077*** 0.021 0.008 22 years old 0.087*** 0.062*** 0.065*** 0.021 0.004 (0.018) (0.020) (0.014) (0.015) (0.016) (0.017) 23 years old 0.092*** 0.066*** 0.07*** 0.012 -0.008 (0.020) (0.021) (0.016) (0.017) 2 -0.008 (0.019) (0.023) (0.015) (0.016) (0.017) 2 24 years old 0.056*** 0.021 0.066*** 0.051*** -0.011 -0.034* (0.019) (0.020) (0.018) (0.017) (0.017) (0.017) 0.
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(0.014) (0.019) (0.009) (0.012) (0.012) 20 years old 0.044*** 0.035** 0.052*** 0.048*** -0.005 -0.010 (0.016) (0.016) (0.011) (0.012) (0.013) (0.013) 21 years old 0.074*** 0.057*** 0.076*** 0.060*** 0.001 22 years old 0.087*** 0.062*** 0.076*** 0.065*** 0.012 0.004 23 years old 0.098*** 0.066*** 0.076*** 0.076*** 0.012 0.004 23 years old 0.098*** 0.066*** 0.076*** 0.075*** 0.012 -0.008 24 years old 0.056*** 0.021 0.076*** 0.075*** 0.011 -0.034 24 years old 0.056*** 0.021 0.066*** 0.018) (0.014) (0.017) 24 years old 0.035 0.023 (0.018) (0.014) (0.017) (0.017) 24 years old 0.040 -0.104*** -0.068*** -0.058*** -0.058***
20 years old 0.044*** 0.035** 0.052*** 0.048*** -0.005 -0.010 21 years old 0.074*** 0.057*** 0.077*** 0.071*** 0.002 -0.008 21 years old 0.074*** 0.062*** 0.076*** 0.065*** 0.0021 0.004 22 years old 0.087*** 0.062*** 0.076*** 0.065*** 0.021 0.004 23 years old 0.087*** 0.062*** 0.076*** 0.075*** 0.012 0.004 24 years old 0.08*** 0.060*** 0.014) (0.016) (0.015) (0.016) 24 years old 0.056*** 0.021 0.066*** 0.051*** -0.011 -0.034* (0.019) (0.023) (0.015) (0.018) (0.017) (0.018) (0.017) 24 years old 0.056*** 0.021 0.066*** 0.051*** -0.058*** -0.056*** Self-assessed health (SAH) ref. : Very pov//Port/Fair
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Circumstances 0.051* 0.042 0.041* 0.035 0.009 0.005 Vital status 0.051* 0.042 0.024 0.024 0.023 (0.024) Country of birth 0.027* 0.031** 0.024* 0.025* 0.004 0.008 (0.015) (0.015) (0.013) (0.013) (0.012) (0.012) Separated parents 0.042*** 0.035** 0.019 0.016 0.025* 0.021
Circumstances Vital status 0.051^* 0.042 0.041^* 0.035 0.009 0.005 (0.029) (0.029) (0.024) (0.024) (0.023) (0.024) Country of birth 0.027^* 0.031^{**} 0.024^* 0.025^* 0.004 0.008 (0.015) (0.015) (0.013) (0.012) (0.012) Separated parents 0.042^{***} 0.035^{**} 0.019 0.016 0.025^* 0.021
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(0.015) (0.015) (0.013) (0.013) (0.012) (0.012) Separated parents 0.042^{***} 0.035^{**} 0.019 0.016 0.025^{*} 0.021
Separated parents 0.042^{***} 0.035^{**} 0.019 0.016 0.025^{*} 0.021
(0.016) (0.016) (0.012) (0.012) (0.013) (0.013)
Parents equivalised income -0.011 -0.009 -0.007 -0.005 -0.003 -0.003
(0.008) (0.006) (0.006) (0.006) (0.006) (0.006) (0.006)
Parents diploma 0.002 0.010 -0.008 0.013 0.023^{***} (a a1a) (a a11) (a aaa) (a aaa) (a aaa)
(0.010) (0.011) (0.008) (0.008) (0.008) (0.009)
Eather's occupation ref. : Employed
$\begin{array}{ccc} \text{Inemployed} \\ \text{Inemployed} \\ 0.041 \\ 0.038 \\ 0.029 \\ 0.097 \\ 0.091 \\ 0.091 \\ 0.010 \\ \end{array}$
(0.025) (0.025) (0.020) (0.021) (0.021) (0.021) (0.021) (0.021) (0.021) (0.020) (0.0
Retired 0.038^* 0.031 0.032^* 0.026 0.011 0.009
Continued on next page

Table 5: Linear probabilities models of unmet care need

	At least o	one unmet	At least o	one barrier	At least o	ne preference		
	care	need	unmet (care need	unmet	care need		
	(0.021)	(0.021)	(0.017)	(0.017)	(0.017)	(0.017)		
Inactive	0.055	0.049	0.071**	0.064**	0.007	0.006		
	(0.033)	(0.033)	(0.030)	(0.029)	(0.025)	(0.025)		
Unknown	0.021	0.020	0.019	0.019	0.009	0.009		
	(0.022)	(0.022)	(0.017)	(0.017)	(0.019)	(0.019)		
Mother's occupation ref.	: Employed	(0.022)	(01011)	(0.011)	(0.010)	(0.010)		
Unemployed	0.010	0.000	0.004	-0.003	0.011	0.006		
F5	(0.020)	(0.020)	(0.016)	(0.016)	(0.016)	(0.016)		
Retired	-0.006	-0.007	0.013	0.013	-0.008	-0.010		
1000000	(0.031)	(0.031)	(0.027)	(0.026)	(0.023)	(0.023)		
Inactive	0.012	0.004	0.009	0.003	0.013	0.009		
maative	(0.012)	(0.015)	(0.012)	(0.012)	(0.012)	(0,012)		
Unknown	0.029	0.021	0.020	0.016	0.011	0.007		
0 IIKIIOW II	(0.025)	(0.021)	(0.020)	(0.020)	(0.027)	(0, 0.007)		
	(0.033)	(0.034)	(0.025)	(0.025)	(0.027)	(0.027)		
Size of agglomeration ref.	: Less than 2.00	00 inhabitant	s					
2,000 to 4,999	0.045*	0.041	0.019	0.014	0.029	0.029		
	(0.026)	(0.026)	(0.018)	(0.018)	(0.022)	(0.022)		
5,000 to 9,999	0.009	0.006	0.008	0.005	0.002	0.001		
	(0.022)	(0.022)	(0.016)	(0.015)	(0.017)	(0.017)		
10,000 to 19,999	0.079^{***}	0.078^{***}	0.037^{*}	0.039^{**}	0.056^{**}	0.056**		
	(0.026)	(0.026)	(0.019)	(0.019)	(0.023)	(0.023)		
20,000 to 49,999	0.045^{**}	0.045^{**}	0.025^{*}	0.025*	0.023	0.024		
	(0.019)	(0.019)	(0.014)	(0.014)	(0.016)	(0.016)		
50,000 to 99,999	0.043**	0.040**	0.034**	0.031^{**}	0.015	0.015		
	(0.020)	(0.020)	(0.015)	(0.015)	(0.016)	(0.016)		
100,000 to 199,999	0.034	0.026	0.024	0.016	0.017	0.018		
	(0.021)	(0.021)	(0.015)	(0.015)	(0.017)	(0.017)		
200,000 to 1,999,999	0.046^{***}	0.039***	0.038^{***}	0.031^{***}	0.013	0.013		
	(0.014)	(0.014)	(0.010)	(0.010)	(0.011)	(0.011)		
Paris agglo.	0.019	0.016	0.024^{*}	0.017	-0.002	0.002		
	(0.017)	(0.017)	(0.013)	(0.013)	(0.014)	(0.014)		
Fforta								
Occupation ref : Employe	d							
Apprentice	, a	0.029		0 050***		-0.013		
Tippionoteo		(0.022)		(0.017)		(0,018)		
Student		0.022		0.035***		-0.013		
Student		(0.022)		(0.013)		(0.013)		
Unemployed		0.075***		0.077***		0.020		
0 nemployed		(0.070		(0.019)		(0.020)		
Other		0.015		0.001		0.022		
Other		(0.030)		(0.023)		(0.023)		
				. ,		. ,		
Highest diploma ref. : No	o diploma							
Secondary education		-0.014		-0.007		-0.018		
		(0.029)		(0.023)		(0.025)		
Vocational		-0.009		-0.008		-0.012		
		(0.027)		(0.021)		(0.023)		
High school		-0.034		-0.011		-0.038*		
		Continued on next page						

	At least one unmet		At least o	one barrier	At least of	ne preference
	care	need	unmet o	care need	unmet	care need
		(0.025)		(0.020)		(0.021)
Two-year degree		-0.035		-0.025		-0.030
		(0.030)		(0.024)		(0.024)
Three- and four-year degree		0.015		0.015		-0.014
		(0.034)		(0.028)		(0.027)
Master and beyond		-0.019		0.029		-0.053*
		(0.041)		(0.036)		(0.029)
Not living with parents		0.072^{***}		0.049***		0.026**
		(0.015)		(0.012)		(0.012)
Equivalised income		0.007		0.002		0.005*
		(0.004)		(0.004)		(0.003)
Constant	0.194^{***}	0.217^{***}	0.075	0.097	0.114**	0.128**
	(0.063)	(0.076)	(0.047)	(0.060)	(0.050)	(0.061)
Observations	5.197	5.197	4.762	4.762	4.792	4.792
\mathbb{R}^2	0.049	0.061	0.058	0.073	0.017	0.022

Note: at the top of the columns are indicated the variables of the model: C for circumstances, E for efforts ref. : reference; agglo.: agglomeration

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

4.3 Decomposition of health care access

In order to measure the respective magnitude of inequalities of opportunity and legitimate inequalities, we look at the respective contribution of circumstances, efforts and needs to the variance predicted by the models. The linear probability models from which we assess the contribution of each of the variables correspond to those presented above, including both circumstance and effort variables.

For each access to care variable, the variables that contribute most to the variance are those related to the needs of the young adult, except for non-use of the gynecologist (Figure 2). This is reassuring in the sense as it means that the use of care is first of all differentiated according to needs. This suggests that the health system is meeting the objective of vertical equity in access to care. That is, those with the highest care needs must receive more care, in accordance with the saying "to everyone according to their needs". However, for the unmet care needs variables, the proportion due to need is lower than for the non-use variables, excluding the non-use of the gynecologist. Among the unmet care needs variables, the contribution of needs is at most 47%, for barrier unmet care needs, while among the non-use variables it is at least 59%, for non-use of dentist. This difference seems to come from the variation in the contribution of the gender variable between inequality in unmet care needs



Figure 2: Relative contributions of needs, efforts and circumstances to the predicted variance of health care access variables (in %)

and inequality in non-use (see Tables 6 and 7). For example, for non-use of the general practitioner, the contribution of sex is 33.6% while for unmet care need this contribution is 1.6%.

Circumstances have a part less important than efforts when the correlation between efforts and circumstances are considered following the Barry's vision. Adding the correlation between efforts and circumstances in the circumstances, following the Roemer's vision, increases mechanically the part of circumstances and decreases the part of efforts. In the case of non-use, the efforts contribution remains more important than the one of circumstances in the scenario "à la Roemer". For unmet care need variables, the contribution of circonstances increases enough to be more important of the one of efforts in the scenario "à la Roemer". The contribution of circumstances is higher for unmet care need variables and for non-use of gynecologist than for other variables.

In detail, among the circumstances, the variables that contribute the most are the father's employment status and the size of the agglomeration of living (Tables 6 and 7). The fact that the parents are separated is one of the largest contributor to the variance of unmet care need.

				Non-	use				
	G	Р	Spec	ialist	Der	ntist	Gynec	$\operatorname{Gynecologist}$	
	$Contri.^a$	$Contri.^{b}$	Contri.	Contri.	Contri.	Contri.	Contri.	Contri.	
	B.(%)	R.(%)	B.(%)	R.(%)	B.(%)	R.(%)	B.(%)	R.(%)	
Explained variance	0.0060	0.0060	0.0167	0.0167	0.0081	0.0081	0.0144	0.0144	
Needs	65.2	65.2	70.3	70.3	62.5	62.5	29.8	29.8	
Woman	33.6	33.6	16.7	16.7	4.6	4.6			
Age	12.8	12.8	6.4	6.4	52.4	52.4	27.7	27.7	
\mathbf{SAH}	5.5	5.5	9.9	9.9	0.1	0.1	0.0	0.0	
$\operatorname{Is} \operatorname{limited}$	1.9	1.9	14.3	14.3	0.1	0.1	1.2	1.2	
Chronic disease	11.1	11.1	21.5	21.5	0.8	0.8	0.2	0.2	
BMI	0.4	0.4	1.5	1.5	4.3	4.3	0.7	0.7	
Efforts	20.9	18.4	19.3	15.7	24.9	22.3	37.8	35.1	
Occupation	5.4	4.9	6.7	5.7	8.3	7.3	10.4	11.3	
$\operatorname{Diploma}$	12.8	11.5	4.8	3.7	2.0	2.5	6.6	6.2	
Living with parents	0.4	0.3	2.2	2.0	9.3	8.5	8.1	7.2	
Living standards	0.3	0.2	0.5	0.2	1.4	0.9	10.0	8.3	
Health insurance	2.0	1.4	5.2	4.2	3.8	3.0	2.7	2.1	
Circumstances	13.9	16.4	10.3	13.9	12.7	15.3	32.5	35.2	
Parent's vital status	0.4	0.9	0.1	0.2	2.0	2.3	0.2	0.2	
Parent's country of birth	1.1	1.3	0.3	0.4	-0.1	-0.1	4.3	5.5	
Parent's marital status	0.1	0.0	0.5	0.9	1.8	2.1	4.0	3.8	
Parent's living standards	0.1	0.5	0.8	1.2	0.1	0.1	6.8	8.9	
Parent's diploma	-0.4	0.2	2.4	4.4	1.0	1.8	0.3	-0.1	
Father's occupation	5.6	6.0	1.2	1.3	-1.0	-0.8	2.8	2.9	
Mother's occupation	2.0	2.4	2.5	3.0	1.1	1.4	7.7	7.9	
Agglomeration size	5.0	5.1	2.4	2.5	7.8	8.4	6.3	6.2	

Table 6: Details of non-use variance decomposition

 a contribution in percentage of the variable of the variance for the scenario "à la Barry"

^bcontribution in percentage of the variable of the variance for the scenario "à la Roemer"

Regarding the efforts, not living with one's parents is the most important contributor to inequality in the case of unmet care need, but its contribution is smaller in the case of non-use (except for dentist non-use). The diploma level of the young adult is the main source of legitimate inequalities in non-use and preference unmet care need. However, it is the effort variable for which the contribution decreases most in the Roemer scenario. For example, in the case of non-use of GP, the diploma level contribution is 12.8% in the scenario "à la Barry" and 11.5% in the scenario "à la Roemer". Circumstances are highly correlated to this variable, which is in line with the literature of inequality of opportunity for education.

The nature of inequality in the non-use of gynecologist appears very different from that of other variables. The variance appears to be less explained by care needs than for the other use or unmet care need variables. In the case of non-use of gynecologist, the efforts variables become more important. It can thus be assumed that using the gynecologist is essentially

	At least one					
	unmet care need		barrier unmet care need		preference unmet care need	
	$Contri.^a$	$Contri.^{b}$	Contri.	Contri.	Contri.	Contri.
	B.(%)	R.(%)	B.(%)	$\mathrm{R}.(\%)$	B.(%)	m R.(%)
Explained variance	0.0079	0.0079	0.0051	0.0051	0.0017	0.0017
Needs	46.1	46.1	47.0	47.0	43.9	43.9
Woman	1.6	1.6	6.0	6.0	0.5	0.5
Age	10.9	10.9	19.9	19.9	2.9	2.9
SAH	20.9	20.9	13.4	13.4	25.7	25.7
$\operatorname{Is} \operatorname{limited}$	3.8	3.8	3.1	3.1	3.8	3.8
Chronic disease	6.9	6.9	3.7	3.7	7.3	7.3
BMI	2.0	2.0	0.8	0.8	3.5	3.5
Efforts	30.6	25.9	30.4	26.0	30.5	27.5
Occupation	5.9	5.0	7.9	7.5	7.9	7.3
$\operatorname{Diploma}$	5.2	3.9	3.6	3.1	13.0	11.0
Living with parents	13.4	11.8	10.7	9.2	7.0	6.4
Living standards	0.2	0.8	-0.2	0.0	1.3	1.9
Health insurance	6.0	4.5	8.4	6.3	1.3	1.0
Circumstances	23.3	28.0	22.6	27.0	25.7	28.6
Parent's vital status	2.7	3.3	3.2	3.7	0.2	0.5
Parent's country of birth	2.5	2.1	2.7	2.6	0.6	0.3
Parent's marital status	4.6	5.4	1.7	2.2	7.4	8.9
Parent's living standards	1.3	1.2	0.9	1.1	00.5	0.2
Parent's diploma	-0.8	0.0	1.2	1.4	0.8	0,4
Father's occupation	6.1	7.6	8.0	9.3	3.4	4.5
Mother's occupation	0.9	1.9	1.0	1.8	2.0	2.9
Agglomeration size	6.0	6.4	4.1	4.8	10.8	10.9

Table 7: Details of unmet care need variance decomposition

 a contribution in percentage of the variable of the variance for the scenario "à la Barry"

 b contribution in percentage of the variable of the variance for the scenario "à la Roemer"

preventive and therefore less related to health problems. Despite the importance of efforts variables, we see that circumstances still play a significant role in contributing to 32% of the variance in the Barry scenario and 35% in the Roemer scenario.

5 Discussion and conclusion

This work offers another perspective on the inequality of access to care for an under-studied population in France, young adults. The problems of access to health care for young people do not seem to be similar to those of the general population. Indeed, in the general population, social inequalities of access are greater for visits to specialists and dentists than for visits to general practitioners (Devaux, 2015). Here, on the contrary, the inequalities of non-use according to the parents' standard of living are greater for the general practitioner than for the specialist or dentist. Our results also differ from those of Mosquera et al. (2017)

for young adults in Sweden. While the concentration indexes for general practitioner use indicate more use among the poorest, our results are in the opposite direction: more non-use among those whose parents have lower incomes. This difference may be due to the fact that France and Sweden do not have the same health care systems. It may also be due to differences in the analysis. While we use parental income as a rank variable, they use household disposable income, which can be composed of both the young adult alone and the young adult and her family. Moreover, the variables of use of the general practitioner do not relate to the same time period since those of our study concern the last year whereas for them it refers to the last three months.

The decomposition by source of explained inequalities in access to care shows that care needs have the largest contribution to inequalities. This suggests that these inequalities are mainly legitimate. The second source of legitimate inequalities, efforts, has a larger contribution than circumstances, which are a source of illegitimate inequalities. This result is sensitive to the normative approach considered as well as to the variable of access to health care.

The ENRJ data allowed a significant number of circumstances variables to be included in the analysis, but a relatively small number of effort variables. In particular, health risk behaviors are not included in this survey. This may lead to an overestimation of the relative share of access inequalities explained by the circumstances, thus to an overestimation of opportunity inequalities and, on the contrary, to an underestimation of legitimate inequalities. Moreover, the literature on inequalities of opportunity has shown the importance of social reproduction, whether it involves the intergenerational transmission of social classes, studies or income. Since education is not completed for our entire study population, and wage levels or occupations are not stable at the beginning of working life, it can be assumed that the correlation between circumstances and effort may be underestimated.

Despite these limitations, our results show the importance of parental characteristics in explaining inequalities in access to care among youth. They stress the importance of taking them into account in policies aiming at reducing inequalities in access to care. In addition to monitoring inequalities in opportunities throughout the life cycle, taking parental resources into account when granting aid to access to care also appears to be a possible approach. However, our work also shows that circumstances are more associated with subjective variables of access to care, unmet care need, than with more objective variables of non-use of care. This provide a difficulty to identify population that suffer most from illegitimate inequalities.

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