Immigration and health care utilisation in France: New evidences from the Health, Health Care and Insurance Survey

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Preliminary Version - (Please do not quote)

Abstract : According to the French principle of horizontal equity in health care utilisation, access to care should only be based on medical need to guarantee equal treatment for equal individuals. Nevertheless, holding need factors equal, recent French studies found disparities in health care utilisation between immigrant and native population. For the purpose of this research, we use a general health survey representative of the French population, the 2006 and 2008 French Health, Health Care and Insurance Survey. We consider separately the decision to seek care and the intensity of care to compare immigrant pattern of health care utilisation with the French-born population one. In addition, we use the Fairlie's and the Blinder-Oaxaca decomposition methods in order to highlight immigrant access barriers to medical services. Although immigrant is less likely than French born population to initiate a GP or a specialist visit, the intensity of medical services utilisation appears much higher than the French-born population. Subsequently, decomposition analyses reveal that immigrant lower access to complementary health coverage represents the first access barrier to visit a GP while their lower education and lower income are the most important drivers of inequalities in the propensity to visit a specialist. If immigrant intensity of visit is higher because of their impaired health status, their disadvantaged socio-economic conditions and they lower access to complementary health coverage are the most important factors explaining the higher number of GP visit while, together, these factors downsize the immigrant frequency of specialist visit.

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1. INTRODUCTION

Horizontal health equity, which is supposed to guarantee equal treatment for equal individuals, is regarded as a key objective for a number of OECD countries to ensure adequate access to care (De Louper and Lafortune, 2009). However, a growing body of studies shown persistent disparities in access to care across the income distribution, according to educational level or according to the migratory status (Van Doorslaer, Koolman and Jones, 2004; Wagstaff and Van Doorslaer, 2000; Or et al., 2008; Dourgnon et et al.,2009). Health care disparities related to immigration has been recognised as a major priority for action in the health domain by the World Health Organisation (WHO, 2003). The European Commission gives also a special attention to this issue since the Portuguese Presidency of the EU in 2007 (ECDC, 2009) which has supported the AMAC project "Assisting Migrants and Communities: Analysis of Social Determinants of Health and Health Inequalities"[1]. Under these premises, the promotion of immigrant access to healthcare is regarded as a political commitment for Member States (ECDC, 2009). However, the understanding of immigrant health care use remains limited in France because of a small number of studies having addressed this question.

Despite limited evidences on this issue, the French literature suggests that immigrants, for equivalent health care needs, experience a lower use of medical services compared to the native population. Recently, Dourgnon et *al.* (2009) have used the 2002-2003 National Health and Medical Care Survey with the aim of comparing the access to ambulatory care in France for foreign, naturalised and the native population. The authors found that, holding healthcare needs equal, both foreign and naturalised immigrants present a lower access rate to General Practitioner (GP) than French population. Regarding the decision to visit a specialist, the probability appears lower for foreign immigrants while the utilisation pattern of naturalised individuals does not differ from the French population. The authors conclude that observed inequalities in access to health services are largely explained by immigrants' disadvantaged social and economic conditions in France. Findings of Mizrahi and Mizrahi (2008), based on the 2000-2002 "Health, Health care and Insurance" survey, are consistent with the previous study. After standardization for age and sex, the immigrant consumption of care is lower for general practitioner and dental care but appears however higher for specialist and hospital visit. On the other hand, the study of Athias-Donfut and Tessier (2005) based on a sample of immigrants aged between 45 to 70 years old, provide different conclusions. The authors found few noticeable evidences of a different pattern of GP utilisation between both immigrant and French populations. Conversely, they showed a lower access rate to specialist among the immigrant population as compared to the French one.

[1] http://www.migrant-health-europe.org/

In addition, recent studies indicate that immigrant population is more likely than French population to foregone health care (Boisguerin and Haury, 2008; Beauchemin et *al.,* 2011). Approximately 25% of immigrant beneficiaries of the State Medical Assistance in 2007 declare foregoing health care (Boisguerin and Haury, 2008). The first reason of the health care foregone is a financial one which is also confirmed by the survey "Trajectoire et Origine" that provides evidences of a more pronounced health care foregone among mostly immigrants from Sahelia Africa (Beauchemin et *al*., 2011).

Many factors may constitute access barriers and limit immigrant access to care. As stated by previous literature (Dourgnon *et al*., 2009; Mizrahi and Mizrahi, 2008), disadvantaged economic and social conditions of immigrants may explain disparities in health care use. The unemployment rate among immigrant in France is twice as much important as the native one (Insee, 2005). The foreign population presents also poorer market outcomes such as lower wages than the natives' population, in part because of the limited transferability of their skills in the host country. In addition to poorer socio-economic conditions, immigrant population suffers from difficulties to access to the complementary health coverage. According to the 2002-2003 Health and Medical Care Survey, 35% of the immigrant population residing in France do not have complementary health coverage against 7% of the French population (Dourgnon *et al*., 2009). A differential in social exclusion or social integration may also be the result of inequalities in health care use between immigrant and native population. Social support, social network or social participation has been found to be positively related to a number of health indicators including health care use (Putnam, 93; Laporte *et al*., 2008; Sirven and Debrand, 2011). Migration may imply social isolation and induce a loss of social network, which may generate difficulties to obtain tangible or intangible support to access to the health care system. Language difficulties and cultural factor constitutes additional access barriers that yield inequality in access to health care. Immigrant populations when lacking from language proficiency may misunderstand the information related to preventive care, to treatment or more broadly to access to healthcare system (Chaouchi *et al.,* 2006). Several foreign studies provide evidence that immigrant reporting language difficulties experienced a lower access to health professional or perceived higher barriers to healthcare use (Sander, 2009; Leclere, Jensen and Biddlecom, 1994; Zambrana et al., 1994). Finally, it has been acknowledge that health care inequalities are related to discriminatory practice or to a different response from the health care system. In France for instance, one third of the beneficiaries from the State Medical Assistance have reported a care refusal from health professional (Boisguerin and Haury, 2008).

Under these premises, the objective of the present research is to shed in light differences in the pattern of health care utilisation according to migratory status. The main contribution

of this paper lies in the fact that it is the first research in France analysing separately the decision to seek care and the intensity of care in comparing immigrants from the French born population. In addition, the present research is innovative in France in using the Fairlie's and the Blinder-Oaxaca decomposition method to highlight access barriers to medical services. Understanding the main access barriers for immigrant population is necessary for the definition of relevant public policies in order to improve their access to health care services.

The empirical estimation is based on a two-fold analysis to study (i) the pattern of medical service utilisation of immigrants using a two part model with a Heckman correction, (ii) the sources of healthcare inequalities based on the Fairlie's and the Blinder-Oaxaca decomposition procedures.

2. SOURCE AND DATA

The analysis is based on a population survey, representative of the French population, the Health, Health Care and Insurance Survey (ESPS: "Enquête sur la santé et la protection sociale"), coordinated by the Institute for Research and Information in Health Economics (IRDES). We use the 2006 and 2008 waves which include a wide variety of information about medical utilisation, health care coverage, health status, nationality, socio-economic conditions and social capital. The survey is representative of the French population and is based on a random draw from administrative files of the main sickness funds to which over 90% of the population living in France belong. Individuals drawn at random from the administrative files are used to identify households (Allonier *et al*., 2008). The socio-economic questionnaire is answered by one key informant in each household (aged at least 18), who needs not be the individual selected at random and self-selected voluntary. Questions on health status and medical health care utilisation are collected through a self-administered questionnaire completed individually by each household member. Questions on social capital and nationality are answered by the key informant for him or her-self. For the purposed of this research we restrict analysis to the individual aged more than 18 years old with non-missing observations for consultation to a general practitioner and to specialist doctor.

2.1. Health Care utilisation variables

The Health, Health Care and Insurance Survey provide information on visit to a general practitioner (GP) and to a specialist doctor over the past twelve months preceding the survey. The contact decision to visit a GP or a specialist doctor is constructed on the basis of the question: "During the past twelve months, have you visited at least once: (i) a General Practitioner?, (ii) a specialist doctor?". The intensity of GP and specialist visit is

measured on the basis of the question "During the past twelve months, how many times have you visited: (i) a general practitioner?, (ii) a specialist doctor? ".

– Insert Table 1 about Here –

Table 1 displays the mean statistics of the key dependant health care use variables that we employed in the empirical estimation. The vast majority of respondent (87.8 % of the whole population) reports having a consultation to a GP during the past twelve months preceding the survey and the mean number of consultation among those individuals is about 4.5. The contact and frequency decisions to use specialist services appear lower than the utilisation pattern of GP services. Approximately 60.4 % of respondent have reported at least one visit to a specialist doctor during the past twelve months and among those individuals the mean number of specialist visit is about 3.6.

2.2. Migratory status

Immigrant status, which is the key variable in the econometric specification, is created using information relating to the respondent nationality in order to create 2 dummy migratory statuses: "French-born individuals" and "immigrants individuals". The population of French individuals gathers individuals with French nationality whether they are born in France or not while the population of immigrants gathers foreign individuals who are born abroad. French individuals, representing the reference population in our research, represent 91.4 % of the sample (Table 1) while 8.6 % of the sample is composed by foreign-born individuals.

The distribution of health care utilisation according to migratory status is depicted in Table 1. Immigrant respondents report a significant lower access rate to a GP than the French-born population (P=0,0297). Among French population, 88% of respondent initiate at least a GP visit against approximately 85.9% for immigrant population. However, among individuals having consulted a GP, the average number of visit is significantly higher among immigrants than the French-born population (P=0,0001). The average number of GP visit is about 5.16 for immigrant respondent against 4.5 for the French-born population.

The utilisation pattern for specialist services is similar as the GP one since immigrants reports a significant lower access rate to a specialist doctor (P=0,0015) but the immigrant mean number of visit appears significantly higher than the French population one (P=0,0965). Descriptive statistics indicate that 55.8% of immigrant respondents consulted at least once a specialist over the past twelve months against 60.8 % of the French born population. The conditional mean number of visit is 3.8 among immigrants individual against approximately 3.5 for the French population.

2.3. Need Variables

Following the Anderson model of health care utilisation (Anderson, 95), needs factors are the first individual's characteristics that influence health care services. First, we consider a set of health related indicators as a proxy for health care need. The first question that we used to measure health is the perceived health status which is measured in five categories: very good, good, fair, poor or very poor self-assessed health status. The second and third questions concern functional limitations and chronic conditions that respondents perceived. Finally, the body mass index is introduced in our analysis in a binary way, it measures whether or not individual is obese or overweight. Six dummy variables are employed in the analysis to capture age effect: 18-29, 30-39, 40-49, 50-64, 65-74 and over 75 years old. Sex of respondent is also introduced by a dummy variable considering male as the reference category. Lastly, we include one variable referring to the smoking behaviour to consider lifestyle factor. Smoking behaviour is introduced through three different statuses: actual smoker, former smoker and non smoker.

– Insert Table 2 about Here –

The descriptive statistics depicted in Table 2 show that the proportion of women respondent is higher among the French born population than the immigrant one; the latter population being younger than the former one (48.3 versus 49.16 years old respectively). Immigrant respondents display higher health care needs than the French born population since their health outcomes appears lower for the 4 indicators considered in the analysis (Table 2). There are relatively more immigrants reporting a poor health status, a chronic condition or a functional limitation than the French-born population. The rate of overweight and obese individuals is also higher among the immigrant population than the French one (40% versus 37% respectively). In terms of health behaviour, 23% of French born population were actual smoker against 20.2% of immigrant population.

2.4. Non-need variables

Non-need variables have been included to the analysis to capture their influence on health care utilisation. Referring to logistical aspect of obtaining care (Anderson, 95), income and insurance status are the first enabling factors that have a direct influence on health care utilisation.

Income is measured as household income (from all sources of income), divided by the OECD equivalent scale (1 for the first household composition, 0.5 for the second and 0.3 for the third and following one). We created income quintile and a last category was built

which refers to those who did not provide income information. Complementary health coverage and long term affection are introduced as a proxy of health insurance. Although universal, the French health system leaves to patient out-of-pocket payments so that complementary health insurance has become a major determinant of access to care (Guthmuller *et al*., 2010; Perronin *et al*., 2011). In France, complementary health coverage may be privately funded but for individual whose standard of living is below 7611 Euros the complementary health coverage may be publicly funded (the means tested complementary health coverage is called in France the "Couverture Maladie Universelle Complementaire"- CMUC). However, due to financial constraint or individual choice, approximately 6% of the French metropolitan population in 2008 remained without complementary health coverage (Perronin *et al*., 2011). For the empirical estimation of our research, we considered the 3 following situations: having private complementary health coverage, having mean-tested complementary health coverage or not having complementary health coverage. Finally, the diagnosed long term affection is also employed as a proxy of health insurance tenure because all cares related to the affection are fully reimbursed by the French health system.

Other non-need variables are included in the econometric specification. The first one is the educational level which is measured as follow: without qualification, primary level, first level of secondary school, second level of secondary school and post-secondary education. For the analytical framework, the activity status is considered by four dummy variables: in employment, non-working, retired and unemployed. To capture the household composition we constructed 5 categories: couple with child, single, single-parent, childless couple and other household composition. To measure the level of social capital we rely on two different questions. The first one refers to social participation indicating whether the respondent is involve in collective activity such as local school association, neighbourhood, community associations, sports and cultural clubs, religious community, union or political party. The second question that we employed in this study refers to social isolation in measuring whether or not respondent has suffered from loneliness during their life. Finally, we consider in the empirical estimation the GP and the specialist density at the department level[2] as a proxy for health care supply. We created quartile dummy for GP and specialist density measures with the expectation that a larger health care supply has a positive effect on the demand side for both contact and frequency decisions.

The descriptive statistics show that foreign-born individuals present in average disadvantaged socio-economic conditions as compared to the French population. There are relatively more immigrants having no qualification, being unemployed and being in the lowest incomes categories (Table 2). The proportion of immigrants with no qualification,

[2] These data are taken from the "Eco-Santé Santé" data base: http://www.ecosante.fr/

for instance, is nearly three times as much important as the French one. The unemployment rate among immigrant is also 1.7 times higher important than the French population one. The vast majority of respondent (94.2 % of the whole population) have private or mean-tested complementary health coverage but large differences appear according to the migratory status. Approximately 14.1 % of immigrant reports not having complementary health coverage against only 5% of the French population. Conversely, 20.5% of immigrants are entitled in the means-tested French complementary health coverage against 6.5% of the French born population.

Finally, descriptive statistics depicted in table 2 display a low level of social participation in France, which seems not to be equally distributed among the sample population. With a social participation rate of about 22.8%, immigrant population under invest in social participation. Not surprisingly, the social isolation rate is nearly 3 times higher among the immigrant than among the French population.

3. EMPIRICAL ESTIMATION: A TWO FOLD ANALYSIS

3.1. Two part model

The analysis of count data that takes only non-integers value such as our health care utilisation variable usually rely on the Poisson or the negative binomial model (Green, 2002). While the former appears too restrictive in assuming equi-dispersion (that is equality between the mean and the variance), the latter allows for over-dispersion so that it is considered as a good alternative method. However, these two models consider health care utilisation as a one process decision making so that it is not possible to consider separately the contact decision from the frequency decision. Another possible alternative is to employ a two part model (Green, 2002) to first assume that health care utilisation relies on a two stages decision process and second to make a distinction between users and non-users of medical services. The decomposition of the health care variable into two parts to consider separately the users and the non users may implies unobserved heterogeneity because of omitted variables that affect both decisions stages and results in estimation bias. In our study, the two-part model with the Heckman correction is employed to account for sample selection[3]. The contact decision is estimated using a Probit model and thefrequency contact, represented by the log transformation of the conditional number of visit, is modelled separately using Ordinary Least Squares regression.

[3] To compare the econometric performance of the two part model with a negative binomial model and a zero truncated negative binomial model, we computed the Akaike and the Bayesian Information Criterions. Results support the two part model with Heckman correction.

- **Empirical estimation of the contact decision**

The first step of the strategy is to consider y_1 representing the probability to contact a GP or a specialist doctor at least once over the past twelve month of the survey. The binary contact decision is explained by the latent variable y_1^* .

$$y_1 = 1 \text{ if } y_{1i}^* > 0$$
$$y_1 = 0 \text{ Otherwise}$$

$$\text{Where } y_1^* = \alpha_1 + \beta_1 Mig + \mu_1 X + \varepsilon_1 \qquad (1)$$

The latent variable y_1^* is a function of the respondent migratory status (Mig) and all other individuals' characteristics (X) which refers in our study to need factors and all other non-need variables such as socio-economic status, complementary health coverage, individual social capital and health care supply. Two different models are estimated to analyse the effect of being immigrant on the decision to seek care. The first model is only adjusted by need factors such as health indicators, age, sex and smoking behaviour. If we observed a different pattern of health care utilisation according to migratory status while need factors are holding equals, we will then confirm that no horizontal equity is found in France. In the second model, socio-economic characteristics, complementary health coverage, individual social capital and health care supply are introduced in the estimation to examine whether or not these variables added new information regarding the effect of migratory status on the probability to seek care.

- **Empirical estimation of the frequency decision**

In the second part we consider y_2 which represents the number of visit to a GP or to a specialist doctor among individual that reported a consultation. To avoid the influence of extreme value because the number of visit is skewed with a long right tail, we used as dependent variable the log transformation of the conditional number of visit.

The objective of the second equation is to predict the effect of being an immigrant on the intensity of care, given that the number of visit to a GP or a specialist is positive. Respondent with zero observations for the number of GP or specialist visit were thus excluded from the second equation. This exclusion may result in selection bias because of unobserved heterogeneity that affects both decisions. Individual that report a positive number of visits, for instance, may present particular characteristics that affect both the decision to seek care and the intensity of care. To correct for the unobserved heterogeneity, the inversed Mills ratio was calculated from the first equation using maximum likelihood estimation (Green, 2002).

The inverse Mills ratio (λ) is defined as following:

$$\lambda = \frac{f(\alpha_1 + \beta_1 Mig_1 + \mu_1 X_1)}{F(\alpha_1 + \beta_1 Mig_1 + \mu_1 X_1)}$$

where f is the probability density function of a standard normal variable, F is the cumulative normal distribution function, and α_1, β_1 and μ_1 are regression parameters from the Probit estimation.

The second equation is thus specified as:

$$y_2 = \alpha_2 + \beta_2 Mig + \mu_2 X + \partial\lambda + \varepsilon_2 \qquad (2)$$

The second equation therefore includes an additional variable that was not introduced in the Probit estimation. The added variable is the inverse Mills ratio (λ), which correct for selection bias using the regression results of whether or not the respondent had a visit (Greene, 2002). As for the decision to seek care, two models are computed to determine first the pattern of health care utilisation according to migratory status for equivalent health care needs and then to analyse the indirect influence of non-need variables on the immigrant intensity of care received.

3.2. THE BLIDER-OAXACA AND THE FAIRLIE DECOMPOSITIONS

The second step of the analysis aims at explaining health care use inequalities between the French-born population and immigrant population. For this purpose, we use two decomposition analyses: (i) the Fairlie decomposition and (ii) the Oaxaca-blinder decomposition. Both methodologies decompose the difference in the mean outcome between immigrant and French born population into a part attributed to a difference in the distribution of characteristics and a part attributed to differences in the effect of characteristics. Interestingly, these techniques enable to display the contributory factors of health care use inequalities between immigrant and French born population. It consists, for instance, in exploring whether and how much the distribution of healthcare needs, socio-economic conditions or access to complementary health coverage contribute to the explained disparity in health care use.

For the purpose of this research, the Fairlie decomposition is used to explore inequalities in the contact decision - referring to the propensity to visit a GP or a specialist at least once during the past twelve months (y_1) - while the Oaxaca-Blinder decomposition is used to analyse inequalities in the frequency decision - referring to the (log) conditional number of GP and specialist visit (y_2).

The decomposition procedure proposed by Oaxaca (1973) and Blinder (1973) was initially developed to analyse, based on linear regression, discrimination in the labour market between two groups such as sex or racial differences in wages. For our research, the decomposition of the French-immigrant difference in the (log) mean conditional number of visit can be specified as:

$$\bar{y}_2^F - \bar{y}_2^I = (\bar{X}^F - \bar{X}^I)\mu_2^F + (\mu_2^F - \mu_2^I)\bar{X}^I \quad (3)$$

and

$$\bar{y}_2^F - \bar{y}_2^I = (\bar{X}^F - \bar{X}^I)\mu_2^I + (\mu_2^F - \mu_2^I)\bar{X}^F \quad (4)$$

Where $\bar{y}_2^j$ represents the mean (log) conditional number of visit to a GP or a specialist in population *j* (with j=*F,I* for French born population and immigrant population respectively), $\bar{X}^j$ refers to the mean distribution of observable characteristics in population *j*, $\hat{\mu}_2^j$ represents the estimated coefficients associated to observable characteristics. The Blinder and Oaxaca procedure decomposes in two parts the difference in the mean number of visit to a GP and a specialist between immigrant and French born population. The first term of equations 3 and 4 provide an estimate of health care use disparities due to groups' differences in the distribution of individual characteristics (like a different access to health care coverage) while the second term of both equations is an estimate of the overall difference in health care use attributable to differences in the estimated coefficient or in the effect of characteristics (like a difference in the effect of education).

In using the French estimated coefficient to weight the first term of equation 3, the first decomposition procedure employs the French population as the reference group, meaning that discrimination is only directed toward the immigrant population (Blinder, 1973; Oaxaca, 1973). Conversely, immigrants estimated coefficients are used to weight the first term of the decomposition in equation 4, suggesting that discrimination is only directed toward French born population. Although expression 3 and 4 differ in the choice of the reference group, both equations are equivalent regarding the decomposition of health care use inequalities. Nevertheless, there is no reason to assume that the coefficients of one or

the other group are nondiscriminatory so that several economists have proposed different weight to be used (Jann, 2008). Actually, inequality in health care use may be caused by the overutilization of one group and the underutilization by the other group. For the purpose of this research, we follow the solution proposed by Neumark (1988) and Fairlie (2002, 2005) that recommends to employ estimated coefficients obtained from a pooled regression over both groups. Taking estimated coefficient on the full sample (μ^*) and then rearranging equation 3 using conditional expectation, the difference in utilisation between French-born population and immigrant one is expressed as:

$$\bar{y}_2^F - \bar{y}_2^I = \left[E_{\mu_2^*}\left(y_2^F \middle| X^F\right) - E_{\mu_2^*}\left(y_2^I \middle| X^I\right)\right] + \left[E_{\mu_2^F}\left(y_2^F \middle| X^F\right) - E_{\mu_2^*}\left(y_2^F \middle| X^F\right)\right] + \left[E_{\mu_2^*}\left(y_2^I \middle| X^I\right) - E_{\mu_2^I}\left(y_2^I \middle| X^I\right)\right] \quad (5)$$

The first term measures the differences in utilisation explained by differences in the distribution of characteristics while the second and third terms evaluate the differences attributed to the effect of these characteristics.

The decomposition proposed by Fairlie (2003, 2005) is an extension of the Blinder-Oaxaca procedure that applies to non-linear model with binary outcomes as our contact decision variable (y_1).Following the Oaxaca and Blinder procedure, this technique decomposes in two parts the difference in the probability to visit a GP or a specialist between immigrant and French born population[4].

Our aim is, finally, to evaluate the relative contribution of each individual variable and their respective effects in the difference in health care use between immigrant and French born population.
For the linear case - referring to the (log) conditional number of visit – the detailed decomposition is easily obtained because the total component of the first and second difference is a sum over all contribution (Jann, 2008). The individual contribution is thus obtained using the group mean of the relevant X variable independently of the other variables. The contribution of the X_1 characteristics in the health care use difference attributed to characteristic is reduced to $(\bar{X}_1^F - \bar{X}_1^I)\mu_{21}^*$. Similarly, the contribution of the estimated coefficients associated with the X1 variable is reduced to $(\mu_{21}^F - \mu_{21}^I)\bar{X}_1^I$.

The procedure developed by Fairlie (2003) for the non linear-case – referring to the probability to seek care - only display the relative contribution of each individual characteristics to the difference in the mean probability to visit a GP or a specialist between

[4] The difference in the mean probability of consulting a GP or a specialist is, in taking French as the reference group, decomposed as follow: $\bar{Y}_1^F - \bar{Y}_1^I = \left[\sum_{i=1}^{N^F} \frac{F(X^F \hat{\mu}_1^F)}{N^F} - \sum_{i=1}^{N^I} \frac{F(X^I \hat{\mu}_1^F)}{N^I}\right] + \left[\sum_{i=1}^{N^I} \frac{F(X^I \hat{\mu}_1^F)}{N^I} - \sum_{i=1}^{N^I} \frac{F(X^I \hat{\mu}_1^I)}{N^I}\right]$

The first part of the difference is attributable to group differences in the distribution of observables characteristics between both populations while the second part is attributable to group differences in the estimated coefficients.

both populations. Contrary to the linear case, one need to keep the value of all other variable constant and change the value of the relevant variable to determine the individual contribution to the health care inequality. The contribution of the characteristics X_1 can be expressed as:

$$\frac{1}{N^I}\sum_{i=1}^{N^I} F(\hat{\mu}_0^* + X_{1i}^F \hat{\mu}_1^* + \ldots + X_{ki}^I \hat{\mu}_k^*) - F(\hat{\mu}_0{}^* + X_{1i}^I \hat{\mu}_1^* + \ldots + X_{ki}^I \hat{\mu}_k^*) \qquad (6)$$

The contribution of each variable to the overall difference in use "is equal to the change in the average predicted probability from replacing the immigrant distribution with the French one of that variable, while holding the distributions of the other variable constant" (Fairlie, 2003).

Whatever the methodology employed (i.e. the Fairlie or the Oaxaca-Blinder), the contribution of each characteristic may be positive or negative. A negative estimation would suggest that the given characteristics contribute to reduce the difference in health care use attributable to difference in individuals' characteristics between both populations. Conversely, a positive contribution would indicate that the given characteristics represents a barrier to care in reducing the utilisation of medical services, which *in fine* would increase the disparity in health care utilisation between both populations.

4. RESULTS

4.1. Immigrant health care utilisation pattern in France

To compare the econometric specifications we use the Akaike information criterion (AIC) and the Bayesian information criterion (BIC)[5], the idea being to select the model that minimizes the Akaike and the Bayesian information criterions (Green, 2002). The AIC and the BIC point out that the best approximating model is the two part model with the Heckman correction. Therefore, only the results of the two part model with the Heckman correction are reported and discussed is the following section.

- Contact and frequency decision for GP visit

Table 3 displays the result of the probit estimation to visit a GP and the log linear regression of the number of GP visits conditional on utilisation.

[5] Data not reported but results are available upon request.

– Insert Table 3 about Here –

The empirical result provides evidence of horizontal inequity in GP utilisation between immigrants and the French born population since immigrants are less likely to visit a GP for equivalents health care needs (Column 2 of Table 3). However, once the others individuals characteristics are considered in the analysis (Column 3 of Table 3) there is no more significant difference in the propensity to visit a GP between both populations. Thereby, our result are consistent with recent study (Dourgnon et *al*., 2009) since we show that immigrant disadvantaged economic and social conditions, their lack of social integration in France and their lower access to complementary health coverage largely explain their lower propensity to initiate a GP visit. The estimates regarding the conditional number of GP visit display different result. The conditional number of GP visit is significantly higher among immigrant than the French born population with or without adjustment for non-need variables. As found in previous research using Canadian data (Laporte et al, 2008), if immigrants were less likely than French population to initiate a GP visit, there were more visit once immigrant get into the system.

Results concerning the other covariates are to a great extent in line with previous studies (Dourgnon *et al*., 2009; Quevedo and Rubio, 2008, Anton and Munoz de Batillo, 2010). Health indicators have the expected influence on the contact and the frequency decision to visit a GP. Individuals reporting a poor self-assessed health status, having functional limitation or obese individuals present not only a higher likelihood to visit a GP but report also a higher frequency of visit. Compared to men, women visit their GP more often but also more intensely.

Results depicted in Table 2 display a different relationship between both decisions stages of GP visits and all other non-need variables. Lower education is associated with a slightly increased likelihood of GP visit and is positively associated with the conditional number of GP visit. Retired individuals are more likely to visit their GP as compared to employed individual but among those having used GP services the number of visit for retired individuals appears to be significantly lower. Interestingly, inactivity had the opposite effect in reducing significantly the contact decision but in increasing the frequency of GP visit. Although income is not significantly associated with the propensity to visit a GP, the conditional number of visit significantly decreases as the income categories grows. Single individuals are less likely to contact a GP but among those having consulted, the intensity of visit is higher for single individuals. As suggested by the empirical literature (Debrand and Sirven, 2011; Laporte *et al*., 2008, Putnam, 93), individuals not involved in social activity present a lower likelihood to visit their GP but the opposite relationship is observed for the frequency decision. Surprisingly, the conditional number of GP visit is positively related with no participation in social activity, possibly reflecting the poor health status among

individual not involved in social activity. However, we do not observe a significant relationship between social isolation and both decision stages to visit a GP. Other thing being equals, the health care supply is correlated to the demand side but mostly for the frequency decision to visit a GP. Although the GP density is not significantly associated with the likelihood to visit a GP, it largely increases the conditional number of visit. Conversely, higher specialist density slightly reduces the propensity to initiate a GP visit but it sharply decreases the intensity of visit.

Finally, the complementary health coverage appears to have important effect on both decisions stages to visit a GP. No significant difference in the propensity to visit a GP is observed between individuals' recipient from the mean-tested complementary health coverage and those having a private one. Not surprisingly, individuals with no complementary health coverage are less likely to initiate a GP visit. However, among individuals having consulted a GP over the past twelve months, recipients from the mean tested health coverage and individuals with no complementary health coverage consult more intensely their GP that individuals with a private one. This last result is consistent with the study conducted by Anton and Munoz de Bastillon (2010) that show a reduction in the frequency of GP visit for individual having private health coverage. One possible interpretation is that individual having a private complementary health coverage, as compared to individuals with mean-tested coverage or no complementary health coverage, can access more easily to a specialist because they are less likely to experience a health care refusal. The Mills ratio is significant which confirms the need to correct for unobserved heterogeneity that affects residual terms in both equations.

- **Contact and frequency decision for specialist visit**

Regarding the propensity to visit a specialist doctor, results displayed in table 4 provide, as the previous analysis, evidences of horizontal inequity in health care use according to migratory status.

– Insert Table 4 about Here –

Holding needs factors equivalent, immigrant population are less likely to visit a specialist at least once during the past twelve months than the French born population. Nevertheless, after adjustment for all other non-need variables, there is no more significant difference in the contact decision to visit a specialist between immigrants and French born population. In addition, there is no statistical significant difference between immigrants and the French born population regarding the conditional number of specialist visit. The pattern of immigrant utilisation in term of intensity is thus similar to that of French-born population.

Much of the same relationship was observed between need factors and the decisions to visit a specialist doctor. Being in poor health status for instance, compare to being in good health status, not only increases the propensity to initiate a specialist visit but it also increases the conditional number of visit. Compared to men, women consult more often and also more frequently their specialist, perhaps because of the motherhood and childbirth.

There is a clear socio-economic gradient related to education for both decisions to visit a specialist, suggesting a negative relationship between lower education level and the propensity or the frequency of specialist visit. Being inactive increase the conditional number of specialist visit while it has no effect on the likelihood to initiate a specialist visit. Income is positively associated with both decision stages to visit a specialist, suggesting that wealthiest individuals may afford a much higher frequency of visit to their specialist. Respondent in couple with child present a higher propensity to use specialist service. Regarding social capital indicators, findings provide evidence of a negative relationship between no participation in social activity and specialist visit in terms of both access and frequency. One explanation is that individual not getting involved in a social activity may not receive appropriate information about available medical resources like specialist doctor. Social isolation is positively associated with the propensity to initiate a specialist visit and the intensity of those visit.

The density of GP and specialist is found to be correlated with both the contact and frequency decision. High level of GP density is associated with a slight decrease in the likelihood to visit a specialist but it has not significant effect on the conditional number of visit. Conversely and as expected, the density of specialist is strongly associated with the propensity to visit a specialist and with the conditional number of visit. Finally, the absence of complementary health coverage significantly decreases the decision to initiate a specialist visit and the intensity of visit.

A selection effect was also found as depicted by the significance of the inversed Mills Ratio in the log-OLS for specialist visit.

4.2. Sources of inequality in the propensity to visit a GP or a specialist

Table 4 presents the Fairlies' decomposition analysis aims at determine the contributory factors of inequalities in the contact decision to visit a GP (column 2) and a specialist (column 3). As mentioned by the descriptive statistics and by the empirical estimations, immigrant population in France is less likely to initiate a GP and a specialist visit than the French population. The purpose is thus to explain these inequalities in exploring the immigrant access barrier.

First of all, it should be mentioned that individual characteristics appear to play an important role in explaining the most part of the disparity in health care access. Approximately 78% and 89% of the overall difference in the propensity to initiate a GP and a specialist visit respectively is explained by the set of characteristics that we consider in both decomposition analyses.

– Insert Table 5 about Here –

A particular attention is given to characteristics that display a significant contribution in explaining the gap in health care utilisation between both populations. By and large, differences in health care needs contribute to explain health care use inequality but only for the propensity to visit a GP visit. The contribution of health care needs is negative and reaches about 37% of the explained difference. It means, for instance, that the more impaired health status of immigrant increases their propensity to access to medical services, leading thereby to a large reduction of inequalities in health care use between both populations. Although the contribution of health care needs to specialist visit is on average no significant, a more detailed decomposition[6] indicates that health status or smoking behavior are significant contributory factors explaining inequality in specialist visit.

However, results suggest that the distribution of the others characteristics considered in the decomposition analyses mostly account positively to the explained gap and may thus be considered as access barrier to medical services for immigrant population. These characteristics make immigrants less likely than French population to initiate a GP or a specialist visit and seem to largely offset the negative contribution of health care needs to health care use inequality.

For the probability to visit a GP, result indicates that among all observables characteristics the lack of complementary health coverage constitutes the first access barrier that yields inequality in access. Accordingly, differences in access to complementary health coverage between both populations account for 44% of the explained gap in GP visit. It means that, on average, immigrants are less likely to visit a GP because of a higher proportion of respondents not having access to complementary health coverage. The lower investment in social participation also seems to be an important access barrier for immigrant with a contribution of about 20.3%. Differences in household composition and activity status between immigrants and French-born population account for nearly 20% of the explained gap in GP visit. As depicted by the descriptive analysis presented in table 1, the proportion of inactive and single individuals is higher among immigrants than the French population,

[6] Data not reported but available upon request.

decreasing their propensity to visit a GP. Finally, the specialist density accounts positively to the health care use disparity because immigrant population is mostly concentrated in department with high specialist density which in turn decreases their propensity to visit a GP and thus foster the difference in GP contact between both populations.

The first barriers that explained inequalities in specialist access between immigrants and French population seems to be education and income. With a positive contribution of about 33% and 32% of the explained gap, difference in education and income are the most important driver of inequalities in the propensity to initiate a specialist visit. The proportion of individuals having no formal qualification is nearly 3 times higher among immigrants which largely decrease their propensity to visit a specialist. Similarly, the number of wealthiest individuals (in the fourth and fifth quintiles of the income categories) is 1.8 times higher among the French population than the immigrant population, making French population more likely to visit a specialist. The lower access to complementary health coverage is the third access barrier immigrants face, followed by social participation and household composition. Interestingly, social exclusion and specialist density account negatively to the inequalities in specialist access, meaning that these characteristics decrease the existing difference between both populations.

4.3. Sources of inequality in the intensity to visit a GP or a specialist

Results depicted in Table 6 presents the detailed Oaxaca-Blinder decomposition to evaluate the contributory factors of inequalities in the intensity of GP visit (column 2) and specialist visit (column 3). Contrary to the previous analysis (c.f. section 4.2), the objective of the present one is to explain the immigrant over-utilisation of GP and specialist services that we observed in both the descriptive and empirical analysis.

– Insert Table 6 about Here –

The difference in the conditional number of GP visit appear to be determine two at a time by the distribution of characteristics (49%) and by the effect of these characteristics (51%). By and large, the analysis emphasizes the importance of health care need to explain health care use inequalities attributable to characteristics. In the decomposition analysis, these factors account positively because immigrant present a poorer health status, higher functional limitations and higher chronic conditions. Interestingly, the decomposition reveals quite the same important contributory factors as the Fairlie decomposition; these factors playing now in the opposite direction. Differences in access to complementary health coverage or in social participation are the most important drivers of health care use inequalities with a contribution of nearly 37% and 22% respectively. The conditional

number of GP visit is significantly higher for immigrants because they are more likely to be enrolled in the means tested complementary health coverage and because they are less likely to be involved in social activity. By the same token, immigrant lower income and lower educational level make immigrant to have more GP visits than French population. In sum, the decomposition analysis proves that the lower access to private complementary health coverage of immigrant and their disadvantaged socio-economic conditions foster their intensity of GP visit, which increase health care use disparity between both populations. Only two characteristics display a negative contribution to the health care use inequalities attributable to characteristics: the GP and the specialist density. Both characteristics reduce the immigrant frequency of GP visit which enable to reduce the difference between both populations.

The part attributable to a difference in the estimated coefficients reaches 51% of the difference in the number of GP visit between immigrant and French born population. Nevertheless, only the effect of the specialist density displays a significant contribution, meaning that specialist density does not have the same influence among the immigrant frequency of GP visit. Put differently, this last result shows that immigrant population responds differently to specialist density in spite of its average negative effect on the number of GP visit. One possible explanation is that immigrant may be face to care refusal from specialist in department with high specialist density so that immigrant heading more easily toward GP services.

Column 2 of table 5 indicates that the difference in the number of specialist visits between immigrant and French born population is entirely explained by the distribution of characteristic. The contribution of characteristics is about 75% while the difference in the number of specialist visit attributable to coefficients does not appear significantly different from zero.

With a contribution of 61% and 31% respectively, health care need factors and specialist density are the most important factors yielding inequality in the intensity of care between both populations. By the same token as previously, immigrant present a more impaired health status than French born population and are more likely to live in a department with high specialist density, both effect increasing their number of specialist visit. Similarly, their social isolation rate and their activity status are representing among the characteristics that foster the difference in the frequency decision to visit a specialist. Conversely, the lack of income, the lower educational level and the lower social participation of immigrant represent barrier to the frequency of care received and thus restraint immigrant number of specialist visit. With a negative contribution to the explained difference, these factors slightly decrease the inequality in the number of specialist visit between both populations.

5. CONCLUSION

This paper has analysed, based on the 2006-2008 Health, Health Care and Insurance Survey, the demand for health care determinants in separating the contact decision from the frequency decision. A special attention was given to the differences in the utilisation patterns between immigrants and the French population. Our results provide new empirical evidences in France of a different health care utilisation pattern between French born population and immigrant population.

Findings are consistent with previous French study (Dourgnon et al., 2009) since for equivalent need factors immigrant presents lower access rates to GP and specialist. The immigrant disadvantaged economic conditions; their lack of social integration in France and their lower access to complementary health coverage appear to largely explain their lower propensity to visit a GP and a specialist. More specifically, the decomposition analysis illustrates that the first access barrier to a GP that immigrant faces is the lower access to complementary health coverage. In addition, estimations predict that education and income (followed by the complementary health coverage) are the most important drivers of inequalities in the probability to visit a specialist between immigrants and French population. With regard to policy concern, these results emphasize the need to improve immigrant knowledge about available health services for those having a particular low level of education but also the need to extend access to complementary health coverage. From this point, our analysis support the necessity to increase the number of recipient from the French program called "Aide Complémentaire Santé". This complementary health coverage voucher program has been implemented in France in 2005 to improve the financial access to complementary health insurance. However, in 2009 only 18% of the eligible population was registered in the program (Guthmuller *et al*., 2010) and it may be possible that a number of eligible immigrants do not have any information regarding its implementation.

If immigrants present higher access barriers to GP and specialist visit than French population, the intensity of visit appears much higher. As mentioned in section 4.3, the over-utilisation of immigrants regarding the intensity of GP and specialist visits is, first, explained by a more deteriorated health status. Likewise, the Blinder-Oaxaca decomposition analysis have shown that disadvantaged socio-economic condition and they lower access to complementary health coverage are the most important factors explaining their higher number of GP visit while at the same time these factors downsizes the immigrant frequency of specialist visit.

As depicted in the Blinder Oaxaca decomposition, 51% of the difference in the conditional number of GP visit is explained by the effect of coefficients or by unobserved factors.

Although the effect of specialist density plays a significant role in this difference, other factor such as cultural background or health preferences may determine this difference. Immigrant populations may have different aspirations regarding their health which would be consistent with a "Catching up effect". In this light, immigrants being at disadvantage compared with the French population may have strong incentives to invest intensely in their health once the access barriers are removed, perhaps because of higher expectations than the French born population.

Additional studies are needed to consider in the empirical estimation more information on migration such as the country of origin, the length of stay in France but also the immigrant language proficiency. These information have not been included in the analysis so far, which is a major limit. Yet, the present research confirms that horizontal equity in France is not achieved and it provides evidences that immigrant faces important barriers to access to medical services. Public policy should primarily focus on the enlargement of immigrant access to complementary health coverage since it appears to be one of the most important barriers for immigrant's access to health care in France.

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7. TABLES

Table 1. Sample means of key health care use variables

	Total population (N=14 760)	French population (91.4%)	Immigrant population (8.6%)	Diff. between French et Immigrant
Visit to GP				
Access rate (%)	87,8	88,0	85,9	2,1 (P= 0,0297)
Mean number (visit>0)	4,55	4,50	5,16	-0,66 (P= 0,0001)
Visit to specialist				
Access rate (%)	60,4	60,8	55,8	5,0 (P=0,0015)
Mean number	3,56	3,55	3,80	-0,24 (P= 0,0965)

Source: Health, Health Care and Insurance Survey - 2006 and 2008 waves.

Table 2. Statistics descriptives: Characteristics of the whole population and sub-population (% col)

	Total population (N=14 760)	French (91.4%)	Immigrant (8.6%)
Need Variables			
Female	59,2	59,6	54,9
Age (mean)	49,1	49,2	48,6
Poor self reported health	24,8	24,0	33,2
Chronic illness	25,2	25,1	25,8
Activity limitations	17,8	17,5	21,2
Obesity/overweight	37,3	37,0	40,0
Actual smoker	22,8	23,0	20,3
Non-Need Variables			
Without qualification	8,0	6,8	20,9
Primary level of education	14,9	15,0	13,8
1st level of secondary school	19,9	20,0	18,6
2nd level of secondary school	28,8	29,4	22,5
Post-secondary level of education	28,4	28,8	24,3
In employment	57,9	58,1	55,4
Inactive	9,5	9,0	14,2
Retired	24,9	25,5	18,1
Unemployed	7,7	7,3	12,3
Income: 1st quintile	17,2	15,8	32,2
2nd quintile	16,6	16,2	20,1
3rd quintile	16,8	16,9	15,7
4th quintile	17,3	18,0	9,8
5th quintile	19,4	20,2	11,0
Income Non response	12,7	12,8	11,3
Household composition: Couple with child	19,3	19,3	19,2
Single	8,0	7,7	10,6
Single-parent	29,0	29,8	20,2
Childless couple	40,9	40,6	44,2
Other household composition	2,9	2,7	5,9
Social participation	33,7	34,8	22,8
No social participation	57,8	56,9	66,8
No answer	8,5	8,3	10,4
Social support	86,0	86,9	75,8
No social support	8,3	7,3	18,4
Non response	5,8	5,8	5,8
Q1 GP density	25,1	24,4	33,0
Q2 GP density	25,2	25,2	24,8
Q3 GP density	25,7	26,5	18,1
Q4 GP density	24,0	24,0	24,1
Q1 specialist density	25,6	26,4	16,6
Q2 specialist density	25,0	25,3	21,8
Q3 specialist density	24,9	25,0	24,1
Q4 specialist density	24,5	23,3	37,5
Private complementary health cov.	86,5	88.49	65.41
Means-tested complementary health cov.	7,7	6.5	20.49
No complementary health cov.	5,8	5,0	14.11
In long term affection	16,8	16,8	17.65

Source: Health, Health Care and Insurance Survey - 2006 and 2008 waves.

Table 3. Two-part regression results for General Practionner (GP) visit

	Probability of consulting a GP (Probit)						Conditionnal number of visits to a GP (Log OLS)					
	M1			M2			M1			M2		
Characteristics	Mfx	P-Value		Mfx	P-Value		Coeff	P-Value		Coeff	P-Value	
Migratory status: French	Ref			Ref			Ref			Ref		
Immigrant	-0,027	0,01	**	-0,005	0,59		0,107	0,00	***	0,052	0,03	**
Need Factors												
Health indicators												
Very good self-reported health	Ref			Ref			Ref			Ref		
Good	0,058	0,00	***	0,054	0,00	***	-0,016	0,64		0,026	0,34	
Fair	0,088	0,00	***	0,082	0,00	***	0,196	0,00	***	0,222	0,00	***
Poor	0,062	0,00	***	0,056	0,00	***	0,457	0,00	***	0,434	0,00	***
Very poor	0,055	0,07	*	0,056	0,05	**	0,641	0,00	***	0,578	0,00	***
Non response	0,058	0,04	**	0,046	0,12		0,033	0,72		0,098	0,26	
No Chronic illness	Ref			Ref			Ref			Ref		
Chronic illness	0,069	0,00	***	0,056	0,00	***	0,041	0,15		0,089	0,00	***
Non response	0,036	0,00	**	0,036	0,00	**	-0,004	0,89		0,017	0,54	
No Activity limitations	Ref			Ref			Ref			Ref		
Activity limitation	0,022	0,02	**	0,019	0,03	**	0,148	0,00	***	0,134	0,00	***
Non response	0,037	0,05	**	0,034	0,05	*	0,000	1,00		-0,002	0,97	
Obesity/overweight	0,012	0,03	***	0,010	0,07	*	0,074	0,00	***	0,071	0,00	***
No smoker	Ref			Ref			Ref			Ref		
Former smoker	-0,001	0,82		-0,004	0,52		0,032	0,04	**	0,044	0,01	**
Actual Smoker	-0,019	0,00	**	-0,013	0,04	**	0,076	0,00	***	0,027	0,13	
Non response	0,018	0,26		0,014	0,36		-0,067	0,05	**	-0,078	0,02	**
Sex: Male	Ref			Ref			Ref			Ref		
Female	0,051	0,00	***	0,051	0,00	***	0,052	0,02	**	0,075	0,00	***
Age: <30	Ref			Ref			Ref			Ref		
30<=age<40	-0,014	0,11		-0,022	0,01	**	-0,028	0,26		-0,014	0,59	
40<=age<50	-0,034	0,00	***	-0,044	0,00	***	-0,033	0,23		-0,029	0,29	
50<=age<65	-0,007	0,40		-0,037	0,00	***	-0,035	0,15		0,014	0,60	
65<=age<75	0,041	0,00	***	-0,026	0,13		-0,035	0,25		0,077	0,03	**
age>=75	0,056	0,00	***	0,006	0,73		0,087	0,01	**	0,156	0,00	***
Non-need factors												
Education: Post-secondary level				Ref						Ref		
Without qualification				-0,016	0,19					0,075	0,01	**
Primary				0,024	0,02	**				0,035	0,15	
1st level of secondary school				0,002	0,75					0,036	0,08	*
2nd level of secondary school				0,000	0,97					0,019	0,30	
Activity status : In employment				Ref						Ref		
Inactive				-0,018	0,07	*				0,064	0,01	**
Retired				0,043	0,00	***				-0,051	0,05	*
Unemployed				-0,001	0,92					0,009	0,74	
Income: 5st quintile				Ref						Ref		
1st quintile				-0,001	0,90					0,071	0,00	**
2nd quintile				-0,005	0,61					0,059	0,01	**
3rd quintile				0,000	0,98					0,052	0,02	**
4th quintile				0,000	0,98					0,039	0,06	*
Unknown				0,005	0,57					-0,034	0,15	
Household composition: Couple with child				Ref						Ref		
Single				-0,016	0,03	**				0,037	0,07	*
Single-parent				0,019	0,01	**				-0,048	0,01	**
Childless couple				0,003	0,72					-0,004	0,89	
Other household composition				-0,030	0,07	*				0,142	0,00	**
Civic engagement: Social participation				Ref						Ref		
No social participation				-0,022	0,00	***				0,095	0,00	***
No answer				-0,016	0,41					-0,013	0,79	
Social support: Yes				Ref						Ref		
No social support				0,003	0,79					0,012	0,61	
No answer				0,000	0,98					0,012	0,67	

(To continue)

Table 3. Continued

	Probability of consulting a GP (Probit)						Conditionnal number of visits to a GP (Log OLS)					
	M1			M2			M1			M2		
Characteristics	Mfx	P-Value		Mfx	P-Value		Coeff	P-Value		Coeff	P-Value	
Low density of GP: Q1				Ref						Ref		
Q2 density of GP				0,007	0,36					0,057	0,00	**
Q3 density of GP				0,007	0,30					0,098	0,00	***
Q4 density of GP				0,013	0,10					0,146	0,00	***
Low density of specialist: Q1				Ref						Ref		
Q2 density of specialist				-0,002	0,76					-0,031	0,09	*
Q3 density of specialist				-0,003	0,73					-0,095	0,00	***
Q4 density of specialist				-0,015	0,09	*				-0,089	0,00	***
Private complementary health cov.				Ref						Ref		
Means-tested complementary health cov.				0,014	0,18					0,051	0,10	*
No complementary health cov.				-0,092	0,00	***				0,123	0,00	**
Not in Long term affection				Ref						Ref		
In Long term affection				0,052	0,00	***				0,042	0,04	**
Survey edition: 2006	Ref			Ref			Ref			Ref		
Edition 2008	-0,014	0,01	**	-0,012	0,03	**	0,013	0,34		0,006	0,67	
Constant term							1,360	0,00		1,054	0,00	***
N	12842			12842			11279			11279		
Adjusted R^2	0,098		***	0,12		***	0,253		***	0,271		***
Mills Ratio	-			-			-1,63	0,00	***	-1,25	0,00	***

Source: Health, Health Care and Insurance Survey - 2006 and 2008 waves. Legend :* p<0,1; ** p<0,05; *** p<0,01

Table 4. Two-part regression results for specialist visit

	Probability of consulting a specialist (Probit)						Conditionnal number of visits to a specialist (Log OLS)					
	M1			M2			M1			M2		
Characteristics	Mfx	P-Value		Mfx	P-Value		Coeff	P-Value		Coeff	P-Value	
Migratory status: French	Ref			Ref			Ref			Ref		
First generation Migrant	-0,052	0,00	**	-0,008	0,65		0,020	0,60		0,024	0,46	
Need Factors												
Health indicators												
Very good self-reported health	Ref			Ref			Ref			Ref		
Good	0,066	0,00	***	0,081	0,00	***	0,139	0,00	***	0,150	0,00	***
Fair	0,117	0,00	***	0,159	0,00	***	0,322	0,00	***	0,339	0,00	***
Poor	0,180	0,00	***	0,218	0,00	***	0,544	0,00	***	0,520	0,00	***
Very poor	0,041	0,48		0,107	0,06	*	0,470	0,00	***	0,503	0,00	***
Non response	0,163	0,00	**	0,167	0,00	**	0,213	0,07	*	0,211	0,04	**
No Chronic illness	Ref			Ref			Ref			Ref		
Chronic illness	0,140	0,00	***	0,091	0,00	***	0,187	0,00	**	0,113	0,00	***
Non response	0,051	0,02	**	0,044	0,04	**	0,058	0,16		0,035	0,33	
No Activity limitations	Ref			Ref			Ref			Ref		
Activity limitation	0,078	0,00	***	0,086	0,00	***	0,258	0,00	***	0,254	0,00	***
Non response	-0,003	0,94		0,015	0,66		0,115	0,06	*	0,138	0,02	**
Obesity/overweight	-0,048	0,00	***	-0,030	0,00	**	-0,023	0,39		-0,005	0,81	
No smoker	Ref			Ref			Ref			Ref		
Former smoker	0,117	0,00	***	0,097	0,00	***	0,120	0,02	**	0,098	0,00	**
Actual Smoker	-0,058	0,00	***	-0,022	0,07	*	0,014	0,67		0,030	0,20	
Non response	0,025	0,38		0,061	0,03	**	0,101	0,03	**	0,122	0,01	**
Sex: Male	Ref			Ref			Ref			Ref		
Female	0,247	0,00	***	0,272	0,00	***	0,337	0,00	**	0,348	0,00	***
Age: <30	Ref			Ref			Ref			Ref		
30<=age<40	-0,002	0,88		-0,028	0,11		-0,022	0,51		-0,026	0,46	
40<=age<50	-0,016	0,31		-0,026	0,13		-0,201	0,00	***	-0,195	0,00	***
50<=age<65	-0,001	0,93		-0,017	0,35		-0,180	0,00	***	-0,181	0,00	***
65<=age<75	-0,048	0,02	**	-0,040	0,16		-0,267	0,00	***	-0,218	0,00	***
age>=75	-0,146	0,00	***	-0,098	0,00	**	-0,442	0,00	***	-0,349	0,00	***

(To continue)

Table 4. Continued

	Probability of consulting a specialist (Probit)					Conditionnal number of visits to a specialist (Log OLS)				
	M1		M2			M1		M2		
Characteristics	Mfx	P-Value	Mfx	P-Value		Coeff	P-Value	Coeff	P-Value	
Non-need factors										
Education: Post-secondary level			Ref					Ref		
Without qualification			-0,215	0,00	***			-0,150	0,02	**
Primary			-0,179	0,00	***			-0,174	0,00	***
1st level of secondary school			-0,127	0,00	***			-0,114	0,00	**
2nd level of secondary school			-0,074	0,00	***			-0,068	0,02	**
Activity status : In employment			Ref					Ref		
Inactive			0,014	0,46				0,106	0,00	**
Retired			0,015	0,43				-0,031	0,33	
Unemployed			0,002	0,93				0,017	0,67	
Income: 5st quintile			Ref					Ref		
1st quintile			-0,123	0,00	***			-0,120	0,01	**
2nd quintile			-0,106	0,00	***			-0,086	0,02	**
3rd quintile			-0,063	0,00	***			-0,003	0,92	
4th quintile			-0,041	0,01	**			-0,030	0,28	
Unknown			-0,071	0,00	***			-0,060	0,08	*
Household composition: Couple with child			Ref					Ref		
Single			-0,074	0,00	***			-0,062	0,06	*
Single-parent			-0,010	0,46				0,040	0,11	
Childless couple			-0,063	0,00	**			0,038	0,34	
Other household composition			-0,098	0,00	**			0,003	0,96	
Civic engagement: Social participation			Ref					Ref		
No social participation			-0,062	0,00	***			-0,069	0,00	**
No answer			-0,069	0,08	*			-0,022	0,71	
Social support: Yes			Ref					Ref		
No social support			0,035	0,05	*			0,077	0,02	**
No answer			-0,007	0,73				0,043	0,25	
Low density of GP: Q1			Ref					Ref		
Q2 density of GP			-0,012	0,38				0,007	0,77	
Q3 density of GP			-0,026	0,06	*			-0,028	0,26	
Q4 density of GP			-0,038	0,02	**			-0,032	0,27	
Low density of specialist: Q1			Ref					Ref		
Q2 density of specialist			0,039	0,00	**			0,019	0,46	
Q3 density of specialist			0,029	0,04	**			0,043	0,10	*
Q4 density of specialist			0,074	0,00	***			0,174	0,00	***
Private complementary health cov.			Ref					Ref		
Means-tested complementary health cov.			-0,007	0,73				0,068	0,11	
No complementary health cov.			-0,139	0,00	***			-0,186	0,00	**
Not in Long term affection			Ref					Ref		
In Long term affection			0,147	0,00	***			0,224	0,00	***
Survey edition: 2006	Ref		Ref			Ref		Ref		
Edition 2008	0,005	0,56	-0,001	0,90		-0,002	0,92	-0,009	0,62	
Constant term						0,316	0,29	0,368	0,01	**
N	12103		12103			7307		7307		
Adjusted R^2	0,086		0,127			0,087		0,106		
Mills Ratio	-		-			0,375	0,20	0,377	0,02	***

Source: Health, Health Care and Insurance Survey - 2006 and 2008 waves. Legend :* p<0,1; ** p<0,05; *** p<0,01

Table 5: Fairlie's decomposition: Relative contribution of individuals caracteristics to the explained difference in GP and specialist visit between French population and immigrants

	Propensity to visit a GP			Propensity to visit a specialist		
N (French)	11785			11139		
N (Migrant)	1057			964		
P(Y=1) if French	0,8800			0,6077		
P(Y=1) if immigrant	0,8590			0,5581		
Overall Difference in GP visit	0,0210			0,0496		
Explained Differences (by characteristics)	0,0164	78,2 %		0,0442	89,2 %	
Unexplained Differences (by coefficients)	0,0046	21,8 %		0,0054	10,8 %	
Contribution to explained differences	Coeff	%	P-Value	Coeff	%	P-Value
Need factors	-0,0061	-37,4	0,011 **	0,0004	0,8	0,894
Health coverage	0,0073	44,4	0,020 **	0,0088	19,8	0,033 **
Education	0,0019	11,3	0,308	0,0145	32,8	0,000 ***
Activity status	0,0033	20,2	0,024 **	0,0001	0,3	0,942
Income	0,0005	3,3	0,770	0,0141	31,8	0,000 ***
Household Composition	0,0033	20,2	0,005 **	0,0038	8,6	0,018 **
Social participation	0,0033	20,3	0,001 **	0,0064	14,5	0,000 ***
Social exclusion	-0,0004	-2,2	0,787	-0,0033	-7,5	0,099 *
GP density	0,0008	5,0	0,280	-0,0014	-3,2	0,170
Specialist density	0,0022	13,3	0,088 *	-0,0068	-15,4	0,002 **
Mills ratio	0,0002	1,3	0,959	0,0080	18,0	0,362
Survey edition	0,0000	-0,2	0,876	0,0000	-0,1	0,934

Source: Health, Health Care and Insurance Survey - 2006 and 2008 waves.
Legend :* p<0,1; ** p<0,05; *** p<0,01

Table 6: Oaxaca-Blinder decomposition: Relative contribution of individuals caracteristics and the effect of these caracteristics to difference in the frequency of GP and specialist visits between immigrant and french-born population

	Number of visit to a GP				Number of visit to a specialist			
N (Migrant)	908				536			
N (French)	10371				6706			
P(Y=1) if immigrant	1,315		P=0,00	***	1,041		P=0,00	***
P(Y=1) if French	1,212		P=0,00	***	0,946		P=0,00	***
Overall Difference in GP visit	0,103		P=0,00	***	0,095		P=0,00	**
Explained Differences (by characteristics)	0,051	49,4%	P=0,00	***	0,071	74,9%	P=0,00	***
Unexplained Differences (by coefficients)	0,052	50,6%	P=0,03	**	0,024	25,1%	P=0,46	
Contribution of caracteristics	Coeff	%	P-Value		Coeff	%	P-Value	
Need	0,041	79,9	0,00	***	0,043	61,0	0,00	**
Health coverage	0,019	37,2	0,00	**	0,004	5,5	0,68	
Education	0,008	16,2	0,03	**	-0,012	-16,7	0,08	*
Activity status	0,009	17,9	0,01	**	0,010	13,8	0,01	**
Income	0,011	22,2	0,01	**	-0,021	-29,5	0,01	**
Household Composition	0,010	19,5	0,00	***	-0,006	-7,8	0,13	
Social participation	0,011	22,4	0,00	***	-0,008	-11,5	0,01	**
Social exclusion	0,001	2,9	0,61		0,011	15,5	0,03	**
GP density	-0,008	-15,9	0,00	**	0,002	3,0	0,27	
Specialist density	-0,011	-22,3	0,00	***	0,022	31,0	0,00	***
Mills ratio	-0,041	-79,7	0,00	***	0,025	35,5	0,04	**
Survey edition	0,000	-0,2	0,70		0,000	0,3	0,66	
Contribution of coefficients	Coeff	%	P-Value		Coeff	%	P-Value	
Need	0,082	156,7	0,59		-0,463	-1938	0,17	
Health coverage	-0,003	-5,8	0,90		0,011	47	0,78	
Education	0,070	133,7	0,14		0,023	95	0,83	
Activity status	0,003	6,7	0,92		0,052	218	0,23	
Income	0,039	75,3	0,57		0,126	529	0,23	
Household Composition	-0,020	-39,1	0,54		-0,057	-237	0,25	
Social participation	-0,048	-90,9	0,27		0,060	252	0,31	
Social exclusion	-0,004	-8,5	0,73		-0,006	-24	0,79	
GP density	-0,017	-31,8	0,66		0,034	140	0,55	
Specialist density	0,106	202,6	0,09	*	-0,070	-295	0,45	
Mills ratio	0,117	223,0	0,28		-0,217	-910	0,58	
Survey edition	0,005	9,3	0,85		0,057	237	0,08	*
_cons	-0,278	-531,2	0,26		0,474	1984	0,41	

Source: Health, Health Care and Insurance Survey - 2006 and 2008 waves. Legend :* p<0,1; ** p<0,05; *** p<0,01