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Preliminary Version - (Please do not quote)

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"[2]. 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

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consumption of care is lower for general practitioner and dental care but appears however higher for specialist and hospital visit.

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. 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). 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 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.

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 and we restrict the analysis to 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 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 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 population (P=0,0001). The average number of GP visit is about 5.16 for immigrant respondent against 4.5 for the French 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 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

Needs factors are the first individual's characteristics that influence health care services. We consider a set of health related indicators (such as perceived health status, functional limitations, chronic conditions and the body mass index) as a proxy of health status. 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.

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, 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. Complementary health coverage and long term affection are introduced as a proxy of health insurance. 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: educational level (without qualification, primary level, first level of secondary school, second level of

secondary school and post-secondary education), activity status (in employment, non-working, retired and unemployed), household composition (couple with child, single, single-parent, childless couple and other household composition), social participation (indicating whether the respondent is involve in a collective activity), social isolation (whether or not respondent has suffered from loneliness during their life)and the GP and specialist density at the department level.

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].

- **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^* .

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

[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.

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

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. 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 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 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 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 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 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 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 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 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 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 $(\overline{X}_1^F - \overline{X}_1^I)\mu_{21}^*$. Similarly, the contribution of the estimated coefficients associated with the X1 variable is reduced to $(\mu_{21}^F - \mu_{21}^I)\overline{X}_1^I$

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 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).

[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: $\overline{Y}_1^F - \overline{Y}_1^I = \left[\sum_{i=1}^{N^F}\frac{F(X^F\hat{\mu}_1{}^F)}{N^F} - \sum_{i=1}^{N^I}\frac{F(X^I\hat{\mu}_1{}^F)}{N^I}\right] + \left[\sum_{i=1}^{N^I}\frac{F(X^I\hat{\mu}_1{}^F)}{N^I} - \sum_{i=1}^{N^I}\frac{F(X^I\hat{\mu}_1{}^I)}{N^I}\right]$

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.

4. RESULTS

4.1. Immigrant health care utilisation pattern in France

Table 2 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].

– Insert Table 2 about Here –

The empirical result provides evidence of horizontal inequity in GP utilisation between immigrants and the French population since immigrants are less likely to visit a GP for equivalents health care needs (Column 2 of Table 2). However, once the others individuals characteristics are considered in the analysis (Column 3 of Table 2) 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 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.

Regarding the propensity to visit a specialist doctor, results displayed in table 3 provide, as the previous analysis, evidences of horizontal inequity in health care use according to migratory status.

– Insert Table 3 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 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 population. In addition, there is no statistical significant difference between immigrants and the French population regarding the conditional number of specialist visit. The pattern of immigrant utilisation in term of intensity is thus similar to that of French- population.

[5] Only the results associated to the effect of migratory status are commented for the sake of brevity.

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). The purpose is to explain 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 4 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. 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- population account for nearly 20% of the explained gap in GP visit. 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.

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

Results depicted in Table 5 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 5 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. 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. 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 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 population is entirely explained by the distribution of characteristic (the contribution of characteristics reach 75%).

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 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.

5. CONCLUSION

Findings are consistent with previous French study (Dourgnon et al., 2009) since we show that the principle of horizontal equity in access to care is not achieved in France. 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 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". 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 population.

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8. 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. 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 2. 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 3. 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 3. 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 4: 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 5: 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- 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