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IMMIGRANTS' ACCESS TO AND USE OF HEALTH CARE SERVICES: THE CASE OF ITALY

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Abstract

The aim of this work is to assess the presence of differences in access to and use of health care services between the immigrant and the native population in Italy.

Besides descriptive indicators, the study provides an in-depth quantitative analysis of the determinants of health care use and of the differences in the types of health care services accessed by immigrants and natives.

The analysis is based on micro-data from a national survey on health conditions and health care services utilization carried out by ISTAT in 2004 and 2005. The survey involved 128,040 individuals resident in Italy, including 3,509 non-citizens regularly residing in Italy.

The results of the analysis are in line with the main findings from the European empirical literature on the issue. Even controlling for socio-demographic characteristics, a lower use of healthcare services by immigrants compared to natives is found, especially within particularly sensitive groups of individuals, such as immigrant pregnant women and immigrants of second generation, born in Italy.

The empirical analysis also highlights significant differences in the use of emergency services and in the frequency of medical visits. Immigrants are found to over use the emergency ward with respect to the Italian population, while they report, ceteris paribus, less visits to specialists than natives. No significant difference is instead found related to visits to general practitioners.

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1. Introduction

Italy has been experiencing large immigration flows since the 1990s. This relatively recent phenomenon has raised, among others, questions on how immigrants access and use healthcare services in the host country.

Findings from other European countries with a longer history of immigration report evidence of immigrants' excessive use of emergency services, at the expense of specialty and preventive medicine.

In Italy, the access of immigrants to health care services has been mainly considered by healthcare professionals and voluntary organizations. However, in recent years, also economists have found an interest in the issue.

The problem of immigrants' integration into the healthcare system is indeed relevant not only from an ethical and a health perspective, but also from an economic point of view. A misuse of healthcare services and resources may lead, in the long run, to inefficiencies which may threaten the sustainability of the healthcare system itself. The substitution of specialty and preventive medicine with an excessive use of emergency wards, does not only question the equity in access to the healthcare system, but also its efficiency, threatened by an increase in the consumption of more costly medical services.

This work describes the current situation in Italy, considering the different patterns of utilization of health care services by the immigrant and the native population. The analysis develops an in-depth quantitative study of the use of different types of healthcare services by immigrants, and focuses on particularly health sensitive groups of individuals, such as immigrant pregnant women and immigrants of second generation born in Italy.

The quantitative analysis is based on micro-data coming from a national survey on health conditions and health care services utilization, carried out by ISTAT in 2004 and 2005 and involving 50,474 households and 128,040 individuals resident in Italy; of these 3,509 are non-citizens regularly residing in Italy. The survey collects information on the individuals' demographic and socio-economic characteristics as well as on people's habits, health conditions, and use of healthcare facilities.

The immigrant condition is defined according to the citizenship status at first, then the analysis differentiates, within the non-citizen's group, among individuals coming from inside and outside the European Union 25 Member States and second generation immigrants born in Italy, who largely consist of immigrants' children.

The empirical analysis adopts two separate econometric models. A logistic regression investigates the differences in access to medical examinations and to emergency services among the immigrant and the native populations. A negative binomial model is, instead, performed in order to count for the frequency of visits to general practitioners and specialists.

The results are in line with the main findings from the European empirical literature on the issue. Even controlling for socio-demographic characteristics, a lower use of healthcare services by immigrants compared to natives is found, especially within immigrant pregnant women and immigrants of second generation, born in Italy.

The empirical analysis also highlights significant differences in the use of emergency services and in the frequency of medical visits. Immigrants are found to over use the emergency ward with respect to the Italian population, while they report, ceteris paribus, less visits to specialists than natives. No significant difference is instead found related to visits to general practitioners.

The discussion proceeds as follows: section 2 provides a review of the economic models on the demand for healthcare and the main findings of empirical studies

carried out in the United States and Europe, with a particular attention to Italy. Section 3 briefly summarizes the Italian legislation on immigration and access to healthcare services and the main policies implemented in Italy for the inclusion of the immigrant population in the Italian National Healthcare System. Section 4 presents the variables selected for the analysis and reports the results of a descriptive analysis, providing an overview of the Italian case in terms of immigrants' access to and use of various healthcare facilities. Section 5 presents the econometric strategy adopted in the analysis and a discussion of the main findings. Section 6 concludes.

2. Literature review

2.1 The demand for healthcare in economic models

The phenomenon of migration and its socioeconomic implications in host countries have been deeply analyzed by economists. However, the literature on the relation between immigration and access to and use of health care services in the host countries is relatively new.

Studies on immigrants' use and access to health care are only recently becoming an issue of interest among economists. The most prolific literature on the issue comes from the United States, even though the interaction between migration and health care systems is becoming a topic of primary interest also in Europe.

The starting point in explaining differences in healthcare patterns of utilization between immigrants and natives is to see how economic models explain the determinants of the demand for healthcare.

The Grossman human capital model and the Andersen behavioral model are the first models focusing on the demand for healthcare and date to the late sixties and early seventies.

The Grossman model (1972) predicts that the demand for healthcare increases with age, but it is negatively related to education and wage. No predictions can be made on the effect of ethnicity, once the model controls for socio-economic characteristics.

The Andersen model (1968) specifies three macro categories of explanatory variables which are to be considered in determining the demand for healthcare: predisposing characteristics, enabling factors and need variables. These factors are able to explain differences in access to health services by groups of individuals.

A third, more recent, model is framed by Blundell and Windmeijer (2000) and starts from the equilibrium waiting time theory in order to highlight the determinants of the demand for health. Different from the preceding ones, this model includes supply side factors, which are instrumented for in the regression.

All these models do not explicitly consider the migration factor in the analysis of the demand for healthcare.

2.1.1 The Grossman human capital model

In the Grossman model, the decision making process which lies behind the demand for health is studied as a one stage process depending solely on the individual's decision to seek for health care[1]. Grossman adopts a utility maximization framework, with the demand for healthcare considered as a derived demand from the demand for health. The individuals' final aim is to reach or to maintain a given health status. This approach has been often referred to as the human capital model because of its clear reminding of the theory of human capital investment.

The Human Capital theory, in brief, argues that investments in a person's stock of human capital raise his productivity both in the market sector of the economy, where he earns a labor income, and in the nonmarket or household sector, where he produces goods that enter his utility function (Grossman, 1972). The human capital model for the demand for health, however, goes beyond and states that the health capital differs from other forms of human capital. In detail, while a person's stock of knowledge (i.e. his/her investments in human capital) affects his/her market and nonmarket productivity, his/her stock of health (i.e. his/her investments in health)

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[1] Subsequent research on the topic of health care demand has gone beyond the one stage model and has framed a two stage decision making model.
Pohlmeier and Ulrich (1995) developed a two stage model of the demand for health care where the first stage decision is specified as the Grossman's model and deals with the individual decision on whether to contact a physician. The second stage decision is, instead, entirely taken by the physician and is about the total amount of health care needed by the patient, that is the number of visits following the first contact with the doctor.

determines the total amount of time he/she can spend producing money earnings and goods.

A health production approach is adopted, which distinguishes between good "health", as an output variable, and medical care services, as input variables. In a given time period T the individual invests in health and in other commodities. The health production function depends on medical care services, time inputs, and the level of education (see Grossman, 1999):

(1) $I = I (M, T_H, |E)$,

where I represents investment in health, M stands for medical services, T_H is time devoted to health care and E stands for the level of education.

According to the health production function approach, age is positively correlated with the use of health care services, while individuals with higher education or a higher wage are less likely to demand for medical services. This happens because the depreciation rate of the individuals' health stock increases with age, while higher educated individuals and individuals earning higher wages are more able than others to maintain a good health status (Grossman, 1972).

The production function for the other commodities takes the form of (see Grossman, 1999):

(2) $Z = Z (X, T, | E)$,

where Z is a vector of commodities, X is a vector of inputs which contributes to the production of goods Z, T is a vector of time inputs and E is the level of education.

Both the above functions are time constrained, since consumer has a given time T, which equals the sum of the time lost due to illness (T_L), the time spent to work (T_W), the time devoted to the production of health (T_H) and other goods (T_Z).

Grossman (1999) outlines two distinct models: a pure investment model and a pure consumption model for the demand for health.

As for investments, the model states that when the time spent for health production (T_H) increases, time spent for illness (T_L) is reduced. Given that the net effect is positive, time to be spent for other activities goes up and income potentially increases. In equilibrium, we have that the rate of return on health investments must equal the marginal cost of the capital invested.

Grossman interpretation of the demand for health also involves health as a consumption good directly affecting the individual's utility function:

(3) $U = f(H, Z)$,

where U is the individual's utility, H is the health stock and Z is a vector of other goods.

The regression equation on the demand for medical services is estimated as follows (see Pohlmeier and Ulrich, 1995):

(4) $\ln M(t) = \beta_0 + \ln H(t) + \beta_1 \ln w(t) - \beta_2 \ln P_m(t) + \beta_3 t + \beta_4 X_1 + \beta_5 E + u(t)$,

where $M(t)$ represents the amount of medical services demanded and depends on the variable $H(t)$, which stands for "health status", the wage, $w(t)$, a vector of prices for medical services, $P_m(t)$, a time variable (t), a vector of socioeconomic and environmental characteristics (X), and the level of education (E).

If the immigrant population is "self-selected", in the sense that it is on average younger, more educated, and healthier than the native population, then different results in terms of the use of health care services should be observed. Following the reasoning behind the Grossman model and assuming that immigrants are on

average healthier than natives, being an immigrant should negatively affect the demand for health care services. However, once controlling for age, health status, and education the model is not able to make any a priori prediction.

Many studies report that immigrants have a good health status at their arrival in the host country. This is the consequence of the so called "healthy migrant effect", meaning that those who decide to migrate are self selected. Migrants are usually in good health, own a high level of education, and are emotionally stable[2]. Once in the host country, however, immigrants are subject to risk factors, in particular poverty and exclusion, which may threaten and deteriorate their psychological and physical health status (Spinelli et al., 2003).

2.1.2 The Andersen behavioral model

A careful analysis of which are the driving factors of the individuals' access to health care services is also carried out by Andersen (1968). The initial model, developed in the 1960s (figure 2.1), argues that individuals' use of health services is a function of predisposing characteristics, mutable and immutable socioeconomic variables (such as, health beliefs and gender respectively); factors which enable or impede people's use of health care services; and people's need for health care. These variables are supposed to have a different explanatory power on each measure of healthcare use listed below (Andersen, 1995).

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[2] On the healthy migrant effect see, among the others, Kennedy et al. (2006), Wolff et al. (2005), the Italian National Health Plan (1998-2000)

PREDISPOSING CHARACTERISTICS →	ENABLING RESOURCES →	NEED →	USE OF HEALTH SERVICES
Demographic	Personal/Family	Perceived	
Social Structure	Community	(Evaluated)	
Health Beliefs			

The behavioral model developed by Andersen provides measures of access to medical care and aims at finding the determinants of health care use. The latter is proxied by three different dependent variables: units of physician ambulatory care, hospital and physician inpatient services, and dental care consumed by households during a year. Andersen argues that the number of visits to physician and ambulatory care are well explained by all the predicting variables. Need and demographic characteristics alone are good predictors for the use of hospital and physician inpatient service (since hospitals usually deal with emergency and very serious cases), while the use of dental care is well explained by variables such as social structure, health beliefs and enabling factors.

Further developments of the model have included the health care system (in terms of its resources and organization) as an important determinant of access to medical care and have added new inputs to the equations, giving more importance to the characteristics of the external environment (physical, political, and economic variables) and to personal health care practices (diet, exercise, and self-care). This latest version of the model makes room for new factors affecting access to healthcare. Determinants of health supply, such as the characteristics of the health

care system, become part of the model and play a role in explaining not only the supply, but also the demand for health care.

Figure 2.2: The Latest Andersen's Behavioral Model (1980s-1990s)

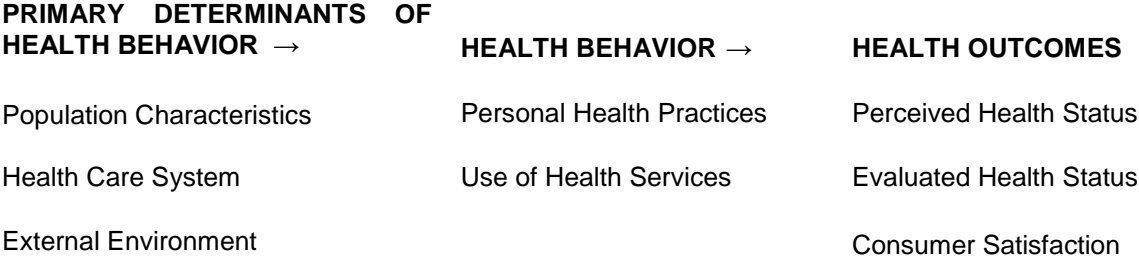| PRIMARY DETERMINANTS OF HEALTH BEHAVIOR →	HEALTH BEHAVIOR →	HEALTH OUTCOMES
Population Characteristics	Personal Health Practices	Perceived Health Status
Health Care System	Use of Health Services	Evaluated Health Status
External Environment		Consumer Satisfaction

Source: Andersen, R. M., "Revisiting the behavioral Model and Access to Medical Care: Does it Matter?", (1995)

Important definitions are also provided by Andersen on potential and realized access and on equitable and inequitable access to health care and they represent a good starting point for the kind of analysis which will be carried out in the following sections. In brief, potential access is considered as a mere function of enabling resources (i.e. more enabling resources lead to more means which, consequently, increase the likelihood that health care use will actually occur), while realized access is simply defined as the actual use of medical services. Access is, instead, defined "equitable (inequitable)" when demographic and need variables (social structure, health beliefs, and enabling resources) account for most of the variance (Andersen, 1995).

2.1.3 The relevance of supply conditions: the Blundell and Windmeijer model

Recent theoretical developments in health economics have led to the development of models which stress the importance of health supply in the study of the demand for health services. In equilibrium waiting time models, waiting time acts as a price device, affecting healthcare demand and supply. For example, a rise in waiting time leads to a decrease in the demand for health care. The two main hypotheses behind

this theory are the existence of a state of equilibrium between demand and supply and the use of waiting time as a good proxy for waiting time costs.

Blundell and Windmeijer (2000) outline a model which aims at estimating the effective determinants of the demand for health care taking into account the influence of health supply factors on variables affecting health demand and on health demand itself. The authors formulate a model in which waiting time is used to assess the determinants of the demand for healthcare services. Waiting time and health supply factors in general, cannot be omitted from the analysis of the demand for health since they may directly affect the use of health services through rationing and self-selection.

The model evaluates the determinants of the demand for health services controlling for biases related to the provision of health services. Waiting time represents a cost in the use of health care: an increase in the demand for health leads to an increase in waiting time, which, at the very end, induces some individuals to give up waiting and address private structures or exit the system at all. A first specification of the model includes measures of supply in the regression equation:

(5) $y_i^d = \beta' x_i^d + \gamma W_i + u_i^d$,

where y_i^d represents the demand for health resources in ward i of individual d, x_i^d is a vector of characteristics of the local population, consisting of need variables, W_i is the waiting time level, and u_i^d is the error term. Supply factors enter the regression function through the variable W_i and may be affected by endogeneity.

Waiting time, as well as other supply variables such as the number of physicians per inhabitant or distance to hospitals, may be correlated not only with the dependent utilization variable, but also with unobserved need variables which are part of the error term. For example, richer individuals may be more likely to give up waiting in case of high waiting times and to contact private structures. The sample analyzed

would thus end up being self selected. To solve for endogeneity, the authors study health care utilization only in low waiting time healthcare areas, arguing that only areas with sufficiently low waiting time do not affect demand, while high waiting time healthcare areas may ambiguously affect unobserved need variables (Blundell and Windmeijer, 2000).

The final specification of the model is the following:

$$(6) \ y_i^{\ d} = \beta'x_i^{\ d} + u_i^{\ d} \ \text{for } W_i < W^m,$$

where waiting time in ward i (W_i) is constrained and needs to be lower than W^m, the lower quintiles of the waiting time distribution. This model may, however, rise critiques related to the solution of the endogeneity problem. Selecting only low waiting time areas may, indeed, generate problems of sample selection.

2.2 The empirical evidence

In the previous paragraph three different models of the demand for health care have been discussed: the Grossman model, the Andersen model and the Blundell and Windmeijer model. Although these models outline the basis of the demand for healthcare and its determinants, their conclusions remain vague. Moreover, methodological choices are sometimes not adequately justified (as the inclusion of only low waiting time healthcare areas in the Blundell and Windmeijer model), and the role played by citizenship in explaining access to and use of medical care is often neglected.

The empirical literature which is presented here, thus, often moves further from the above mentioned models in order to investigate on the existence of barriers to access to health care services by the immigrant population in host countries. Empirical findings show an overall coherence once the analysis specifies the type of medical service demanded by the population (visits to general practitioners, visits to

specialists, inpatient and outpatient services, emergency services, gynecological or obstetrics services, and preventive medicine).

Table 2.1 at the end of this section presents an overview of the main empirical studies and their findings. As it is clear from table 2.1, several studies have found evidence of differences in utilization of health care services between the immigrant and the host population. In particular, it emerges clearly that immigrants compensate a lower access to and use of ordinary healthcare services with higher use of emergency services. Empirical findings confirm the importance of both demand and supply side factors in preventing patients, especially those usually at risk of social exclusion such as immigrants, from accessing the health care system.

The institutional framework on the provision of healthcare services and the rights granted to immigrants are particularly relevant in explaining the different results of empirical studies across countries. Indeed, results that come from studies on European countries differ from those relating to the United States. In particular, the empirical literature from the United States does not report evidence of immigrants' excessive use of emergency services as happens in Europe. The difference can be easily explained by the fact that the great majority of European countries has a national healthcare system, unlike the United States, where the healthcare system is privately regulated.

In the United States the regulation of healthcare is mainly based on private insurance companies, and the only two public programs are the Medicare and the Medicaid. The former is a federal program regulated by the government which grants healthcare coverage for the elderly over 65 years old and for some disabled people, while the Medicaid is administered by the single states and grants healthcare assistance to the very poor and the disabled. The eligibility requirements to enter Medicaid are stricter for non-citizens than natives: as a consequence of a 1996 federal law, legal immigrants became ineligible for Medicaid for the first five years of residence in the United States. Undocumented and temporary resident immigrants

are, instead, generally not eligible for the program, irrespective of their length of stay in the country (Schwarts and Artiga, 2007).

In a report published by the Kaiser Commission (2007), it emerges that low-income[3] non-citizens in the US are much less likely than their native counterpart to receive primary and preventive care as well as to have recently contacted a doctor. This difference in access to medical services is partly due to the higher presence of uninsured among non-citizens rather than natives[4]. However, also when focusing on the insured individuals, those without US citizenship report lower access to healthcare: these barriers to access persist also among the insured. The report shows that, despite their lower access to primary and preventive care, low-income non-citizens adults do not replace the lack of assistance with an over utilization of emergency rooms as in European countries. Emergency healthcare is granted for those undocumented and legal immigrants who match the eligibility conditions for Medicaid except for their non-citizens status. However, the provision of healthcare through the Emergency Medicaid service is limited to urgent cases, while preventive and ordinary services are not treated. The main sources of care accessed by low income non-citizens adults, both insured and uninsured, remain clinics and health centers.

In most European countries, instead, the National Healthcare System grants access to health care services to the regularly resident immigrant population in the same way as to the native population[5]. Recent studies, however, have shown evidence of barriers to access to and use of medical services encountered by immigrants and of differences in terms of demand for health care between the immigrant and the native

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[3] Low-income is twice below the federal poverty level, which was $2,600 per month for a family of three in 2005 (Schwartz and Artiga, 2007).

[4] In 2005, 36% of low-income nonelderly citizens adults (i.e. individuals in between 18 and 64 years of age) in the United States were uninsured, versus 60% of the non-citizens who have been in the US for more than 5 years and 67% of the non-citizens who have been in the US for less than 5 years (Schwartz and Artiga, 2007).

[5] Directorate-General for Employment, Social Affairs and Equal Opportunities, European Commission, 2008

populations. As for legally resident immigrants, there exist at least three main factors which discourage access to health services: the strictness of requirements for getting permanent residence, language and cultural barriers, and lack of knowledge of the system and its bureaucratic procedures (Mladovsky, 2007). Both demand and supply barriers may negatively impact the use of the health care system and its efficiency in the long run. In particular, language and cultural barriers, as well as lack of knowledge of how the health care system works, are among the main causes of disparities in access to medical services (Hernández Quevedo, and Jiménez Rubio, 2010).

According to Ingleby et al. (2005), in European countries barriers to access negatively affect utilization of medical services, leading to over utilization of emergency services. Failures of the national healthcare systems in satisfying the needs of the immigrant population and in including them into the system are partially compensated by private institutions and by non-profit organizations. However, the former are not affordable by a great part of the immigrant population, and the latter may lack the necessary resources in order to grant a service comparable with that of the national healthcare system. If emergency rooms are the only healthcare service available to the whole population, they will end up being over-used for simple cases. Failures in supplying medical services, thus, create inefficiencies and increase costs in the long run.

In a study by Gravelle et al. (2003) the socioeconomic and health characteristics affecting the demand for health services in England are isolated after controlling for supply factors. Utilization models are estimated with a combined analysis of data on acute hospitalizations, socioeconomic and need characteristics of individuals belonging to small selected areas in England. The results report the existence of a negative correlation between ethnicity and health care use resulting in horizontal inequity in utilization of health care services with respect to ethnicity.

Another study by Morris, et al. (2005) tests the existence of inequality and inequity[6] in utilization of primary care visits, day hospital care, and inpatient, and outpatient visits in England. A linear model is used to estimate health care service utilization. Supply factors are included in the regression as well as need variables, and socioeconomic characteristics such as income and age. Ethnicity enters the regression as a dummy taking value 1 if the individual is non-white and zero otherwise. The authors find evidence of both inequality and horizontal inequity in the utilization of health services by ethnicity. As for inequality, in particular, the study reports an over use of primary care and an under utilization of secondary care services with respect to the native population. Moreover, supply-side determinants, such as the number of physicians per 1000 inhabitants or distance to healthcare structures, are found to significantly affect the utilization of services and the arising of inequalities.

Smaje and Le Grand (1997) have also found evidence of differences in access to various types of health services in Britain related to ethnicity. Their study uses data from the General Household Surveys from 1984 to 1991 and questions the equity of the British National Health Service in terms of differences in access to healthcare facilities due to ethnicity. Dummy variables which reveal whether or not the individual visited a general practitioner and whether or not he/she made use of outpatient and inpatient services enter the logistic regressions as outcome variables. The independent variables, instead, are indicators of need, age, gender, ethnicity and socio-economic factors. Results show that, even though no evidence of inequity is found as for visits to general practitioners comparing the white population and ethnic minorities, the latter report lower use of outpatient services.

Applications and testing of the Andersen behavioral model can be found in many studies which try to evaluate the determinants of access to and use of healthcare

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[6] Inequality means a different use of services made by different individuals, while horizontal inequity means a different consumption of services made by individuals with the same needs (Morris, et al. 2005).

services and which focus their attention on the comparison between immigrants and natives.

A recent study by Akresh (2009) analyses the utilization of medical services by Hispanic and Asian immigrants in the United States using data from the New Immigrant Survey. Variables related to the use of homeopathic and traditional medicine are introduced and the Andersen behavioral model is tested. The latter reveals a good predictive power for physician visits and dental care utilization, while its explanatory power is weak when homeopathic and traditional medicine use is considered. The author stresses the relevance of the Andersen model in explaining certain types of health care service utilization (physician visits and dental care) and its weakness in explaining others, such as hospital use and traditional or homeopathic medicine use.

A similar study was conducted by Leclere, et al. (1994). The analysis focused on utilization of medical services by US immigrant and native- born adults. The standard health care utilization framework was enriched by adding variables such as duration of residence, family health and indicators of immigrant adaptation (such as age at migration and language in which people were surveyed). They found out a strong relationship between the duration of residence and health care utilization. Native-born and immigrants of longer permanence in the host country (longer than 10 years) do not differ in terms of medical care use, while recent immigrants are much less likely to receive timely health care.

A study by Jiménez Rubio (2008) tests horizontal equity in the use of medical services between the immigrant and the native population starting from a linear model which regresses medical care use on income, a vector of need variables, and a vector of non-need variables. According to the principle of universal access to health care, need variables should be found to have an influence on medical care use, while enabling variables should not (Jiménez Rubio, 2008). The analysis, based on a survey of the Spanish National Health System, reveals that, even though need

factors are responsible for the main part of the demand for health care, some non need variables do actually matter in explaining the use of medical services, and nationality is one of these. In particular, immigrants are more likely than Spaniards to be hospitalized through the emergency department and to ask for emergency visits; while they have lower probability to contact a specialist.

Differences in healthcare access and use between the immigrant and the native populations have been explained not only with the presence of demand and supply side barriers, but also through the study of differences in preferences and in subjective evaluation of health status across races. According to Rosen, et al. (2003) evidence of differences in access to health care between immigrants and natives can be explained by differences in preferences across races. The analysis is carried out using a multivariable model which regresses risk attitudes on socio demographic variables (including ethnicity). The findings reveal different risk attitudes according to race: white race individuals turn out to be more risk averse than others and this could explain under utilization of health services by immigrants with respect to natives.

Winkelmann (2002) in an attempt to compare immigrants and Swiss citizens with respect to the use of healthcare services, finds out that, once controlling for health status, no difference occurs in the use of health services between immigrants and natives. The analysis uses data from the Swiss Household Panel collected in 1999 and aims at assessing the cost of an individual to society through the utilization of healthcare services. The individual cost is proxied with a variable measuring the number of visits to physician in twelve months and the model used is a negative binomial regression model. Results show that access to health care is not directly affected by socio economic variables, but rather by the effect they have on individuals' health status. In particular, immigrant women, compared to similar native women, display a higher number of visits to physicians, while no significant difference is found between immigrant and native males. The difference, however, can be fully explained by the lower subjective perceptions of health status reported by female

immigrants. Once the model includes measures of subjective evaluation of health status, the difference in the number of visits to physicians between female citizens and non citizens becomes insignificant.

What clearly emerges from several European studies which compare healthcare use by the immigrant and the native populations is an overutilization of emergency services associated to an underutilization of preventive care services among the immigrant population.

A study conducted by Wolf et al. (2005) surveyed 161 pregnant undocumented women who went at the University hospital in Geneva, Switzerland, between February 2005 and October 2006, and 233 regularly resident pregnant women who wished to give birth in the same hospital in the same period as the illegal immigrants. Women were asked questions on their health status, health insurance, demographic and socioeconomic characteristics. The main outcomes of the analysis relate to the use of medical preventive services during pregnancy, complications during delivery and post-partum, and knowledge of contraceptive devices and cancer screening devices. After having performed a descriptive analysis using Chi-square and means tests, the authors run a multiple logistic regression in order to find evidence of differences related to women's legal status. The analysis controls for those factors which could lead to misinterpretation of the results, such as education, age, civil status, length of stay in Geneva, presence of a family member or of a psychological support in the host country. Results report that irregular immigrants encounter barriers to access to preventive health care services, in particular to contraceptive devices, immunizations, and cervical cancer screening. Undocumented women are more likely to have unintended pregnancies and to delay prenatal care. They make their first pregnant visit, on average, 4 weeks later than regularly resident women and only 63% of them starts prenatal healthcare in the first trimester versus 96% of the control group.

Munoz de Bustillo and Anton (2009) study health care services utilization of Spanish immigrants using data from the 2006 Spanish National Health Survey. They run different econometric specifications, including a negative binomial regression model, a two-stage regression model which includes a probit and a zero truncated negative binomial, a zero truncated Poisson, and a hurdle negative binomial regression model on the number of visits to general practitioners and to specialists. A two-stage evaluation is made in order to capture the two processes which lie behind healthcare services utilization: the decision whether to contact a doctor and the subsequent number of visits. A test is made in order to evaluate the model which performs better and the simple negative binomial regression is the one which scores the best. The outcome variables are measures of healthcare use and include visits to general practitioners, visits to specialists, and emergency room visits. The factors entering the regression function as input variables are, instead, proxies of need variables, demographic and socioeconomic factors, and indicators of health supply. The analysis finds no evidence supporting the popular belief of immigrants' over utilization of the National Health Service. On the other hand, no evidence is found of a lack of equity in access to health care services between the immigrant and the native population. Immigrants do not report more visits to general practitioners or days of hospitalization than Spaniards. However, the latter present higher frequency of visits to specialists and less use of emergency rooms with respect to immigrants.

Evidence of an over utilization of emergency services by the immigrant population also emerges from a paper by Sanz, et al. (2000). Their analysis focuses on immigrants residing in a district of Madrid and finds out that immigrants' over utilization of emergency rooms is compensated by under utilization of visits to specialists. The lower frequency of visits to specialists made by immigrants with respect to natives is explained with the existence of barriers to access.

A study by Cots et al. (2007) on hospital emergency department utilization in Barcelona finds out that immigrants report higher use of the emergency department

compared with natives and that they indeed use the emergency ward also for not urgent cases. The study reinforces the hypothesis that immigrants try overcome certain barriers to access to health care by substituting ordinary care with emergency care.

Table 2.1: Overview of the main empirical findings

Country	Author	Model	Main findings
USA	Schwartz and Artiga (2007)	Descriptive study	Differences found in access to healthcare services comparing low-income adults by citizenship. Non citizens report lower access to primary and preventive healthcare, as well as to emergency services than natives.
USA	Akresh (2009)	Andersen behavioral model	Duration of residence, knowledge of host country language, and insurance increase immigrants' access to healthcare services.
USA	Leclere, et al. (1994)	A modification of Andersen behavioral model	Natives and long-term immigrants are more likely to receive timely health care than recent immigrants. The family also plays a role in help-seeking behaviors among the immigrant population
USA	Rosen, et al. (2003)	Multivariable linear model	Differences found in access to and use of health care services are explained through differences in risk attitudes among ethnicities.
The Netherlands	Ingleby et al. (2005)	Descriptive study	Failures of the national healthcare system in addressing the needs of the immigrant population lead to inefficiencies and misuse of resources, such as immigrants' unnecessary overutilization of emergency services.
Switzerland	Winkellman (2002)	Grossman model	Once controlling for health needs, no significant difference is found in access to health care services between the immigrant and the native population
Switzerland	Wolff et al. (2008)	Multiple logistic regression analysis	Evidence of under utilization of preventive medicine by undocumented immigrant women with respect to their native counterpart
Spain	Munoz de Bustillo and Anton (2009)	Negative binomial model and hurdle negative binomial model	No evidence of immigrants' overutilization of medical services. Immigrants seem to compensate a lower use of specialty medicine with higher use of emergency services.
Spain	Sanz, et al. (2000)	Descriptive study	Overutilization of emergency services by the immigrant population in Madrid
Spain	Jiménez Rubio (2008)	Linear model which regresses medical care use on a vector of need and non-need variables	Immigrants are more likely than Spaniards to ask for emergency visits and to be hospitalized through the emergency department

Country	Author	Model	Main findings
Spain	Cots, et al. (2007)	Negative binomial model	Immigrants try to overcome barriers to primary care through emergency services
England	Gravelle (2003)	Equilibrium waiting time framework	Evidence of horizontal inequity in utilization of health care services with respect to ethnicity. Supply factors affect the demand for healthcare.
England	Morris, et al. (2005)	Equilibrium waiting time framework	Evidence of inequalities and inequities in the utilization of health care services with respect to ethnicity. Differences in access to secondary care are found. No difference regarding primary care. Supply factors affect the demand for healthcare.
England	Smaje and Le Grand (1997)	Logistic model	No evidence of inequity in visits to general practitioners with respect to ethnicity. Differences between ethnic minorities and natives are found for what regards outpatient services.

2.3 Evidence from Italy

Immigration in Italy is a relatively recent phenomenon and interest on immigrants' access to health care services is only recently growing. Almost all the literature available takes the form of reports published by health care professionals or voluntary organizations rather than economists.

Table 2.2 at the end of this section, presents most of the Italian literature on the subject. As in other countries, also in Italy there is evidence of excessive use of emergency wards and underutilization of preventive medicine by immigrants compared with the native population.

One of the few studies which develops a quantitative analysis of immigrants' use of health care services in Italy is that of Giannoni (2009). The study uses data from the Eurostat EUSILC cross sectional 2007 survey for Italy and aims at outlining those factors which affect the probability that an individual's need for healthcare remains unmet. The sample includes individuals older than 17 years of age and is made up of about 44,000 observations. A logit regression is run in order to estimate, among others, the effect of being a non-citizen on the probability of failing in accessing

medical visits or dental care visits. The outcome variables are based on answers to the question on whether in the last twelve months the respondent needed to visit a doctor or a dentist but he/she did not manage to do it.

The regression equation is the following:

(7) $y=1$ if $y^* >= 0$
   $y=0$ otherwise;

where y_i is the dependent variable, which takes value 1 if the individual did not have access to medical or dentist visits and 0 otherwise, and y^* is as follows:

(8) $y^* = \alpha + \beta \ln inc + \gamma X + \delta Z + \varepsilon$;

where X is a vector of variables which includes the individual's sex and age, a variable which indicates whether the individual has some disease limiting his/her everyday activities and a measure of subjective evaluation of health status. The vector of variables Z, instead, includes a set of factors which are not "natural" determinants of healthcare needs, and which instead may lead to inequities in access to medical services, such as citizenship, employment status, level of education and civil status. The logarithm of income belongs to this last set of variables ($\ln inc$). Results show that variables which imply the need for healthcare, such as health status, age, and gender, are the main determinants of access to medical services. However, analyzing the results for different geographic areas, inequities emerge related to citizenship. Extra European Union citizens living in the Northern and in the Southern part of Italy have higher probability of not accessing healthcare visits than Italian citizens (Giannoni, 2009).

The Rapporto Caritas-Zancan 2004 collects data on access to services offered by the Italian National Health System. The focus is on the immigrant population, which is considered at high risk of social exclusion. A questionnaire was submitted to a

sample of 1,836 general practitioners (the answer rate was 79%). The report finds out that immigrants have difficulties in accessing medical services mainly because of language barriers, lack of knowledge on the existence of a network of health care services, and economic difficulties. Despite the above findings, the report emphasizes the uniqueness of the Italian National Health System, which is one of the few health care systems in the world which guarantees universal coverage to its citizens (Caritas Italiana, 2004).

The second report of the Ministry of the Interior on the activity of the territorial boards on immigration (Ministero dell' Interno, 2009) reports that only 68% of immigrants legally residing in Italy is registered at the National Health Service. This may partly explain evidence found in a large part of the literature of a tendency to replace ordinary health care assistance with hospital emergency care among the immigrant population.

Evidence on the inappropriate use of emergency services by immigrants residing in the city of Rome is found in a paper by Bernardotti (2003), which reports the results of a study conducted by the Public Health Agency of Lazio on hospital discharges of the immigrant population in the year 2000. The total amount of hospitalizations of immigrants from developing countries in the city of Rome is 25,537. Data show that the rate of hospitalization for the immigrant population is higher than that of Italians for those diagnostic categories which are considered at high risk of inappropriateness[7]. The paper argues that immigrants' higher rate of hospitalization is partly due to problems in accessing other healthcare services, which result in an over utilization of emergency wards once the disease is degenerated and the individual needs emergency care. Moreover, emergency services respond more easily to immigrants health care needs by offering an immediate and timely solution to a given health problem and by reducing the language, cultural and bureaucratic

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[7] Inappropriate hospitalizations are related to diagnostic diseases which could be treated differently, at a less intense level of medical assistance, with the same efficacy, less risk of iatrogenic effects and higher efficiency in the use of resources (Ministero della Salute, e 2002)

barriers that immigrants may face when trying to access the health care system through primary or specialists medical services. The substitution of specialty or general healthcare with emergency services does not only rise questions on the actual equity in access to the health care system, but also on the efficiency of the system itself, due to an increase in the consumption of more costly medical services (like emergency services), at the expense of less-intense healthcare services.

The low access to preventive healthcare and specialty medicine also results in a study conducted by Coffano and Mondo (2004) on the immigrants' use of health care services in the Piemonte region. The authors find out that immigrants' new born are more likely to be born premature or malformed or dead with respect to the Italian newborn population. The causes are mainly related to pregnancies which are not adequately monitored by doctors. An analysis of certificates of childbirth assistance and of hospital discharges shows that only 80% of immigrant women who had given birth made a first visit within the first three months of pregnancy, versus 94% of the Italians. The study also reveals that immigrants' children report a higher number of hospitalizations for otitis and bronchitis than Italian children. This is partly due to the inadequate and overcrowding living conditions and to parents' difficulties of access to healthcare services other than the emergency ones. This behavior makes hospitalization inevitable even though the disease is originally a home care treatable matter (Coffano, and Mondo, 2004).

The hypothesis of immigrants' overutilization of obstetric and gynecologic services is supported by evidence on fertility rates which suggests that the immigrant population is in general more fertile than the host population (Billari, 2008). The over utilization of gynecologic and obstetrics services among immigrants is strictly related to delivery and abortion. Rates of voluntary abortion are much higher among immigrant than Italian women. In 2005, the abortion rates were about 26.5 and 7.1 per 1000 immigrant and Italian women between 18 and 49 years of age respectively (Ministero del Lavoro, della Salute e delle Politiche Sociali, 2009). However, when prenatal care

and preventive female care services (such as pap test exams) are considered, evidence of immigrants' barriers to access is found[8].

Difficulties in immigrants' access to health care are also reported in a study of the Italian National Health Institute on immigrants' access to health care services during pregnancy and at childbirth (Spinelli et al., 2003). The study involves five hospitals located within the municipality of Rome and it is based on a questionnaire submitted to 605 women who went to the hospital to give birth. Data reveals an improvement in assistance to immigrant women at childbirth and pregnancy comparing years 1995-1996 and 2000-2001. However, a comparison with similar Italian women reveals that immigrants still have more difficulties in having assistance and in finding information on health care access and use.

Most of the evidence on inequity of access to health care services between immigrants and natives is related to obstetrics, pre and post-natal services, but also to health care need as a consequence of accidents at workplace (Consiglio Nazionale dell'Economia e del Lavoro, 2000). With regard to cases of workplace injuries and deaths, a report by the National Insurance Institution against accidents at work (INAIL, 2010) reveals a decreasing trend for the first time in the last ten years. In 2009, the amount of registered accidents involving immigrants decreased of about 17% with respect to 2008. However, a part of this decrease deals with the economic crisis, which significantly reduced the employment opportunities in the manufacturing and construction industry, largely occupied by immigrants. Moreover, the same report, estimates that about 15% of the overall registered cases of accidents at workplace involves the immigrant population.

A summary of the main trends on immigrants' health conditions and access to health care services in Italy is provided by ISTAT[9] (ISTAT, 2008), reporting the main results

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[8] Evidence is found, among others in the work of Giannoni (2009), as well as in the report by ISTAT on Health conditions and access to healthcare services (2008).

from a questionnaire conducted on about 60,000 households resident in Italy on their health status and use of healthcare facilities. Among them, about 3,500 non-Italian citizens were interviewed. What emerges from a descriptive analysis on health conditions and health care utilization is that the immigrant population is on average healthier than the Italian population. This information emerges both from answers related to the individuals' perceived health status and from questions related to respondents' suffering from diseases. Immigrants, controlling by age, report an overall lower access to medical services than natives. In particular, immigrants report about half the visits to specialists than natives and the rate of hospitalization of male non-citizens is lower than that of Italians, as is that of females, once admissions for childbirth are excluded. Access to emergency rooms is instead higher among the immigrant than the host population, specifically, the percentage of male non-citizens who made use of emergency services in the three months before the survey (7%) were significantly higher than that of natives (4.2%). Further differences between citizens and non-citizens are found in access to preventive medical services, in particular for what regards check visits and female cancer screening devices, which are lower among immigrants than natives. Only 51.6% and 49.2% of female immigrants have recourse to pap test and mammography respectively, compared with 71.8% and 73.1% of the Italian female population.

Another study on differences in hospitalization rates between immigrants and natives (Cacciani, et al., 2006) finds evidence of overall lower rates of hospitalization among the immigrant population. However, once the analysis is done for specific diseases, the rate of hospitalization is higher for immigrants than for the host population when accidental events are considered.

Evidence of under utilization of medical services by the immigrant population also deals with access to and use of preventive medical care. The underutilization of

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[9] The report is published in the ISTAT series "Statistiche in breve" and describes the same dataset I have used in the statistical and econometric analysis presented in sections 4 and 5.

preventive medical services, which usually results in the inappropriate over utilization of emergency services, is mainly driven by the lack of knowledge of the existence of the services themselves (Davies, et al., 2010).

A study by Devillanova (2008) stresses the positive effect of social networks in reducing barriers to entry the health care system for undocumented immigrants. The dataset used was collected by Naga, a voluntary association which provides free primary care to irregular immigrants in Milan. The paper studies the time it takes for an immigrant to receive first medical aid after his arrival Italy, by regressing the logarithm of the time it takes for individual i from country j to be visited, on a constant, the network variable, which is a dummy indicating if the individual came into contact with the healthcare facility through a friend or a relative (in this case immigrants are considered as having strong social ties) and on a set of individual and country-related controls. The findings reveal that the network effect reduces the time spent by undocumented immigrants in Italy before receiving medical assistance.

Author	Model	Main findings
Spinelli et al. (2003)	Descriptive study	Evidence of barriers to access to medical services for immigrant women at childbirth and pregnancy
Bernardotti (2003)	Descriptive study	Emergency services are often the most immediate and timely answer to immigrants' health care needs
Caritas italiana (2004)	Descriptive study	Evidence of language, knowledge and economic barriers for immigrants in accessing health care services
Coffano and Mondo (2004)	Descriptive study	Lower utilization of monitoring visits by pregnant immigrant women and lower use of preventive and primary care by immigrant population compared with natives.
Cacciani et all. (2006)	Descriptive study	Overall, hospitalization rates are lower for immigrants compared with natives. Once focusing on hospitalizations due to accidents, however, the hospitalization rate is higher for the immigrant population.
Devillanova (2008)	Log-linear specification	Social networks play a relevant role in reducing barriers to access to medical services for the immigrant population. In particular, the network effect is that of reducing the time spent by immigrants in the host country before receiving first medical assistance
ISTAT (2008)	Descriptive study	Immigrants report less visits to specialists and hospitalization rates but a higher number of emergency visits
Ministero del Lavoro, della Salute e delle Politiche Sociali (2009)	Descriptive study	The rate of voluntary abortion is much higher among immigrant than native women
Giannoni (2009)	Logit regression model	Non-EU-citizens living in the North and in the South of Italy are found to be more likely to fail in accessing visits to the doctor.

3. Immigration and healthcare services: the Italian legislation and policy framework

Italy has for long been an emigration country and it has only recently become an immigration one. The large immigration flows have started only since the nineties and nowadays, Italy, with 4,235,059[10] of immigrants regularly residing in the country, has become one of the EU27 members reporting among the highest numbers of non-nationals residents in absolute values[11] (Eurostat, 2010).

In addition, Italy has a large incidence of irregular immigrants which are often employed in the black economy. The sixteenth report of the ISMU foundation on migrations (2010) estimates the presence of about 544,000 immigrants irregularly living in Italy (at 1st January 2010).

Graph 3.1 below reports Italian net migration trends across years. It is since the 1990s that Italy has been started to experience a sharp positive increase in the net immigration rate. At the beginning of 2009 immigrants regularly resident in Italy represented about 7% of the overall population (ISTAT, 2010). In particular, 1.9% of the total Italian population comes from other EU27 member states (Eurostat, 2010).

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[10] Source: ISTAT (2010)

[11] It is, however, to mention a problem of divergent regulations as for the obtainment of citizenship in different European countries. In particular, in Italy the obtainment of naturalization and citizenship by immigrants follows a stricter regulation than in other European countries (such as France and Germany).

Italy: Net Migration Rate per 1000 inhabitants 1956-2006
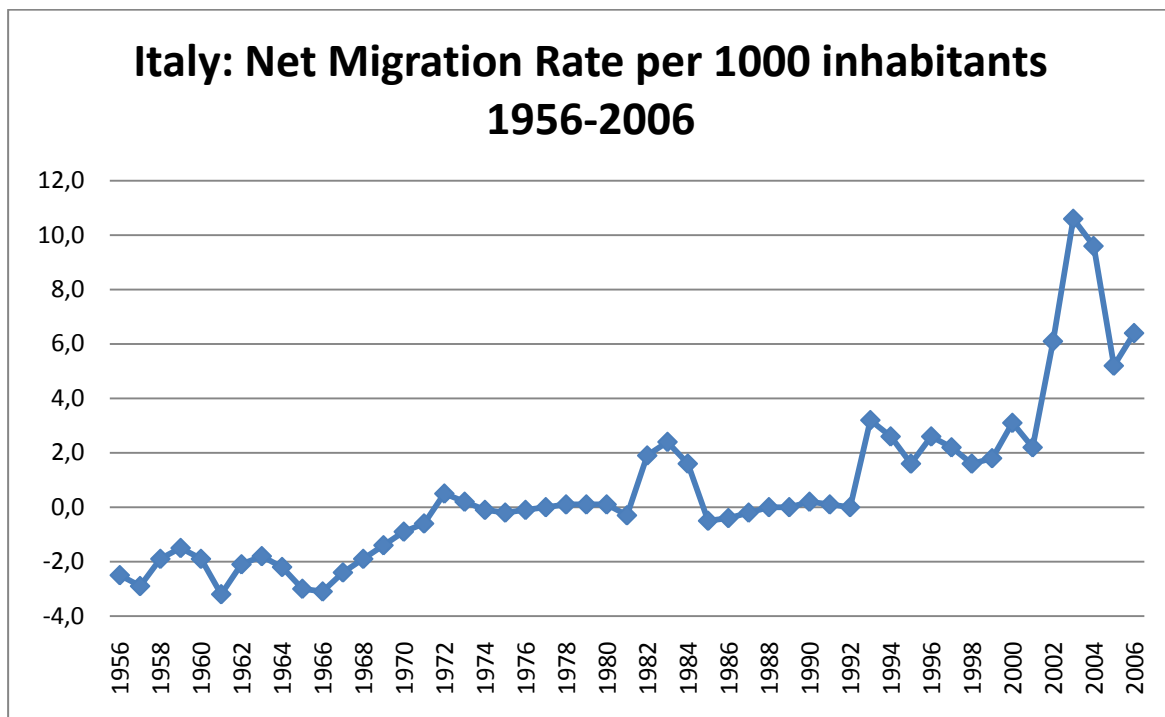
The immigrant population is on average younger than the Italian one and the age differential is among the largest recorded in EU27 member states: on average immigrants are 11.6 years younger than Italians (Eurostat, 2010).

3.1 Legislation on immigration and access to the healthcare system

A first attempt to regulate immigrant status and immigration flows by the Italian legislation comes with Acts n. 943/1986 and n. 39/1990. The former defines, for the first time, the status of non-EU immigrant workers legally residing in the country and identifies the fundamental rights to be granted, among which access to health care and education.

Act n. 39/1990, focuses on the planning and restriction of incoming flows and on the requirements necessary for obtaining or renewing residence permits. These two Acts

can be considered as the premises of an Italian legislation on immigration, even though they have often been proved inefficient in attempting to restrict immigration waves, and inaccurate in dealing with the rights for asylum seekers.

More recent legislation includes Act n. 40/1998 and Act n. 189/2002, which regulate migration flows, access to resident permits, and illegal migration. The latter is known as the Bossi-Fini Act. The *ratio* behind it is that of creating a causal and ineludible link between the working status and the residence permit. A permit is granted only to immigrants having at least a temporary but regular job, and the admission into the country is allowed only after having received a job offer (1° Rapporto sugli immigrati in Italia del Ministero dell'Interno, 2007).

The Bossi-Fini Act has been reformed by Act n.94 of the 15th of July 2009. The latter is the one currently in force and establishes restrictions on immigrants' legal status by introducing the crime of illegal immigration. Moreover, the renewal of residence permit depends on integration, and long-residence permits require the passing of an Italian language test. This Act does not undermine the ban on reporting any illegal or irregular[12] immigrant by the medical staff. However, by introducing the crime of illegal immigration, the regulation makes room for different interpretation of the norm and for the spread of confusion and misinterpretation, which, at the very end, have already led to a decrease in access to healthcare facilities by the irregular immigrant population in late 2009 and early 2010 (Carrillo and Pasini, 2010).

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[12] Irregular immigrants are those with an expired residence permit

Box 3.1 summarizes the most relevant regulations on immigration.

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│         Box 3.1 - Main norms affecting healthcare access by immigrants        │
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- **Art. 32 of the Italian Constitution**
Safeguards individuals' health also for the interest of the whole community.

- **Act n. 943/1986**
Norms on the placement and treatment of foreign workers and immigrants against illegal immigration.

- **Act n. 39/1990**
Urgent measures on political asylum, on entry and residence of non-EU citizens and on the regularization of non-EU and stateless citizens already in the State. Provisions on asylum seekers.

- **Act n. 40/1998**
Regulation of immigration and the immigrant status.

- **Legislative Decree of the 25th of July 1998, n. 286**
Provisions on immigration and the status of foreigners.

- **Decree of the President of the Republic of July 23rd ,1998**
Approval of the National Health Plan for the period 1998-2000.

- **Decree of the President of the Republic of August 31st 1999, n. 394**
Regulations for the Implementation of the provisions on immigration and the immigrant status, in accordance with Article 1, paragraph 6 of the Legislative Decree of the 25th of July 1998, N.286.

- **Decree of the President of the Republic of May 23rd 2003, n. 95**
Approval of the National Health Plan for the period 2003-2005.

- **Act n. 189 of July the 30th 2002, ("Bossi-Fini" Act)**
Changes the legislation on immigration and asylum. Nothing changes for the health standards.

- **Decree of the President of the Republic of October 18th 2004, n. 334**
Regulation amending and supplementing the decree of the President of the Republic of August 31st, 1999, N. 394, on immigration.

- **Decree of the President of the Republic of April 7 th2006**
Approval of the National Health Plan for the period 2006-2008.

- **Decree of the President of the Republic of May 13th 2005, n. 128**
Approval of the policy paper on immigration policy and foreigners in the State, pursuant to art. 3 of Act n. 40 of March 6th 1998.

- **Circular of the Ministry of Health of April 17th 2007**
Clarifications on non-EU citizens' healthcare after the recent directives issued by the Ministry of Interior.

- **Circular of the Ministry of Health of July 19th 2007**
On students registration at the National Health Service.

Box 3.1 - Main norms affecting healthcare access by immigrants
• **Circular of the Ministry of Health of November 19th 2007** Registration at the National Health Service while waiting for the residence permit for family reasons. • **Circular of the Ministry of Interior, protocol 0008450, of December 23rd 2009** Regulation on the exiting from irregular work in the assistance to families ex Act 102/09. Health Care assistance in delays in the conclusion of the regularization procedures. • **Circular of the Ministry of Labour, Health and Social Policie of February 24th 2009** New rules on family reunification under Article 29 of the Consolidation Act on Immigration, as amended by Legislative Decree n.l60 of October 3rd, 2008. Health insurance for parent reunification over sixty-five years old. • **Circular of the Minister of Interior No 19, August 7th , 2009** Act July 15th, 2009, n. 94, on "Measures on public safety". Provisions on population's registration and civil status. • **Circular of the Ministry of Intern, n.12, of November 27th , 2009** Healthcare insurance for foreigners not registered to the National Health System. A ban on reporting of irregular immigrants. • **Act n. 94 of July 15th , 2009** The Bossi-Fini Act is reformed. In particular, the crime of illegal immigration is introduced. Knowledge of the Italian language facilitates the obtaining of long regular residence permits. Nothing changes for the healthcare regulation.

Source: adapted from Geraci, et al., 2010

The growing presence of foreign citizens residing in Italy calls for reforms and improvements in the healthcare system so as to be able to adequately face the immigration phenomenon.

The Italian National Health Service was established in 1978. It is a public healthcare service modeled on the basis of the UK National Health Service and its primary goal is that of guaranteeing universal coverage to all the members of society. It is mainly funded by general taxation. Administrative and managerial responsibility is largely left to Italian Regions. The decentralized nature of the system and the important differences existing in terms of wealth, demography, economic and infrastructural development among Italian regions, result in a wide divide between the North and the South of the country in terms of provision of health care services and health care structures (France et al., 2005).

As mentioned above, the Italian national health system has universal coverage and regularly resident immigrants are granted, at least formally, the same access to and use of health care services as the native population. Undocumented immigrants, instead, are only provided coverage for emergency care and for preventive care and treatments related to communicable disease, pregnancy and childbirth (see art.35, Legislative Decree 286/98).

Immigrants' access to healthcare is regulated by national laws. Act n. 40/1998 sets up the main standards for immigrants' healthcare assistance and regulates access to services by both regular and irregular immigrants. The main objectives are to include regular immigrants within the National Healthcare System and to deal with healthcare regulation for illegal immigrants. In detail, art. 34 deals with immigrants regularly registered to the National Health System, while art. 35 regulates healthcare access by immigrants not registered to the National Healthcare System. Art. 34 grants immigrants the same rights and duties of the Italian population, while irregular immigrants are granted access to emergency services, essential and continuative care and to preventive medicine.

The Circular n.5 of March 24th, 2000 clarifies the meaning of emergency and essential care, while the Regulation for Implementation delegates to the Regions the management of the emergency and essential care mentioned in art. 35 (Geraci, et al., 2010). As for undocumented immigrants, Act n. 94 of July 15th 2009 introduces the crime for illegal entry and residence in the country. The right to access to specific health care services as specified in art.35 of the Legislative Decree 286/98, however, is still granted.

3.2 Policies on immigrants' access to and use of the healthcare system

In recent years, the Italian government, both at national and regional level, has begun designing policies aimed at tackling immigrants' access to healthcare services and their specific health needs.

The policy objectives which emerge from an analysis of the Italian National Health Plans (1998-2000, 2003-2005, and 2006-2008) aim at granting immigrants' access to health care and at strengthening immigrants' health protection. The strategies adopted relate to specific health problems, try to improve access to medical services, identify specific health needs and adapt the system and train its personnel to immigrants' necessities. In detail, the specific health problem addressed deal with maternity and childcare, the promotion of health education campaign, and the prevention and treatment of communicable diseases such as HIV and other sexually transmitted diseases (STD). Adequate access to services is improved through information campaigns, cultural mediation, and the development of tools able to detect and measure health needs (Vazquez, et al., 2010).

A careful overview of the health policies addressing the immigrant population in Italy is part of a study by Vazquez et al. (2010). As for policies targeting health problems which specifically affect immigrants, governmental action has focused on medical services related to pregnancy and childbirth, and to infectious diseases. In particular, the 2003-2005 and the 2006-2008 National Health Plans refer to the need for reducing cases of HIV and other sexually communicable diseases among immigrants and for reaching coverage of vaccinated immigrant children equal to that of Italians.

Moreover, the above mentioned plans, stress the need for increasing access to and use of preventive medicine by the immigrant population and for reducing the rate of voluntary abortion among immigrant women. National and regional health plans have also dealt with the problem of the existing barriers to access to health services by improving the spreading of information of services provided by local authorities and through campaigns promoting immigrants' application to the National Health System (Vazquez et al., 2010).

The spreading of information is aimed at increasing knowledge of the rights to access to medical services by the immigrant population, with a focus on services related to preventive medicine and gynecological and obstetric services (National Health Plan,

2003-2005, 2006-2008). Specific policies aiming at the presence of cultural mediators inside health care structures and including the training of health care professional on ethnic diversities are, instead, part of regional and local health plans only (Vazquez et al., 2010).

4. Empirical strategy and descriptive analysis

The aim of the empirical analysis is to assess the presence of differences in access to and use of healthcare resources between the immigrant and the native population.

In order to do this I proceed as follows: in this chapter I present the variables selected for the analysis and the results of a descriptive analysis, including significance tests such as the chi squared and means tests; while, in the next chapter I present the main results of the econometric regressions in order to assess the significance of the *citizenship* status in accessing healthcare services, ceteris paribus.

The empirical analysis is based on micro-data from a national survey on health conditions and health care services utilization, carried out by ISTAT[13], the Italian national institute of statistics. The survey is part of a more comprehensive range of statistical investigations on households in Italy (Indagini Multiscopo sulle Famiglie).

The dataset refers to a survey carried out in 2004 and 2005 on 50,474 households, involving 128,040 individuals representative[14] of the population residing in Italy, of these, 3,509 are non-citizens regularly residing in Italy.

The questionnaire contains a first part with information on the individuals' socio-demographic conditions and includes general information on the individuals, among which age, sex, education, citizenship, civil status, and the individual's position in the labor market. The central part of the questionnaire, instead, focuses on general health conditions, visits to specialists and general practitioners (GPs), medical

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[13] The first survey on health care conditions and use of medical services dates to 1993 and, since then, it has been carried out every five years. Part of the questionnaire is directly completed by the respondent and another part by an interviewer. When the respondent was not available questions were answered by a family member.

[14] In order to get representative results the whole analysis is conducted by weighting the sample at hand using sampling weights. The latter are provided by ISTAT and, in the dataset record, are referred to as "coefficienti di riporto all'universo".

prevention, pregnancy and childbirth, living conditions and households' income resources. The subjective perception of health status and the presence of chronic diseases are investigated, as well as health prevention, the utilization of health care services, and the use of drugs or therapies which can be classified as 'alternative 'or 'non conventional'. Maternity is analyzed in depth through a series of questions which range from pregnancy to lactation. Participants are also asked about their suffering from any kind of disability and about their life-style habits (i.e. smoking habits or the practicing of any physical activity).

The following sections present a selection of the variables considered in the survey and a descriptive analysis of the dataset at hand. The selected variables are those relevant for the analysis of differences in the use of healthcare services between the immigrant and the Italian population, and of differences in the use of the medical resources specifically accessed by immigrants.

The descriptive statistics consider the frequency distributions and tests on the means. Individuals' demographic and socioeconomic characteristics, health conditions, visits to the doctor and use of emergency rooms, as well as access to pregnancy and childbirth services and preventive medicine are studied in detail.

Main findings confirm an overall underutilization of medical services by immigrants with respect to natives, also when considering subgroups with specific healthcare needs. This difference persists once controlling for age and for healthcare needs. In particular, immigrants' children visit specialist doctors less, on average, than Italians even if the percentage of children suffering from disabilities is found to be higher than that of natives. As for pregnancy, even though immigrant women over use obstetric services relative to Italian women because of their higher fertility rate, they undergo, on average, less visits to monitor their pregnancy. Moreover, the use of medical preventive services is lower among immigrants than natives, especially with regard to cancer screening devices for the female population, such as mammography and pap test. The male immigrant population, instead, reports a higher use of emergency

related services than the Italian population, but this may be related to their being employed in high risk jobs.

4.1 Variables selection and description

The independent variables used in the analysis are grouped into three main categories: socio-demographic variables, income variables, and need variables. I also include territorial variables as proxies for supply constraints (as suggested by the Blundell and Windmeijer model and by results from empirical literature, supply factors do have an influence on the demand for healthcare services).

4.1.1 Socio-demographic variables

The socio-demographic variables include the individuals' characteristics, such as *age*, *sex*, *civil status*, *job position*, and *citizenship*, as well as indicators of the individuals' life-style habits, such as information on whether the individual *smokes*, whether he/she carries out a *physical activity*, or is *on a diet* and whether he/she has particular *health believes*. The latter is proxied by a variable which measures if respondents believe in the usefulness of alternative medicine.

The discriminating variable, on which the whole analysis is built, refers to the immigrants' status. To pursue the scope of the research, which is that of investigating differences in access to and use of healthcare resources by immigrants and natives, I consider the distinction by citizenship to be the most appropriate.

The population is thus divided between Italians and immigrants regularly residing in Italy on the basis of *citizenship*, which is a dummy taking value 1 when the individual has no Italian citizenship (i.e. the individual has a citizenship different from Italian or is stateless) and 0 otherwise.

The choice of citizenship to discriminate between immigrants and natives excludes from the foreigners group those immigrants who managed to get the Italian

citizenship (Devillanova, 2009). However, I have no way to isolate, among citizens, those who were originally immigrants. At the same time, discriminating by birthplace would be misleading, since it would include individuals born outside Italy, but who are Italian citizens (the 2% of the Italian citizens' weighted sample). In addition, since the legal requirements to get citizenship under the Italian law are very restrictive and usually imply a very long period of residence[15], referring to this group of individuals as Italians does not bias the analysis.

In order to check for differences in access to and use of healthcare services within the immigrant group, I split the variable *citizenship* into three dummies considering the place of birth: *ue_25* which takes value 1 if the individual is a non-citizen and was born in one of the 25 member states of the European Union[16] (EU-25) and 0 otherwise; *no_ue25* which takes value 1 if the individual has no Italian citizenship and was born in a country outside the EU-25 and 0 otherwise[17], and, finally, *italy* which takes value 1 for non-citizens born in Italy and zero otherwise. The latter dummy represents, for a large part, the immigrants' children.

4.1.2 Income variables

The second group includes variables which try to measure the individuals' wealth. I do not have a measure of family or per capita income, and I use the respondent's *subjective evaluation of his/her economic well being* as a proxy for individuals' wealth. The variable is drawn from answers to the question on the overall family economic resources in the last twelve months[18]: very good, good, scarce, or insufficient. Measures of *housing status* and conditions are included among the

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[15] See the Legislative Decree n. 286 of the 25th of July 1998

[16] The EU-25 does not include Romania and Bulgaria, which joined the European Union in 2007

[17] Countries outside the European Union 25 include: Albania, Romania, other European countries which are not European Union 25 members, Morocco, other African countries, Latin-American countries, East and South-West Asian countries, and North-American or Oceanic countries. The percentage of non-citizens from North-America and Oceania together is negligible.

[18] The question is: "Con riferimento agli ultimi 12 mesi e tenendo presente le esigenze di tutti i componenti della famiglia, come sono state le risorse economiche complessive della famiglia?"

control variables. The information available deals with the kind of house where the individual lives (i.e. whether it is a private home, a popular home, or a squatter home), and with the presence of at least one bathroom, heating, and regular water supply. The respondents are also asked about problems related to housing, such as costly bills, small dwellings, or bad housing conditions.

4.1.3 Need variables

Need variables measure actual and perceived individuals' need for health care assistance. Among others, I include in the analysis variables related to the suffering of chronic diseases or disabilities, which may imply a more intensive use of medical services. I generate the variable *chronic_disease*, which takes value one if the respondent says he/she suffered from at least one of the 25 chronic diseases listed in the questionnaire[19] in the previous twelve months, and zero otherwise. I also create the variable *dis_type*, which merges different kinds of disabilities and takes value 1 if the individual suffers from at least one type of disability and 0 otherwise[20]. It is necessary to control for other morbidity factors which are likely to affect the use of medical services, such as *subjective measures of individuals' health status*. I thus include in the analysis a variable on general health conditions (*very good*, *good*, *average*, *bad*, *very bad*). Two more variables are used as measures of the individuals' need for health care, and they give information on whether respondents suffered from health diseases (*diesease*) and on whether they had an accident in the four weeks before the interview (*accident*).

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[19] The questionnaire identifies as chronic diseases the following: asthma, allergic diseases, diabetes, cataract, hypertension, myocardial infarction, angina pectoris, other heart diseases, stroke or brain hemorrhage, chronic bronchitis or emphysema, arthrosis or arthritis, osteoporosis, gastric or duodenal ulcer, cancer including lymphoma and leukemia, migraine and headache, chronic anxiety and depression, Alzheimer or senile insanity, parkinson, other diseases of the nervous system, cholecystolithiasis or kidney stones, liver cirrhosis, diseases of the thyroid, sever skin diseases, and other chronic diseases.

[20] The different kinds of disabilities are: difficulties of moving; difficulties of sight, hearing and speaking; individual confinement and isolation; difficulties in ordinary activities; disables.

4.1.4 Territorial variables

Information on individuals' *area of residence* and *size of the municipality of residence* are considered. In this way I try to account for differences in the provision of healthcare services which exist among different Italian Regions and among municipalities of different size and which may affect the demand for healthcare services.

4.1.5 Dependent variables

I use more than one variable in order to proxy for the individuals' access to health care services. The variable *n_visits* counts for the overall number of visits to the doctor without distinguishing between visits to specialists and to general practitioners. The two variables *n_visits_sp* and *n_visits_gen* measure the number of specialists and generic visits respectively, in the four weeks before the interview.

A third variable assesses whether the respondent visited a doctor (a specialists or a physician) in the four weeks before the survey. I create a variable, *dn_visits*, which takes values 1 if the respondent visited a doctor at least once in the last four weeks and zero otherwise.

As for emergency services, the variable considered is a dummy which takes value 1 if the individual used the emergency room in the three months before the interview and 0 otherwise (*er*).

4.2 Descriptive analysis

In the following, I report the results of a preliminary analysis of the sample at hand. Starting from a general description of the socio-demographic characteristics of the population sampled, I present the main findings of a first analysis on the individuals' health status, access to and use of healthcare services, distinguishing between the Italian and the immigrant population.

4.2.1 Demographic and socioeconomic characteristics

In the following analysis I have considered as immigrants those individuals with no Italian citizenship. It is important to stress that all immigrants in the sample are regularly resident in Italy and that the Italian sample includes individuals who originally came as immigrants and then managed to get Italian citizenship. Since the legal requirements to get citizenship under the Italian law are very restrictive and usually imply a very long period of residence, referring to this group of individuals as Italians does not bias the analysis.

Table 4.1 reports the distribution of the weighted sampled[21] population by citizenship and by place of birth. Immigrants represent about 4.3% of the total population, a relevant part of whom (14.5%) was born in Italy. These are, for a large part, immigrants' children who, indeed, have no Italian citizenship.

Table 4.1: Distribution of the sampled population by citizenship and place of birth

	Citizenship		
Place of birth	**Italian**	**Immigrant**	**Total**
Italy	98.08%	14.53%	94.51%
Abroad	1.92%	85.47%	5.49%
Total	100.00%	100.00%	100.00%

Table 4.2 shows the distribution of males and females among the Italian and the immigrant population. The gender's distribution is relatively balanced within each group, even if males are slightly over represented among the immigrant population relative to the native one.

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[21] In order to have representative results, I have developed both the descriptive and the regression analysis using sampling weights (i.e. a universal coefficient is used).

Table 4.2: Gender distribution of the population by citizenship

	Citizenship		
Sex	**Italian**	**Immigrant**	**Total**
Female	51.50%	48.95%	51.39%
Male	48.50%	51.05%	48.61%
Total	100.00%	100.00%	100.00%

The pie chart below (graph 4.1), shows the countries or geographic areas from which the immigrant population comes from. Albania, Romania and Morocco represent alone the native countries for about 30.5% of immigrants. As for macro-areas, a high percentage of immigrants (12.6%) belongs to European countries outside the European Union (with the exception of Albania and Romania, which are considered separately), 11% comes from African countries (Morocco excluded), 15.4% have Asian origins, and 8.3% is Latin-American.

The survey provides no information on the region of residence for immigrants and natives nor on the Italian region of birth. The region of birth is specified only for those individuals who were born in a different region from that of residence (otherwise the respondent indicates to be born in the same region of residence).

It is, thus, only possible to distinguish between individuals who still live in the same region of birth and individuals who, instead, moved. From such an analysis, it appears that 85.3% of Italians still reside in their region of birth, while 12.8% have moved to a different Italian region. Among immigrants born in Italy (14.5% of the immigrant population), instead, only about 1.1% reside in a region different from that of birth.

Graph 4.1: Distribution of the immigrant population by birthplace

- North-America, Oceania 1.23%
- South-West Asia 7.83%
- East Asia 7.57%
- Central-South America 8.3%
- Africa (Morocco excluded) 11.03%
- European not EU (Romania Albania exclouded) 12.63%
- EU-25 6.41%
- Morocco 10.27%
- Romania 9.58%
- Albania 10.62%
- Italy 14.53%
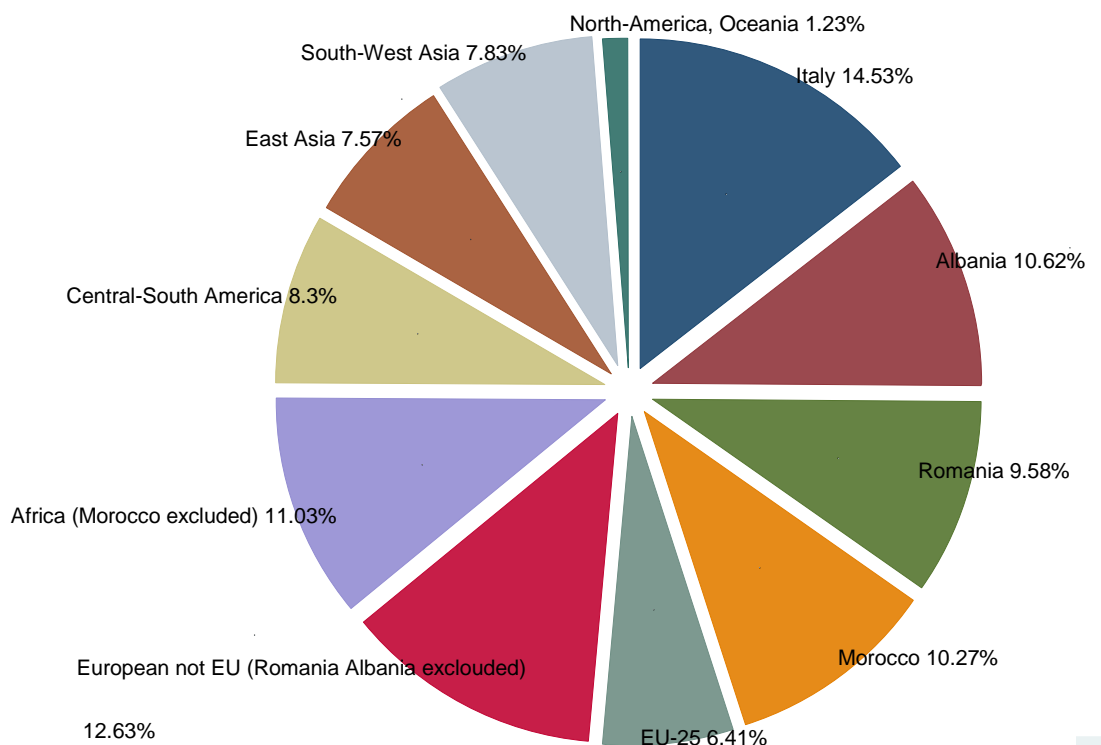
Table 4.3 shows the geographic distribution of immigrants and natives separately. Individuals are not uniformly distributed across regions. A much larger share of immigrants than Italians lives in the Northern part of Italy.

Looking at the distribution of the immigrant population across Italy, it emerges that the highest share of immigrants living in the North-West comes from African countries (22.7% including Morocco), immediately followed by individuals from Asian (17.1%) and South American (13.1%) countries. As for the North-East, a large part of the immigrant population comes from European countries outside the EU-25 (17.7%) and from Romania (13.7%), Albania (18.8%), and Morocco (12.6%). The Central part of Italy is highly populated by Asian (17.7%) and African immigrants (about 16%, Morocco included), even though Albania and Romania alone count for 23.8% of

foreign presences in the area. Immigrants living in the South mainly come from European countries (within and outside the EU25) and from African countries. In particular, Albanians and Moroccans alone count for 18.7% and about 11%, respectively, of immigrants living in the area. Finally, 42.4% of non-citizens living in the islands are African immigrants (Morocco included), followed by 16.4% of Asians.

Immigrants tend to concentrate in metropolitan areas and in highly inhabited municipalities in general.

Table 4.3: Geographic dispersion of the population grouped by citizenship and place of living

Geographic distribution	Italians	Immigrants	Total
North-West	25.89%	37.11%	26.37%
North-East	18.44%	27.13%	18.82%
Centre	19.01%	23.87%	19.22%
South	24.86%	8.64%	24.17%
Insular	11.79%	3.25%	11.42%
Total	100.00%	100.00%	100.00%

Immigrants are, on average, younger than Italians, with a difference, on average, of about 13 years (see table 4.4). A test on the means shows that age is significantly different across the two groups.

Table 4.4: Age distribution of Italian and Immigrant population

	Age(mean)	Age(std.err.)	Age(min)	Age(max)
Citizenship				
Italian	42.37	0.07	0	106
Immigrant	29.43	0.32	0	91
Total	41.82	0.07	0	106

The distribution by the level of education is similar for the two groups. Table 4.5 reports the level of education reached by the immigrant and the native population which is 25 years old or older. In this way I avoid misinterpretation driven by the higher percentage of children within the immigrant group, which may unjustifiably

increase the percentage of respondents having a pre-primary or primary level of education. The range of possible answers to the question related to the level of education has been grouped to conform to the ISCED[22] classification. The table below shows that the percentage of immigrants with a first stage tertiary level of education is higher than that of Italians, as well as the percentage of those without any kind of educational license, while the number of Italians who left school after primary license more than doubles that of immigrants. Once the same analysis is done controlling for different age groups, it emerges that a higher share of Italians than immigrants reached a level of schooling above lower secondary education among young age cohorts (15-29 and 30-45 years old). However, the situation is reversed once older individuals are considered (above 45 years old). Among them, the share of immigrants with an upper-secondary, post-secondary, or second-stage tertiary level of education is higher than that of Italians.

Table 4.5: Level of education of Italian and Immigrant population 25 years old or more (%)

	Italians	Immigrants	Total
Level of education			
Second stage tertiary	0.69%	0.43%	0.68%
First stage tertiary	8.79%	9.12%	8.80%
Post secondary	1.02%	1.47%	1.04%
Upper secondary	29.16%	32.66%	29.29%
Lower secondary	29.63%	37.97%	29.95%
Primary	25.06%	10.87%	24.53%
Pre primary	5.64%	7.48%	5.71%
Total	100.00%	100.00%	100.00%

As for the employment status, table 4.6 shows that the percentage of employed individuals is much higher among immigrants (67.6%) than Italians (45.9%). Italians also report a higher percentage of retired individuals than immigrants (19.5% and 1.8% respectively) and a lower share of unemployed (3% versus 4.2%). Once controlling by gender, responses indicates that the percentage of unemployed males

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[22] The International Standard Classification of Education

is similar comparing the immigrant and the native populations, indeed, the percentage of unemployed is slightly higher within the Italian group (3.3% and 3.2% respectively), while a much larger difference is found for the female population: 5.3% of female immigrants are unemployed versus 2.7% of their Italian counterpart.

Moreover, looking at the job position of employed individuals with at least a post secondary level of education (table 4.7), emerges that Italians hold, on average, more prestigious job positions than immigrants. 34.3% of immigrants with a high level of schooling hold a blue collar worker position versus only 3.1% of natives with the same level of education.

Table 4.6: Employment status of the Italian and the immigrant populations (%)

	Italians	Immigrants	Total
Employment status			
Employed	45.86%	67.55%	46.70%
Unemployed	2.98%	4.20%	3.02%
Seeking first job	2.54%	2.47%	2.54%
Housewife	17.33%	17.32%	17.33%
Student	7.96%	5.15%	7.85%
Retired	19.45%	1.81%	18.77%
Unable to work	1.57%	0.29%	1.52%
Civil military service	0.06%	0.03%	0.05%
Other	2.27%	1.18%	2.22%
Total	100.00%	100.00%	100.00%

Table 4.7: Job position of employed individuals, Italians and immigrants, with at least a post secondary level of education

	Italians	Immigrants	Total
Job position			
Manager	12.10%	9.14%	11.99%
Director	19.86%	7.01%	19.38%
White collar	40.67%	27.29%	40.16%
Blue collar	3.09%	34.33%	4.27%
Apprentice	0.53%	0.00%	0.51%
Housewife	0.08%	0.38%	0.09%
Entrepreneur	2.65%	1.44%	2.60%
Freelance	17.10%	12.53%	16.93%
Self-employed	3.09%	6.93%	3.24%
Cooperative member	0.33%	0.23%	0.32%
Colf	0.51%	0.72%	0.51%
Total	100.00%	100.00%	100.00%

Table 4.8 reports a subjective evaluation of the family's economic resources. As expected, responses indicate that the percentage of households with a "very good" or "good" level of economic resources is, on average, significantly higher among natives than immigrants. It emerges clearly that Italian families declare to be, on average, wealthier than their immigrant counterpart. This may be a consequence of the fact that immigrants, even when controlling for the level of education, hold on average lower-paid job positions than natives. In particular, data shows that among the over 24 years old with a pre-primary level of education, 39.3% and 6.7% of Italians appear to live with scarce or insufficient economic resources respectively, versus 57.2% and 11.4% of immigrants with the same level of education.

Table 4.8: Economic resources of Italian and Immigrant families (%)

Family wellbeing	Italians	Immigrants	Total
Very good	3.61%	2.36%	3.55%
Good	65.67%	42.54%	64.68%
Scarce	26.30%	45.75%	27.13%
Insufficient	4.43%	9.35%	4.64%
Total	100.00%	100.00%	100.00%

4.2.2 Health conditions

The following description of general health conditions emerging from the dataset clearly supports the hypothesis of the "healthy migrant effect". The reason why immigrants are found to be on average healthier than Italians may be due to the fact that the decision to migrate is usually undertaken by younger and healthier individuals who are strong enough to survive to a physically and psychologically dangerous experience.

A description of life style habits is available through an analysis of data on the practicing of sports or physical activities in general, the smoking condition and

nutritional habits related to diet. As for physical activity, data show that the percentage of Italians who practices sports implying an intense, or medium as well as a low physical effort is significantly higher than that of immigrants (50.9% and 46.3%). Results related to smoking habits, instead, reveal significant differences both between the immigrant and native male and female populations. The percentage of male immigrants smoking (30.2%) is higher than that of natives (27.4%), while the result is reversed for females, with 14.2% of immigrant women smoking compared to 16.3% of Italian women. As for eating habits, the share of immigrants who are on a diet is significantly lower than that of Italians. Moreover, among those on a diet, immigrants report a much higher share of individuals whose diet is not prescribed by a doctor.

Table 4.9 roughly describes the health status of the sampled populations, providing information on the incidence of disabled and people affected by chronic diseases.

Table 4.9: Frequency and percentage of disabled and of people suffering from chronic diseases among the native and immigrant populations

	Italians	Immigrants	Total
Suffering from at least one chronic disease	41.36%	16.05%	40.28%
Disabled	4.66%	0.84%	4.50%

We do observe a negative correlation between the suffering from a chronic disease and the immigrant status, both for males and females. In particular, the immigrant population appears to be healthier, on average, than the Italian population. Immigrants and natives may have different perceptions of their health conditions. It is worth mentioning that these are the results of a subjective evaluation of health status, which may differ across the two groups. Responses show that, on average, only 13.3% of the male immigrant population suffers from a chronic illness versus 36.3% of the correspondent Italian population. This difference is even larger among women: 18.9% of immigrant women appears to suffer from a chronic illness versus 46.1% of the correspondent Italian population.

Considering age, graph 4.2 below pictures the distribution of answers to the question on whether the respondent suffered from any kind of disability across age ranges. The percentage of disabled appears to be higher among Italians within each age class, except for the very young (under 19 years old) where the percentage of immigrants suffering from disabilities is slightly higher than that of natives.

Graph 4.2: Percentage by age range of immigrants and Italians disabled
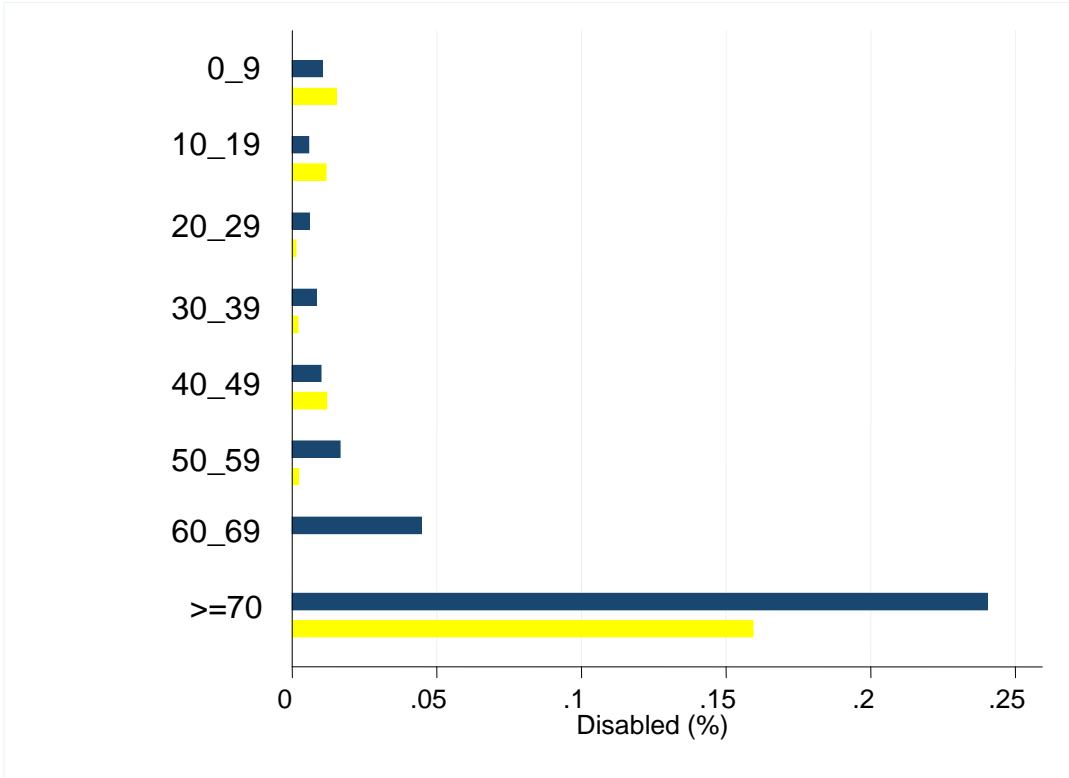
Graph 4.3 depicts the distribution of individuals who have suffered from at least one chronic disease in the last twelve months. Responses report that the percentage of Italians which suffers from chronic diseases is higher, on average, than that of immigrants in each age class.

Graph 4.3: Percentage by age range of immigrants and Italians suffering from chronic diseases
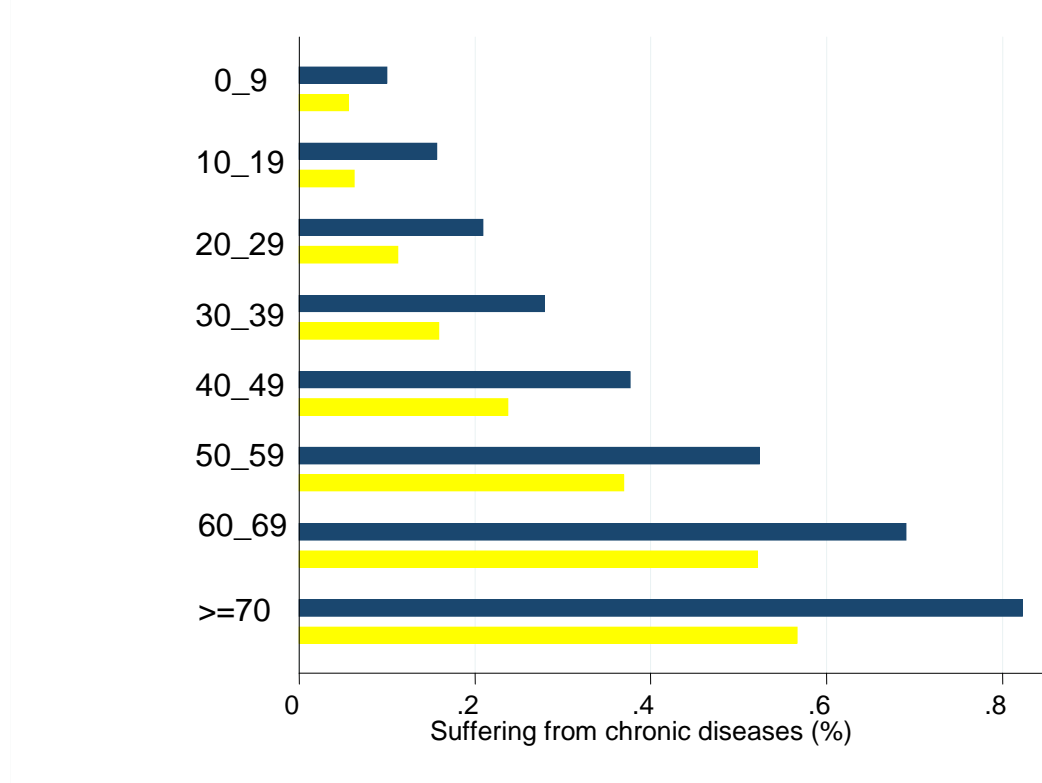
Italians ▮   Immigrants ▯

4.2.3 Access to general and specialist healthcare related services and to emergency rooms

As for visits to physicians, the analysis shows a discrepancy between immigrants and natives. What emerges is that the percentage of immigrants having seen a specialist, a general practitioner or both in the 4 weeks before the interview is always lower than that of natives.

Responses in table 4.10 indicate that 16.9% of the Italian population visited a specialist, versus 10.3% of the immigrant population. The difference remains when visits to general practitioners are taken into account.

Table 4.10: Percentage of immigrants and natives who visited a specialist and a GP

	Italians	Immigrants	Total
Visited a specialist	16.90%	10.33%	16.62%
Visited a GP	16.35%	10.22%	16.09%

These differences cannot be only explained by better health conditions perceived by immigrants relative to natives. Indeed, the discrepancy is significant and persists also when controlling by age and by the presence of chronic diseases. Considering the difference in answers between immigrant and natives under 15 years of age, results that 24.7% of Italian kids between 0 and 15 made a visit to a specialist in the 4 weeks before the interview, versus 16.4% of their immigrant counterpart (see table 4.11). On the other hand, no significant difference is found when considering visits to general practitioners.

Table 4.11: Percentage of immigrants and natives in between 0 and 15 years of age who visited a specialist

	Italians	Immigrants	Total
Visited a specialist	24.68%	16.44%	24.15%

Also the average number of visits to specialist is different and highly significant (1% level) in particular among people under 15 years old. Table 4.12 shows that Italians under 15 years old made, on average, 0.41 visits in the 4 weeks before the interview, compared with an average of 0.26 visits for similar immigrant population.

Again, no significant difference is, instead, found relative to the number of visits to general practitioners.

Table 4.12: T-test on the number of visits to specialist done by less than 15 years old individuals

Group	Mean	Std. Err.	[95% Conf. Interval]	
Italians	0.41	0.01	0.40	0.43
Immigrants	0.26	0.03	0.21	0.32

Coefficient	Std. Err.	T	P>t	[95% Conf. Interval]	
-0.15	0.03	-4.93	0.00	-0.21	-0.09

Graph 4.4 below reports the percentage of individuals who visited a specialist in the four weeks before the interview. The distribution is displayed by the age group and shows that the percentage of Italians who saw a specialist is always higher than that of immigrants in each age group.

Graph 4.4: Percentage by age range of immigrants and Italians who visited a specialist
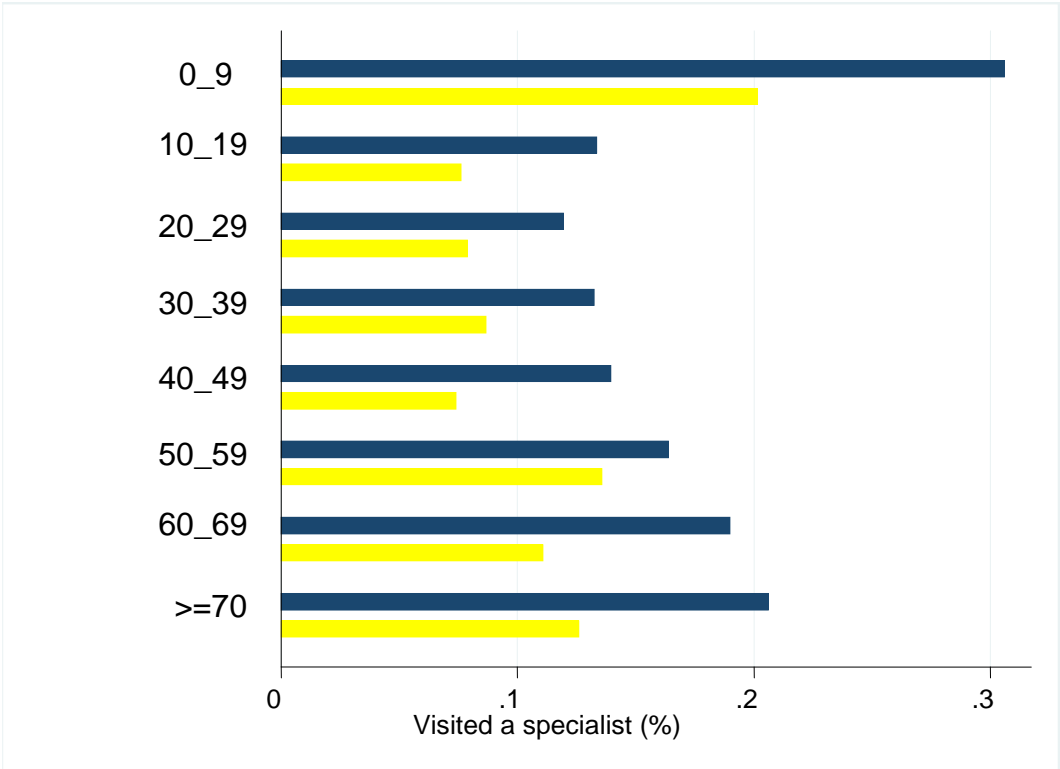
Italians ▮ Immigrants ▯

Even when considering only individuals suffering from chronic diseases, immigrants present a significantly lower frequency of visits to GPs compared to natives. A test on the means reports a difference in the average number of visits significant at 1% level. A significant difference in means is also found when comparing the average number of visits to specialists by immigrants and natives suffering from chronic diseases (see table 4.13 below).

Table 4.13: T-test on the number of visits to specialists done by individuals suffering from chronic diseases

Group	Mean	Std. Err.	[95% Conf.Interval]	
Italians	0.41	0.01	0.40	0.42
Immigrants	0.30	0.04	0.22	0.37

Coefficient	Std. Err.	t	P>t	[95% Conf.Interval]	
-0.11	0.04	-2.86	0.00	-0.19	-0.04

Tables 4.14 and 4.15 report the result of a means test on the total number of visits to general practitioners by the female and the male population, respectively. On average, females undergo more visits than males; however, being an immigrant seems to reduce, on average, the number of visits to general practitioners, both for the male and the female population. The difference in means is higher for females than for males (0.14 and 0.10 respectively) and they are both significant at 1% level.

Table 4.14: T test on the total number of visits to general practitioners done by females

Group	Mean	Std. Err.	[95% Conf.Interval]	
Italians	0.29	0.00	0.29	0.30
Immigrants	0.15	0.01	0.13	0.18

Coefficient	Std. Err.	t	P>t	[95% Conf.Interval]	
-0.14	0.01	-10.54	0.00	-0.17	-0.12

Table 4.15: T test on the total number of visits to general practitioners done by males

Group	Mean	Std. Err.	[95% Conf.Interval]	
Italians	0.21	0.00	0.21	0.22
Immigrants	0.12	0.01	0.10	0.14

Coefficient	Std. Err.	t	P>t	[95% Conf.Interval]	
-0.10	0.01	-8.64	0.00	-0.12	-0.08

A test on the means is also done using the number of visits to specialists made by the male and female population. The number of visits to specialists is, on average, higher than that of visits to general practitioners and females make, on average, more visits than males. The t test rejects the hypothesis of equal means for the two

subgroups of the population (Italians and immigrants), supporting the idea that being an immigrant is related to a lower access to services of specialty medicine.

Graph 4.5 shows that the percentage of women who visited a specialist is higher than that of men for both immigrants and natives. However, the percentage of immigrants who saw a specialist is always lower than that of Italians both for the female and the male population.

Graph 4.5: Percentage, by gender, of immigrants and natives who visited a specialist
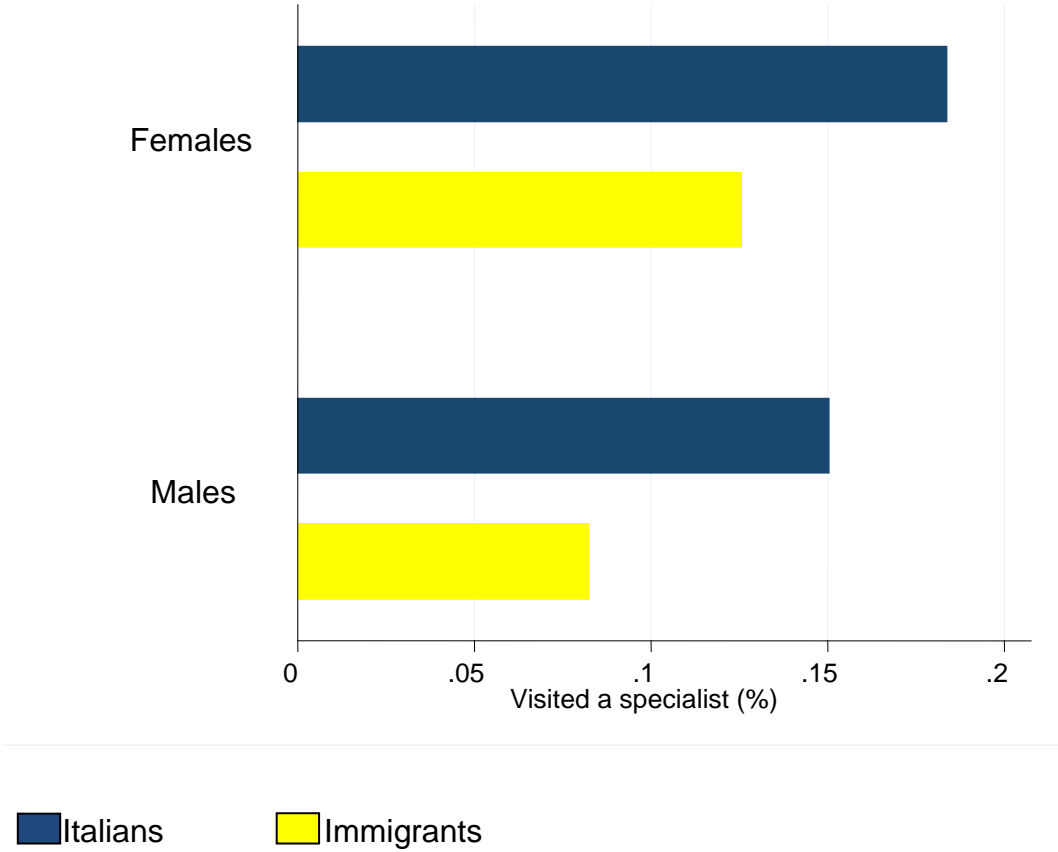
As for emergency related services, I test differences in access using a dummy variable which takes value 1 if the individual used the emergency room at least once in the three months before the survey and 0 otherwise. No significant difference in the use between immigrant and native females emerges, while the percentage of

immigrant males using emergency room services is significantly higher than that of natives (table 4.16). Among others, a possible explanation of the male immigrants over utilization of urgent care services with respect to both immigrant females and the Italian population could rely in their job position. Male immigrants are more likely than females and Italians to be employed in jobs which imply intense physical effort and which are at high risk of accidents, table 4.17 below shows that the percentage of employed immigrants who had an accident in the four weeks before the survey is significantly higher than that of their Italian counterpart. This explanation is to be added to the possible cultural, income, and information barriers to ordinary healthcare services.

Table 4.16: Use of emergency room in the three months before the interview by male and female population[23]

	Italians	Immigrants	Total
Males			
Made use of ER services	4.83%	6.76%	4.92%
Females			
Made use of ER services	4.18%	4.52%	4.19%

Table 4.17: Percentages of Italian and immigrants' working males who had an accident in the four weeks before the survey[24]

	Italians	Immigrants	Total
Working males who had an accident	2.90%	3.89%	2.96%

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[23] Pearson (males): Uncorrected chi2(1)=21.0651 Design-based F(1, 61916)=10.1337 P= 0.0015
Pearson (females):Uncorrected chi2(1)=0.7375   Design-based F(1, 66122)=0.4143 P= 0.5198
[24] Pearson: Uncorrected chi2(1) = 5.7936 Design-based F(1, 30371) = 3.0443 P= 0.0810

4.2.4 Access to pregnancy and childbirth related services

The focus on pregnant women makes evidence of differences in access to obstetric and gynecologic services highly significant, since the pregnant condition eliminates any ambiguity related to differences in healthcare needs between the immigrant and the Italian population.

Responses on pregnancy and childbirth reveal that immigrant women make on average less visits during pregnancy than Italian women and that they undergo their first visit later (time is calculated in terms of months of pregnancy). In particular, table 4.18 shows that the percentage of immigrant women who does her first ultrasound within the third month of pregnancy is much lower than that of Italian women. The percentage of those not having an ultrasound at all is very low for both groups, however this percentage for immigrant women is much higher (0.4% versus 0.1%). Moreover, the number of immigrant women who do the first ultrasound only at the 5th and 6th month of pregnancy is more than three times that of Italian women.

Table 4.18: Month of the first ultrasound for pregnant women

Month of the first ultrasound	Italians	Immigrants	Total
Never	0.05%	0.41%	0.09%
1	15.69%	12.29%	15.37%
2	33.32%	18.65%	31.96%
3	39.22%	37.14%	39.02%
4	7.11%	15.84%	7.92%
5	3.67%	11.79%	4.42%
6	0.81%	2.90%	1.01%
7	0.13%	0.98%	0.21%
Total	100.00%	100.00%	100.00%
Pearson: Uncorrected chi2(7)=203.2293 Design-based F(6.80, 39539.01)=16.7082 P=0.0000			

Table 4.19 reports the result of a t test on the total number of echographies done by women during pregnancy. The hypothesis of equality of means is rejected: the fact that Italian women do, on average, more echographies than immigrant women is not

a casual effect, but seems to be related to women's nationality. The difference persists and remains significant once controlling by age. In detail, among young women between 15 and 30 years old, immigrants do on average about one ultrasound and a half less than Italians. Among women over 30 years old, instead, the difference in the number of ultrasounds is reduced, but is still significant (on average, about one visit less for immigrants compared with natives).

Table 4.19: T-test on the total number of ultrasounds during pregnancy

Group	Mean	Std. Err.	[95% Conf. Interval]	
Italians	4.56	0.04	4.48	4.64
Immigrants	3.43	0.11	3.21	3.66

Coefficient	Std. Err.	T	P>t	[95% Conf. Interval]	
-1.13	0.12	-9.40	0.00	-1.36	-0.89

Table 4.20 shows a clear difference in the percentage of immigrant and native women who attended a pre-natal course during pregnancy. More than 84% of pregnant immigrant women did not attend a pre-natal course, relative to about 67% of Italian women in the same condition. Italian women seem to have a significantly higher probability to take part into a pre-natal course with respect to their immigrant counterpart.

Table 4.20: Percentage of pregnant women who did attend a pre-natal course during pregnancy

	Italians	Immigrants	Total
Took part in a prenatal course	32.58%	15.51%	30.99%
Pearson: Uncorrected chi2(1) = 66.8474 Design-based F(1, 5811) =37.7229 P = 0.0000			

By looking at table 4.21, the previous evidence on differences in access to prenatal courses between Italian and immigrant women is reinforced. Lack of knowledge is among the first reasons among immigrants women for not having attended a pre-natal course: responses indicate that about 19% of immigrant versus only 5.1% of Italian women did not take part in the course because they ignored its existence.

Reason for not attending the pre-natal course	Italians	Immigrants	Total
Already attended the course in the previous pregnancy	20.46%	11.39%	19.42%
Not useful	25.40%	28.28%	25.73%
Did not found an available structure	13.55%	11.53%	13.32%
Did not have time	19.41%	17.87%	19.23%
Did not know about the existence	5.14%	18.97%	6.71%
Was forced to stay in bed	3.04%	1.60%	2.88%
A cesarean delivery was already planned	9.89%	4.40%	9.26%
Other	3.12%	5.98%	3.45%
Total	100.00%	100.00%	100.00%

As for the type of structure which assisted women during pregnancy, immigrants make use of public health advisory structures much more than Italians. The chi squared test reveals that the difference is significant: 38.4% of immigrants compared to 13.7% of Italians.

4.2.5 Access to and utilization of preventive medicine

A focus on the use of preventive medical services by immigrants and natives reinforces previous evidence of different patterns of utilization between the native and the immigrant population. The focus on preventive medicine removes problems related to the interpretation of the results, since the use of preventive medical services is not related to differences in need conditions which may differ across the immigrant and the native population.

General prevention

Differences among immigrants and natives are present in relation to the use of preventive medical services. Data show that the percentage of immigrants under 15 and in between 15 and 60 years old who goes to a doctor for a check-up visit is significantly lower than that of natives.

Once controlling for sex, a significant difference is found comparing immigrant and native women: 6.5% of immigrant versus 10.1% of native females made a check-up visit.

A chi-squared test reports significantly different results also within the male population: responses indicate that a lower percentage of immigrants with respect to natives make control visits (7.6% of the Italian population made a control visit compared with 2.9% of the immigrant population).

Prevention during pregnancy

Table 4.22 below displays what emerges from answers to the question on the use of fetal morphology scan during pregnancy by immigrant and native women. I divided the population into two age groups to take into account that pregnancy for women older than 30 years old may necessarily imply more visits and controls.

Table 4.22: Fetal morphology scan among Italian and immigrant pregnant women in between 15-30 and older than 30 years old

Fetal morphology scan	Italians	Immigrants	Total	Fetal morphology scan	Italians	Immigrants	Total
Between 15-30				**Older than 30**			
No	18.08%	26.04%	19.54%	**No**	16.07%	22.36%	16.51%
Yes	77.37%	64.69%	75.05%	**Yes**	81.74%	68.51%	80.81%
Don't know	4.55%	9.27%	5.41%	**Don't know**	2.19%	9.12%	2.68%
Total	100.00%	100.00%	100.00%	**Total**	100.00%	100.00%	100.00%

The percentage of Italian women doing the scan is always higher, on average, than that of immigrants, both for those younger and older than 30 years old. It also emerges clearly that a much higher percentage of immigrants relative to native women does not to know whether she did the test or not during pregnancy. This trend in answers is similar for other questions related to pregnancy medical care: high percentages of immigrant women reveal not to know whether they were subjected to particular medical treatments during pregnancy (for example to alpha-

fetoprotein usage, chorionic sampling, and amniocentesis test). Moreover, a means test on the number of blood collection done by women during pregnancy reports a significant difference between immigrants and natives both for women under and above 30 years of age. In particular, Italian women do on average more blood sample tests than immigrant women during pregnancy. Immigrant pregnant women also report a lower usage of food supplements with respect to their Italian counterpart. In detail, about 57% of immigrant women did not take any supplement during pregnancy, compared to 30.9% of Italians.

Evidence of the lack of information on the services provided among immigrants, is also related to the possibility of undergoing an antenatal diagnosis during pregnancy: 36.9% of immigrant women do not know to have this opportunity, compared with 11.6% of similar Italian population (see table 4.23).

Table 4.23: Percentage of women informed about the possibility of a prenatal diagnosis during pregnancy

Informed about the possibility of a prenatal diagnosis	Italians	Immigrants	Total
No	11.60%	36.89%	13.95%
Yes	88.40%	63.11%	86.05%
Total	100.00%	100.00%	100.00%

Females' prevention services

In order to test for differences in the use of females' health care prevention services by the immigrant and the native population, I focus on responses to questions related to control visits, such as pap-test and mammography, by women in between 30 and 60 years old. The chi-squared test tells us that the percentage of immigrant women who has never had a mammography is significantly higher than that of Italians, 75.8% versus 53.6% respectively. As for the pap-test visit the results are similar, with 45.7% of immigrant females who has never done a pap test, compared with 24.6% of their Italian counterpart (see tables 4.24 and 4.25).

Table 4.24: Percentage of sampled Italian and immigrant women aged between 30 and 60 years old who did and did not have a mammography

Mammography	Italians	Immigrants	Total
No	53.62%	75.78%	54.68%
Yes	46.38%	24.22%	45.32%
Total	100.00%	100.00%	100.00%

Table 4.25: Percentage of sampled Italian and immigrant women aged between 30 and 60 years old who did and did not have a pap test

Pap Test	Italians	Immigrants	Total
No	24.56%	45.67%	25.57%
Yes	75.44%	54.33%	74.43%
Total	100.00%	100.00%	100.00%

5. Empirical models and main results

The descriptive analysis in chapter 4 has highlighted the existence of differences in access to and use of healthcare services by the immigrant and the native population.

The following econometric analysis aims at evaluating the presence of different patterns of utilization between immigrants and natives, controlling for other determinants of the demand for healthcare services. The objective of this quantitative study is thus to assess whether the differences found in access to and use of healthcare services depend on being an immigrant, ceteris paribus.

The empirical analysis which follows adopts two separate models in order to deal with the two different kinds of dependent variables available: binary variables and count variables.

The first model fits binary outcomes and is a **logistic regression model** which aims at catching the determinants of the probability for the respondent of having visited a doctor or the emergency ward. Logistic models are frequently used in health economics. Giannoni (2009), for example, develops a logistic regression in order to estimate the determinants of unmet needs in the use of health care services in Italy.

To deal with count data, instead, I run a **negative binomial regression model** using as depend variables measures of the total number of visits (*n_visits*), the number of visits to specialists (*n_visits_sp*) and the number of visits to general practitioners (*n_visits_gen*).

I run each regression twice: firstly including the variable citizenship to distinguish between immigrants and natives and without controlling for the immigrants' country of origin. Then the regression is run omitting the variable citizenship and including three dummies as indicators of immigrants' origins: the first dummy, *ue_25*, takes value 1 if the individual is a non-citizen and was born in one of the 25 countries members of

the European union (EU-25), and zero otherwise. The variable *no_ue25* crosses the non-citizen status with birthplace, this time the country of origin is outside the EU-25[25]. The third predictor is *Italy* and groups all non-citizens born in Italy. In this way I try to capture differences in access to health care services related to immigrants' birthplace.

Variables have been selected considering the empirical literature on the issue and the results are robust to the exclusion of some variables from the model[26].Results are also robust to the exclusion of the variable *citizenship* from the analysis, meaning that the coefficients related to the other determinants of the demand for healthcare do not change (in terms of sign, size and significance) when *citizenship* is excluded from the regression[27].

5.1 Access to doctors

In order to estimate access to healthcare services by the immigrant and the native population, I first run a **logistic model**. The outcome of interest is a dummy taking value 1 if the individual visited a doctor in the four weeks before the interview, and zero otherwise (the *dn_visits* variable).

The logit regression is as follows:

(1) $y_i=1$ if $y_i^* >=0$

   $y_i=0$ otherwise;

where y_i is the dependent variable, which takes value 1 if the individual i accessed medical visits and 0 otherwise, and y_i^* is as follows:

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[25] Countries outside the European Union 25 include: Albania, Romania, other European countries which are not European Union 25 members, Morocco, other African countries, Latin-American countries, East and South-West Asian countries, and North-American or Oceanic countries. These two last groups present a very low incidence on non EU25 immigrants (1.57%)
[26] The regressions have been performed progressively adding the independent variables in order to check for problems related to collinearity.
[27] The data are also clustered according to the area of residence.

(2) $y_i^* = \alpha + \beta\,citizenship + \gamma X_i + \delta Z_i + \varepsilon_i;$

where *citizenship* is a dummy taking value one if the individual is a non-citizen and 0 otherwise, X is a vector of socio-economic and need variables, which include age (*age*), sex (*male*), the level of education (*basic_educ, medium_educ, high_educ*), a self-reported measure of income (*insufficient_income, low_income, medium_income, high_income*), the number of family members (*fam_num*), the civil status (*married*), the smoking habit (*smoking)*, the working condition (*working*), housing conditions (*bad_condition, small_home*), the practicing of sports (*sport*), being on a diet (*on_diet*), health beliefs on alternative medicine (*alternative_medicine*), the suffering from chronic diseases (*chronic_disease*), the suffering from disabilities (*dis_type*), the occurrence of an accident (*accident*), the suffering from any disease (*disease*), being limited in any working activity (*limited_working*), the fact of being subjected to surgery (*surgery*), and a self-reported measure of health status (*very_good_health, good_health, average_health, bad_health, very_bad_health*). Z is another vector of variables including indicators of the size of the municipality of residence (*city1-city6*), and of the area of residence. The latter is expressed in the regression as a set of dummies giving information on where in Italy the individual resides (*North-West, North-East, Central, South, and Insular*).

ε_i is the error term for individual i.

The model estimates the probability of using healthcare services, that is:

(3) $P(y_i = 1) = P(y_i^* > 0)$

The results of the logit regression are reported in table 5.1 below. The first column (a) reports the results of the analysis which uses *citizenship* as the discriminating factor between immigrants and natives, while the second column (b) shows the results of the analysis in which citizenship is replaced by the three dummies which combine the non-citizen characteristic with information on the country of origin.

Table 5.1: Results of the logistic regressions on dn_visits

	Having visited a doctor (a)	Having visited a doctor (b)
citizenship	-0.250*** (0.0492)	
ue25		0.104 (0.240)
no_ue25		-0.243*** (0.0785)
Italy		-0.423*** (0.0453)
Socio-demographic variables:		
age	-0.0162*** (0.00275)	-0.0163*** (0.00280)
age_sq	0.000182*** (3.43e-05)	0.000183*** (3.48e-05)
male	-0.147*** (0.0147)	-0.146*** (0.0146)
Level of education[28]:		
basic_educ	-0.0712** (0.0332)	-0.0694** (0.0319)
medium_educ	-0.00232 (0.0134)	-0.000874 (0.0148)
Level of income[29]:		
medium_income	0.00912 (0.0547)	0.00944 (0.0550)
low_income	0.0409 (0.0634)	0.0424 (0.0645)
insufficient_income	-0.133 (0.107)	-0.132 (0.108)
married[30]	0.118*** (0.0137)	0.118*** (0.0136)
fam_num	-0.0453*** (0.00848)	-0.0446*** (0.00853)
working	0.0251 (0.0277)	0.0251 (0.0281)
on_diet	0.358*** (0.0122)	0.358*** (0.0124)
alternative_medicine	0.0730*** (0.0256)	0.0731*** (0.0258)
smoking	-0.128*** (0.0327)	-0.128*** (0.0328)
sport	0.164***	0.164***

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[28] The baseline category is "high_educ"
[29] The baseline category is "high_income"

[30] Missing values for "married", "smoking", "working", "smoking", and "limited_working" have been added as additional category (coefficients not reported)

	Having visited a doctor (a)	Having visited a doctor (b)
	(0.0178)	(0.0179)
Housing conditions:		
small_home	0.00832	0.0106
	(0.0361)	(0.0347)
bad_condition	-0.0906*	-0.0878*
	(0.0483)	(0.0466)
Need variables:		
chronic_disease	0.373***	0.373***
	(0.0315)	(0.0312)
dis_type	-0.126***	-0.127***
	(0.0487)	(0.0489)
accident	0.760***	0.760***
	(0.0623)	(0.0623)
disease	1.250***	1.249***
	(0.0498)	(0.0502)
limited_working	0.577***	0.577***
	(0.0288)	(0.0288)
surgery	0.587***	0.587***
	(0.0380)	(0.0378)
Self-reported health measures[31]:		
good_health	0.270***	0.271***
	(0.0397)	(0.0402)
average_health	0.576***	0.577***
	(0.0296)	(0.0303)
bad_health	0.770***	0.771***
	(0.0668)	(0.0672)
very_bad_health	0.863***	0.864***
	(0.0102)	(0.0104)
Territorial variables:		
Size of the municipality[32]:		
city2	0.00599	0.00587
	(0.0885)	(0.0889)
city3	-0.120	-0.120
	(0.178)	(0.178)
city4	0.0445	0.0451
	(0.121)	(0.120)
city5	-0.0167	-0.0163
	(0.120)	(0.120)
city6	-0.0648	-0.0640
	(0.114)	(0.113)
Area of residence[33]:		
north_west	0.0816***	0.0830***
	(0.0169)	(0.0164)
north_east	0.170***	0.171***

[31] The baseline category is "very_good_health"

[32] The baseline category is "city1"

[33] The baseline category is "south"

	Having visited a doctor (a)	Having visited a doctor (b)
	(0.0134)	(0.0133)
central	0.153***	0.154***
	(0.0227)	(0.0224)
insular	-0.00452	-0.00434
	(0.00901)	(0.00891)
constant	-1.987***	-1.994***
	(0.115)	(0.111)
Observations	128,040	128,040
Pseudo R2	0.1627	0.1628

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

It appears immediately that, ceteris paribus, being an immigrant (*citizenship*), significantly diminishes the probability to visit a doctor. In particular, being an immigrant leads to a 0.25 units decrease of the log-odds of the dependent variable *dn_visits*. The exponentiation of this raw coefficient, tells us that the probability that an immigrant makes a visit is 78% than that of an Italian. Once considering the different *areas of origin*, the signs of the coefficients remain negative and significant, except for those immigrants coming from the EU-25. In particular, the coefficient for non-citizens born in Italy is relatively high (-0.423) and refers, at least for a large part, to immigrants' children.

All other estimates are similar for both the regressions (with and without *citizenship*). In detail, the *age coefficient* (*age*) is negative and significant. The introduction of the square of age as input variable reveals that the relationship between age and the use of healthcare services is not linear. Although a positive sign could be expected (based on the predictions of the Grossman model), empirical evidence does not show clear cut results. Moreover, in this analysis, the positive effect of aging on the use of health care services may be captured by other predictors which are included in the regressions, such as the suffering from disabilities or chronic diseases. The *gender* factor, instead, has a significant effect on the probability of having visited a doctor. Being *male*, has a negative and significant impact on the probability of a visit.

As for other *socio-demographic* controls, individuals with a low level of education (*basic_educ*) are less likely to have visited a doctor relative to highly educated individuals (coefficients are -0.0712 and -0.0694 in regressions (a) and (b) respectively). A negative relation also holds between the probability of a contact with a doctor and the number of family members (*fam_num*). The effect of income, instead, is not significant. Being married (*married*), and playing sport (*sport*) have both a positive and significant effect on the probability of a visit, while for smoking habits (*smoking*) the relationship is reversed.

Environmental factors seem to have an influence: in particular, living in bad housing conditions negatively and significantly affect the probability of a visit to the doctor.

Measures of the individual's *health status*, subjective and objective, have a significant effect on the dependent variable. The probability of visiting a doctor rises with the worsening of the individual's perception of his/her health status[34]. The suffering from chronic diseases (*chronic_disease)*, the occurrence of a recent accident (*accident*), as well as the suffering from a disease in the four weeks before the survey (*disease*), also make a visit to the doctor more likely (coefficients are 0.373, 0.76, and 1.25 respectively in regression (a)). Being a disabled (*dis_type*), instead, significantly and negatively affect the probability of having visited a physician in the four weeks before the survey. The coefficients are -0.126 and -0.127 in the regressions (a) and (b) respectively. A possible explanation is that disabled people, because of their physical limitations, may find it more difficult to reach healthcare structures. This result is in line with what found by Giannoni (2009), who reports that being disabled increases the probability of having healthcare needs unmet.

The analysis also reveals differences in the coefficients of the *macro-regions of residence*, which reflect the availability of healthcare services. Living in the Northern

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[34] Each category of subjective health status in the regression (good_health, average_health, bad_health, very_bad_health) is to be compared with the best possible health condition (very_good_health)

(*north_west* and *north_east*) or Central (*central*) Italian regions increases the probability of having contacted a doctor, relative to living in the South (*south*). In particular, living in the North-West, North-East, or in the Centre leads to a 0.0816, 0.17, and a 0.153 units increase in the log-odds of the probability of visiting a physician (in regression (a)). This geographic difference may reflect a different provision of services across the country, because of the higher supply of medical services in the North than in the South of Italy.

5.2 Access to emergency services

The regressions run are estimates of a **logistic model** as before, and results are presented in table 5.2 below. The output variable of interest here is a measure of urgent healthcare services utilization. The dummy (*er*) takes value 1 if the individual used the emergency room services in the three months before the interview and 0 otherwise.

Table 5.2: Results of the logistic regressions on ER

	Having used ER services (a)	Having used ER services (b)
citizenship	0.272*** (0.0944)	
ue25		-0.150 (0.503)
no_ue25		0.332*** (0.0616)
Italy		0.120 (0.210)
Socio-demographic variables:		
age	-0.0388*** (0.0101)	-0.0387*** (0.0101)
age_sq	0.000285*** (9.40e-05)	0.000285*** (9.42e-05)
male	0.241*** (0.0208)	0.240*** (0.0208)
Level of education[35]:		

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[35] The baseline category is "high_educ"

	Having used ER services (a)	Having used ER services (b)
basic_educ	-0.00759 (0.0780)	-0.0131 (0.0773)
medium_educ	0.0217 (0.0821)	0.0184 (0.0834)
Level of income[36]: medium_income	-0.131** (0.0608)	-0.132** (0.0602)
low_income	-0.0430 (0.0700)	-0.0436 (0.0693)
insufficient_income	0.0554 (0.0576)	0.0535 (0.0574)
married[37]	0.142*** (0.0107)	0.141*** (0.0111)
fam_num	-0.0571*** (0.0178)	-0.0565*** (0.0185)
working	0.172** (0.0780)	0.171** (0.0774)
on_diet	0.164*** (0.0276)	0.164*** (0.0280)
alternative_medicine	0.0690 (0.0471)	0.0705 (0.0470)
smoking	0.147*** (0.0495)	0.148*** (0.0497)
sport	0.0735 (0.0544)	0.0737 (0.0541)
Housing conditions: small_home	0.109*** (0.0238)	0.109*** (0.0257)
bad_condition	0.0579 (0.0766)	0.0563 (0.0788)
Need variables: chronic_disease	0.309*** (0.0720)	0.310*** (0.0715)
dis_type	0.160** (0.0775)	0.160** (0.0784)
accident	2.251*** (0.0395)	2.251*** (0.0395)
disease	0.472*** (0.0504)	0.471*** (0.0505)
llimited_working	0.550*** (0.0552)	0.550*** (0.0555)
surgery	0.331*** (0.0552)	0.331*** (0.0554)
Self-reported health measures[38]:		

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[36] The baseline category is "high_income"

[37] Missing values for "married", "smoking", "working", "smoking", and "limited_working" have been added as additional category (coefficients not reported)

[38] The baseline category is "very_good_health"

	Having used ER services (a)	Having used ER services (b)
good_health	0.122**	0.121**
	(0.0526)	(0.0520)
average_health	0.281***	0.281***
	(0.0935)	(0.0929)
bad_health	0.533***	0.533***
	(0.0829)	(0.0824)
very_bad_health	0.618**	0.617**
	(0.252)	(0.252)
Territorial variables:		
Size of the municipality[39]:		
city2	0.103	0.104
	(0.0851)	(0.0857)
city3	0.149	0.151
	(0.0977)	(0.0975)
city4	0.177*	0.179*
	(0.0920)	(0.0926)
city5	0.101**	0.102**
	(0.0406)	(0.0409)
city6	0.112	0.113
	(0.109)	(0.109)
Area of residence[40]:		
north_west	0.492***	0.492***
	(0.0308)	(0.0306)
north_east	0.573***	0.573***
	(0.0322)	(0.0323)
central	0.459***	0.459***
	(0.0276)	(0.0279)
insular	0.0778***	0.0779***
	(0.0100)	(0.0102)
constant	-3.553***	-3.558***
	(0.137)	(0.134)
Observations	128,040	128,040
Pseudo R2	0.1118	0.1119

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

When confronting immigrants and natives through *citizenship*, being a non-citizen leads, ceteris paribus, to a much higher and significant probability of having used the emergency room (ER) than being an Italian citizen (being immigrant implies a 0.272 increase in the log-odds of the *er* variable).

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[39] The baseline category is "city1"

[40] The baseline category is "south"

As mentioned in the previous chapter, the overutilization of ER by immigrants with respect to natives may have different explanations. Information barriers on how to contact general physicians may lead to the chronicization of diseases which could have been treated through different healthcare services. Moreover, ER services may be easier to access by immigrants and provide immediate solutions to problems which, however, could have been more efficiently treated at a less intense level of medical assistance. The size of the coefficient could also be influenced by the position occupied by immigrants at work. Immigrants are more likely than Italians to do manual and risky jobs and to be thus more exposed to the risk of accidents at work. This latter explanation is reinforced by evidence found in the second regression, which distinguishes among immigrants of different origins. In this case, only immigrants belonging to countries *outside the EU25* report a positive and significant coefficient (0.332). Immigrants coming from outside the EU25 may be more likely to have migrated for working reasons and to hold job positions at high risk of physical accidents. The higher usage of emergency wards by the immigrant population is in line with previous findings on the issue, which report an over utilization of emergency services by the immigrant with respect to the native population[41].

As for other determinant factors, *age* seems to be significantly and negatively correlated with the use of emergency services. Being *male* highly increases the probability of having used the ER with respect to being female (a 0.241 units increase in the log-odds of the dependent variable in the first regression). Indicators of the *level of education* are not significant, while the number of family members seems to be significantly and negatively correlated with the probability of recourse to ER. Moreover, living in an inadequate *housing environment* (in a *too small house* for the number of inhabitants), increases the probability of ER usage.

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[41] See, among others, Munoz de Bustillo and Anton (2009), Sanz, et al. (2000), Cots et al. (2007), ISTAT (2008), Bernardotti (2003)

Variables controlling for *health status* have a high and significant effect on the ER usage whether they are objective evaluations such as *accident*, *chronic_disease*, and *disease,* as well as subjective evaluation of health conditions (*good_health*, *average_health*, *bad_health*, and *very_bad_health*). In detail, having had an accident is highly and significantly correlated with the probability of ER usage. The same is true for individuals suffering from chronic diseases and for those who suffered from an illness in the four weeks before the survey. The same positive sign is found comparing a good, average, bad or very bad health status with their reference category (very good health status). Being a disabled highly and significantly increase the probability of having used the emergency ward. Disabled people may find it easier to access emergency wards rather than other healthcare services because the ER eliminates the difficulty of reaching the healthcare structure alone. The working condition also has a positive and significant impact on the variable of interest.

As for *geographic areas*, the divide between the North-Center and the South of Italy widens for ER services utilization with respect to the previous case. Individuals living in the Northern and Central part of the peninsula have a much higher probability of using ER services with respect to the South. In detail, residing in the North-West, North-East, or the Centre of Italy leads to a 0.492, 0.573, and 0.459 units increase in the log-odds of the *ER* variable.

5.3 Number of visits

As for the count data analysis, large part of the literature on health economics have relied on Poisson and negative binomial regression models, as well as on their modifications such as zero-truncated Poisson and zero-truncated negative binomial[42]. I perform a **negative binomial regression model** on the number of visits to physicians (*n_visits*), both general and specialist, in the four weeks before the survey and, after that, I distinguish between visits to specialists and general

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[42] See, among others, Munoz de Bustillo and Anton (2009) and Winkelmann (2002)

practitioners (*n_visits_sp* and *n_visits_gen*). The negative binomial regression model (NBRM) fits the data better than the Poisson, since a Wald test rejects the hypothesis of equality between mean and variance and supports the hypothesis of over-dispersion.

Assuming y is a count variable taking only non negative integer values, the probability of y to occur N times is:

(4) $P(y_i = N) = (e^{-\lambda} \lambda_i^N)/N!$ for $N = 0, 1, ..., \infty$

Where λ_i is a random variable which takes the form:

(5) $\lambda_i = \exp(\Sigma b_j X_{ji}) \exp(e_i)$,

where b_s is the vector of the coefficients of the input variables and X is the vector including all the predictors; j stands for the j-th variable and i stands for the i-th individual[43]. The input variables used in the regression are the same as those in the logistic regression (see section 5.1). The error term, e_i, is unobserved and follows a gamma distribution.

Table 5.3 shows the results of the negative binomial regressions. All regressions are run twice: once with the variable *citizenship* as discriminating factor between immigrants and natives and the other time crossing the variable *citizenship* with information on birthplace (generating the three dummies mentioned above: *ue_25*, *no_ue25*, and *Italy*).

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[43] See Gerdtham, 1997

Table 5.3: Results of the negative binomial regression

	Visits to GPs and specialists (a)	Visits to GPs and specialists (b)	Visits to specialists (a)	Visits to specialists (b)	Visits to GPs (a)	Visits to GPs (b)
Citizenship	-0.236*** (0.0145)		-0.402*** (0.0634)		0.0166 (0.0723)	
ue25		0.181 (0.216)		0.359 (0.274)		-0.0858 (0.0707)
no_ue25		-0.272*** (0.0361)		-0.518*** (0.0330)		0.0169 (0.0637)
Italy		-0.284*** (0.0530)		-0.385*** (0.117)		0.0998 (0.265)
Socio-demographic variables:						
age	-0.00987*** (0.00127)	-0.00995*** (0.00131)	-0.0104*** (0.00303)	-0.0106*** (0.00298)	0.000517 (0.00435)	0.000532 (0.00436)
age_sq	9.29e-05*** (1.20e-05)	9.35e-05*** (1.23e-05)	1.89e-05 (2.78e-05)	1.97e-05 (2.78e-05)	6.40e-05 (4.19e-05)	6.38e-05 (4.21e-05)
male	-0.129*** (0.00962)	-0.128*** (0.00988)	-0.149*** (0.00960)	-0.147*** (0.00983)	-0.0694*** (0.0182)	-0.0695*** (0.0182)
Level of education[44]:						
basic_educ	-0.0777** (0.0350)	-0.0741** (0.0332)	-0.286*** (0.0400)	-0.278*** (0.0401)	0.154*** (0.0543)	0.153*** (0.0544)
medium_educ	-0.0303 (0.0214)	-0.0278 (0.0205)	-0.141*** (0.0436)	-0.136*** (0.0436)	0.139*** (0.0328)	0.139*** (0.0327)
Level of income[45]:						
medium_income	-0.0188 (0.0467)	-0.0188 (0.0466)	-0.0486 (0.0547)	-0.0492 (0.0544)	0.0242 (0.0445)	0.0242 (0.0445)
low_income	-0.00969 (0.0548)	-0.00880 (0.0554)	-0.106 (0.0731)	-0.105 (0.0736)	0.113** (0.0558)	0.113** (0.0559)
insufficient_income	-0.0949 (0.102)	-0.0935 (0.102)	-0.160 (0.126)	-0.159 (0.127)	0.0167 (0.100)	0.0164 (0.101)
married[46]	0.121*** (0.00680)	0.121*** (0.00675)	0.181*** (0.0216)	0.181*** (0.0207)	0.0490*** (0.0132)	0.0491*** (0.0133)
fam_num	-0.0393*** (0.00828)	-0.0390*** (0.00829)	-0.0404*** (0.0132)	-0.0402*** (0.0132)	-0.0347*** (0.00739)	-0.0349*** (0.00754)
working	-0.0237 (0.0234)	-0.0233 (0.0232)	-0.00412 (0.0337)	-0.00351 (0.0335)	-0.0680** (0.0291)	-0.0679** (0.0291)
on_diet	0.254*** (0.0138)	0.254*** (0.0139)	0.310*** (0.0264)	0.310*** (0.0264)	0.171*** (0.0128)	0.171*** (0.0126)
alternative_medicine	0.0568***	0.0563***	0.148***	0.147***	-0.0329	-0.0329

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[44] The baseline category is "high_educ"
[45] The baseline category is "high_income"

[46] Missing values for "married", "smoking", "working", "smoking", and "limited_working" have been added as additional category (coefficients not reported)

	Visits to GPs and specialists (a)	Visits to GPs and specialists (b)	Visits to specialists (a)	Visits to specialists (b)	Visits to GPs (a)	Visits to GPs (b)
	(0.0190)	(0.0188)	(0.0310)	(0.0294)	(0.0294)	(0.0292)
smoking	-0.0768***	-0.0774***	-0.0612**	-0.0634**	-0.101***	-0.101***
	(0.0177)	(0.0175)	(0.0260)	(0.0260)	(0.0172)	(0.0173)
sport	0.0848***	0.0845***	0.151***	0.150***	0.0108	0.0108
	(0.00813)	(0.00825)	(0.0200)	(0.0201)	(0.0147)	(0.0147)
Housing conditions: small_home	-0.00383	-0.00259	-0.0210	-0.0186	0.0301	0.0296
	(0.0107)	(0.0109)	(0.0404)	(0.0419)	(0.0287)	(0.0285)
bad_condition	-0.0246	-0.0217	-0.0696***	-0.0629***	0.0433	0.0427
	(0.0396)	(0.0388)	(0.0226)	(0.0217)	(0.0550)	(0.0550)
Need variables:						
chronic_disease	0.341***	0.340***	0.323***	0.321***	0.364***	0.364***
	(0.0355)	(0.0354)	(0.0339)	(0.0339)	(0.0369)	(0.0370)
dis_type	0.0506**	0.0504**	0.0753	0.0751	0.0303	0.0304
	(0.0245)	(0.0247)	(0.0518)	(0.0521)	(0.0285)	(0.0285)
accident	0.608***	0.609***	0.766***	0.767***	0.360***	0.360***
	(0.0296)	(0.0297)	(0.0596)	(0.0606)	(0.0547)	(0.0544)
disease	0.890***	0.890***	0.743***	0.744***	1.048***	1.048***
	(0.0456)	(0.0457)	(0.0426)	(0.0426)	(0.0401)	(0.0400)
limited_working	0.454***	0.454***	0.492***	0.493***	0.405***	0.405***
	(0.0256)	(0.0256)	(0.0172)	(0.0172)	(0.0390)	(0.0390)
surgery	0.453***	0.453***	0.677***	0.675***	0.172***	0.172***
	(0.0456)	(0.0454)	(0.0793)	(0.0789)	(0.0357)	(0.0355)
Self-reported health measures[47]: good_health	0.228***	0.230***	0.216***	0.218***	0.258***	0.258***
	(0.0319)	(0.0312)	(0.0311)	(0.0295)	(0.0591)	(0.0588)
average_health	0.538***	0.540***	0.524***	0.527***	0.567***	0.566***
	(0.0262)	(0.0252)	(0.0434)	(0.0414)	(0.0500)	(0.0499)
bad_health	0.722***	0.724***	0.811***	0.815***	0.663***	0.663***
	(0.0365)	(0.0354)	(0.0561)	(0.0547)	(0.0626)	(0.0626)
very_bad_health	0.871***	0.873***	0.929***	0.932***	0.849***	0.849***
	(0.0367)	(0.0365)	(0.0781)	(0.0771)	(0.0194)	(0.0195)
Territorial variables: Municipality of residence[48]: city2	0.0506	0.0499	0.103**	0.101**	-0.0177	-0.0177
	(0.0416)	(0.0419)	(0.0425)	(0.0416)	(0.118)	(0.118)
city3	-0.0494	-0.0506	-0.0558	-0.0587	-0.0272	-0.0270
	(0.127)	(0.127)	(0.106)	(0.106)	(0.154)	(0.154)
city4	0.0642	0.0639	0.0466	0.0454	0.0915	0.0914
	(0.0799)	(0.0797)	(0.0440)	(0.0439)	(0.119)	(0.119)
city5	0.0354	0.0350	0.0459*	0.0444*	0.0247	0.0247

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[47] The baseline category is "very_good_health"

[48] The baseline category is "city1"

	Visits to GPs and specialists (a)	Visits to GPs and specialists (b)	Visits to specialists (a)	Visits to specialists (b)	Visits to GPs (a)	Visits to GPs (b)
	(0.0738)	(0.0739)	(0.0252)	(0.0256)	(0.130)	(0.130)
city6	-0.0446	-0.0443	-0.0312	-0.0309	-0.0569	-0.0570
	(0.0759)	(0.0757)	(0.0472)	(0.0470)	(0.104)	(0.104)
Area of residence[49]:						
north_west	-0.0140	-0.0129	0.131***	0.132***	-0.197***	-0.197***
	(0.0124)	(0.0121)	(0.0101)	(0.00920)	(0.0222)	(0.0223)
north_east	0.00688	0.00832	0.0641***	0.0670***	-0.0558***	-0.0562***
	(0.00583)	(0.00660)	(0.00780)	(0.00792)	(0.0165)	(0.0167)
central	0.0856***	0.0858***	0.138***	0.138***	0.0123	0.0122
	(0.0136)	(0.0135)	(0.00523)	(0.00482)	(0.0256)	(0.0256)
insular	0.0177***	0.0177***	0.0341***	0.0341***	-0.00544	-0.00550
	(0.00671)	(0.00668)	(0.00309)	(0.00300)	(0.0142)	(0.0143)
constant	-1.561***	-1.564***	-1.988***	-1.988***	-2.843***	-2.841***
	(0.108)	(0.106)	(0.119)	(0.116)	(0.159)	(0.159)
lnalpha	0.313***	0.313***	1.012***	1.010***	0.355**	0.355**
	(0.0881)	(0.0880)	(0.0573)	(0.0574)	(0.145)	(0.145)
Observations	128,040	128,040	128,040	128,040	128,040	128,040

Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Considering the total number of visits (*n_visits*), the *citizenship* coefficient is negative and highly significant, meaning that the difference in the logs of the expected counts is 0.236 units lower for immigrants compared to natives. Again, once the variable *citizenship* is split into three according to the place of birth, no significant result is found for immigrants belonging to EU-25 Member States. Coefficients related to non-citizens from outside the EU-25 and to non-citizens born in Italy are, instead, negative and significant at 1% level (-0.272 and -0.284 respectively).

The *age* coefficient is low, negative and significant. The square of age reveals a non linear relationship between age and the frequency of visits. In detail, it seems that very young individuals visit doctors more frequently than older individuals. However, running the same regression only for people above 40 reverses the sign of the coefficient, making age positively related to the dependent variable.

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[49] The baseline category is "south"

Males have a 0.129 units expected decrease in the difference in the logs of the expected counts (i.e. the number of visits) relative to females, given that the other predictor variables are held constant. Evidence of differences in access to health care services related to gender is in line with empirical evidence found in the literature on females' higher usage of health care services compared with males[50]. Other *socio-demographic factors*, such as the *level of education*, have a negative effect on the number of visits. In detail, having a low level instead of a high level of education, leads to a 0.0777 (or 0.0741 if we consider the second column regression) units expected decrease in the difference in the logs of the expected counts, holding the other predictors constant. That is the frequency of visits is lower for low educated individuals compared with highly educated ones.

As expected, *morbidity factors* have a significant effect on the number of visits. Among others, suffering from *chronic diseases*, the occurrence of an *accident* or the worsening of the self perceived *health status* positively and significantly affect the number of visits done.

Differences across *regional groups* are found only when comparing the Centre or the Islands with the South of Italy. Residing in the central and insular part of the country appear to have a positive effect on the number of visits made, while no significant effect is found comparing the North and the South.

Once distinguishing between visits to specialists and general practitioners, results partly change.

As for *visits to specialists* (*n_visits_sp*), the sign of the *citizenship* coefficient remains negative and its size increases with respect to the total number of visits (-0.402). Immigrants are much less likely to visit specialists than Italians. The same happens once the *citizenship* variable is disaggregated according to birthplace: the coefficient related to *ue25* is not significant, while those of *no_ue25* and *Italy* remain negative

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[50] See, among others, Akresh (2009), Bustillo and Anton (2009), Gerdtham (1997)

and significant and their size increases with respect to the case in which the total number of visits was taken into account.

The *age* coefficient remains negative and significant, as well as the *gender* coefficient. Measures of the *level of education* report that a low level has a large negative impact on the outcome variable compared to a high level of education. Results show that with the decrease of the level of education the coefficient increases in absolute values and remains negative. In particular, compared with the regression on the total number of visits, the coefficient related to basic education rises (-0.0777 versus -0.286 in regressions (a)).

Need variables measuring *health status*, both objective and subjective, remain significant. In particular, being *limited in ordinary working activities* and having undergone a *surgery* are factors which positively and significantly affect the frequency of visits to specialists.

Geographic differences turn out to be significant when the analysis focuses on visits to specialists. Specifically, living in the Northern or in the Central part of Italy positively affects the outcome variable with respect to living in the South. One possible interpretation of these results brings up the backwardness of Southern Italy in terms of provision of healthcare services when dealing with specialty medicine.

For what regards visits to *general practitioners* (*n_visits_gen*), instead, no significant effect is found related to *citizenship*. Being immigrant does not influence the number of visits to general practitioners. The same result is found once *citizenship* is crossed with birthplace and split into the three considered dummies (*eu_25*, *no_eu25*, and *Italy*). Indeed, no difference seems to exist between the immigrant and the Italian population. A similar result emerges from a paper by Bustillo and Anton (2009), where immigrants are found to under utilize specialty medical services compared with natives, but there is no difference regarding visits to general practitioners.

The *age* coefficient is positive, but not significant. The *gender* coefficient remains negative and significant, indicating males' lower access to visits with respect to females, but the difference between genders is smaller than that found for visits to specialists. As for the *level of education*, instead, the sign of the coefficients is reversed with respect to the case of visits to specialists: having a basic compared to a high level of education seems to increase the frequency of visits to general physicians. In detail, having a low level of education leads to a 0.154 units expected increase in the difference in the logs of the expected counts compared with a high level of education, holding the other predictors constant. Also the coefficient of *low_income* is positive and significant (at 5% level), indicating that having a low level of economic resources positively impacts the frequency of visits to general practitioners compared with having high income levels.

Predictors related to *health status* are still positive and significant, meaning that *morbidity factors* positively affect the frequency of visits to general practitioners. *Regional differences* still holds, though the signs of the coefficients are reversed: living in the North-West of Italy, for example, seems to lead, ceteris paribus, to a 0.197 units expected decrease in the difference in the logs of the expected counts with respect to living in the South. Living in the South, has a positive effect on the frequency of visits to general practitioners with respect to living in the North of Italy.

In addition to the **negative binomial model**, I performed a **hurdle negative binomial regression** model. The latter belongs to the category of two part regression models, which have been adopted, among others, by Pohlmeier and Ulrich (1995) and basically consists of splitting the decision process into two phases. The first decision (of whether contacting a doctor or not) is modeled through a probit or a logit, while the intensity of the treatment once the doctor has been contacted is modeled through a count model based on the number of times an individual has

visited a doctor. Results are in line with what found with the negative binomial regression model[51].

To conclude, once distinguishing between the kind of service used (emergency services, visits to general practitioners or to specialists), it appears that large differences exist among the immigrant and the Italian population in the use of services for urgency care and specialty medicine.

Results on access to emergency wards are in line with a large part of the European literature (Ingleby et al., 2005; Munoz de Bustillo and Anton, 2009; Sanz, et al., 2000; Jiménez Rubio, 2008; Cots, et al., 2007): immigrants over use urgent care services with respect to the native population. Specialists are, instead, more likely to be visited by Italians than immigrants. Visits to specialists are also more frequent among high income or highly educated individuals, rather than by economically disadvantaged people with a low level of education.

No significant differences are found in the frequency of visits to general practitioners comparing immigrants and natives. Moreover, general practitioners are found to be more frequently accessed by low educated people and low income people, rather than by highly educated or wealthy individuals. These results are in line with evidence found in other studies (Smaje, and Le Grand, 1997; Morris, et al., 2005; Bustillo and Anton, 2009) of equal or higher use of general health care services by

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[51] The tables report only the results of the simple negative binomial model. The results related to the hurdle model are summarized here. The model consists of a logit and a negative binomial regression. The negative binomial hurdle model is run on three count variables, *n_visits*, *n_visits_sp*, and *n_visits_gen*. Each regression is performed twice: once using *citizenship*, and the other time using *ue_25*, *no_ue25*, and *Italy* as the discriminating factors between immigrants and natives.
 Results show that the variable c*itizenship* is negative and significant only in the first stage of the regression for both the total number of visits and visits to specialist (the citizenship coefficient are always not significant in the case of visits to GPs). Once the second stage of the regression is performed, *citizenship* loses significance. The immigrant status, thus, seem to influence only the first part of the decision on the use of healthcare services, that is, whether to visit the doctor or not.
However, once *citizenshi*p is disaggregated, results become similar to those obtained with the simple negative binomial regression model: second-stage regressions on *n_visits* and *n_visits_sp* report that non-citizens born outside the EU-25 report significantly less visits than Italians. The coefficient for immigrants born in Italy is not significant in all second-stage regressions, although it is negative and highly significant in the first-stage regressions (logit regression).

immigrants with respect to natives and of significant differences across ethnicities once regressing on various types of health care services separately.

The analysis also highlights differences within the immigrant group itself once different birth areas are considered. In detail, immigrants coming from the European Union (EU-25) Member States do not significantly differ from natives in terms of access to and use of health care resources. On the other hand, relevant and significant differences are found for immigrants born outside the EU-25. Significant differences in access affect also non-citizens born in Italy, second generation immigrants, once compared with the native population. This group of immigrants report significantly lower access to specialty medicine services compared to the Italian population.

6. Conclusions

Considering a large dataset available from a survey carried out by ISTAT on individuals' health conditions and access to healthcare services in Italy, this work has developed an analysis of the determinants of access to and use of healthcare facilities. Differences in patterns of utilization have been investigated distinguishing between the immigrant and the native population.

From an initial descriptive analysis immigrants result being younger and healthier, on average, than Italians. However, significant differences in the use of medical services emerge among immigrants and natives also when controlling for age, and health status. These differences are particularly relevant for the children of immigrants and immigrant women. In particular, although immigrants' children report, on average, a higher percentage of individuals suffering from disabilities, they visit the doctor less frequently than their Italian counterpart. Moreover, investigating access to preventive care during pregnancy reveals that immigrant women report fewer visits to monitor their pregnancy and make, on average, their first scan at a later month of pregnancy than Italian women. These latter results are highly significant, since confronting pregnant women eliminates any doubt related to the potential initial differences in needs between immigrants and natives. Large differences are also found regarding female's preventive care: immigrant women report, on average, less visits related to cancer screening devices with respect to Italian women.

Results from the regression analysis based on logistic and negative binomial models, confirm these findings. Immigrants have lower probability of visiting a doctor and a higher probability of using the emergency services than Italians, ceteris paribus. The over use of emergency services refers, in particular, to male immigrants. On the other hand immigrants report a significant lower frequency of visits to specialists with respect to Italians. No difference is, instead, found regarding visits to general practitioners. In particular, barriers in access to specialty medicine are evident and

significant for immigrants coming from outside the EU-25 and for second generations. Findings related to immigrants' children born in Italy are particularly worrying, and reveal failures in the process of integration of immigrants' children into the healthcare system and the passing on of barriers in access to healthcare along generations.

Significant differences in the use of healthcare services also emerge across the country, reflecting territorial differences in the supply of such services. The provision of healthcare services reveals a differentiated situation, in particular with respect to the supply of specialty medicine. Living in the North or in the Centre of Italy positively affects the frequency of visits to specialists, ceteris paribus, with respect to living in the South.

The results of these analyses are in line with the main findings from the European empirical literature on the issue. In detail, immigrants tend to over-use urgent care services, because they are often employed in jobs at high risk of injuries. Moreover, the emergency service is easier to access than ordinary healthcare when there exist barriers related to language or information. The empirical literature has also found evidence of immigrants' tendency to substitute specialty medicine visits with emergency ones. The frequency of visits to specialists is in fact found to be lower for the immigrant with respect to the native population in many European studies, as well as in this work.

Further research is needed, in order to increase knowledge of the differences existing in access to and use of healthcare services by the immigrant and the Italian population and to implement adequate policies to ease integration. Descriptive studies on the matter should go hand in hand with more in-depth quantitative empirical investigations. In order to do that, however, more detailed information needs to be collected, such as information related to the length of stay of immigrants in the host country, the immigrants' political status, and immigrants' age at migration.

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