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Migrants' Health and Mortality. Evidence from the Italian Context

PhD student:

Eleonora Trappolini

Supervisor:

Prof. Cristina Giudici

Coordinator:

Prof. Elisabetta Barbi

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5. LIST OF ACRONYMS

BCSDR	Birth-Cohort Specific Death Rate
BMI	Body Mass Index
CI	Confidence Intervals
CPT	Centri di Permanenza Temporanea
CSDH	Commission on Social Determinant of Health
CUR	Crude Usage Rate
CVDs	Cardiovascular diseases
D-RoLS	Rome Dynamic Longitudinal Study cohort
ED	Emergency Department
GP	General Practitioner
HDC	Higly Developed Country
HIS	Health Information System
HIS-EC	Health Information System on Emergency Care
HMPC	High Migratory Pressure Country
HR	Hazard Ratio
ICD-9-CM	International Classification of Diseases, Ninth Revision, Clinical Modification
IDOS	Immigrazione Dossier Statistico
IN-liMeS	Italian Network of Longitudinal Metropolitan Studies
ISTAT	Italian National Institute of Statistics
ITA	Italians
IT-SILC	Italian Survey on Income and Living Conditions
MRR	Mortality Rate Ratio
NB	Negative Binomial
NHS	National Healthcare System
OECD	Organisation for Economic Co-operation and Development
ORs	Odds Ratios
ReNCaM	Register of the causes of death
RR	Rate Ratio
SD	Standard Deviation
SHARE	The Survey of Health, Ageing and Retirement in Europe
SRH	Self-Rated Health

SUR	Standardized Usage Rate
STP	Straniero Temporaneamente Presente (*Temporary foreigner*)
TU	Testo Unico sull'Immigrazione (*Legislative Decree No. 286 of 1998*)
UN DESA	United Nations Department of Economic and Social Affairs
WHO	World Health Organisation

"Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.

The enjoyment of the highest attainable standard of health is one of the most fundamental rights of every human being without distinction of race, religion, political belief, economic or social condition."

WHO, 1948

INTRODUCTION

Migration has always been a part of human experience. Today, it represents a challenge for every European country as the continent shifts towards a multi-ethnic and multi-cultural reality. Health particularly plays an important role in migrant integration. The study of health and migration should, therefore, be a major concern for demographers. However, studying migrant health is a complex matter, because many factors modify and shape the health of migrants. They include, before arrival in the host country, exposure to potential risk factors, such as environmental, microbiological and cultural factors, not to mention access to preventative care. To these, one should also add the act of migration itself, which may affect the physical, mental and perceived health of migrants. Finally, once in the destination country, life conditions (in economic, working and environmental terms) and access to healthcare become really important.

In the international literature, the debate around migrant health is not new, particularly with regard to the "healthy migrant effect" (Williams, 1993; McDonald & Kennedy, 2004), which has been of renewed interest with the increase in the number of migrants over the last years. Migrants have better health and show lower mortality rates than natives, thanks to a *positive selection* in their origin country, and perhaps also to a remigration of unhealthy individuals – *salmon bias* – with the increase in the duration of stay. However, because of negative acculturation and low socioeconomic status, their health may get worse (e.g., Bollini & Siem, 1995; Hill et al., 2012). This result has social and health implications, because the composition of migration flows, especially in Italy, is characterised by multiple migrant groups, which have different needs and different levels of vulnerability. A situation that shifts the focus of migrant health problems to politics and to all interventions to tackle social inequalities in the population.

In Europe, the onset of the economic recession in 2008 added further interest to this debate. The economic conjuncture and the austerity policies adopted in many countries to help weather the crisis have emphasised socioeconomic health inequalities, and have further worsened the health conditions of vulnerable social groups, such as migrants. This is true both in absolute terms and in terms of access to healthcare (Economou et al., 2014). Despite it being difficult to individuate the influence of the recession on health, some European studies have pointed to a recent change in individual health behaviour that could affect the future health status of populations (e.g., Falagas et al., 2009; De Belvis, 2012).

Italy was a late-comer to the club of European immigration countries. The country has experienced, in the last years, a rapid increase in migrant numbers, reaching more than five million in 2019. Migration has become as such a structural component of Italian society, rather than a transient phenomenon, as was the case in the 1970s. Thus, promoting health and improving health programming, both at the national and at the local level, requires a complex strategy. Policy-makers must both meet, adequately and effectively, the healthcare needs of this disadvantaged population (96% of all migrants are from High Migratory Pressure Countries, 2019), and ensure that migrants have access to health services so as to manage their health in their new homes. A policy aimed at achieving full integration has to identify appropriate health policies.

Evidence on migrant health and on the effect of migration on health, healthcare use and mortality is, unfortunately, limited and recent for Italy. At the national level, the main health outcome analysed is hospitalisation, information for which is obtained from the Health Information System (HIS), through hospital discharge data. The HIS allows for researchers to monitor, for example, infectious diseases as well as causes of death, to provide an overview of migrant health. However, the complex sociodemographic composition of migration flows in Italy, which involves different health needs according to the different migrant backgrounds, and

migrant origin countries, poses new questions about migrant health needs. This includes their access to the healthcare sector, potential risk factors and individual health behaviour. These are questions that administrative data alone do not allow to study properly. It is crucial, of course, to use surveys, which provide health information jointly with family, socioeconomic and cultural information. The first Italian "Health Condition and Use of Health Services" survey appeared in 1993. However, it is only from 2005 that information on migrant status was added. Later, in 2011-2012, due to the increase in the migrant population, another survey was implemented: the "Social Condition and Integration of Foreign Citizens". This represented the first Italian project for monitoring and examining values, cultures, the use of health services, and the integration of migrants: even if the survey cannot be employed to analyse health differences between migrants and natives. The latest available health survey dates back to 2013 ("Health Condition and Use of Health Services"), and this is the first edition which reports information on migrants' duration of stay.

Recent national studies on migrant health are available, then. However, they mainly focus on differences between migrants and natives, without considering gender differences. As regards healthcare use, most studies focus on hospitalisation. Others focus more on the appropriateness of the use of the Emergency Department (ED), typically using cross-sectional data from one hospital, producing research outputs that are hard to generalise with. Finally, migrant mortality studies have some shortcomings. They are mainly descriptive, they also use cross-sectional data and none consider mortality differences by birth-cohorts.

The present thesis aims to analyse migrant health issues from a holistic point of view. To accomplish this aim, the first chapter, performing a cross-sectional study at national level and using survey data, is the first study in Italy to examine gendered health disparities between natives and migrants by duration of stay. Looking at the probability of declaring poor health, having functional limitations and chronic conditions, the study aims: to verify the persistence

of gender health differences within migrant groups; to examine migrants' health convergence to native health by duration of stay; and asks whether the convergence pattern differs by gender.

Numerous studies analyse the health ratings of several ethnic groups using the self-rated health (SRH) principally as an indicator of health status. While SRH appears to be a valid measure for assessing health, there are potential cultural differences in how ethnic groups and natives rate their health. This diversity must be taken into consideration when making comparisons between populations (Chandola & Jenkinson, 2000; Bombak & Bruce, 2012; Moullan & Jusot, 2014).

In the second chapter, using an eleven-year longitudinal study and the administrative data for all residents in Rome, the goal is to provide new evidence on the migrant healthcare use. The study analyses differences between Italians and migrants in Emergency Department usage rates (for all-cause and for selected causes) by comparing the pre-2008 and the post-2008 time-periods, taking also into account the decision-making process in the ED use.

Finally, the last contribution of this thesis regards migrant mortality. By using data from the Municipal register of Rome and linking this to the Mortality register and adopting a longitudinal cohort approach, the study analyses, first, mortality differences between Italians and migrants residing in Rome and mortality changes, by comparing three different time-periods, before and during the Great Recession. Second, it analyses mortality variations among birth-cohorts to examine whether the migrant mortality advantage is verified across all birth-cohorts.

The Municipality of Rome, which registers the highest number of migrants in Italy, offers a useful context for addressing these two last goals.

This thesis belongs to the classic tradition of demographic studies that looks at the micro-level, in this case examining the association between migrant status and health, healthcare use and mortality. By using survey data and administrative data and by filling some

gaps in the research on the relationship between migration and health, it contributes to the Italian literature. It does so by analysing differences in health status, in healthcare use and in mortality between migrants and natives in Italy.

Excluding this introduction and the thesis conclusion, where the findings from the three studies are brought together, with policy implications and some suggested policy measures for tackling migrant health determinants, there are four chapters. In the first, an overview of the evolution of the migration phenomenon in Italy and Rome, and a summary of the main international and national empirical evidence on migrant health, healthcare use and mortality are provided. This includes also the prevalent theories which have been used in the literature. The second, third and fourth chapters regard the three health dimensions and they are entitled: "Gendering health disparities between natives and migrants by duration of stay in Italy", "Disparity in Emergency Department use for host and immigrant populations in Rome, Italy. The Rome Dynamic Longitudinal study (2005-2015)", and "Mortality differences between migrants and Italians residing in Rome before and during the Great Recession. A longitudinal cohort study (2001-2015)".

The present study shows that migrant health and mortality are changing, with significant differences in terms of gender and origin area. Results yield important findings which underscore the complexity of the relationship between migration and health, results which might help improve or develop health policy for migrants.

CHAPTER 1

Migrant health and migrant mortality in Italy

1.1. The migration phenomenon: Italy in the European context

As regards the total number of migrants, both regular and irregular, in the European continent, Germany is the first country for number of migrants (13.1 million), followed by the United Kingdom (9.6 million), France (8.3 million), Italy (6.2 million) and Spain (6.1 million).

When excluding the European countries with a small population (e.g. Luxemburg, Monaco, Malta, Liechtenstein, San Marino), and looking at the number of migrants over the total population in each country, the scenario changes. Sweden tops the list with 20.0% of migrants, followed by Austria (19.9%), Belgium (17.2%), Norway (16.1%) and Germany (15.7%), while Italy appears in the eleventh position with 10% of migrants (UN DESA, 2019).

Although the actual number of migrants in Italy is lower compared to that in other countries, it should be stressed that the increase in the number of migrants over time, in such countries, was different. Unlike the aforementioned countries where the number of migrants was already higher in 2000 (higher or equal to 10%), in Italy migrants have more than tripled, passing from 3.01% of the total population in 2000 to 10.0% in 2019. According to the UN DESA (1998), this figure refers to "any person who is moving or has moved across an international border or within a State away from his/her habitual place of residence". Since at the international level, there is no a universally accepted definition for *migrant*, the International Organisation for Migration developed a more precise definition adding to the previous definition "regardless of (1) the person's legal status; (2) whether the movement is voluntary or involuntary; (3) what the causes for the movement are; or (4) what the length of the stay is" (IOM, 2019). The gap is quite similar considering only the residents (*see Chapter 1, Figure 1.2*).

Migrants in Italy are now experiencing what other migrants experienced in the past in other European countries characterised by a long history of migrations (e.g. in Germany, in France and in the United Kingdom).

Before starting to address the topic of migrants' health and mortality, the following paragraphs are not only intended to show an excursus of such phenomenon in Italy, from a chronological and historical perspective, but rather to highlight the major aspects, driving factors, and the complexity of the Italian migration phenomenon, the characteristics of migrants and their distribution on the national territory. The first peculiarity is the lack of relevant policies aimed at regulating inflows resulted in a succession of different and several migrant groups, unlike other countries, which were characterised by specific group of migrants (e.g. Turks in Germany and North Africans in France).

1.2. Migration in Italy

In Italy, when people talk about migration, they nearly always refer to the last "wave" of migrants. These recent arrivals have obscured, almost completely, past migration flows, some of which are more significant numerically. Thus, there is the mistake of considering immigration a recent phenomenon, neglecting its complex and stratified history. Migration has long been the subject of heated political debates. By reducing migration to a series of conjectural events, all too often an emergency phenomenon, the structural nature of migration is lost to view.

In terms of migration, Italy turns out to be a very particular country.

For a century, Italy was a country of *emigration*: indeed, between 1876 and 1976, Italy sent almost 24 million migrants to the Americas, Australia and Northern Europe (Rosoli, 1978). It was only in 1973, that Italy registered positive net immigration; a result of the oil crisis. Italy had switched from being an emigration to being an *immigration* country.

Italy was, then, a late-comer to the club of European immigration countries, and the study of migration to the country has proved particularly intriguing.

The first flows of immigrants were Italians who were returning to their own country. In the following years, thanks to repatriations from Europe, migration became increasingly important[1]. Since repatriations were caused by the negative international economic situation, there were many problems associated with the return migrants and parliamentary debates and inquires followed. It was in this period that several Italian institutions pushed the Government to launch preliminary enquiries and to coordinate initiatives on migration.

From an international point of view, immigration to Italy was more than just a reflex of the 1973 crisis. In fact, during the second half of the 1970s, restricted entrance policies in other European countries (France, Germany, Belgium, etc.), diverted migration flows from the Mediterranean area and from other developing countries to Italy, which assumed the role of *replacement destination*, and later to Spain, Greece and Portugal. Nevertheless, analysing the first arrivals from abroad (Yugoslavia, Tunisia and Egypt) it becomes clear that Italy was not a second choice for migrants. Rather it was, for many, a clear objective (King, 1993).

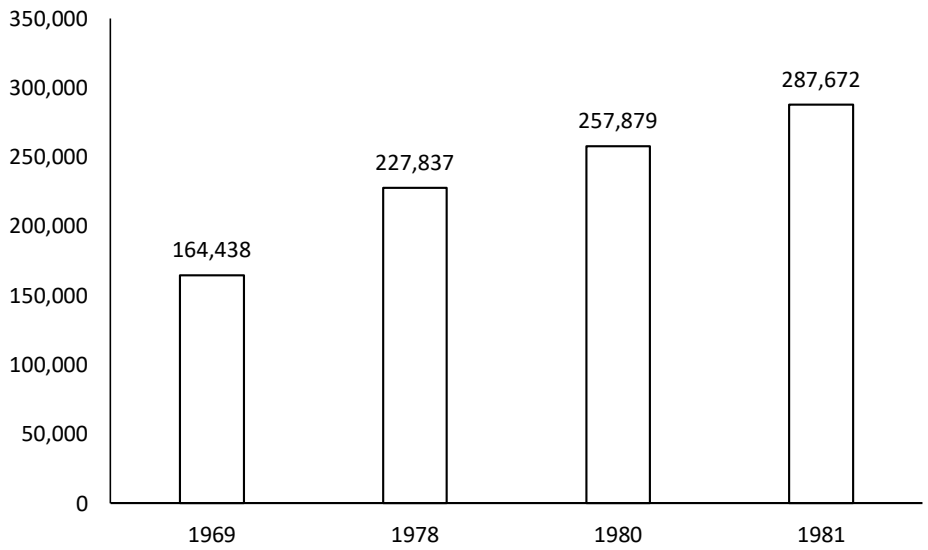
1978 represents a crucial point in Italian migration history. For the first time the Interministerial Committee for Emigration gathered in Rome, with the aim of developing, implementing and supporting immigration policy. However, the Committee had been created, as its name suggests, to deal primarily with *emigration*. Thus, the development and implementation of immigration policies was entrusted to emigration experts and an associated infrastructure (Colucci, 2018). The consequences of this choice still affect migration governance in Italy today.

[1] During these years the most numerous five nationalities in terms of migrants were the USA, Germany, Switzerland, Britain and Yugoslavia. If we exclude Yugoslavia, it is evident that the foreign population was mainly composed of migrants from Central-Europe and North America (Fig. 1.1).

Until 1980, there were very few immigrants in Italy[2]. The Census of 1981 shows that the most important migrant groups came from Europe, the Americas, Asia and Africa (Bettin & Cela, 2014). This, though, began to change in the second half of the 1980s. In those years, Italy overtook Germany, to become the first European country by number of migrants. Indeed, in this period, the number of migrants increased from 227,837 to 287,672. It was no longer a matter of Italians returning home. There were also now flows from developing countries.

However, the first big flows date from later, between 1984 and 1989, when approximately 700,000-800,000 people entered the country (mainly from Africa and Asia). Of these, it is estimated that around half entered or remained in Italy without a valid residence permit. It is useful to single out two significant features of the migration process in Italy: rapid, substantial flows; and a high proportion of undocumented migrants[3].

Figure 1.1 – Migrants in Italy, 1969-1981



Source: Colucci, 2018.

[2]During the 1970s there were fewer than 165,000 migrants (0.3% of the total population).
[3] Illegal immigration, in Italy as elsewhere, was attracted by a large hidden economy (Reyneri, 1998) and poor border control.

These features were not only due to the location of the country, but also a result of its immigration policies. It should be noted that relevant policies aimed at regulating inflows and the legal treatment of foreign nationals as potential immigrants started only in the late 1980s.

The lack of an immigration policy resulted in two other peculiarities: the plurality of countries represented among the migrant population; and the plurality of destinations. Taking these in order, first, Italy was not characterized by considerable and specific groups of nationalities as had been the case in Germany, France and Great Britain; where migrants came mainly from the former colonies. Second, immigration was not only towards developed and industrialized parts of Italy, but it covered almost the entire territory (Macioti, 1991; Bonifazi, 1998).

The plurality of origins was also the result of a lack of a formal channel of entry. In other Western European countries, immigration was supported and promoted through active recruitment: it was particularly driven by the demand for labour in the industrial sector (*pull factors in the host country*)[4]. Conversely, in Italy immigration resulted from alternating push and pull factors. At the beginning, migration to Italy was driven by poverty, demographic growth and political instability in origin countries (*push factors)*. This was the case, in the 1990s, with immigrants from Slovenia, Croatia and Bosnia during the war in the Former Yugoslavia. Then, the fall of the Berlin Wall in 1989, also, shaped the history of immigration to Western Europe, generally and, to Italy specifically. From 1980 to 1990, there was a change in the composition of migration flows. Migrants from Africa and Asia increased in number in comparison to Europeans, Americans and migrants from the rest of the World. The strongest increase was recorded by Apulia (53.4%) in 1991, with arrivals from Albania due to political and economic chaos there (King, 1993). It was during the 1990s that migration to Italy began

[4]In Germany, for example, migrant flows were based on the recruitment of *Gastarbeiter* ("guest or migrant workers"). This term was coined during the 1950s for the large number of migrant workers coming to what was then West Germany (Colucci, 2018).

to gain the central role that we know today, with arrivals also from Poland and Romania, which developed after the establishment of democracy and freedom of emigration in Eastern Europe. Bonifazi and Sabatino (2000) identified four important aspects of the 1990s migration to Italy: the improvement of available statistics; the limited number of irregular migrants; most immigrants came from Eastern Europe; and the settlement of certain groups from North Africa.

In these years, frontiers started to become important. In 1995, the "Puglia Law" anticipated the closure of borders and the use of the detention centre as a *hotspot*, where migrants upon their arrival were taken. These were and continue to be the key elements of Italian migration policies.

In the new millennium, in Italy, and more generally in Southern Europe, migration was due to demographic events, with an ageing Italian population (*pull factor in the host country)*. In this context, Italy has started to experience female immigration, women who look after elderly people who are not self-sufficient. These flows generated a new migration phenomenon, known as *caregiver migration*, composed of women from Eastern Europe, South America and Morocco (Bordogna & Ornaghi, 2012).

Those are also the years when immigration in Italy depended on conflicts in some African (Syria, Libya and Horn of Africa) and some Asian (Iraq, Lebanon, Palestine, Jordan and Afghanistan) countries (*push factors in origin country*).

1.2.1. The importance of civic associations and the regularisation campaigns

Another important driving factor of migration to Italy, was the generalised support of different civic associations including labour movements (e.g. Cgil, Cisl, Uil), religious (e.g. Caritas, Acli, Comunità di Sant'Egidio) and cooperative institutions. The first area of intervention concerned that of social-assistance with counselling services, literacy classes, reception centres, canteens and dormitories. The second area concerned awareness campaigns

with the aim of reporting problems experienced by migrants. The third area was political and concerned appeals to Parliament and to the Government to legislate on immigration and protection for migrant rights. The fourth and final area was research to measure and analyse immigration. During the 1980s, analyses were limited to Ministerial initiatives, while 1991 represents an important moment from the statistical point of view. The census in that year allowed the migrant population to be measured. From 1981 to 1991 resident migrants passed from 0.4% (256,000) to 0.6% (356,159) of the total population. Slightly fewer than half of all migrants came from European countries, while 25% were Africans. In addition, in 1991, there was the publication of the first Statistical report on immigration in Italy and in the Lazio region (*Dossier statistico sull'immigrazione*) by Caritas in Rome.

Migrant-friendly institutions and labour movements were to prove important for creating a deep and widespread consensus, which would eventually lead to the approval of specific laws. Unlike Germany, that from the early 1950s, actively recruited its workforce from abroad, Italy conformed to the "Mediterranean model of immigration[5]" managing the entry of immigrants through a series of regularisation campaigns. Thus, the history of immigration laws in Italy was marked by extra-parliamentary events that pushed the Italian parliament and government to act in times of emergency. Actually, Italy, for a long time, was characterized by a reactive attitude to migration emergencies (which represents another important driving factor) (Bolaffi, 1996)[6]. Starting from the 1980s, as the settlement of immigrants produced social tension and migration became a matter of political debate. The most striking feature of the Italian migration system has been the recurring use of regularisations. Since 2012, the Italian Government has not launched any regularisation drive for irregular migrants. Yet, for at least two decades before

[5] With the "Mediterranean model of immigration", researchers refer to Mediterranean countries (except for France, which is included in the Northern countries because of its long migratory past), namely Italy, Greece, Portugal and Spain. These have been characterized by quite homogenous migration patterns, including: demographic, political, socio-economic and geographical factors (Guarneri, 2005).

[6] In general, immigration policies would appear to react to dramatic events rather than following a planned strategy (Penninx, 2004).

that, regularisation programmes had been the main mechanism for ensuring the legal integration of migrants in Italy. The regularisation programme started in 1986 with the "Foschi Law". This law regulated family unification, which was granted to spouses, parents and minors of migrants. A further important moment came in 1989 when a black labourer, Jerry Masslo, was murdered[7]. In the tumult following his murder, the geographical limitation was abolished with the development and adoption of another important law, (Law no. 39 of 28 February 1990), the "Martelli Law" was brought in. The "Martelli Law" referred to urgent rules on: political asylum, the regularisation of non-European citizens settled in the country, and the protection of foreign-worker rights. In 1995, another regularisation was registered, known as the "Dini Decree". It partially reformed the previous law (the Martelli Law of 1990), implementing, for the first time, an annual quota benchmark for work permits, setting the limit at 25,000 workers. The text of the Decree was complex. First, it introduced work visas for seasonal workers that lasted for up to six months while granting welfare rights. Second, it introduced: expulsions and regularisations. After being extended several times, it became the biggest amnesty before 2002, with over 244,000 migrants being regularised. The most comprehensive law on the issue of immigration in Italian history was the Turco-Napolitano Law approved and adopted in 1998. It modified an idea introduced by the previous law[8], allowing for entry to be obtained via a sponsor[9] (art. 23). It created, too, the *Centri di Permanenza Temporanea* (Cpt) (Einaudi, 2007). With this law, migrant healthcare policies were developed, and later this legislative act (Law no. 40 of 25 July 1998)[10] on migrant health merged into the *Legislative Decree No. 286 of 1998*

[7] Jerry Masslo was a South-African refugee. He was killed in Villa Literno, a well-known tomato-farming area near Naples. In Italy, in 1989, the geographical limitation was still in force. This provided for the recognition of refugee status only for those individuals coming from European countries. Thus, Jerry Masslo could not apply for international protection as a refugee. His murder became a huge news event, which generated the first national anti-racist demonstrations and the adoption of laws for the protection of non-EU refugees.

[8] With the Martelli Law (1990), a migrant could obtain a job visa only through a specific job vacancy.

[9] This means that immigrants who did not have a specific job offer, could, nonetheless, legally enter the country, through an individual or an organization that provided a house and a pay to the foreign national looking for a job in Italy (Barbagli, 2008).

[10] The first law was developed in 1995, but at the end of 1996, after a judgment of the Constitutional Court, the right disappeared from Italian law (Trappolini, 2016).

– *Title V* ("Testo Unico sull'Immigrazione" - TU). The Presidential Decree no. 394 of 31 August 1999 provided for the practical implementation of the TU's provision regarding migrants' right to healthcare, according to Article 32 of the Italian Constitution Chart[11]. While Article 34[12] of the TU is dedicated to foreign people regularly registered in the National Health Service, Article 35[13] deals with irregular migrants, defined as Temporarily Present Foreign Nationals (Rinaldi et al., 2013). In these documents there was the political will to guarantee the right to health for foreign nationals, and to equate the rights and duties related to the health care of migrants with those of Italian citizens. Later, the framework of Italian legislation in this area was further enriched. The regularisation of 2002 (the Bossi-Fini Law no. 189) was the most far-reaching measure ever introduced in any European country. More than 705,000 applications were received and nearly 647,000 were approved. After 2002, there have been two other regularisation procedures. The first one, the "Pacchetto Sicurezza" in 2008-2009, which modified and restricted family reunification, made it a crime to enter Italy illegally and extended time in detention centres up to 180 days. The second and last regularisation was in 2012. It mitigated the restrictions introduced in the previous law. It allowed a stay of up to eighteen months in detention centres, and introduced penalties for employers who hire irregular migrants (Einaudi, 2007). The regularisation process is still, it might be noted, in force, evidence of Italy's inability to read and control migration.

[11] "The Republic safeguards health as a fundamental right of the individual and as a collective interest, and guarantees free medical care to the indigent. No one may be obliged to undergo any health treatment except under the provisions of the law. The law may not under any circumstances violate the limits imposed by respect for the human person."

[12]"Obligation to register at the National Health Service and equal treatment and full equality of rights and duties compared to Italian citizens as regards contributive obligations, assistance provided in Italy by the National Health Service and its temporal validity is all provided for as regards the following subjects […]" (Available at https://www.refworld.org/docid/54a2c23a4.html, accessed 05 September 2019).

[13]"As regards health services provided to aliens not registered at the National health service it is necessary to pay, with reference to the subjects obliged to the payment of said services, the tariffs established by regions and autonomous provinces pursuant to article 8, paragraphs 5 and 7, of legislative decree n. 502 dated 30 December 1992, and following amendments […]" (Available at https://www.refworld.org/docid/54a2c23a4.html, accessed 05 September 2019).

1.2.2 The issue of citizenship

Today Italy is evolving a more structured approach to migration, after years of emergency and reactive migration policies. In particular, the increase in the number of migrants influenced the idea of citizenship which increasingly depends on more than just State-led definitions. This debate started during the 1990s, when a more comprehensive sense of citizenship was proposed compared to the national one (Giudici & de Wenden, 2016).

The granting of citizenship in the destination country is one of the final outcomes of the migration process. It leads to the acquisition of political rights, and thus to full participation in the life of the community into which people have immigrated. In Italy, the criterion for the granting of citizenship is based on an ethnic concept of citizenship, *ius sanguinis*[14] (blood right); the acquisition of citizenship by *ius soli*[15] is not provided for by Italian law.

According to the decree from the President of the Republic, Italian citizenship may be conferred upon a foreign citizen who has been legally resident in Italy for at least ten years. However, the overall time is twelve years, because the application lasts a minimum of two years. Migrants' children who were born in Italy may apply for citizenship when they reach their eighteenth birthday, as long as they have legally and continually resided in the country.

These criteria made naturalization difficult for immigrants, despite the fairly high numbers of them having the necessary requisites for citizenship. The increasing number of foreign nationals born or having grown-up in Italy suggests that making the naturalization process easier would promote their integration into Italian society.

[14] *Ius sanguinis* provides that citizenship is granted by birth. At least one of the parents must have Italian citizenship.

[15] *Ius soli* provides that citizenship is acquired by the fact of being born in the territory of the State.

1.2.3 The recent scenario: the effects of the Great Recession

Between the 1990s and 2000s OECD countries experienced a period of employment growth. Migrants played a key role on the labour market in those years (OECD, 2009).

The Great Recession stemmed from the financial crisis of 2007 in the United States, and spread subsequently to Europe in 2008, though its severity varied greatly across the continent. However, it marked, everywhere, a sudden change in the positive trend registered in the previous years and damaged labour market conditions.

The relationship between the Great Recession and immigration is much debated, especially among labour market experts. Bonifazi and Marini (2014), Ambrosini and Panichella (2016) highlighted how the economic crisis worsened migrant employment conditions, resulting in the demotion of migrant workers, increased workloads, and a further precariousness in contractual conditions. Among migrants, from 2008 to 2014, the unemployment rate rose from 9% to 16.1%; this increase was also registered among Italians (from 6.5% to 11.7%) (Istat, 2015). Although the number of employed foreign nationals increased at a slower rate compared to the pre-crisis period, most were employed in the service sector. The increase was mainly related to an ageing population, something that caused a sharp rise in demand for female labour in the elderly- and family-care services (Bettin & Cela, 2014). Another effect of the economic situation can be found in the increase in the number of migrants who left the country. In 2007, foreign nationals who cancelled their residence in Italy and moved elsewhere, stood at 14,814, while in 2014, the numbers had risen to 47,469. Only half of those migrants, note, went back to their origin country. Most of the others moved to another European country. The Great Recession has, then, modified the migration projects of many migrants (Reyneri, 2010; Corrado & Perrotta, 2012; de Filippo et al., 2013). These years also saw an important decrease in public investment in social policies, something which had already started before the onset of the economic crisis and which has continued during and after the most acute phase: we can talk of

a welfare crisis here. As evidenced by the unemployment data given above, the migrant population, working in less protected sectors, was hit both by the economic and by the welfare crisis. Another effect of the economic crisis related to remittances. Between 2009 and 2010, and later in 2013 and 2014, there was a decrease in annual remittances (IDOS, 2016).

This increasing insecurity spread fear. Migrants were worried about losing their jobs, and, indeed, seeing their efforts and investments reduced to nothing. Italians, meanwhile, came to see foreign nationals as competitors in the job market and, thus, potential opponents.

1.2.4 Characteristics of migrants

Since Italy lacks a coherent policy for migration flows, there have been, as noted in the previous section, different and fragmentary groups of migrants over the years. That is the reason why the composition of migration flows in the country changed rapidly (Tab. 1.1).

Even if, in the 1970s, there were very few migrants (0.3% of the population), they came mainly from European countries and from the US (King, 1993).

From the second half of the 1980s, Italy became the first European country in terms of the number of migrants. In that period, most migrants came from Europe, the Americas, Asia and Africa (Istat, 1981). The main foreign groups in the 1970s were replaced during the 1980s and the early of the 1990s by immigrants from Africa (mainly from Tunisia, Morocco and Senegal) and from Asia (mainly from the Philippines), and starting from the early 2000s they were surpassed by immigrants from Central-Eastern Europe, namely from Romania (Tab. 1.1).

The plurality of origin countries, which characterised Italian migration during the 1980s and 1990s, persists today. Indeed, in 2019, it is possible to count 195 different nationalities in Italy. Nevertheless, the weight of each nationality changes significantly over time. If during the 1970s the first ten nationalities represented 13% of the total migrant population, in the 1990s

the first ten accounted for 40% (Bettin & Cela, 2014); while today the first five nationalities account for 50% of the immigrant population[16] (Istat, 2018).

After the fall of the Berlin Wall, Italy became the major destination of many migrants from Eastern Europe. Most came from Albania, the Former Yugoslavia and from Poland.

The early 2000s saw important changes, feeding through from the 1990s, in the international migratory scenario, changes which would influence migration to Italy. There were new arrivals from Romania, Ukraine and Moldova (Eastern European countries opened their borders) and these were to have an important impact on the migrant population structure in Italy, in terms of age and gender (Bonifazi, 2013). There was a great deal of migrant women, thanks also in part to the regularisation of the Bossi-Fini Law in 2002, the biggest to date.

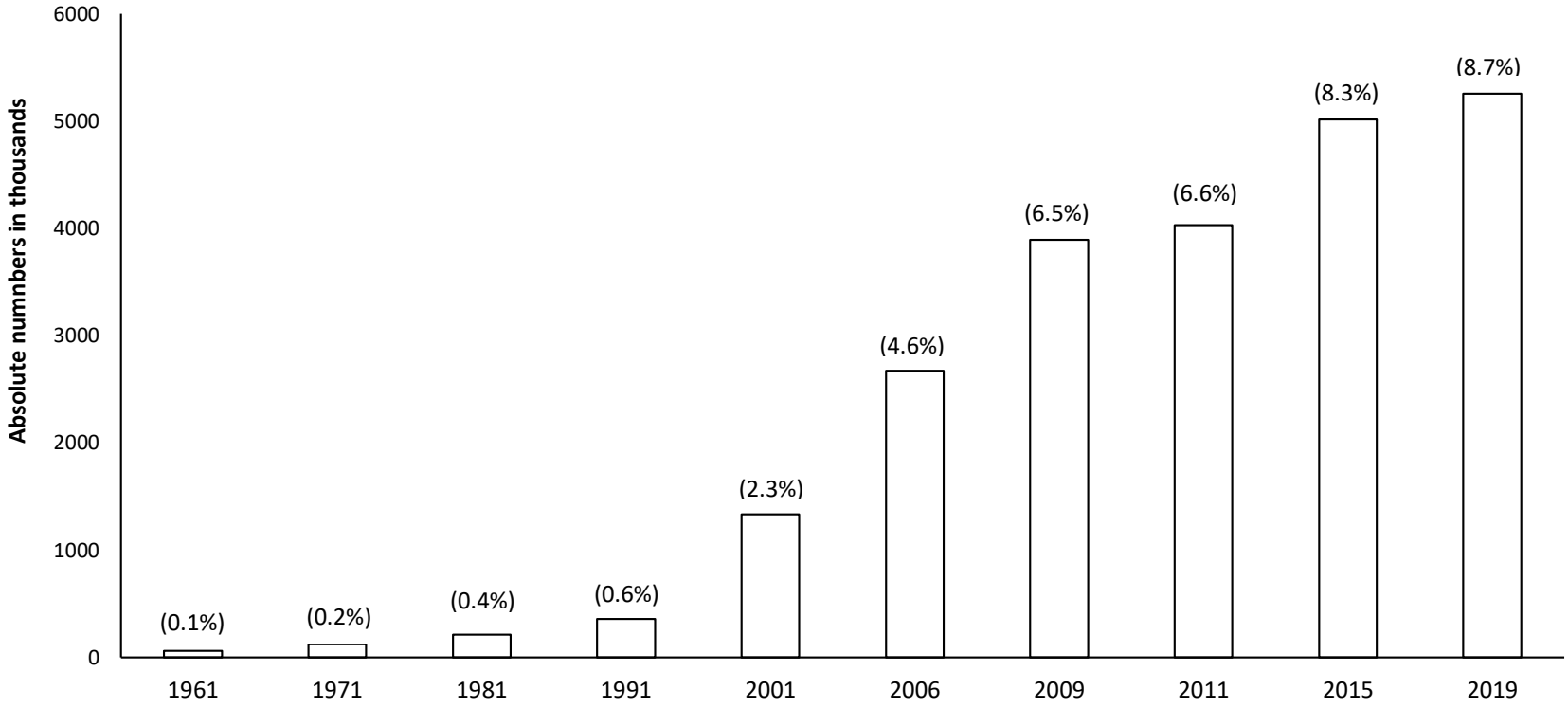
If in the 1990s, migration to Italy was consolidated, in the first ten years of 2000, migratory patterns in Italy has become more like those in France, Germany and Great Britain, at least in terms of dimensions (Livi Bacci, 2010).

In 2001, there were 1,334,889 migrants. Compared to the 1991 census, there had been an increase: from 0.6% to 2.3% of the total population, with a feminization of migration flows. An average annual growth rate of 14.1% was registered in the period 1991-2001, which was higher than the one registered 1981-1991 (5.4%) and even higher than that which would be registered 2001-2011 (11.7%) (Bonifazi, 2013). The first five migrant nationalities were (in order of size): from Albania, Morocco, Romania, China and the Philippines.

From 2001 to 2006 the number of migrant doubled, passing from 1,334,889 (2.3% of the total population) to 2,670,514 (4.6%). From 2001 to 2009 they tripled reaching 3,891,295 (6.5%), exceeding four million in 2011 (4,027,627 – 6.6%) and five million in 2015 (5,014,437 – 8.3% of the total population and in 2019 (5,255,503 – 8.7%) (Istat, 1961-2019) (Fig. 1.2).

[16]The largest migrant population is: Romanians (22.9%), Albanians (8.4%), Moroccans (8.0%), Chinese (5.7%) and Ukrainians (4.6%).

Figure 1.2 – Migrant population residing in Italy on 1st January, 1961-2019



Source: Author's elaboration on Istat data.
Note: The bars show the absolute number of migrants in thousands, and the brackets show the percentage of migrants over the total population residing in Italy.

Table 1.1 – Migrant population in Italy from 1970 to 2019 by country of origin: first 20 nationalities

Country	1970		Country	1985		Country	1990		Country	1995		Country	2000	
	n	*%*		*n*	*%*		*n*	*%*		*n*	*%*		*n*	*%*
USA	26,452	18	USA	51,075	12.07	Morocco	77,971	9.98	Morocco	81,247	11.14	Morocco	162,254	11.76
Germany	16,988	11.56	Germany	37,237	8.8	USA	58,138	7.44	ex-Yugoslavia	73,538	10.09	Albania	146,321	10.6
Switzerland	11,971	8.14	Greece	28,839	6.82	Germany	41,623	5.33	USA	44,830	6.15	Romania	69,999	5.07
Great Britain	10,855	7.38	Great Britain	27,914	6.6	Tunisia	41,234	5.28	Philippines	36,007	4.94	Philippines	65,073	4.72
France	9,574	6.51	France	23,739	5.61	Philippines	34,328	4.39	Tunisia	30,666	4.21	China	60,143	4.36
Spain	7,058	4.8	Switzerland	18,172	4.3	Yugoslavia	29,790	3.81	Germany	30,235	4.15	Tunisia	45,972	3.33
Yugoslavia	6,460	4.39	Yugoslavia	13,862	3.28	Great Britain	26,553	3.4	Albania	30,183	4.14	USA	45,528	3.3
Greece	6,055	4.12	Iran	13,025	3.08	Senegal	25,107	3.21	France	21,006	2.88	Yugoslavia	40,151	2.91
Australia	2,504	1.7	Spain	12,571	2.97	France	24,406	3.12	Senegal	20,816	2.85	Senegal	39,170	2.84
Argentina	2,068	1.41	Poland	7,909	1.87	Greece	20,992	2.69	Great Britain	20,505	2.81	Germany	35,667	2.59
Israel	2,005	1.36	Philippines	7,621	1.8	Switzerland	19,970	2.56	Switzerland	16,270	2.23	Sri Lanka	33,789	2.45
Canada	1,972	1.34	Ethiopia	7,196	1.7	Egypt	19,814	2.54	China	16,200	2.22	Egypt	32,381	2.35
Iran	1,752	1.19	Austria	7,191	1.7	China	18,665	2.39	Sri Lanka	16,010	2.2	Poland	30,419	2.2
Brazil	1,406	0.96	Egypt	6,958	1.64	Poland	16,996	2.18	Egypt	15,530	2.13	Peru	30,142	2.18
Egypt	847	0.58	Netherlands	6,129	1.45	Iran	14,630	1.87	Spain	14,513	1.99	India	30,006	2.17
Somalia	472	0.32	Venezuela	5,620	1.33	Spain	14,394	1.84	Romania	14,212	1.95	France	25,470	1.85
Ethiopia	376	0.26	Romania	5,380	1.27	Brazil	14,293	1.83	Poland	13,955	1.91	Great Britain	23,424	1.7
Tunisia	353	0.24	Tunisia	4,352	1.03	Argentina	12,839	1.64	Brazil	12,985	1.78	Macedonia	22,504	1.63
Philippines	265	0.18	Morocco	2,364	0.56	Ethiopia	11,946	1.53	India	11,984	1.64	Bangladesh	20,820	1.51
Morocco	136	0.09	Albania	923	0.22	Sri Lanka	11,454	1.47	Ghana	10,010	1.37	Ghana	19,650	1.42
Total	*146,989*	*100*	*Total*	*423,004*	*100*	*Total*	*781,138*	*100*	*Total*	*729,159*	*100*	*Total*	*1,379,749*	*100*

Continued to the next page

Table 1.1 - *(Continued)*

Country	2005		Country	2010		Country	2015		Country	2019	
	n	*%*		*n*	*%*		*n*	*%*		*n*	*%*
Romania	271,491	12.87	Romania	968,576	26.09	Romania	1,151,395	27.80	Romania	1,206,938	28.18
Albania	256,916	12.18	Albania	482,627	13.00	Albania	467,687	11.29	Albania	441,027	10.30
Morocco	239,728	11.37	Morocco	452,424	12.18	Morocco	437,485	10.56	Morocco	422,980	9.88
Ukraine	115,087	5.46	China	209,934	5.65	China	271,330	6.55	China	299,823	7.00
China	114,165	5.41	Ukraine	200,730	5.41	Ukraine	230,728	5.57	Ukraine	239,424	5.59
Philippines	74,987	3.56	Philippines	134,154	3.61	Philippines	165,900	4.01	Philippines	168,292	3.93
Poland	73,191	3.47	Moldova	130,948	3.53	India	150,456	3.63	India	157,965	3.69
Tunisia	61,540	2.92	India	121,036	3.26	Moldova	142,266	3.43	Bangladesh	139,953	3.27
Serbia-Montenegro	52,272	2.48	Poland	109,018	2.94	Bangladesh	118,790	2.87	Moldova	128,979	3.01
India	51,832	2.46	Tunisia	106,291	2.86	Egypt	109,871	2.65	Egypt	126,733	2.96
Peru	48,717	2.31	Peru	98,603	2.66	Peru	103,714	2.50	Pakistan	122,308	2.86
Senegal	47,085	2.23	Ecuador	91,625	2.47	Sri Lanka	102,316	2.47	Nigeria	117,358	2.74
Egypt	46,834	2.22	Egypt	90,365	2.43	Pakistan	101,784	2.46	Sri Lanka	111,056	2.59
Ecuador	45,156	2.14	Macedonia	89,900	2.42	Senegal	98,176	2.37	Senegal	110,242	2.57
Moldova	45,006	2.13	Bangladesh	82,451	2.22	Poland	97,986	2.37	Peru	97,128	2.27
Sri Lanka	42,524	2.02	Sri Lanka	81,094	2.18	Tunisia	95,645	2.31	Tunisia	95,071	2.22
Macedonia	40,441	1.92	Senegal	80,989	2.18	Ecuador	87,427	2.11	Poland	94,200	2.20
Bangladesh	37,381	1.77	Pakistan	75,720	2.04	Nigeria	77,264	1.87	Ecuador	79,249	1.85
Pakistan	34,539	1.64	Nigeria	53,613	1.44	Macedonia	73,512	1.77	Macedonia	63,561	1.48
Germany	32,897	1.56	Serbia	52,954	1.43	Bulgaria	58,001	1.40	Bulgaria	60,129	1.40
Total	*2,108,908*	*100*	*Total*	*3,713,052*	*100*	*Total*	*4,141,733*	*100*	*Total*	*4,282,416*	*100*

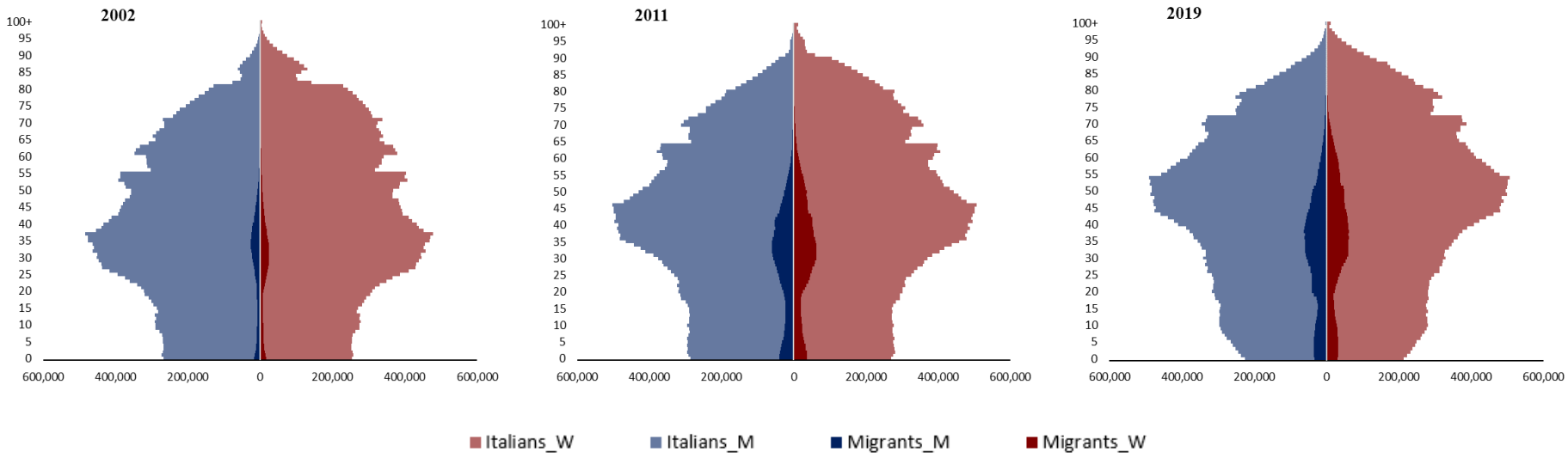
Source: Einaudi (2007) for the period 1970-1990; Author's elaborations on Istat data for the period 1995-2018.

Analysing the structure of the migrant population, in terms of age, they are, naturally, younger than the Italian population: 31 years old (migrants) vs. 42 (Italians). However, over the years, even the migrant population has been affected by the ageing process. In 2019, their mean age was 34 years old vs. 46 for Italians (Istat, 2001; 2019) (Fig. 1.3).

Another characteristic of migration flows to Italy is the increasing importance of women, boosted by the strong demand for domestic workers and caregivers. Today, the share of migrant women is slightly higher than that of men (from 47% in 1992 to 52% in 2019 - Istat, 1992; 2019). However, there is a strong variability within each migrant group. Migrants from Africa (mainly from Egypt and Morocco)[17], and Asia (mainly Bangladesh and India)[18] are male dominated. Conversely, migrants from Ukraine, Poland, Moldova, Peru and Romania[19] tend to be female dominated (Istat, 2018).

[17] Egyptian men account for 66.5%; Moroccan men for 53% of the population.
[18] Indian men account for 58.5%; and Bangladeshi men for 72.4% of the population.
[19] Ukrainian women account for 77.6%; Polish for 73.8%; Moldovan 66.2%, Peruvian for 57.9%; and Romanian for 57.5% of the population.

Figure 1.3 – Migrant & Italian populations pyramids in Italy. 2002, 2011, 2019



Source: Author's elaboration on Istat data.
Note: M refers to men and W refers to women.

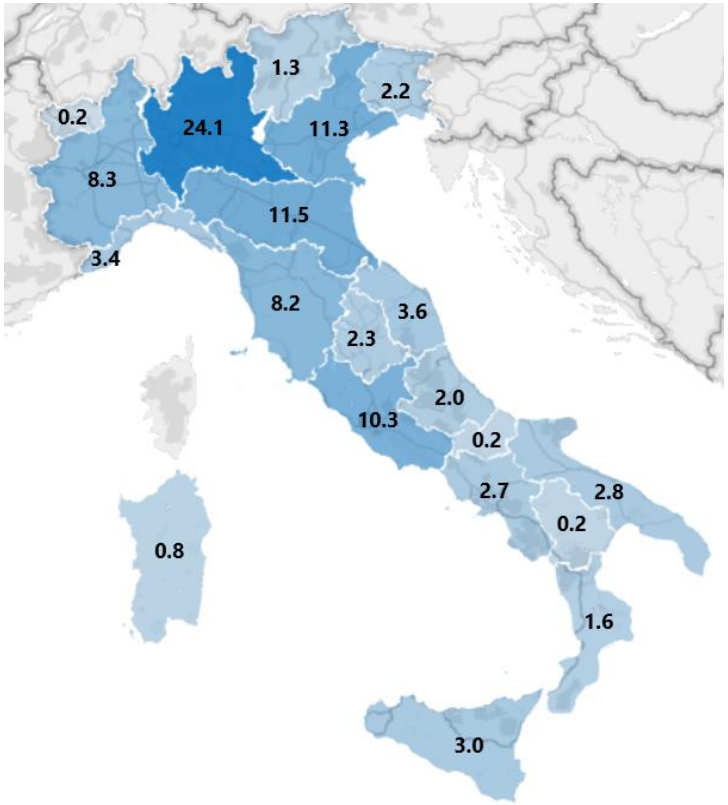
1.2.5 Migrants distribution in Italy

Migration affected Italian regions differently. Migrants resided mostly in the North and in the Centre of Italy. Indeed, the South has been characterized by marginal, or by irregular migration, with migrants employed mainly in seasonal or temporary jobs. The South represents for many migrants the gateway to Italy. They, then, move towards the Centre and North. Migrants settle, naturally enough, in those areas where there are more job opportunities, services and where they can benefit from migrant networks.

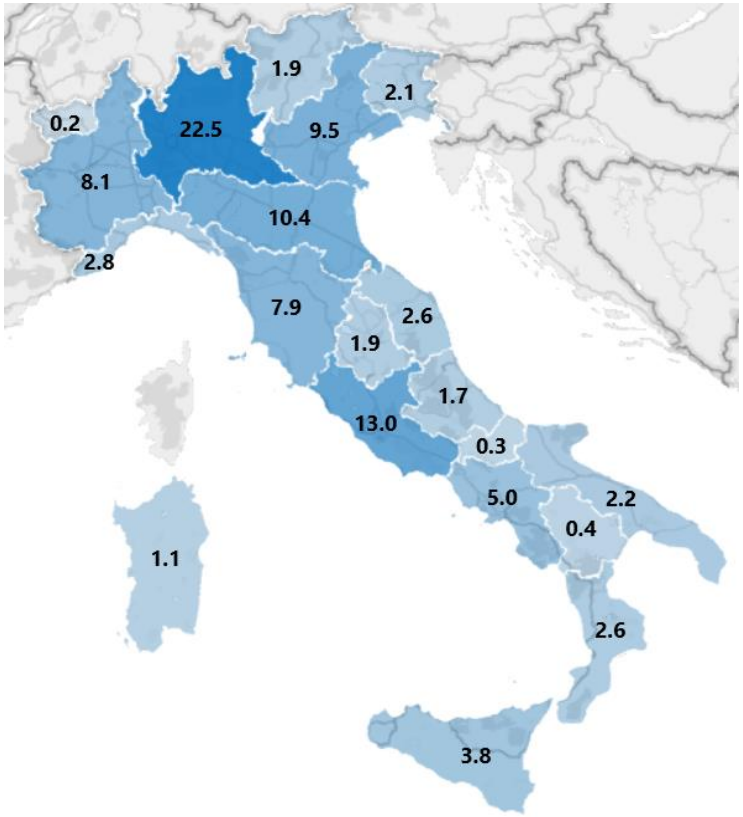
According to the 2001 census, 63.1% of migrants lived in the North of Italy (35.5% in the North-West and 27.6% in the North-East), 24.6% lived in the Centre and only 12.2% in the South. In 2019, the distribution of the migrant population is much the same with small changes in percentages (North 57.5%; Centre 25.4%; South 17.1%). The first region for number of migrants is Lombardy (22.5%), followed by Lazio (13.0%), Emilia-Romagna (10.4%) and Veneto (9.5%) (Istat, 2001; 2019) (Fig. 1.4). However, looking at the share of migrants over the total population in each region, the picture is different. The first region becomes Emilia-Romagna (12.0%), followed by Lazio and Lombardy (respectively 11.52% and 11.50, Tuscany (10.9%), and Umbria (10.8%, mostly international students) (Istat, 2019).

Figure 1.4 – Share of migrants by region in 2001 and 2019

2001



2019



Source: Author's elaboration on Istat data.

1.3 The migrant population in Rome

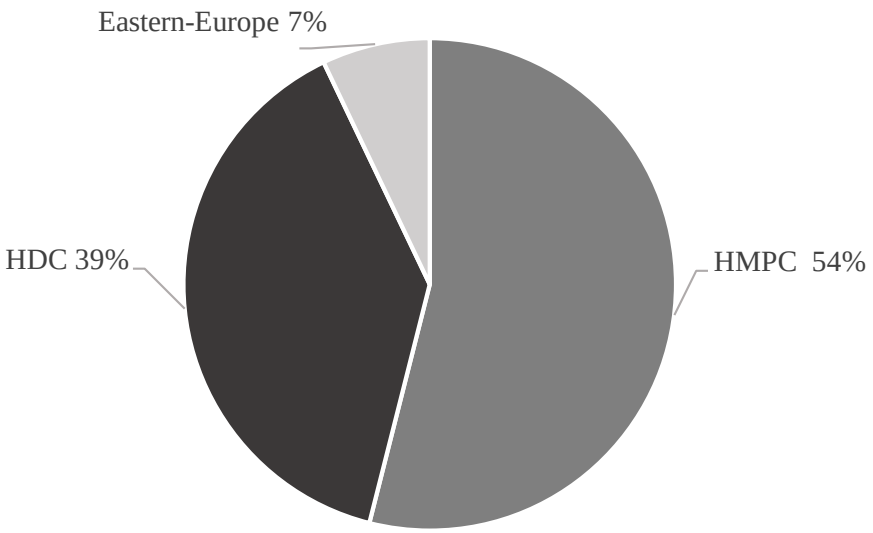
Since the beginning, within the whole national immigration panorama, there has been a significant concentration of migrants around two main areas, that of Milan and Rome (Conti & Strozza, 2006).

In Rome, migration flows reflect national flows. Until 1980 migrants from Highly Developed Countries (HDC) prevailed, followed by migrants from High Migratory Pressure Countries (HMPC)[20] and migrants from Eastern-Europe (Eastern-EU), which at that time represented only a small percentage of all foreign nationals.

Nevertheless, during the 1980s, as nationally, there was a change. In the period 1982-1984, registrations of migrants from HMPC increased constantly, while migrants coming from HDC decreased. Conversely, registrations of migrants from the Eastern-EU changed but little.

In 1990, according to the Municipal Registry of Rome, 74,314 immigrants lived in the capital, accounting for 2.4% of the total residents.

Figure 1.5 –Migrant population residing in Rome by macro-area of origin. 1990



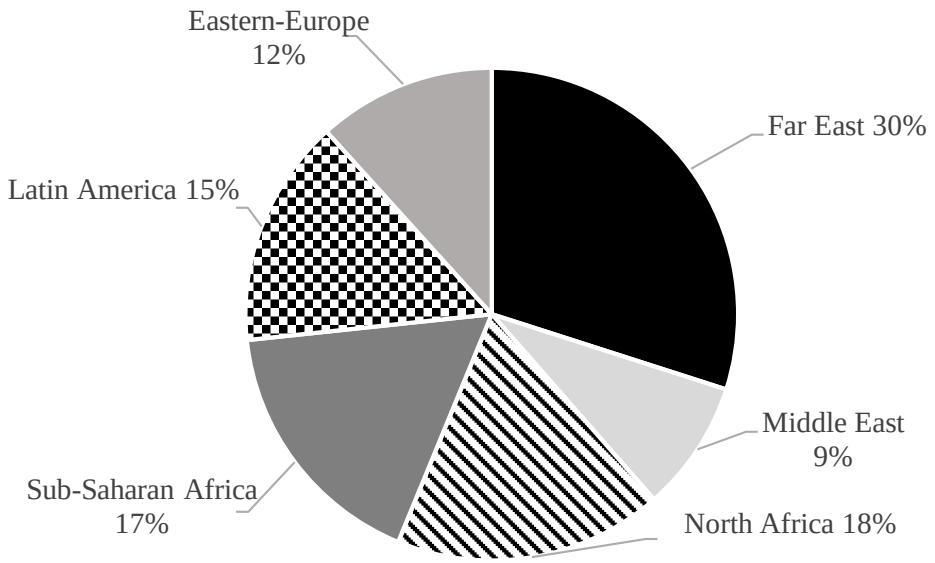
Source: Author's elaboration on data of Comune di Roma - Ufficio Studi e Programmazione Economica, 1991.

[20] HMPC refers to migrants from Central-Eastern Europe, Africa, Asia – except for Israel and Japan – and Latin America, while HDC refers to those from all the other countries.

The plurality of migrant origin countries has also been true of Rome, which had 143 different nationalities. Migrants from HMPC prevailed: the Philippines represented the largest group (7.3%), followed by HDC with migrants from the US (6%) in first place for the developed world.

Among migrants from less developed countries, the numbers were: Asia (39.0%), followed by Africa (35.0%), Latin America (15.0%) and Eastern-Europe (12.0%) (Fig. 1.6).

Figure 1.6 – Migrants from less developed countries residing in Rome by area of origin. 1990



Source: Author's elaboration on data of Comune di Roma - Ufficio Studi e Programmazione Economica, 1991.

The age composition of the population changes from area to area. Most migrants from HDC were in the old age group "50+ years"; conversely, those from HMPC were in the young age group (20-34 years); while migrants from Eastern-EU were in both the young and in the old age group, which could reflect changes in migration characteristics, first for political, and then for economic reasons (Comune di Roma, 1991).

In the 2000s, compared to the national context, the composition of migration flows in the capital showed some differences. Most of migrants come from Central Eastern-Europe (30.7% in 2001), while a smaller proportion come from North Africa (just 9.3% of the total

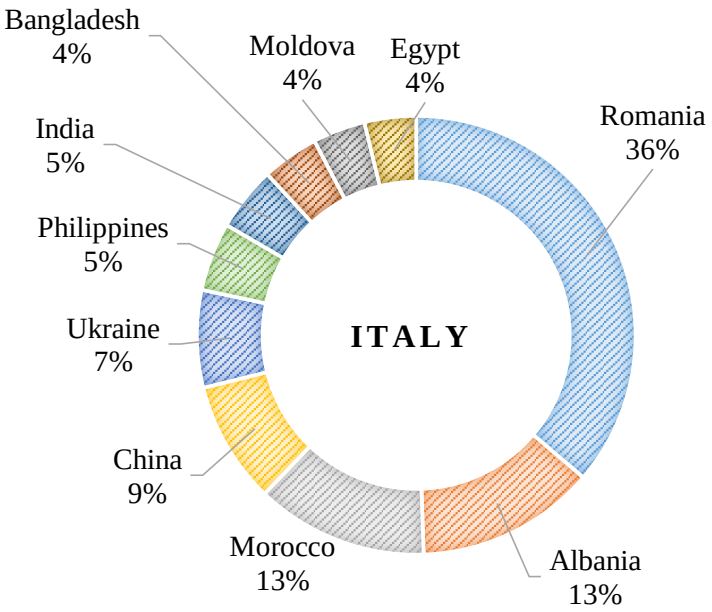
immigrants). In those years, relevant communities (respect to the national context) are those from East Asia (namely Philippines and China), and from Latin America, that have benefited during the years, from particular and favourable labour market conditions (Conti & Strozza, 2006).

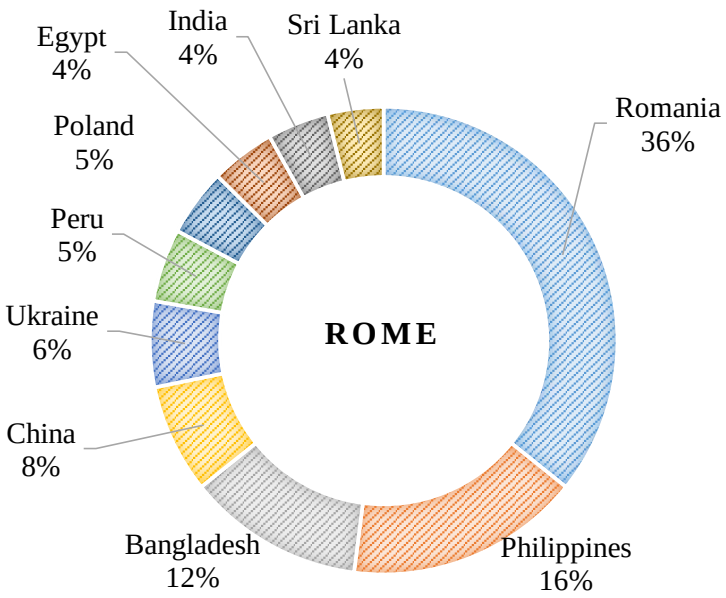
Today, by analysing the first ten nationalities in Italy and in Rome the most numerous nationality are Romanians, while there is a change in the second and third place. Nationally, there are Albanians and Moroccans, while in Rome there are Filipinos and Bangladeshis, and Albanians and Moroccans do not even appear in the first ten nationalities. This kind of difference might reflect migration characteristics. By looking at the gender composition of each migrant group, it should be noted that, unlike Albanians and Moroccans which are male dominated, Romanians and Filipinos are female dominated. This aspect may show the tendency of the capital to attract female migrants, particularly for domestic jobs (Fig. 1.7) (Istat, 2019; Conti & Strozza, 2006).

Figure 1.8 displays the areas in which migrants live, and the different colour gradients show their concentration. The darker the blue colour, the stronger their presence over total residents in each municipality. Both in 1991 and 2018 most of them lived in Rome I municipality, followed by Rome XX (in 1991, and now Rome XV) and Rome II. This distribution reflects, on the one hand, job opportunities (Rome I)[21], and on the other, areas that offer more favourable conditions for migrants, in economic and residential terms (Rome XV)[22].

[21] Rome I include the richest neighbourhoods in central Rome, thus this area offers opportunities for domestic work.
[22] Rome XV include neighbourhoods on the outskirts.

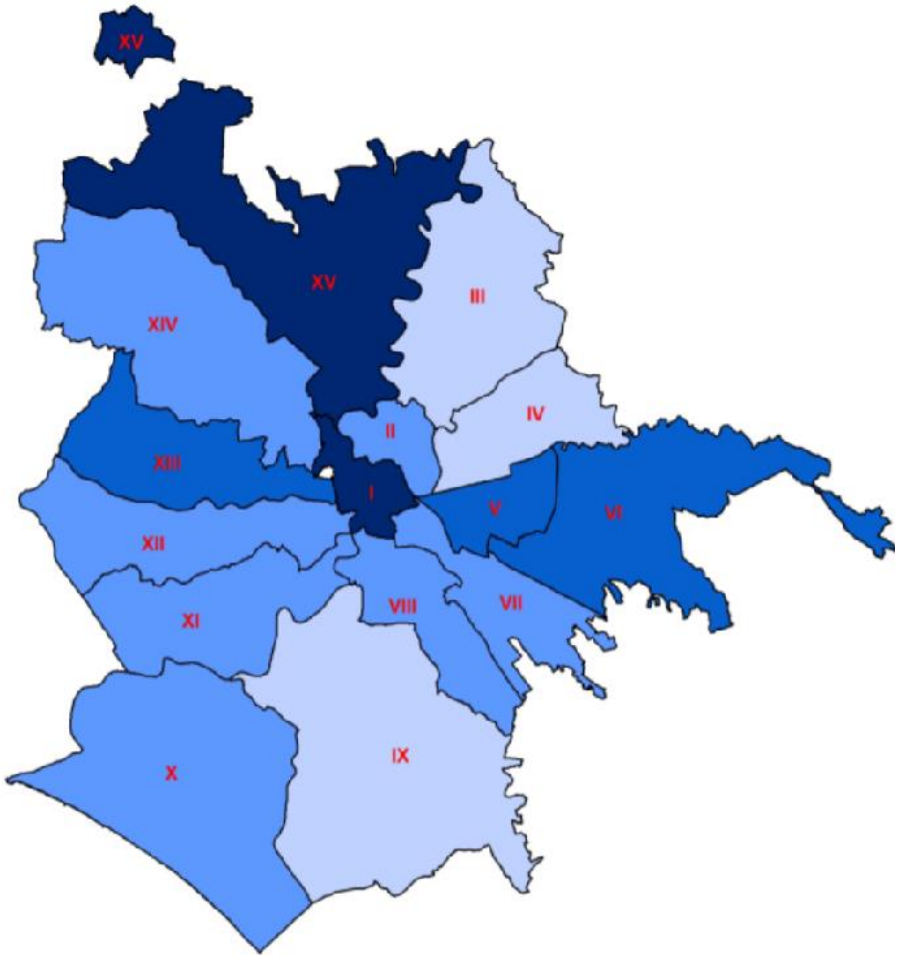
Figure 1.7 – First ten nationalities in Italy and Rome 31 December 2018

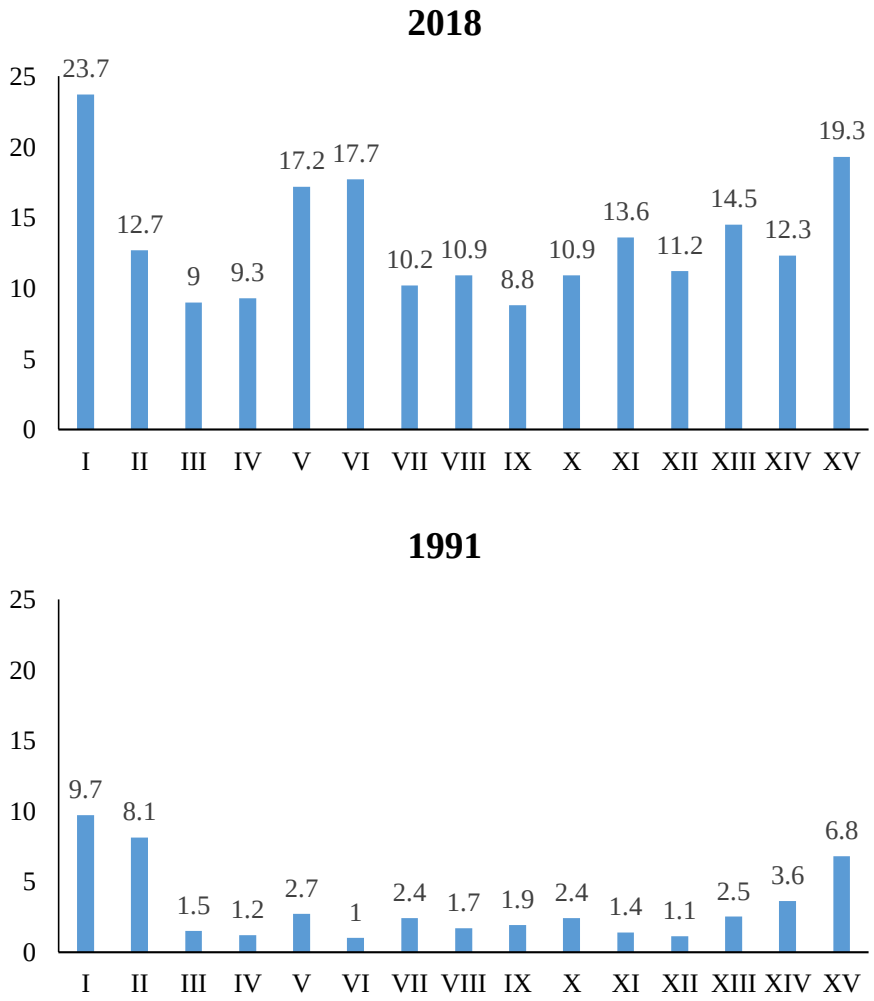




Source: Author's elaboration on Istat data.

Figure 1.8 – Share of migrants over residents by municipality

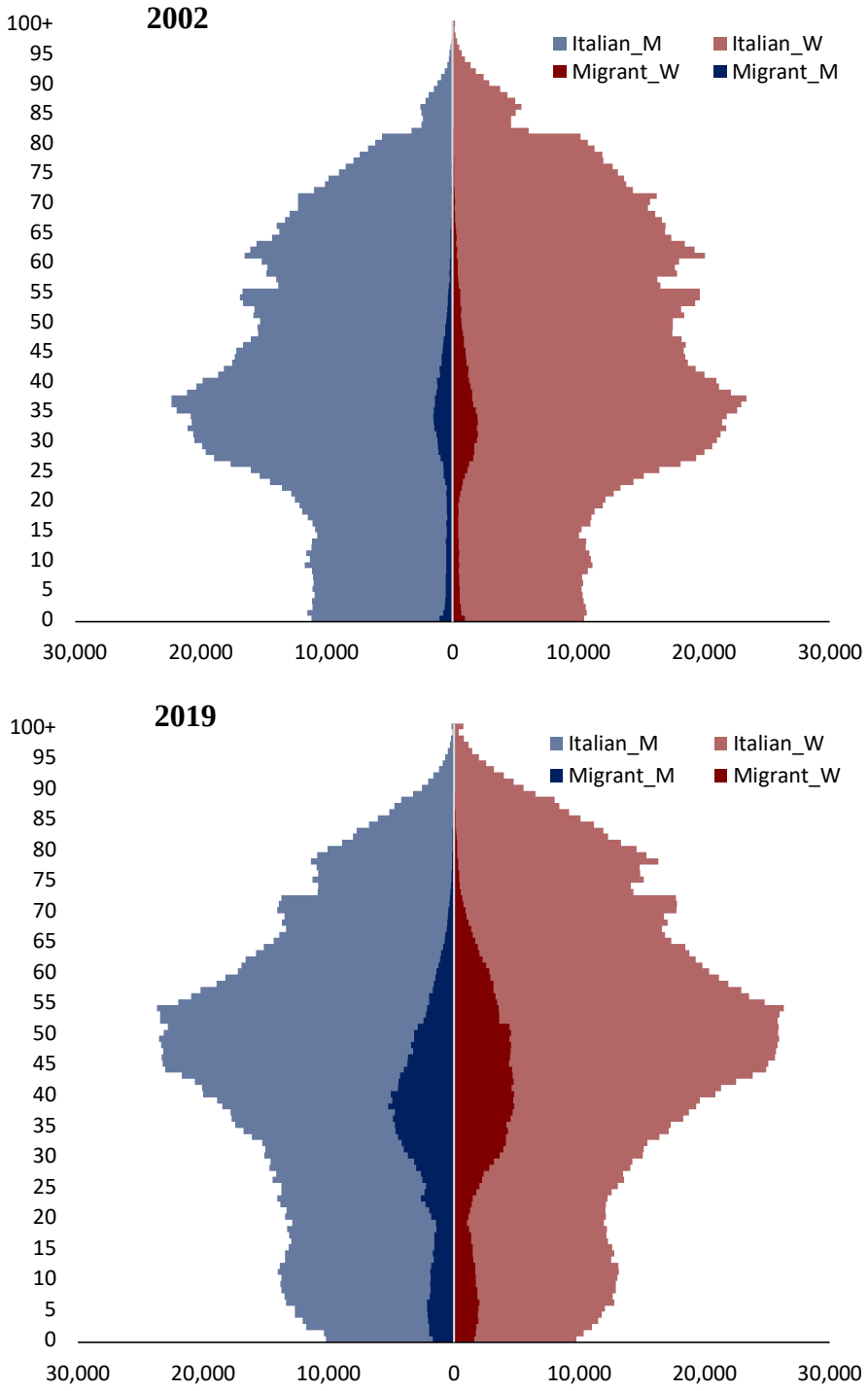




Source: Author's elaboration on Roma Capitale data.

Figure 1.9 shows the age and gender distribution of the migrant and the Italian populations in 2002 and 2019. It is possible to note the increase in the number of migrants, and the ageing of the Italian population. Migrants are mainly in the working age, with more adults (around 40 years old), and women.

Figure 1.9 – Migrant & Italian population pyramids of in Rome. 2002, 2019



Source: Author's elaboration on Istat data.
Note: M refers to men and W refers to women.

1.4 Migrants' Health and Mortality: Background and state of the art

1.4.1 Preamble

For centuries, health was considered as "the absence of disease". However, in 1948 the World Health Organization defined health, instead, as "*a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity*[23]" (WHO, 1948).

At the international level health is guaranteed by the Universal Declaration of Human Rights in Article 2 which states that "*Everyone is entitled to all the rights and freedoms set forth in this Declaration, without distinction of any kind, such as race, colour, sex, language, religion, political or other opinion, national or social origin, property, birth or other status*" (UN General Assembly, 1948).

At the national level article 32 of the Italian Constitution Chart states that "*the Republic safeguards health as a fundamental right of the individual and as a collective interest, and guarantees free medical care to the indigent.*
No one may be obliged to undergo any health treatment except under the provisions of the law. The law may not under any circumstances violate the limits imposed by respect for the human person" (Constitution of Italy, 22 December 1947[24]).

Italian demographic data and migrant numbers highlight the increasing relevance of the migration in Italy, which, in turn, can influence and affect many sectors, including healthcare. Given the large number of migrants, this population becomes increasingly visible in statistical terms, and therefore, it is possible to study migrant health and migrant mortality.

[23]Preamble to the Constitution of WHO as adopted by the International Health Conference, New York, 19 June - 22 July 1946; signed on 22 July 1946 by the representatives of 61 States (Official Records of WHO, no. 2, p. 100) and entered into force 7 April 1948.
[24] Available at: https://www.refworld.org/docid/3ae6b59cc.html [accessed 20 October 2019].

There are several good reasons for focusing on migrant health, migrant healthcare use and migrant mortality in host countries. Migrants make up an increasing percentage of most host country's populations. Thus, the more we know of their health and mortality profile, the better health practitioners, politicians and professionals can make informed decisions. Health is not less important than education and housing, rather it has to be considered as a proxy of the integration process (Ingleby et al., 2005). One should not also forget the increasing importance of meeting the needs of care and assistance in a multi-ethnic and multi-cultural population.

Nørredam and Krasnik (2011) further state a legal argument, based on the concept of "*the right to the highest attainable health*", which was first defined by the WHO Constitution of 1946 (WHO, 1946), then reiterated in the 1978 Alma Ata Declaration (WHO, 1978), and later in the World Health Declaration of 1998 (WHO, 1998). Furthermore, there are a good deal of international human-rights documents that acknowledge the right to health. For instance, the 2008 Resolution of the World Health Assembly on the "*Health of migrants*" introduced a number of steps to reinforce migrant health. This included safeguarding equitable access to healthcare services (World Health Assembly, 2008).

In Italy, migration has, for many years, been underestimated and immigration policies were often used to deal with contingency problems (Geraci, 2009). The right to healthcare use was supported by volunteer groups (e.g., Caritas, the Italian Red Cross, etc…) (Geraci& El Hamad, 2011). The first initiatives on migrant health were developed in the second half of the 1990s. The first Decree-Law was implemented in 1995 (n. 489)[25], and it can be considered the turning point in a complex process towards the recognition of a previously denied right. Nevertheless, at the end of 1996, after a judgment of the Constitutional Court, this right disappeared from Italian law. Today, as noted above, the right to health for migrants is

[25] "Urgent provisions on immigration policy and rules on entry and residence on national territory of citizens of non-EU countries"

guaranteed by the Turco-Napolitano Law, later merged into the *Legislative Decree No. 286 of 1998 – Title V*, which is still in force (Trappolini, 2016).

The promotion and protection of migrant health continues to present some problems in law. There is the lack of appropriate policies and the lack of a role played by the Regions in health planning. Indeed, the Regions have, especially for the most vulnerable populations, inequalities in terms of health supply and inequalities also in access to healthcare services.

1.4.2 Summary of empirical evidence

Given that many migrants come from poor countries and given, too, their low socio-economic status, they might be expected to be at a higher risk of diseases, mortality and to suffer more than non-migrant populations.

However, in the last decades, studies have consistently found evidence of relatively better health and mortality profiles among most migrant groups as compared to natives. This is especially true of voluntary migrants, who have migrated to high income western countries. This finding often referred to as a *migrant health paradox* (e.g., Williams, 1993; Chen et al., 1996; Razum et al., 1998; McDonald & Kennedy, 2004; Domnich et al., 2012), which will be discussed later.

The next four sections present an overview of the main international and, then, national empirical findings on migrant health, migrant healthcare use and migrant mortality, and the most prevalent theories which have been used in literature to explain the patterns observed.

1.4.2.1 Migrant Health

As noted above migrants upon arrival tend to have better health than non-migrant populations. Nevertheless, with the increase in the duration of stay their health status declines. This patterns have been found by many authors in different European and non-European

contexts and in different time-periods (Brahimi, 1980; Chen et al., 1996; Khlat et al., 1998; Darmon & Khlat, 2001; Lindström et al., 2001; Kennedy et al., 2006; Anderson et al., 2004; McDonald & Kennedy, 2004; Attias-Donfut & Tessier, 2005; Newbold, 2005; Lert et al., 2007; Lorant et al., 2008; Rivera et al., 2008; Solé-Auro & Crimmins, 2008; Quevedo & Rubio, 2009; Jusot et al., 2009; Beauchemin et al., 2010; Villarroel & Artazcoz, 2012; Moullan & Jusot, 2014; Loi, 2016; Petrelli et al., 2017; Caselli et al., 2017; Loi et al., 2018; Loi & Hale, 2019).

Among the non-European contexts, there are studies conducted in the USA, Canada and Australia. Chen et al. (1996), used data from the 1994-1995 National Population Health Survey and found that in Canada, migrants, especially recent migrants are healthier than natives with respect to chronic conditions. However, with the increase in the length of stay, the health status declines.

Kennedy et al. (2006), used pooled national cross-sectional national data, to analyse differences in the health status between migrants and non-migrants in the USA, Canada, in the UK and Australia. They found that all migrant groups are more likely to declare better health than natives, in terms of both physical health and in terms of health behaviour.

Anderson et al. (2004) in a study in the US, used pooled data from the 1989-1994 National Health Interview Surveys. They found that with respect to health and activity limitations migrants from Asian countries and non-Hispanic whites fare better than all other racial/ethnic groups. Actually, for non-Hispanic black Americans and native Americans results were worse.

McDonald and Kennedy (2004), using pooled cross-sectional data from two surveys, the 1996 wave of the National Population Health Survey and the 2000-2001 wave of the Canadian Community Health Survey. They found that immigrants have better health on arrival in Canada than their native counterparts. This is so with respect to almost all chronic conditions (exceptions for diabetes and high-blood pressure) and also for self-perceived health. However,

they found, that the health gap between natives and migrants decreases over the years as migrants' health status worsens.

Newbold (2005), in another Canadian study, observed that recent migrants are more likely to report good health than migrants residing in Canada for ten years or longer, who are less healthy.

As regards European countries, Moullan and Jusot (2014) in a recent study, analysing different countries in terms of migratory past (France, Germany, Belgium and Sweden as countries with long migratory histories, and conversely, Italy, Greece, Spain and Portugal as recent immigration countries) found a North-South health gradient. In the first group of countries, migrants were more likely to have worse health, while in the Southern Europe, migrants were more likely to have better health, than natives.

In France, which is considered an "old country" in terms of migration, the studies available show how the health of migrants has changed and has deteriorated over time. The first studies in the 1980s suggest that migrants were more likely to have a good health status. Brahimi (1980) using the 1975 census data found that migrant men had a higher life expectancy than French men. More recently, Khlat et al. (1998) also found a lower incidence of invalidity among migrants compared to French natives and better self-perceived health among Moroccans than among their French equivalents. Another study by Darmon and Khlat published in 2001, reviewing studies on migrant health in France, confirmed that even if migrants from the Mediterranean areas belong to the lowest socio-economic strata of society, they have, on average, better health than the non-migrant population. Conversely, Attias-Donfut and Tessier (2005), in a study conducted later, found that migrants were more likely to have lower perceptions of health than the native French. This pattern was also confirmed by another study (Lert et al., 2007) where the author detected that migrant health status deteriorated the longer they stayed in the host country. Jusot et al. (2009), using data from the National Health survey

conducted in 2002 and 2003 was in agreement with poorer self-perceived health among immigrants. Beauchemin et al. (2010) as well, using data from the Trajectories and Origins survey ("Enquête Trajectoires et Origines") found that immigrants who lived in France for 30 years tended to report poorer health than natives. These studies highlight that whatever the age and gender, during the 1980s and the 1990s, migrants had better health than natives. Conversely, from the 2000s, migrants appear to be in poorer health than the French population.

There are also studies which report poorer health among migrants than natives. Lindström et al. (2001) examined ethnic differences in self-reported health among the 20-80-year-old population in the Swedish city of Malmö. By using a cross-sectional survey (The public health survey in Malmö 1994), they found that, compared with Swedish (men and women), the odds ratios of reporting poor health were significantly higher among men from Yugoslavia, Arabic-speaking countries, Western countries and in the category where they grouped all other countries, and among women from Yugoslavia, Poland and all other countries.

Solé-Auro and Crimmins (2008), studied health differences between natives and migrants in eleven European countries using the 2004/2005 wave of SHARE data. They found that migrants generally had poorer health and more functional limitations with respect to non-migrants at 50 years and over in France, Germany, Netherlands, Sweden and Switzerland, while they report good health in Spain.

In Spain, Quevedo and Rubio (2009), by using the 2003 and 2006 Spanish National Health Survey found that migrants (as a whole group) report better health than non-migrants. However, some differences have been observed among migrants from Bolivia, who had worse self-perceived health and mental health than the Spanish population, while those from Argentina were less likely to report poor health outcomes than natives (Villarroel & Artazcoz, 2012). Another Spanish study by Rivera et al. (2008), exploiting the Spanish National Health Survey, the European Survey on Income and Living Conditions and the European Community

and Health Survey, found that the health profiles of Spanish and those of migrants does not differ substantially. Other evidence which show that migrants enjoy better health than the majority of the population can be detected in another Belgian study by Lorant et al. (2008). The authors using data from the Belgian 2001 Housing and Population Census found that migrants from Turkey, Morocco and other non-European countries were less likely than Belgians to have poor perceptions of their health.

The Italian literature on migrant health is, in comparison, limited and recent. It is limited because, in Italy, studying this topic is complex, due to the poor availability of official statistics. It is recent because, general interest in migrant health has only developed in the last years, with the increase in migration flows.

Loi et al. (2016), using data from the Italian National Institute of Statistics (Istat), analysed migrant health in Italy in 2012. They found that migrants were more likely to report better health and lower chronic illnesses as compared to Italians. The same result was also confirmed in another study by Loi et al. (2018).

Petrelli et al. (2017) conducting a cross-sectional analysis, using the 2005 and 2013 waves of the "Health conditions and the use of health services survey", found that both in 2005 and 2013 migrants (both men and women) enjoyed better health than natives. Nevertheless, results showed a decrease in self-perceived health among migrants in 2013, especially with respect to mental health.

Caselli et al. (2017), using the Italian Survey on Income and Living Conditions of 2009, found that migrants were more likely to report better health and lower functional limitations and fewer chronic illnesses than natives.

In a recent work, Loi and Hale (2019) studied how poverty and social exclusion affected migrant health. By using two pooled surveys carried out by the Italian Statistical Office in 2009: the Italian module of the European Statistics on Income and Living Conditions (It-Silc); and

the It-Silc ad Hoc Module for the non-citizen population, the authors found a migrant-native health convergence over the years of migrant residence. They also highlighted that material deprivation can exacerbate migrant health problems. Indeed, they suspected that the health of recent migrants who lived in poor socioeconomic conditions tends to be more similar to that of natives with respect to those who do not live in poverty.

The *migrant health paradox* assumption may depend on the migrant group and host society analysed. Actually, there is no lack of evidence for the fact that migrant health is context-dependent.

1.4.2.2 Migrant Healthcare Use

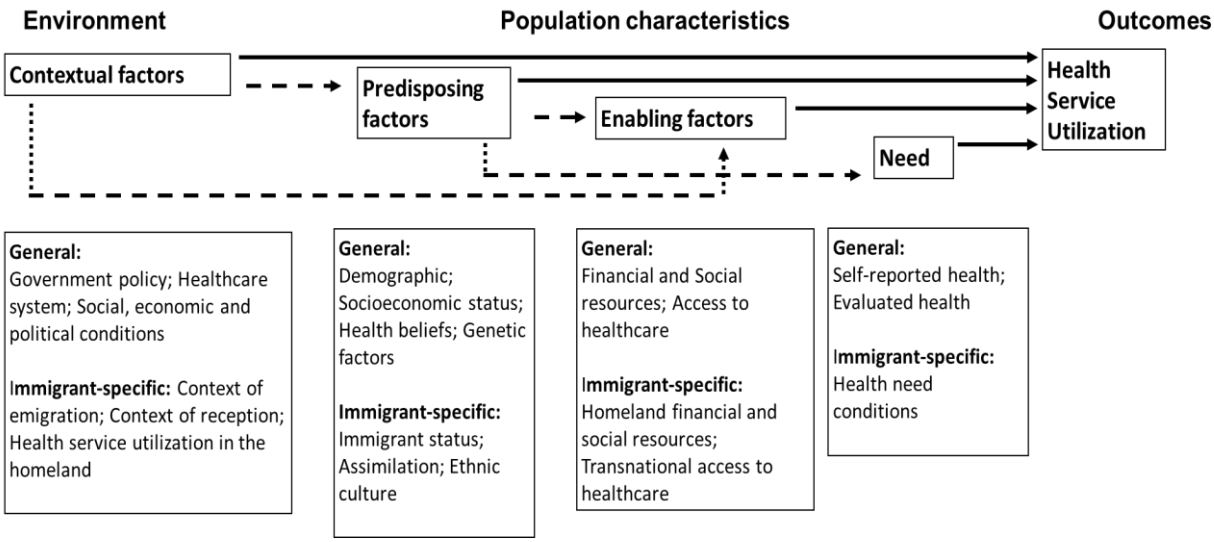
Given the ongoing transformation of cities into multicultural and multi-ethnic spaces, there is an increasing interest in studying migrant healthcare service use. One should also remember that the health of migrants is related to their use of healthcare services.

Before presenting the empirical studies on migrant healthcare use, it is necessary to explain that evaluating and measuring this outcome is extremely complex, as several factors facilitate or impede the use of said services. The Andersen health behavioural model is the most common framework used to study healthcare demand (Yang et al., 2016). This model was first proposed during the 1960s, and has been revised several times over the last decades. With the Andersen model, the author offered four macro categories of explanatory variables as the driving factors of individual access to healthcare services. He argued that the individual use of health services is a function of: first, contextual factors in each country, namely, healthcare organization and the political, economic and social setting; second, predisposing factors or characteristics, like demographic attributes and health beliefs; third, enabling factors, those factors which enable or impede individuals from using healthcare services, as social and financial resources; and fourth, individuals' need for healthcare, and health needs. These

variables are supposed to have a different explanatory power for each healthcare outcome: physician and ambulatory care; hospital and in-patient services; and dental care (Andersen, 1968). In 1995, Andersen proposed a more complex model, by treating the healthcare system and the environmental context as exogenous factors separated from population characteristics, and introducing specific factors (Andersen, 1995). Later, this model was extended to some vulnerable populations, such as the elderly (Evashwick et al., 1984), the homeless (Gelberg et al., 2000; Stein et al., 2007) and to migrants (LeClere et al., 1994; Copeland & Butler, 2007; Akresh, 2009; Bustamante et al., 2012) (Fig. 1.10).

Nevertheless, the Andersen model as applied in migrant studies are most often limited to a simple form, which includes: demographic characteristics and health beliefs, enabling factors, and need for care (LeClere et al., 1994; Akresh, 2009; Bustamante et al., 2012).

Figure 1.10 - The Andersen behavioural model



Source: Author's elaboration on Andersen, 1995

Following this model, the literature on migrants' healthcare use show mixed results, which depend on country, migrant group, health need, and the healthcare service analysed.

Wen et al. (1996), studying the use of healthcare services by migrants in Ontario, and using the 1990 Health Ontario Survey, found that migrants had a higher use of general practitioners and a lower rate of hospital emergency visits than Canadians; while no differences were observed with respect to specialist visits.

In the US, Muennig and Fahs (2002), studying differences in hospitalisation among US - born, foreign-born, and Puerto Rican-born persons residing in New York City, found that foreign-born populations have lower hospitalisation rates. Lucas et al. (2003), using data from the 1997-2000 National Health Interview Survey, compared the healthcare use between foreign-born black men and US-born black and white men. They found that foreign-born black men were less likely to visit a physician and to be hospitalised than US-born black and white men.

As regards the European context, there are some studies which have shown higher use of healthcare services by migrants compared to host populations, other which have shown lower use, and other which have shown similar use (Reijneveld, 1998; Stronks et al., 2001; Nørredam et al., 2004; Cacciani et al., 2006; Lay et al., 2006; Carrasco-Garrido et al., 2007, 2009; Cots et al., 2007; Brigidi et al., 2008; Buron et al., 2008; Gaddini et al., 2008; Grassino et al., 2009; Quevedo & Rubio, 2009; Antón & Muñoz de Bustillo, 2010; Baglio et al., 2010; Bonvicini et al., 2011; Sandvik et al., 2012; Solé-Auro et al., 2012; Ballotari et al., 2013; De Luca et al., 2013; De Waure et al., 2015; Casadei et al., 2016; Loi, 2016; Devillanova & Frattini, 2016; Franchi et al., 2016; Busetta et al., 2018; Fedeli et al., 2018; Klein & von dem Knesebeck, 2018; Loi et al., 2018)

Reijneveld (1998) analysed data on health status, lifestyles, and use of healthcare retrieved by interviews among first generation migrants in Amsterdam in the Netherlands. Results show that migrants from Turkey, Morocco and former Dutch colonies declare a poorer health and a higher use of healthcare, especially primary healthcare among the elderly. The

author affirms that the low socio-economic position partially explains the poor health of these migrants. Actually, even cultural factors and poor living conditions seem to contribute to the poor health of migrants. In turn, their poor health explains most of their higher use of healthcare.

Stronks et al. (2001) analysed the use of healthcare services by first generation migrants in the Netherlands. By using data from a health insurance company linked to data from a health survey among the general population in Amsterdam, the authors observed a lower use of specialist visits among Surinamese, the Netherlands Antilleans, Turkish and Moroccan migrant populations than among the Dutch population.

Nørredam et al. (2004) investigated differences in ED use between migrants and non-migrants in Denmark. Data on population and emergency contacts were provided by the Statistical Office of the Municipality of Copenaghen and represent all citizens residing in the area of the Bisperbjerg Hospital, one of the major hospitals in the capital, in 1998. The authors found differences according to the migrants' origin country. Those from Somalia, Turkey and from the ex-Yugoslavia were more likely to be ED users, those from non-Western countries had similar usage rates, while those from Western countries had a lower ED use, than Danish residents.

Lay et al. (2006) conducted a case-control study to analyse the use of inpatient mental health services by immigrants in Switzerland over a 7-year period. The authors found that compared to natives, migrants had fewer psychiatric hospitalisations, but more emergency and compulsory admissions. Furthermore, they detected that migrants received less psycho-, ergo- and physiotherapy, they spent shorter periods as inpatients and their rate of psychiatric readmissions was significantly lower. Even after accounting for effects of social class, results show that migrants from South Europe, former Yugoslavia, Turkey and East Europe spent significantly shorter time in inpatient treatment, compared to Swiss control patients.

Carrasco-Garrido et al. (2007), using a cross-sectional study from the Spanish National Health Survey in 2003, found higher rates of hospitalisation in the preceding twelve months among migrants than among natives, while they did not observe any differences between those two populations with respect to other healthcare services (medical consultation, dental visits in the preceding three months, emergency visits in the preceding twelve months, and specialist visits). In another study, Carrasco-Garrido et al. (2009), using a cross-sectional study from the Spanish National Health Survey in 2006, found that migrants had higher usage rates in emergency services and with respect to hospitalisation. Quevedo and Rubio (2009), using the 2003 and 2006 waves of the Spanish National Health Survey, found that with respect to general practitioner (GP) visits, migrants from Latin American and from the European Union were more likely to visit a GP, while migrants from Europe, North America and Oceania were less likely to visit a GP, than natives. Overall, migrants registered a lower probability of visiting specialist physicians than the Spanish population. They also found higher hospitalisation among migrants from Latin America and lower hospitalisation among migrants from North America, as compared to natives. Migrants were more (from Latin American and Africa) or less (from European Union and Europe) likely to use the emergency service than native Spanish. Cots et al. (2007), analysing differences in the ED use between migrants and non-migrants in Barcelona using hospital registers between 2002 and 2003, found that migrants were more likely to access the health service through the emergency department. They also registered higher usage rates than Spaniards. Antón and Muñoz de Bustillo (2010) examined differences in the use of healthcare services between migrants and natives in Spain. By using the National Health Survey between 2006 and 2007, the authors found no statistically significant differences in visiting a general practitioner and with respect to hospitalisation. They observed, meanwhile, lower levels of specialist visits and a higher use of the emergency service among migrants than among non-migrants. Conversely, Buron et al. (2008) analysing the ED register of a hospital in Barcelona

in 2004, detected lower overall and for selected causes (surgery, traumatology, medicine and psychiatry) use of the emergency service by migrants with respect to Spanish residents.

Solé-Auro et al. (2012) analysed differences in healthcare use between migrants and non-migrants, among the population, aged 50 years and older, in eleven European countries, employing the 2004 wave of the Survey of Health, Ageing and Retirement in Europe (SHARE) data. In some countries, namely Belgium, Denmark, France, Germany, the Netherlands, Sweden and Switzerland, the authors found that migrants were more likely to be hospitalised and also that they were more likely to visit a general practitioner.

Sandvik et al. (2012) conducted a register-based study analysing differences in ED use between migrants and Norwegians in 2008, found that overall migrants had a lower ED rate than natives. Nevertheless, they found variations in ED use according to migrants' origin group. Those from Poland and Germany, mostly migrant workers, and from Somalia and Iraq, mostly asylum seekers, were more likely to be ED users as compared to Norwegians.

In Germany, Klein and von demKnesebeck (2018), reviewing the studies on the differences in healthcare use between migrants and non-migrants, found a lower use among migrants with respect to specialist visits, medications, consultations, and preventive care. This was especially true among first generation, children and women.

At the national level, there are few studies which analysed differences in healthcare use between migrants and natives. De Luca et al. (2013) and Devillanova and Frattini (2016), using the Italian Health Condition Survey of 2005, found that migrants were less likely to use specialist visits and telephone consultations, while they were more likely to use emergency services than Italians. As regards the use of general practitioners, they did not find any differences between the two populations.

De Waure et al. (2015), using data from the Italian Ministry of Health, found that migrants showed higher hospitalisation rates for strokes, cervical cancer and appendectomies. Lower rates were detected, instead, for chronic liver diseases and mastectomies.

Busetta et al. (2018), using merged data from the 2009 standard Italian Survey on Income and Living Conditions (IT-SILC) and the 2009 special Italian Survey on Income and Living Conditions of households with foreigners, analysed the prevalence of unmet need for medical care among Italians, regular and irregular immigrants. The authors found that compared to Italian citizens, regular and irregular migrants are more likely to experience unmet need for medical care.

Loi et al. (2018), using data from Istat[26] of 2012, found that migrants (both men and women), were less likely to use general practitioners and specialist visits (mainly Chinese, Filipino and Indian migrants), while higher use was detected for hospitalisation and emergency service, especially among women for causes related to pregnancy.

Although at the local level, the literature is still limited for Italy, there are more studies for the regional than for the national level. Most of them, as will shortly be seen, focus on hospitalisation rates.

Cacciani et al. (2006) investigated differences in hospitalisation between migrants and natives in the Lazio Region (the Italian region with Rome at its centre) in 2000, and found that migrants from less developed countries showed lower overall hospitalisation rates than Italians. Nevertheless, migrants registered higher hospitalisation than natives for some selected causes: injuries - mainly for men; infectious diseases mainly for women and abortions. As regards migrants younger than eighteen years of age, the authors did not find any differences between the two population groups, except for infectious diseases. The same pattern was confirmed by Baglio et al. with a study conducted in 2010.

[26] Italian National Institute of Statistics.

Casadei et al. (2016), using hospital discharge data for the period 2009-2012, analysed hospitalisation rates among migrants in the Umbria Region (in central Italy). They found that migrants from high migratory pressure countries registered higher hospitalisation rates, than natives: this was true especially for appendectomies and mastectomies. Among the young, higher hospitalisation rates than non-migrants were registered for pregnancy issues among migrant women, and for causes related to injuries among migrant men.

Franchi et al. (2016), by using data from the administrative database of the Lombardy Region (North of Italy) in 2010, found no statistically significant differences between migrants and natives with respect to hospitalisation, while they observed a lower use of healthcare services among migrants than among Italians.

Another study conducted in the North of Italy (in the Veneto Region) is that one by Fedeli et al. (2018), in which the authors studied differences in acute myocardial infarction hospitalization rates, looking at the numbers for migrants and Italians. The study used hospital discharge data between 2008 to 2013. Higher hospitalisation rates for this condition were found only among South Asian men, while all other migrant groups (from Eastern Europe, North Africa, Sub-Saharan Africa, other Asian countries, Central-South America and high-income countries) displayed similar hospitalisation rates to those of the native population.

As regards ED use, there are a handful of local studies. Most of them focus on the appropriateness of ED use in terms of severity conditions. Brigidi et al. (2008) employing data from a hospital in Genoa found that Latin Americans use the ED for non-urgent medical treatment. Grassino et al. (2009), conducting a study in ten paediatric public EDs, found that both immigrant and Italian patients use the ED for non-urgent or semi-urgent conditions. Similarly, Ballotari et al. (2013) reported that immigrant children are more likely to be taken to the ED inappropriately than native children. Only two works analysed ED usage rates more generally. Bonvicini et al. (2011) found that in the province of Reggio Emilia immigrants report

higher ED rates than Italians. Gaddini et al. (2008) claimed that in Rome, migrants from high-pressure migratory countries more frequently receive a diagnosis of alcohol and substance abuse compared with Italians.

1.4.2.3 Migrant Mortality

Another robust finding in the literature is the migrant mortality advantage. Migrants show lower mortality than natives, or at least lower than might be expected given their double disadvantage, as migrants living in relative poverty. This pattern was found in several high income countries (Khlat & Courbage, 1995; Razum et al., 1998; Abraído-Lanza et al., 1999; Anson, 2004; Palloni & Arias, 2004; DesMeules et al., 2005; Ronellenfitsch et al., 2006; Hajat et al., 2010; Martini et al., 2011; Morandi et al., 2013; Fedeli et al., 2015; Moncho et al., 2015; Uitenbroek, 2015; Vandenheede et al., 2015; Wallace & Kulu, 2015; Pacelli et al., 2016; Caselli et al., 2017; Vang et al., 2017; Caranci et al., 2018; Oksuzyan et al., 2019; Wallace et al., 2019).

Abraído-Lanza et al. (1999) exploiting the National Longitudinal Mortality Study, analysed differences in mortality rates between US-born individuals and Latino ethnic groups. They observed that Cubans and Puerto Ricans have lower mortality rates than non-Latino Whites. In addition, they found that US-born Latinos had lower mortality rates than US-born non-Latino Whites. However, this advantage seemed to decline the longer Latinos resided in the US and, likewise declines through the generations. Another American study by Palloni and Arias (2004), using nine years of mortality follow-up data from the National Health Interview Survey (1985-1994), detected that the Hispanic adult mortality advantage “was not Hispanic”. This pattern was found only among foreign-born Hispanics and foreign-born Mexicans other than Cubans and Puerto Ricans.

DesMeules et al. (2005), using a cohort record linkage study design, examined mortality patterns among migrants in Canada. The authors found lower all-cause mortality rates among all migrant groups as compared to their Canadian counterparts. Analysing causes of death, they

found lower mortality among immigrants than natives, except for infectious, parasitic diseases and for liver and nasopharyngeal cancer. Vang et al. (2017) in a more recent work, reviewing studies published between 1980 and 2014, comparing migrant and native-born Canadian mortality, found that migrants have lower all-cause mortality compared to natives. This feature was more pronounced among migrants from non-European countries. The same pattern was also observed with most causes of death, except for AIDS, where migrant women generally have higher mortality than their Canadian counterparts; while as regards parasitic and infectious diseases mortality patterns were similar for Canadian and for migrant women.

Hajat et al. (2010), exploiting data from the New Zealand Census-Mortality Study from 1996-1999 and 2001-2004, detected that European and Asian migrants show lower mortality patterns compared to natives. Nevertheless, with the increase in duration of stay, the mortality advantage declines. Analysing the mortality level of migrants from Pacific areas, they found that there are no mortality differences with respect to New-Zealand counterparts. However, those migrants show higher mortality rates than Europeans and Asians regardless of duration of stay.

The migrant mortality advantage was also detected in several European countries.

In France, Khlat and Courbage (1995) analysing causes of death between 1979 and 1991 show that Moroccan men had a higher life expectancy than French men. In another recent study, Wallace et al. (2019), using a mortality follow-up from 2004 to 2014 and exploiting the Permanent Demographic Sample ("Échantillon Démographique Permanent"), found a migrant mortality advantage. They stated that this pattern is more pronounced among recent migrants, while it converges to the native level with the duration of stay. Wallace and Kulu (2015) confirmed this kind of a pattern using a longitudinal register-based study from 1971 to 2012 in England and Wales. The authors saw that recent migrants had lower all-cause mortality than

older migrants, except for migrants from Scotland, Northern Ireland and the Republic of Ireland, who have high mortality.

Razum et al. (1998), exploiting death registries from 1980 to 1994, and analysing differences between Turkish migrants and natives in Germany, found a large mortality advantage among the migrants. Ronellenfitsch et al. (2006), used population and causes of death registers, and a longitudinal cohort study over a period of twelve years (1990-2002). They found lower all-cause and cardiovascular mortality rates among migrants from the Former Soviet Union than from among Germans.

In Belgium, Anson (2004), conducting a six-years follow-up of the complete Brussels population aged 25-55 years, observed that migrants show better mortality profiles than natives. Lower mortality was detected among the major migrant groups from Europe, Morocco, Turkey and other countries than among their native counterparts. Nevertheless, mortality risk goes up with duration of stay, except for Moroccan and Turkish migrants. In a recent study, Vandenheede et al. (2015) compared mortality differences between migrants and natives in Belgium. Using the Belgian census of 2001 and population and mortality registers with a follow-up of ten years (2001-2011), the authors discovered that first generation migrants generally have lower mortality rates, while second generation migrants have a higher mortality risk than natives. The higher mortality rates were registered especially among second generation migrants from Morocco, Non-Western countries, France and from Sub-Saharan Africa.

In the Netherlands, using civil registry and mortality registers from 1996 to 2007, Uitenbroek (2015) studied mortality differences between natives and migrants in Amsterdam, analysing life expectancy at birth. The author observed that, for both men and women, there was an increase in the life expectancy in the period analysed, which was stronger among men than among women. Among men, migrants from Morocco, Southern Europe and Industrialised

countries have a higher life expectancy compared to natives. Among women, this pattern was found for migrants from Turkey, the Antilles, and Suriname. However, migrant groups converge in terms of mortality over time.

Moncho et al. (2015) analysed the evolution of mortality among migrants and Spanish-born populations from 1999 to 2008. Their data were based on the Population register and on the Death Statistic Bulletin. The authors found a decrease in the risk of death for the total population in the period analysed. This decrease was more evident among migrants than among natives. Men from Eastern Europe, Southern Europe, Northern Europe and Africa registered. at the beginning of the period, a greater risk of dying than natives. But at the end of the period those migrants showed lower risks of death. Among women, a similar pattern was observed. Migrants from all regions other than Latin America and from the Caribbean and Northern Europe showed a higher risk of dying at the beginning of the period, while at the end of the period, only women from Africa still had a higher mortality than natives.

There are also a handful of studies suggesting an excess of mortality among migrants (Jamrozik et al., 2001; Gadd et al., 2003; Bos et al., 2004; Albin et al., 2005; Harding et al., 2008). These studies analysed specific causes of death such as coronary heart diseases, strokes and aortic aneurysms, or took into account specific migrant groups (e.g. Finnish, Norwegian, Danish, Icelandic, Turkish, Surinamese and Antillean migrants).

A new paper, published by Oksuzyan et al. (2019), suggested that mortality patterns in Sweden change according to gender and by country of birth. Using the collection of registers (STAR), which provide information on population, migration, causes of death and socio-demographic characteristics on Swedish residents, the authors analysed gender mortality differences between migrants and natives. The findings show that migrants from Nordic, Eastern European countries and the ex-Yugoslavia have higher mortality rates compared to their Swedish-born counterparts, and that this pattern is stronger among men than among

women. Conversely, migrants (both men and women) from Western and Southern European countries (Iran, Iraq, Turkey, Central and South America, Asia) show a mortality advantage over Swedes.

At the national level, Caselli et al. (2017), using data from Istat from 2006 to 2014 and analysing mortality differences between migrants and non-migrants in Italy, found higher infant mortality rates and lower adult mortality rates among migrants than among Italians, with differences according to gender. Migrant men had higher mortality than migrant women. Other studies at the local level confirmed the same pattern. Martini et al. (2011) analysing migrants' mortality, overall and for specific causes of death, and using standardized rates in Tuscany, from 1997 to 2008, found a migrant mortality advantage for the adult population. But migrants registered higher infant mortality rates than non-migrants. A national project for monitoring migrant health using Regional Health Service Systems (Morandi et al., 2013), analysed migrant mortality in 2009, showing that migrants from high migratory pressure countries had a lower percentage of deaths than Italians, and the Lazio region registered the highest percentage (1.4%). Fedeli et al. (2015) analysed mortality records for the period 2008-2013 in the Veneto region. Computing standardized mortality rates they found lower overall mortality among migrants than Italians. However, they detected higher mortality rates among Sub-Saharan Africans and Southern Asians for some specific-causes (cardiovascular, cerebrovascular, ischemic heart and infectious diseases). Pacelli et al. (2016) described differences in all and cause-specific mortality among immigrants and Italians residing in Turin and Reggio Emilia (Northern Italy) from 2001 to 2010; they used a longitudinal approach. Immigrants, they found, had lower overall mortality rate ratios than Italians, however they observed differences in mortality according to migrant area of origin and causes of death. Another Italian longitudinal study is that of Caranci et al. (2018), where authors conducted a multicentre study using two open cohorts (Turin and Reggio Emilia) and seven closed cohorts (Venice, Modena, Bologna,

Florence, Leghorn, Prato and Rome) from 2001 and 2012. They found that migrants from high migratory pressure countries generally had a lower mortality pattern than Italians. In addition, a certain heterogeneity between cities and an excess of mortality was reported for some origin areas and specific causes of death.

1.4.3 Theoretical Framework

Explanations about differences in health, healthcare use and mortality between migrants and non-migrants, observed in the aforementioned studies, follow four main hypotheses: the selection process before and after migration; the acculturation process in the host countries; the reliability of migrant mortality data (data artefact); and, with respect to healthcare use, access barriers.

According to the first hypothesis, migrant groups represent a selected group of their population in the origin country due to different kinds of selection in their origin country (Lee, 1966; Abraído-Lanza et al., 1999; Razum et al., 2000; McDonald and Kennedy, 2004; Razum, 2006; Chiswick et al., 2008; Davies et al., 2011; Ullmann et al., 2011; Hollander et al., 2012; Nørredam et al., 2012). The selection process is mainly related to health status. These are the "healthy immigrant effect" and the "salmon bias" hypotheses. According to the "healthy immigrant effect", the mortality or health advantage for migrants is linked to positive health self-selection in the origin country, whereby healthy migrants are most likely to migrate (Razum et al., 2000; Ullmann et al., 2011; Domnich et al., 2012). This effect is more relevant if migration reasons are related to work (Chiswick & Miller, 2006) or education (Chiswick & Miller, 2006; Cattaneo, 2007; Suciu and Florea, 2017), and less relevant among children and family migrants (Chiswick & Miller, 2006) because they follow their parents or spouse. Conversely, there may be a mortality or health disadvantage for those unhealthy individuals who decide to migrate hoping to receive better treatment in destination countries (negative

health self-selection) (McDonald & Kennedy, 2004; Davies et al., 2011) or in the case of involuntary migrants (Hollander et al., 2012; Nørredam et al., 2012). The salmon bias states, instead, that unhealthy migrants tend to return to their origin country (Abraído-Lanza et al., 1999; Md Donald & Kennedy, 2004; Razum, 2006; Domnich et al., 2012).

According to the second hypothesis, the acculturation[27] process in host countries may affect migrants' health or mortality. Rates of acculturation are strongly related to the migrants' origin country and to their length of stay there (Acevedo-Carcia et al., 2010; Hill et al., 2012; Lee et al., 2013; Gimeno-Feliu et al., 2016). This process may involve changes at the group level. First there are physical changes, which depend on new places of residency, new housing types, increasing population density, urbanization, and more pollution. Second, there are biological changes, including new nutritional patterns and new diseases. Third, there are political changes which may involve some loss of autonomy for non-dominant groups. Fourth, there are economic changes which include new types of employment. Fifth, there are cultural changes, including different forms of language, religion, education and technology. At the individual level, several psychological changes occur, including changes in behaviour (value, attitudes, abilities and motives), and social relationships (Berry, 1992).

The acculturation process includes four strategies. When dealing with migrants, generally the most important is *assimilation*. The latter suggest the adoption of the cultural norms of a host population, in place of their original culture. Assimilation can be positive or negative. In the first case, migrants, adopting the cultural norms of the host population, can improve their situation in economic, nutritional, employment, and housing terms, thus improving their health. Conversely, in the second case, migrants can experience "the negative assimilation effect",

[27] "Acculturation comprehends those phenomena which result when groups of individuals having different cultures come into continuous first-hand contact with subsequent changes in the original cultural patterns of either or both groups". Even if "acculturation" is reckoned a neutral term, in practice acculturation influences and changes more cultural norms in one group (Berry J, Handbook of Cross-cultural Psychology: Social behaviour and applications, p. 293).

adopting an unhealthy lifestyle, diets and norms, all of which can cause health deterioration (Berry, 1992; Ro, 2014). In addition, the exposure to risky environments in the destination countries in terms of poor economic and social conditions, poor housing and concentration in deprived neighbourhoods have negative health effects, thus, these are considered the main explanations for this pattern and the loss of the health advantage; this effect known as the *exhausted migrant effect* (Bollini & Siem, 1995; Goldman et al., 2014; Moullan & Jusot, 2014; Loi & Hale, 2019) is further enforced by cultural and language barriers, homesickness and discrimination (Davies et al., 2011; Barbieri, 2016; Giannoni et al., 2016; Kristiansen et al. 2016; Pot et al., 2018).

Considering the aforementioned processes, the size of the mortality or health advantage should be larger in those groups where more positively-selected individuals arrive in the host country. It should, on the other hand, be smaller among those individuals who are less exposed to positive health selection. This kind of an advantage should also decrease with age. After all, fewer "old" migrants arrive and migrant health tends to converge with that of natives later in life, possibly because of the length of their stay (Guillot et al., 2018).

The third hypothesis, that relating to data, is based on the fact that the migrant population is highly mobile and hard to track correctly in data sources. Data problems are inherent with mobile populations. Such problems (known as *data artefact*), deriving from registration errors and inaccurate registration, can be related to a lack of out-registration when migrants move to another country. When migrants who have left the country remain in the host population register, they become "immortal" in the official statistics of the host countries (Weitoft et al., 1999; Kibele et al., 2008; Wallace & Kulu, 2014; Monti et al., 2019). Errors of this type may lead to migrant deaths being underestimated, something which can explain lower mortality levels, among migrants. Other factors which can potentially affect migrants' mortality and

health are age misreporting errors and the misclassification of the origin country (Preston & Elo, 1999).

As regards the use of healthcare services, differences between the migrant and the host population are related to: the right of access health services; the awareness of such right and the effective exercise of this right, which has been called the *health literacy*[28]; and the formal and informal barriers, which restrict access to healthcare for migrants. The formal barriers are those factors related to health policies and the organisation of the health systems. They comprise economic and bureaucratic barriers (Nørredam et al., 2004). Most countries in the European Union have legal restrictions on healthcare use, especially for irregular migrants and asylum seekers. Indeed, irregular migrants in most European countries have access only to emergency healthcare (Cattacin & Björngren-Cuadra, 2010).

In Italy this kind of barrier does not exist. At present, the Italian National Healthcare System provides free-of-charge universal coverage to the whole population, including migrants with a residency permit, and to irregular migrants who have access to care using the Emergency service (Marceca et al., 2012).

Conversely, informal barriers to access include communication issues, language (Fassaert et al., 2010) and socio-cultural (Bach et al., 2004) factors. In this context, the linguistic barrier is the most important, because the absence of effective communication with migrants can lead to misunderstandings in reporting symptoms and therefore to misunderstandings about medical treatment (van Wieringen et al., 2002; Harmsen et al., 2003).

[28]"Health literacy implies the achievement of a level of knowledge, personal skills and confidence to take action to improve personal and community health by changing personal lifestyles and living conditions. Thus, health literacy means more than being able to read pamphlets and make appointments. By improving people's access to health information, and their capacity to use it effectively, health literacy is critical to empowerment" (WHO, 1998).

1.5 Objectives of the study

The aim of this thesis is to overcome some shortcomings in the field of migrant health analysing three different health measures. The three are considered to study the migrant health issue from a holistic point of view, taking into account all health aspects, which include: migrant general health, migrant healthcare use, and migrant mortality.

The aim of the thesis is, then, to fill the gap in the literature by analysing:

- Migrant health by length of stay and gender in Italy;
- Migrant health services use (Emergency Department) in Rome;
- Migrant mortality in Rome.

The first study focuses on general health. Most international and national research on ethnic differences in health do not take into account the different experiences of men and women. But they often adjust for gender. Thus, the first study aims to analyse health differences in self-perceived health, functional limitations and chronic illnesses by duration of stay and by gender by answering the following questions: 1) Do gender differences in self-rated health, functional limitations and chronic illnesses persist among migrants? 2) Is there health convergence between migrants and natives by duration of stay? 3) Does this convergence pattern differ by gender?

The second study focuses on access to care. Unlike most Italian studies which analyses hospitalisation, this study aims to provide evidence on ED usage rates. According to the literature, the emergency department is the first health service used by migrants to access care. ED reflects the need for urgent assistance in the migrant community and it is also an indicator of care accessibility and quality. By performing a longitudinal study over eleven years, the present work analyses differences in ED use between migrants and natives residing in Rome by comparing pre-2008 and post-2008 experiences. The goal of this study can be summarised in

the following research questions: 1) Are there differences in the ED use between migrants and Italians residing in Rome from 2005 to 2015? 2) Are there changes in the ED use (all-cause and for selected causes) in the post-2008 compared to the pre-2008 time-period?

Finally, most Italian studies on migrant mortality uses cross-sectional data and they are mainly descriptive, and none of these studies consider mortality differences by birth-cohort. The last chapter provides additional information on mortality differences between migrants and Italians before and during the Great Recession. By performing a longitudinal analysis over fifteen years and by comparing three time-periods, the study answers the following questions: 1) Are there differences/changes in all-cause mortality between Italians and migrants residing in Rome before and during the Great Recession (2001-2015) by birth-cohort? 2) Does the migrant mortality advantage persist across all birth-cohorts?

Beyond some drawbacks, which will be discussed in each chapters, this Thesis has, though, important strengths. Both in Italy and in Rome, such topic is underexplored, because of data problem. First, by using different data sources (survey and register data) and second, by applying different statistical techniques (a cross-sectional and a longitudinal approach) the Thesis offers a substantial contribution to the literature on migrant health issues, which is still poor.

CHAPTER 2

Gendering health disparities between natives and migrants by duration of stay in Italy

2.1 Introduction

The present chapter focuses on gender disparities in health between natives and migrants by duration of stay. In particular, the study analyses differences in self-rated health, functional limitations and chronic illnesses. SRH, a self-reported global assessment of perceived health, is an important approach in measuring population health and it has been shown to be a strong predictor of mortality (Idler & Benyamini, 1997; Egidi & Spizzichino, 2006), sometimes even a better predictor of mortality that objective measures, because it captures other relevant individual aspects, such as mental and social, that go beyond objective health status (Mladovsky, 2009; Falk et al., 2017), and to be associated with morbidity and disability (Desesquelles et al., 2009). However, SRH evaluation is influenced by and is sensitive to contextual factors, cultural differences and socioeconomic conditions (Vaillant & Wolff, 2010), thus the meaning of "excellent" or "good" health, is subject to various interpretation (Dowd & Zajacova, 2007) and it is still not clear how far this health indicator corresponds to the "real" (objective) health status. This issue might raise concerns related to problems of comparability across different ethnic countries. Nevertheless, the literature has validated the use of the SRH indicator in the adult population and in different ethnic groups (Miilunpalo et al. 1997; Chandola & Jenkinson 2000). Furthermore, as Falk et al. (2017) pointed out "strong empirical evidence suggests that SRH may be useful as a brief and simple measure in the context of public health research, and with practical utility such as identifying vulnerable groups in resource-scarce settings for targeted health interventions".

Given the increasing diversity of European countries' populations and the acknowledged difficulties that migrants face in becoming full members in the host societies, migrant health has become a hot topic of research (Lindström et al., 2001; De Valk & Fokkema 2018; Mladovsky, 2007). As shown in the first chapter, this is also a challenging topic, because of lack of data, making it tricky to analyse and compare migrant health to the native population health (Mladovsky, 2009). Existing quantitative research on migrant health shows a general hypothesis. Migrants tend to report better health (McDonald & Kennedy, 2004; Newbold, 2005; Quevedo & Rubio, 2009), less physical disability (Elo et al., 2011; Mehta et al., 2013), and fewer chronic illnesses (Buja et al., 2013) (*healthy migrant effect*, *salmon bias* and *data artefact*) at arrival, having an initial advantage in terms of health, compared to the native population. Nevertheless, it has been observed that a mix of factors (long duration of stay, the changing composition of the inflows, acculturation, negative assimilation, cultural and language barriers, homesickness and discrimination), known as *exhausted migrant effect*, have negative effects on migrant health, causing a loss and a deterioration of their health advantage (Bollini & Siem, 1995; Hill et al., 2012; Moullan & Jusot, 2014; Kristiansen et al., 2016; Loi & Hale, 2019; Barbieri, 2016; Giannoni et al., 2016; Kristiansen et al., 2016). This pattern seems to vary across countries and across immigrant populations within countries (Kennedy et al., 2006). However, most research on health differences among different ethnicities does not differentiate the experiences of men and women, but these studies often adjust for gender (Gerritsen & Devillé, 2009).

Similarly, a widely shared result in the literature is the gender gap in health and mortality, known as "the male-female health-survival paradox" (Oksuzyan et al., 2009). Although men report better health than women, and women report poorer self-rated health (Verbrugge, 1987; Crimmins & Saito, 2001; Olsen & Dahl, 2007; Oksuzyan et al., 2009; Crimmins et al., 2010; Oksuzyan et al., 2018), more functional limitations (Murtagh & Hubert, 2004; Crimmins et al.,

2010; Oksuzyan et al., 2010; Palacios-Cena et al., 2012) and chronic illnesses than men (Case & Paxson, 2005; Crimmins et al., 2010), they live longer than males. Hypotheses for explaining gender differences include genetic factors (Oksuzyan et al., 2015), such as the protective effect of estrogen (Waldron & Johnston, 1976), the compensatory effect of the second X chromosome (Austad, 2006; Christensen et al., 2000), more active female immune-system functioning (Owens, 2002) and behavioural factors (Denton et al., 2004). The last includes women having healthier behaviour than men (in terms of alcohol consumption, smoking, eating and physical activity); and their tendency to seek medical advice promptly, thanks to their greater health knowledge, sensitivity to symptoms, and the greater likelihood that they report bad health compared to their male counterparts (Benyamini et al., 2000; Idler, 2003).

For the first time, our country has to deal with a significant share of migrants, which has increased from 1.3 million (2.3% of the total population) in 2001, to 4.3 (7.4%) in 2013, peaking at more than five million (8.7%) in 2019 (Istat, 2001, 2013, 2019). Migration should, then now be considered a structural component of our society. In addition, given the increase in the share of migrant women – in 2008 women represented 50.4% of the total (Istat, 2008) – and different gender-specific migratory behaviour, (Llácer et al., 2007; Lutz, 2010), there is the need to integrate a gender perspective into research studies on migration and health. This is especially so for those studies where the health issue is examined with more care because of the growing importance and the maturity of the migration process.

As far as we know, in Italy, there are no studies which analyse gender disparities in health between natives and migrants by duration of stay, and within migrant groups. Nor are there any studies which explore whether health deterioration or convergence differs by gender.

This study contributes to published research on migrant health in Italy by answering the following questions: 1) Do gender differences in self-rated health, functional limitations and

chronic illnesses persist among migrants? 2) Is there health convergence between migrants and natives by duration of stay? 3) Does this convergence pattern differ by gender?

Studies such as this one hold the promise of informing policy on the health status of specific groups according to gender and ethnicity.

2.2 Literature review

2.2.1 Gender & ethnic differences in self-rated health, functional limitations and chronic illnesses

Both gender and migrant status are important and significant factors for health. A common finding is that women tend to report higher morbidity, and poorer health than men (Arber & Ginn, 1993; Idler, 2003; Crimmins et al., 2010; Oksuzyan et al., 2018; Revenson & Marín-Chollom, 2015), and that migrants tend to report better health than natives (e.g., McDonald and Kennedy, 2004; Newbold, 2005; Domnich et al., 2012). However, little is known about whether gender disparities persist within migrant groups. In the literature there are only a handful of studies. In the United Kingdom, Cooper (2002), examining inequalities in the self-rated health of men and women within ethnic groups, found worse general health status among women, especially among those from “Black Caribbean” and Indian populations, but not for those from Pakistan and Bangladesh. Socioeconomic disparity was considered the main explanation of health inequalities here.

A study conducted in the Netherlands (Gerritsen & Devillé, 2009) found gender differences within and between migrant subgroups. According to the authors, women are more likely to report poor health and chronic conditions than men, with large differences among Turkish, Moroccan and Suriname populations.

Gender differences in the prevalence of depressive disorders among ethnic groups were also found in Brazil, with some differences according to ethnicity. Gender differences in depression were not found among white populations, while the largest differences were observed in the moreno and black ethnic groups (Almeida-Filho et al., 2004). Read and Gorman (2006), in a study conducted in the USA, displayed differences and changes in health according to gender and ethnic group. Specifically, functional limitations were found whereby all groups of migrant women fare worse than men. Similarly, Song et al. (2006) analysing gender differences in self-rated health, functional limitations and life-threatening medical conditions within ethnic groups, in the American context, showed that the magnitude of gender differences varies by ethnicity, health outcome and reference category. Another American study (Read & Reynolds, 2012) found gender differences in health, where women tend to declare worse health than men, among Mexican and Middle Eastern migrants.

Gender differences in health may be linked to the characteristics of the migrant population. Men and women migrate for similar reasons, which means an improvement in life quality for themselves and for their families, or they might migrate for family reunification. Nevertheless, there is growing evidence that migration is a gendered phenomenon. In this context, gender norms and expectations, relations and unequal rights can affect migration choices, decisions and experiences. It is important to know how and why women migrate and how they enter host countries differently from men, something which can influence their access to labour market and social services. In the past, in both North America and Western Europe, women often entered destination countries for family reunification (Piper, 2005; Antecol & Bedard, 2006; Gorman et al., 2010). Entering as wives and dependents of men, they faced problems in finding work suited to their qualifications. In the last years, in Europe as in other countries, the way in which women enter host countries has changed: women are far more likely to be in search of jobs than before (Piper, 2005). Globally, most migrant women are employed

in low skilled jobs as domestic or care workers (Sciurba & Palumbo, 2018). In this respect, analysing migrant health from a gender perspective involves recognition of different male and female experiences and behaviour and different actions according to gender (Llácer et al., 2007). Such differences are the result of the different roles, tasks and responsibilities that men and women have in terms of social structure, which in turn can affect and influence health risks (Rohlfs et al., 2000). In addition, such disparities also reflect gender differences in education, living and working conditions, as well as in health status and health behaviour (Kanaiaupuni, 2000; Abraído-Lanza et al., 2005). In cases of family reunification, where the woman is not the main income provider for the family left behind, the selection hypothesis based on health may be weaker among women than among men (Read & Reynolds, 2012).

The studies referenced in the last paragraphs relate to countries with a long migration history. Conversely in Italy, where the migration phenomenon is relatively recent, there is no evidence about gender differences in self-rated health, functional limitations and chronic illnesses within migrant subgroups. On the basis of the existing non-Italian literature, our first hypothesis is that gender differences will also be evident and persistent within migrant groups. We also assume that women are more likely to report poor self-rated health, functional limitations and chronic illnesses than natives.

2.2.2 The loss of the migrant health advantage

Several studies show that migrants are more likely to report better health than the native population upon arrival in the host country (Darmon & Khlat, 2001; Kennedy et al., 2015; Riosmena et al., 2017). Explanations of this pattern lie in selection hypotheses (Lee, 1966; McDonald & Kennedy, 2004; Domnich et al., 2012; Nørredam et al., 2012), cultural factors (Hill et al., 2012; Lee et al., 2013;) and migrant healthy behaviour (Razum et al., 2000; Ullmann et al., 2011). Some recent European studies also show low mortality rates among migrants in

Sweden (Oksuzyan et al., 2019), in France (Wallace et al., 2019), in Germany (Makarova et al., 2016), and in England and Wales (Wallace & Kulu, 2015). It has been observed that migrant health deteriorates and converges with the health of natives the longer they stay in the host country (Razum et al., 1998; Khlat & Darmon, 2003; Antecol & Bedard, 2006). In Europe, migrant health is context-dependent. In countries with a long migratory past (e.g. France, Germany, Belgium and Sweden) migrants are more likely to have worse health than natives, conversely in recent immigration countries (e.g. Italy, Greece, Spain and Portugal) migrants are more likely to have better health than natives. In literature this is known as a North-South health gradient (Moullan & Jusot, 2014). Three models have been proposed in the literature (Llácer et al., 2007) to explain the major causes which drive the loss of migrant health advantage, and therefore migrant-native health convergence. The acculturation and negative assimilation model, suggests that the deterioration of migrant health is due to exposure to new physical, social and cultural influences in the new country. The resettlement stress model suggests that poor living and working conditions, such as unemployment, disadvantageous socioeconomic conditions, a lack of social networks and access to health services, can negatively influence the health of migrants. Finally, the interaction model suggests that pre-migration and post-migration stress, and the strategies and behaviour adopted by migrants, families and society to deal with the migration process can affect migrants' health.

As stated in the first chapter, the Italian literature for migrant health is still poor. However, some authors argued that migrants generally show better health than natives with changes over time (Caselli et al., 2017; Petrelli et al., 2017; Loi et al., 2018; Loi & Hale, 2019), lower mortality rates (Fedeli et al., 2015; Pacelli et al., 2016), lower or higher hospitalisation rates (Cacciani et al., 2011; Casadei et al., 2016), and that they are less likely to report functional limitations and chronic illnesses (Caselli et al., 2017).

It should be noted that none of the three models proposed in the literature for migrant-native health convergence, take into account gender differences; something also true of the majority of the studies cited above.

Since Italy has relatively short migration history, our second hypothesis is that migrants are less likely to report poor health, functional limitations and chronic illnesses than natives. However, long-term migrants have similar levels of self-rated health, functional limitations and chronic illnesses to Italians, while recent migrants report better health than natives.

2.2.3 Gender differences in the health convergence pattern

Since migration is a gendered phenomenon, push and pull factors before migrating and the challenges migrants have to deal with in the host country may affect men's and women's health differently and so the health convergence pattern might likewise be different. As confirmed by the literature, women who migrate for family reasons can face more problems in the host country than those who migrate for working reasons (Piper, 2005). Little is known about the migrant-native health convergence by gender.

Lopez-Gonzalez et al. (2005) in their study about the association between acculturation and immigrant smoking and alcohol consumption in the United States, found a migrant-native health convergence with longer stays only among migrant women. Length of stay did not seem to affect migrant men's health. In another American study, Antecol and Bedard (2006) as well, studying migrant convergence to unhealthy American BMI levels, found a migrant-native health convergence with longer duration of stay. In particular, they detected that migrant women tend to converge to unhealthy American BMI within ten years; while migrant men lose only a third of their advantage within fifteen years. In Italy, as far as we know, there is no gender-based evidence available on migrant-native health convergence. Following the literature, we hypothesize that there is less selection for women in the migration process than

for men which could explain their worse health upon arrival in the host country. Moreover, because of different experiences before, during and after migration between the two genders, and considering also that health status changes with ageing, which in the case of women can be worsened by certain illnesses, the female population is more likely to lose its health advantage.

2.3 Data & Methods

Data

We used the "Italian Health and Condition Survey" (Indagine Multiscopo sulle famiglie "Condizioni di salute e ricorso ai servizi sanitari"), carried out by the Italian National Institute of Statistics (Istat), released in 2013. The first wave of the survey appeared in 1993, but only the 2013 edition reports information about the duration of stay.

Data are nationally representative of people residing in Italy, older than fifteen, living in private dwellings. The survey provides information on age, sex, and citizenship according to origin area, years of residence in Italy (only for foreign nationals), education and working status, as well as information on health and health service use.

Study population

We restricted the analysis to those aged 20-64. We chose twenty because health begins to be conceptualized during childhood and adolescence (Breidablik et al., 2009), thus self-rated health is not very accurate for children; we used age 64 as the upper limit due to the young structure of the migrant population. Our final sample size was n = 70,154.

Outcome variables

We used three dependent variables. The first one was self-rated health which derives from a single question "How is your health in general?" with five possible answers "Very good, good, fair, bad and very bad". For analysis purposes we used a dichotomous variable, grouping answers into two categories: 0 = "Good health" (very good and good), and 1 = "Poor health" (fair, bad and very bad). The second one referred to functional limitations and derives from a single question: "For at least the past six months, to what extent have you been limited because of a health problem in activities people usually do?" There were three possible answers: "Severely limited", "Limited but not severely" and "Not limited at all". We treated functional limitations as a dichotomous variable (0 = Not limited at all; 1 = Limited but not severely and severely limited). Finally, we measured the probability of declaring chronic illnesses. The question here was: "Do you have any longstanding illness or [longstanding] health problem?" There were two possible answers: "Yes" and "No".

Predictor variables

We considered as migrants those individuals without Italian citizenship. The main predictor variables were duration of stay, which was measured by the variable "years of residence in Italy", and gender (men vs. women). Based on preliminary analysis, we distinguished between long-term migrants, those who had arrived in Italy more than seven years before the interview (2013), and recent migrants, those who had arrived less than seven years before 2013. As regards the choice of the seven years as a threshold for dividing long-term and recent migrants, we considered the migrant growth rate and the composition of migration flows. While the total growth rate between 1998 and 2007 was 246.1 per cent, starting from the next year it decreased to 29.1 per cent. Moreover, after 2007-2008 there was a considerable change

in the migration flows. Since 2007 communities from Romania and Bulgaria have almost doubled (these countries entered the EU in 2007) (IOM, 2019; Caponio & Cappiali, 2018).

Control variables

In all analyses we controlled for demographic (*age* – continuous variable), socio-economic (*marital status*: married vs. divorced/single/widow – *education*: low education vs. no education/primary/high school/university - and *employment status*: employed vs. homemaker/inactive/unemployed) and geographical (residence area: North vs. Centre/South) factors. We also controlled for migrant origin area in order to account for the heterogeneity of flows. However, we did not produce models by migrant area of origin. Due to the very small cell size results were difficult to interpret.

Statistical analysis

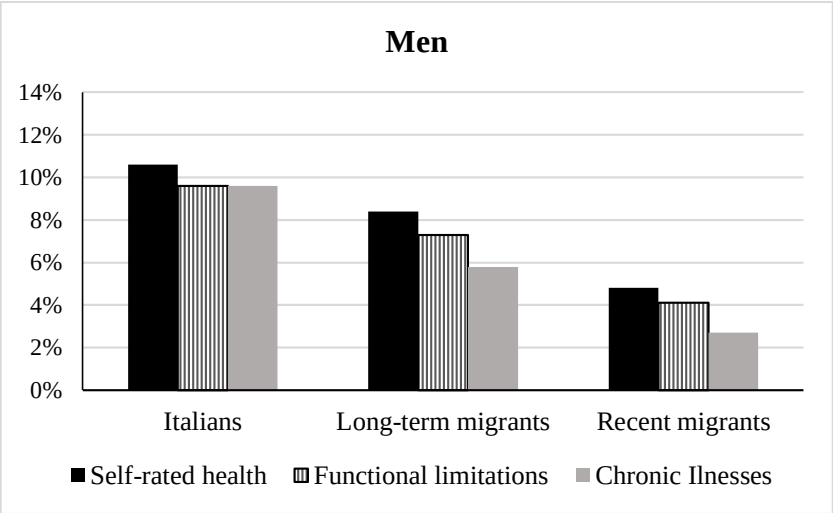
After having described the study population, we performed multivariate logistic regressions to model the association between self-perceived health/functional limitations/chronic illnesses (outcomes), the duration of stay and gender, controlling for age, marital status, education, employment status, residence area and migrant origin area (only for migrants). We used robust standard errors clustered by household. First, we estimated the odds ratios, and then we computed predicted probabilities of the outcomes to avoid the problem of the incomparability of the coefficients obtained by different logistic regression models and to show interactions between gender and duration of stay in a more intuitive way.

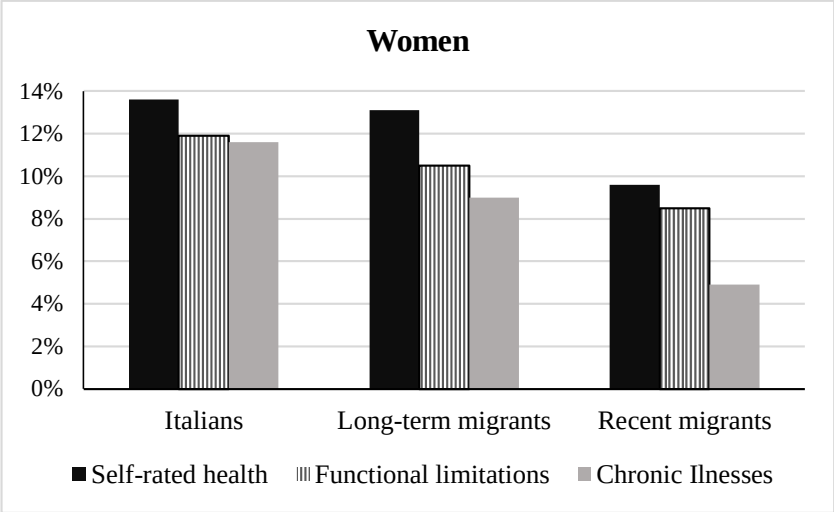
2.4 Results

2.4.1 Descriptive results

The sample was composed of 70,154 individuals aged 20-64 years who were nationally representative. Sample weights have been used to compute descriptive statistics. Migrants represented 9.1% of the total population. Among them, long-term migrants (those who had arrived in Italy more than seven years before 2013) represented 70.0%. Women represented 50.5% of the total population, 50.1% among Italians and 53.9% among migrants. Due to an ageing Italian population, migrants were younger than natives with 39.3% vs. 26.5% of individuals aged 20-34 years and 16.7% vs. 35.1% of individuals aged 50-64. Overall, women rated their health as fair or poor more frequently than men. Indeed, both in the Italian, long-term and recent migrant populations, the share of women reporting poor self-rated health, functional limitations and chronic illnesses was higher than among men (Fig. 2.1). Table 1A, in the Appendix A, shows detailed descriptive statistics for the sample and the three health outcome measures.

Figure 2.1 - Share of men and women reporting *bad* self-rated health, functional limitations and chronic illnesses. Weighted





2.4.2 Regression results

Table 2.1 shows the ORs (for ease of interpretation) for gender differences in self-rated health, functional limitations and chronic illnesses for Italians, long-term migrants and recent migrants, separately: this is net of age, civil status, employment status and area of residence. We found that gender differences in health persist among migrants, as they do among Italians. On average, migrant women were far less likely than migrant men to score well in the three health outcomes analysed. Conversely, among recent migrants, gender differences in functional limitations and chronic illnesses were not statistically significant.

Table 2.1 - Adjusted ORs [90% CIs] for gender differences in self-rated health, functional limitations and chronic illnesses, separately

	Italians (N=63,771)	**Long-term migrants (N=4,440)**	**Recent migrants (N=1,943)**
Self-rated health [a]			
Women	1.41*** [1.35-1.46]	1.44** [1.20-1.73]	1.52* [1.11-2.08]
Functional limitations			
Women	1.29*** [1.24-1.34]	1.38** [1.15-1.66]	1.38 [0.98-1.95]
Chronic Illnesses			
Women	1.27*** [1.22-1.32	1.51** [1.24-1.84]	1.09 [0.71-1.68]

[a] ORs of declaring Bad and Very Bad Self-rated health.
Reference category: Men.
Note: The asterisks indicate significance $^{+}p<0.1$, $p < 0.05$, **$p < 0.01$, ***$p < 0.001$.*
Adjusted for age, civil status, education, employment status and area of residence. Long-term migrants and recent migrants are also adjusted for area of origin.

Figure 2.2 displays the odds ratios of the health outcomes analysed for migrants by gender and by duration of stay compared to Italians. Here we look at our second hypothesis about the migrant-native health convergence. Net of age, civil status, education, employment status, area of residence and origin area for migrants, with increasing duration of stay, the odds ratios approached 1. This indicates migrant-native health convergence. In particular, the migrant health advantage over natives in the three outcomes analysed is narrower among migrants who had arrived in Italy more than seven years before the interview (2013 – Long-term migrants), for both genders.

As displayed in Table 2A, in the Appendix A, which reports detailed results on odds ratios with standard errors, for both men and women, health measures become closer between migrants and natives as migrants' duration of stay lengthens. Indeed, recent migrants displayed lower odd ratio values for all health outcomes, showing that they are healthier than natives. Conversely, odds ratios for long-term migrants with respect to natives are always statistically not significant, except for chronic illnesses, where both migrant men and women are less likely to have chronic illnesses than Italians.

In order to answer our third hypothesis about gender differences in the migrant-native health convergence pattern we estimated the interaction between gender and duration of stay. We computed the predicted probability of the three health outcomes, controlling for age, marital status, education, employment status and area of residence.

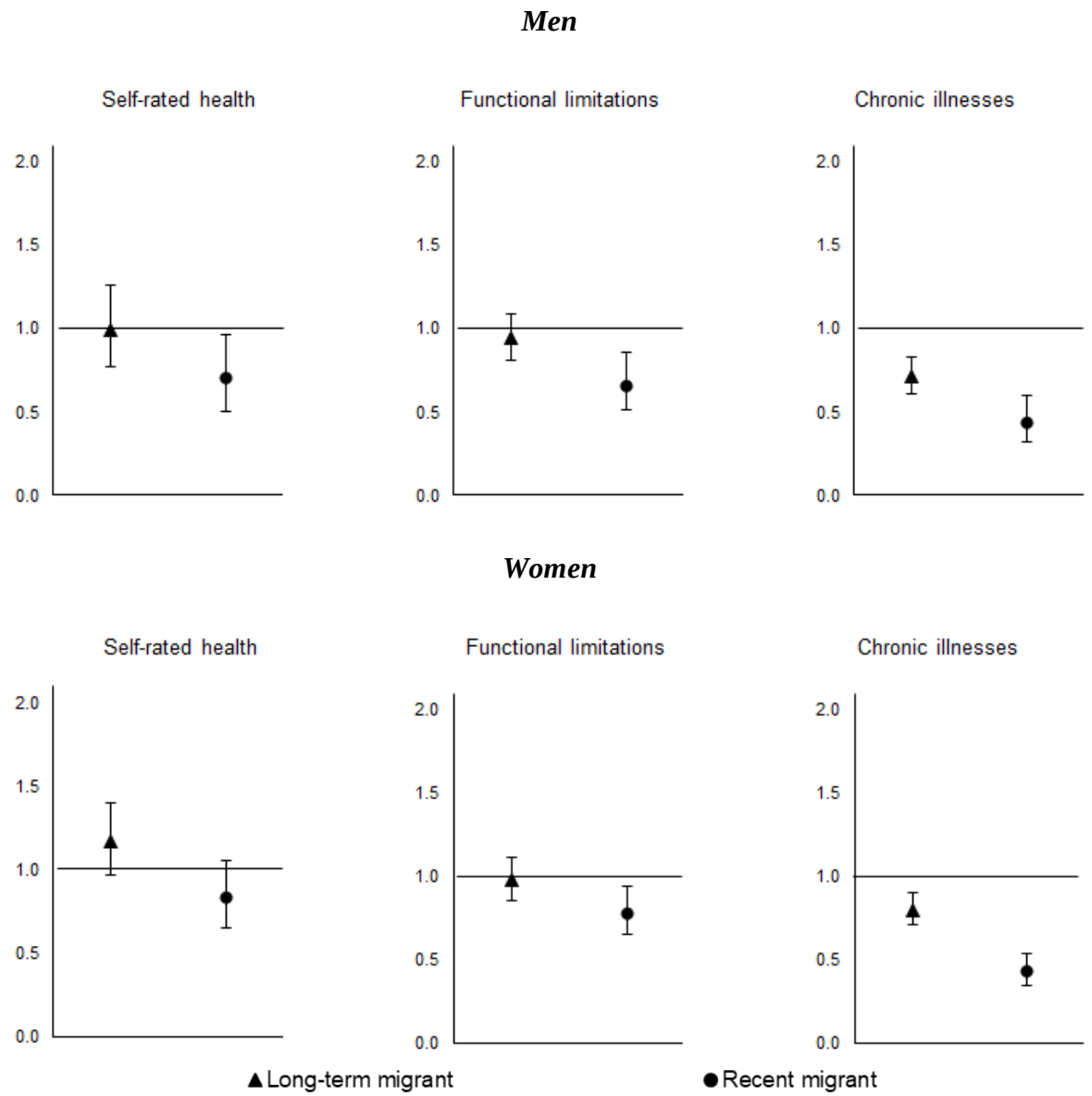
We found a small gender dimension. Indeed, the predicted probabilities suggest three main findings:

1) Women always fare worse than men, except for recent migrants in functional limitations and chronic illnesses (Fig. 2.3 a, b, c);

2) Migrant health converges to that of natives (Fig. 2.3 a, b, c, *see also Table 3A in Appendix A*);

3) This convergence is stronger for women than for men. Among women, recent migrants report better self-rated health than natives and long-term migrants, and the latter show a health status similar to that of natives. But among men, even if recent migrants have better self-rated health than natives, there are no statistically significant differences between long-term and recent migrants (Fig. 2.3 a, b, c, *see also Table 3A in Appendix A*).

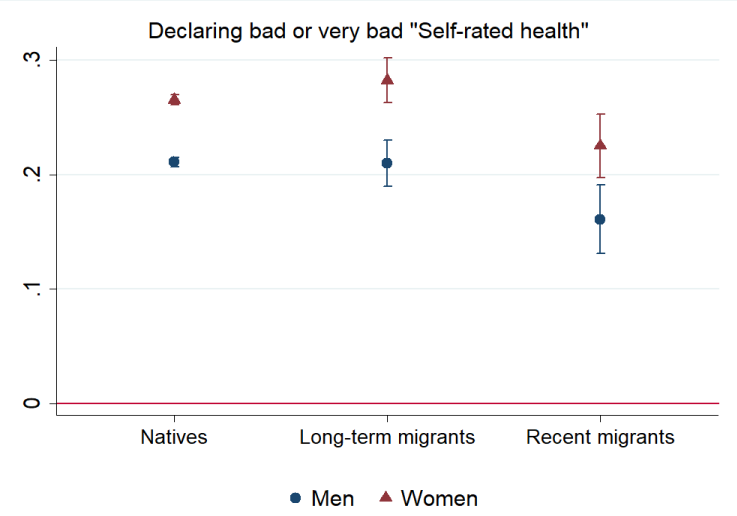
Figure 2.2 - Adjusted ORs [90% CIs] of self-rated health, functional limitations and chronic illnesses by gender and duration of stay compared to Italians



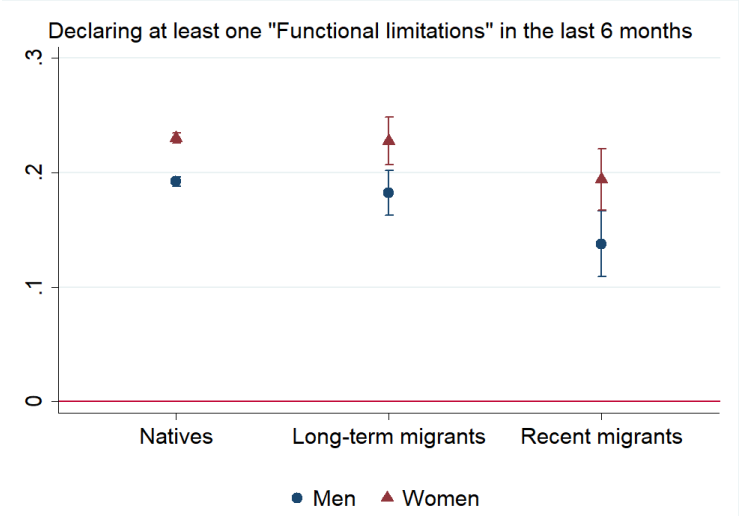
Adjusted for age, civil status, education, employment status and area of residence. For foreign national we also adjusted for area of origin.
Reference category: Italian.

Figure 2.3 - Predicted probabilities of self-rated health, functional limitations and chronic illnesses by gender and duration of stay

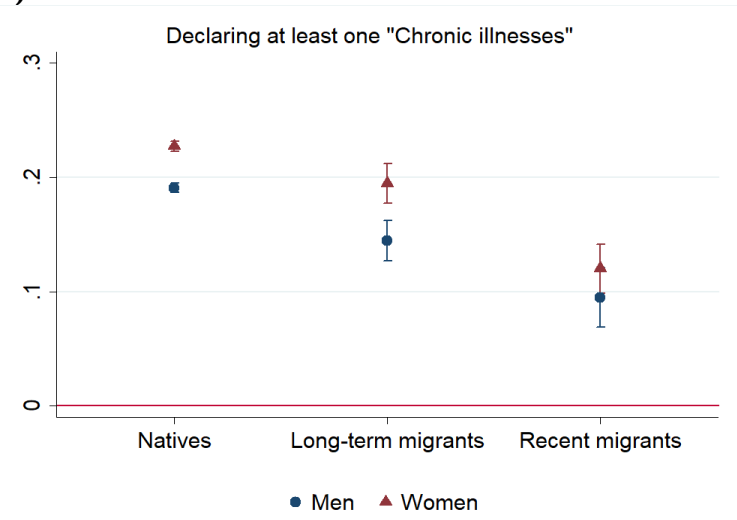
a)



b)



c)



Adjusted for: civil status, education, working conditions, area of residence, and area of origin (only for foreign nationals).

2.5 Discussion

This study calls attention to the lack of empirical evidence on the link between gender, migration and health at the national level. Using the Italian Health and Condition Survey, the current work investigates how self-rated health, functional limitations and chronic illnesses differ between men and women within migrant groups and by duration of stay.

Our hypotheses were that gender differences in health persist among the migrant population. Although in general migrants show better health status with respect to natives, we hypothesized that, with the increase in the duration of stay, migrant health converges to that of natives and that women are more likely to lose their health advantage.

We found support for our hypotheses. As regards the persistence of gender differences in health among migrant groups, our results are in agreement with other international studies (Cooper, 2002; Almeida-Filho et al., 2004; Read & Gorman, 2006; Song et al., 2006; Gerritsen & Devillé, 2009; Read & Reynolds, 2012). The general health status of women is worse compared to that of men among natives and among long-term migrants with respect to the three health measures being analysed. The picture is less bleak among recent migrants with respect to self-rated health, while the gender gap disappears among migrants with respect to functional limitations and chronic illnesses. Explanations for this gender pattern are related to physiological, biological and genetic factors (Waldron & Johnston, 1976; Benyamini et al., 2000; Idler, 2003; Denton et al., 2004; Oksuzyan et al., 2015). To this, one should also add differences in migration circumstances, human and social capital, lifestyle characteristics and socioeconomic status (Del Pinal & Singer, 1997; Read & Gorman, 2006). Moreover, we must consider that the migration process could have selected the two genders in a different way. Only a few studies suggest that the theories used to explain migrants' health, such as selection hypotheses or healthy behaviour, may be more applicable to men than to women, or to particular migrant groups than others (Read & Reynolds, 2012). Some studies, in fact, showed that

individuals who migrate for working reasons are strongly selected for their health, as in the case of men; while selection among women appears to be less strong, because they usually migrate for family reunification, thus, they arrive less healthy (Antecol & Bedard, 2006; Curran et al., 2006; Lopez-Gonzalez et al., 2005). As pointed out by Oksuzyan et al. (2019), push and pull factors before and during the migration process, and the challenges migrants have to face in the host country may be gender-specific, having different effects on the health of female and male migrants.

Our analysis confirms the healthy migrant effect, and the existence of migrant-native health convergence with increase in duration of stay. Migrants (both men and women) are healthier than natives. Nevertheless, distinguishing between recent and long-term migrants, the pattern is true only in the case of the former, while the health gap disappears for the latter, save for chronic illnesses where all migrants show a health advantage over natives. In the case of recent migrants, this pattern may be due to positive selection in the origin country, that according to the literature (Antecol & Bedard, 2006; Lopez-Gonzalez et al., 2005; Read & Reynolds, 2012) is stronger among migrant workers than any other migrant groups. In Italy, especially men arrive for working reasons, while among women resident permits indicate that most arrive for family reunification (di Belgiojoso & Terzera, 2018). However, di Belgiojoso and Terzera (2018) argue that resident permits are not an exhaustive source of data because they exclude foreign nationals who do not need a residence permit. For example, migrants from Romania have needed no permit since 2007 when that country joined the European Union. The loss of the health advantage observed among migrants could be related to their low socio-economic status, which is persistent through the stay in the host country, poor living and above all working conditions (migrants are employed mainly in unqualified and unskilled jobs based on the informal economy). This isolates them on the lower rungs of the social ladder (Hill et al., 2012; Ro, 2014). It should be also stressed the distinction of the origin country (based on

citizenship[29]) between the two migrant groups (recent and long-term migrants). As described in the first chapter, since Italy was and continues to have migrants from many different countries, the health advantage, which was found among recent migrants, and which was lost among long-term migrants can also be the result of the composition of migration flows which have arrived there over time. Unfortunately, in this study, the only variable available to distinguish migrants' citizenship is the area of origin (Africa, America, Asia, Europe, no-Europe), which is not informative, because it is similar across recent and long-term migrant groups. Thus, we have to consider that we do not have migrants' country of origin, which is an important information for understanding and explaining migrant behaviours.

Finally, our study suggests that the convergence process is stronger for women. Women arrive less healthy because the selection is less strong for them than for men (because of their migration type). The migration process may, too, have emphasized their vulnerability, which is related to different physiological, biological and genetic factors. We must also consider the role played by healthy behaviour. In the two American studies described in the literature review (Antecol & Bedard, 2006; Lopez-Gonzalez, 2005) we find support for this result. Antecol and Bedard (2006) analysing the BMI assimilation patterns, found that female migrants converge towards native levels. Conversely, male migrants never fully assimilate. This pattern suggests that the new cultural and environmental factors that migrants are exposed to modify their behaviours, which can mean more health problems. Lopez-Gonzalez et al. (2005) found that migrant adults in general show healthier behaviour than US-born adults. Looking by gender and by duration of stay, they observed that recent migrant women have healthier behaviour than US-born women and long-term migrants. Unlike the association between assimilation/acculturation and health behaviour for women, they found that for men, the

[29] Upon our request, the Italian National Institute of Statistics (Istat) confirms that in Italy, the difference between the migrant population and the foreign population, i.e. considering migrants based on their citizenship or their country of birth, is negligible, less than 1%.

duration of stay seems to make very little difference. These studies provide support for the existence of gendered acculturation.

The present study is not without limitations. Even though the Italian survey on health is the only one which contains duration-of-stay information, first of all, we were unable to control for migration type. This is an important piece of information that would be useful for our analysis and for interpreting our findings in a better way. Second, the survey design is cross-sectional, and at the moment, in Italy, there are no longitudinal surveys for analysing the convergence process. Third, unlike the aforementioned studies in the literature review, which focus on specific migrant groups, race or ethnicity, the survey provides only migrant origin area according to Istat classification. Thus, we could not deepen the analyses by specific migrant groups. When analysing migrant health, this is an important information, which allows to better analyse and explain weather such patterns belong to all migrants or to migrants from certain country of origin. Fourth, the sample size did not allow inferences at sub-populations level. Such information would have been useful for confirming the accuracy of research findings. Finally, as summarised by the literature paragraph about migrant health (*see Paragraph 1.4.2.1*), many studies, which analyse differences in health between natives and migrants, use SRH as an indicator of health status. It should be stressed that this indicator, which is one of the most important health indicator recognised internationally, reflects a person's subjective general perception of health. This indicator seems to provide a good synthesis of individual's overall health status, and moreover it has been shown that the SRH is a good predictor of morbidity, use of healthcare services and mortality (Idler & Benyamini, 1997). However, health perception differs according to health norms and individual aspirations, which relate to culture. Indeed, evidence suggests that ethnic groups differ in their self-perceptions of health, their conceptualisation of what constitute health, and the determinants that factor in their self-rated of health (Bombak & Bruce, 2012). Thus, SRH may suffer from individual reporting

heterogeneity (Bago d'Uva et al., 2008) and its comparability among native and immigrant populations may be questioned (Jürges, 2007). Despite this issue, some studies have validated its use among ethnic groups and have showed that across ethnic groups a poorer SRH is constantly associated with higher disease prevalence rate (Chandola & Jenkinson, 2000).

The results yield several interesting findings. Many of these underscore the complexity of health determinants and highlight the need to consider migrant status and gender in tandem while looking at adult health inequalities. This study, analysing the relationship between migration and health and gender, might be helpful in improving or developing health policies for migrants. However, we would recommend the inclusion of more detailed information on migration background for foreign nationals in the Italian surveys on health.

CHAPTER 3

Disparity in Emergency Department use for host and immigrant populations in Rome, Italy.

The Rome Dynamic Longitudinal study (2005-2015)

3.1 Introduction

Considering migrant health from a holistic point of view, another important measure to analyse is the healthcare use. Starting from the knowledge that the Italian literature focuses more on hospitalisation, in this chapter the Emergency Department use will be analysed adopting a longitudinal approach, in a specific context, the Municipality of Rome. Studying the ED use matters because it arguably reflects the need for urgent assistance and because it is also an indicator of care accessibility and quality. It is not a health indicator *per se*, but it is strictly related to health indicators and it may vary during periods of crisis (Sandvik et al., 2012). Moreover, the ED can capture health needs and behaviour in real time, in contrast to other indicators coming from health surveys which may take longer to detect changes.

Most countries grant full equality of treatment to third country nationals after awarding them permanent residence status. So is access to health care still an issue? Data on this topic are relatively sparse, but several studies suggest migrants do experience unequal access to health care.

Academic interest in health inequalities dates back to 1966, when Meltsner studied equality, civil rights and the elimination of racial discrimination in healthcare use in the US (Bouchard et al., 2015). Later, in the Black Report, published in the UK in 1980, the expert committee on health inequalities chaired by Sir Douglas Black, showed, in great detail, how ill-health and death were unequally distributed among the British population. The committee, in fact, identified four key theories (artefact, selection, structural factors and behaviour) for

understanding how health inequalities arise. However, there is a general consensus that such inequalities amount to "systematic differences in the health of people occupying unequal position in society" (Graham et al., 2009). In 2008, the WHO's Commission on Social Determinant of Health (CSDH) highlighted the rise of new health inequalities between and within countries due to differences in social class, gender and ethnicity; ethnicity referred in part to unequal healthcare use by migrants and natives (CSDH, 2008). In 2012, Mackenbach confirmed the persistence of social inequality in modern welfare states (Mackenbach, 2012).

In Europe, the onset of the Great Recession in 2008, increased interest in this debate. Studies show how the economic crisis affected forms of health behaviour (De Belvis, 2012) and mortality (Falagas et al., 2009) across many countries. In addition, the recession has emphasized socio-economic health inequalities, affecting especially the most vulnerable social groups such as immigrants (Marmot & Bell, 2009; Stuckler et al., 2012; Vlachadis et al., 2014). Finally, the austerity policies adopted in many countries in the wake of the Great Recession have further worsened the health conditions of disadvantaged populations, not least in terms of access to healthcare systems (Economou et al., 2014).

Though Italy has an important number of migrants (2.4 million in 2005; 5.1 in 2018, respectively, 4.1% and 8.5% of the total population) (Istat, 2006; 2018), evidence for migrants' health and their use of health services is poor (Cacciani et al., 2006; Giannoni, 2010; De Luca et al., 2013; De Waure et al., 2015; Devillanova & Frattini, 2016; Loi, 2016; Petrelli et al., 2017; Loi et al., 2018), and few studies focus on the ED rate (Brigidi et al., 2008; Gaddini et al., 2008; Grassino et al., 2009; Bonvicini et al., 2011; Ballotari et al., 2013) during the Great Recession.

Like citizens, migrants require health and social services, and one of the greatest challenges for host countries is the effective management of migrants' health-care needs in terms of equity, access and appropriateness of services.

Disparities in health-service use may be related to differences in health status, lifestyles, and, of course, preparedness to seek health care. Then, there are linguistic, bureaucratic, cultural and organizational barriers, the fear of discrimination, and different factors mainly related to the perception of illness or to what has been called *health literacy*. Selection hypotheses should also be considered. The *healthy migrant effect*, according to which migrants are more likely to report better health than natives, because only those in good health are prone to migrate; and the *salmon bias* which argues that unhealthy migrants are more likely to return to their home countries (McDonald & Kennedy, 2004; Nørredam et al., 2004; Newbold, 2005; Fassaert et al., 2010). However, this selection effect may be offset by the poor conditions (economic, environment, social and housing,) migrants experience in the host country (the *exhausted migrant effect*) (Bollini & Siem, 1995; Hill et al., 2012; Moullan & Jusot, 2014; Loi & Hale, 2019).

Such inequalities are also related to differences in morbidity, self-perceived health and healthcare use. Healthcare use is particularly difficult to evaluate and to measure. As described in the first chapter, several factors can facilitate or impede the use of given healthcare services (Andersen, 1995).

In Italy, health policies which regulate migrants' health are to be found in the *D. Lgs. 286,* including the *Testo Unico sull'Immigrazione* approved in 1998, and in the *Circular n. 5 of 2000* of the Health Department. These provisions provide equal rights in terms of health and healthcare use for both Italians and migrants who are legally present in the country; they also provide for emergency health assistance for illegal migrants, especially for women and children (Marceca et al., 2012).

The Italian National Healthcare System (NHS) is organised on a regional basis. It provides universal coverage free of charge to the population for hospital care with co-payments for ambulatory and pharmaceutical care. Furthermore, immigrants with a residency permit are

obliged to subscribe to the NHS. Any irregular migrants, without a residency permit or with a permit which has expired more than 60 days before, can benefit from medical assistance (essential and urgent care) with a special code (STP - *Straniero Temporaneamente Presente,* temporary foreigner). The STP is valid for all of Italy for one year.

3.2 Literature review

Equitable access to and use of healthcare services is a fundamental and a core objective for healthcare systems. The aim of most healthcare systems is to ensure and satisfy good healthcare according to individuals' needs, regardless of their social, gender, race or ethnicity. The Italian National Health Service, which was set up in 1978 and which inspired by the Beveridge model of the British National Health Service[30], guarantees universal coverage, solidarity, human dignity, and the satisfaction of health needs[31]. However, constitutionally, healthcare responsibility is shared between the central government and the twenty regions and most health policies are developed and implemented by the regions. There is, therefore, an increasing heterogeneity in terms of the quality and quantity of care offered to citizens (Barsanti, 2018). The result is that good and equal healthcare is no long a reality for the whole population. Nor do vulnerable populations necessarily have access to sufficient healthcare. In the literature it is well known that low socio-economic positions are associated with higher levels of mortality and poor health (Mackenbach et al., 2008; Alicandro et al., 2017; Scott et al., 2017), and lower healthcare use (Mackenbach et al., 1997; Veugelers & Yip, 2003; Moscelli et al., 2018). Another determinant of health is ethnicity. European countries, in the last decades, have been and are still characterized by an increase in migration from less developed countries.

[30] In the Beveridge model, funding is based mainly on taxation and is characterized by a centrally organized National Health Service where the services are provided by mainly public health providers, such as hospitals, doctors, etc.
[31] Article 32 of the Italian Constitution.

At the international level, several studies showed that being a migrant – being born abroad, having foreign citizenship, and a low social position – represent risk factors associated with poor health (Sundquist, 1995). What is more, as already shown in the first chapter, differences in healthcare use between migrants and non-migrants have been well documented in the international literature (Wen et al. 1996; Stronks et al., 2001; Muennig & Fahs, 2002; Lucas et al., 2003; Carrasco-Garrido et al., 2007; 2009; Quevedo & Rubio, 2009; Solé-Auró et al., 2012; Klein & von dem Knesebeck, 2018). However, only a few studies analyse migrants' use of the ED and these show mixed results. A number of different cross-sectional works found higher ED use among migrants (Hargreaves et al., 2006; Cots et al., 2007; Rué et al., 2008; Quevedo & Rubio, 2009; Antón & Muñoz de Bustillo, 2010), especially for non-urgent conditions (Diserens et al., 2015; Ruud et al., 2015), and with differences among migrant sub-groups (Nørredam et al., 2004; Sandvik et al., 2012). Others showed no significant differences (Carrasco-Garrido et al., 2007; Shah & Cook, 2008), or lower ED use by migrants as compared to natives (Nørredam et al., 2004; Cots et al., 2007; Buron et al., 2008; Carrasco-Garrido et al., 2009).

As previously shown in the first chapter, some recent research investigated migrant health status in Italy (Loi, 2016: Caselli et al., 2017; Petrelli et al., 2017; Loi et al., 2018; Loi & Hale, 2019), and other studies have analysed access to healthcare services in the same country (Cacciani et al., 2006; Baglio et al., 2010; De Luca et al., 2013; De Waure C. et al. 2015; Casadei et al. 2016; Franchi et al., 2016; Busetta et al., 2018; Fedeli et al. 2018; Loi et al., 2018). Concerning ED utilisation, only a few studies are available. At the national level, there are only two studies (De Luca et al., 2013; Devillanova & Frattini, 2016). Those study used the 2005 wave of the Italian Health Conditions Survey. De Luca et al. (2013) found that migrants from Morocco, other African countries and Albania register higher ED rates than natives. Devillanova and Frattini (2016) suggested that lack of information is the main cause of the

inappropriate use of health services. However, authors confirmed that differences in culture, attitudes and habits cannot be excluded. At the local level, a handful of studies quantify differences in ED use between migrants and natives or among migrant sub-groups. Most of them focus on the appropriateness of ED use in terms of severity of conditions (Brigidi et al., 2008; Grassino et al., 2009; Ballotari et al., 2013), while only two works analysed the ED in terms of ED use rates (Bonvicini et al., 2011; Gaddini et al., 2008).

It should be noted that the studies mentioned here are mainly descriptive, use cross-sectional data and do not cover more than four to five years (Gaddini et al., 2008; Bonvicini et al., 2011), and they do not cover the Great Recession.

Our study contributes to the literature about the healthcare use of immigrants with a comparative analysis of ED use trends for immigrants and Italians residing in the Municipality of Rome. We employ a longitudinal approach based on a dynamic population cohort. The objective of our work is twofold. Firstly, ED use is analysed by migrant status in order to explore whether there are differences between Italian and migrant ED rates, 2005-2015. Secondly, the study analyses changes in ED use by comparing the pre-2008 and the post-2008 period, for all causes and for selected causes (cardio-vascular diseases, mental disorders and injuries). We selected these three healthcare areas because it has been observed that mortality related to such areas is susceptible to economic shocks (Stevens et al., 2015). Our research hypothesis is that migrants tend to register lower ED use with respect to Italians due to their better health. In addition, we suggest that, over time, migrants' health status may worsen due to economic downturns, and to changes in lifestyles, with poor living and working conditions in the host country.

3.3 Ethics statement

The Rome Longitudinal Study is part of the National Statistical Program for the years 2001–2019 and was approved by the Italian Data Protection Authority. Data have been analysed anonymously and results are shown in aggregate form. The Department of Epidemiology of the Lazio Regional Health Service is permitted by the Lazio Committee to manage and to analyse data from regional health information systems for epidemiological purposes.

3.4 Data & Methods

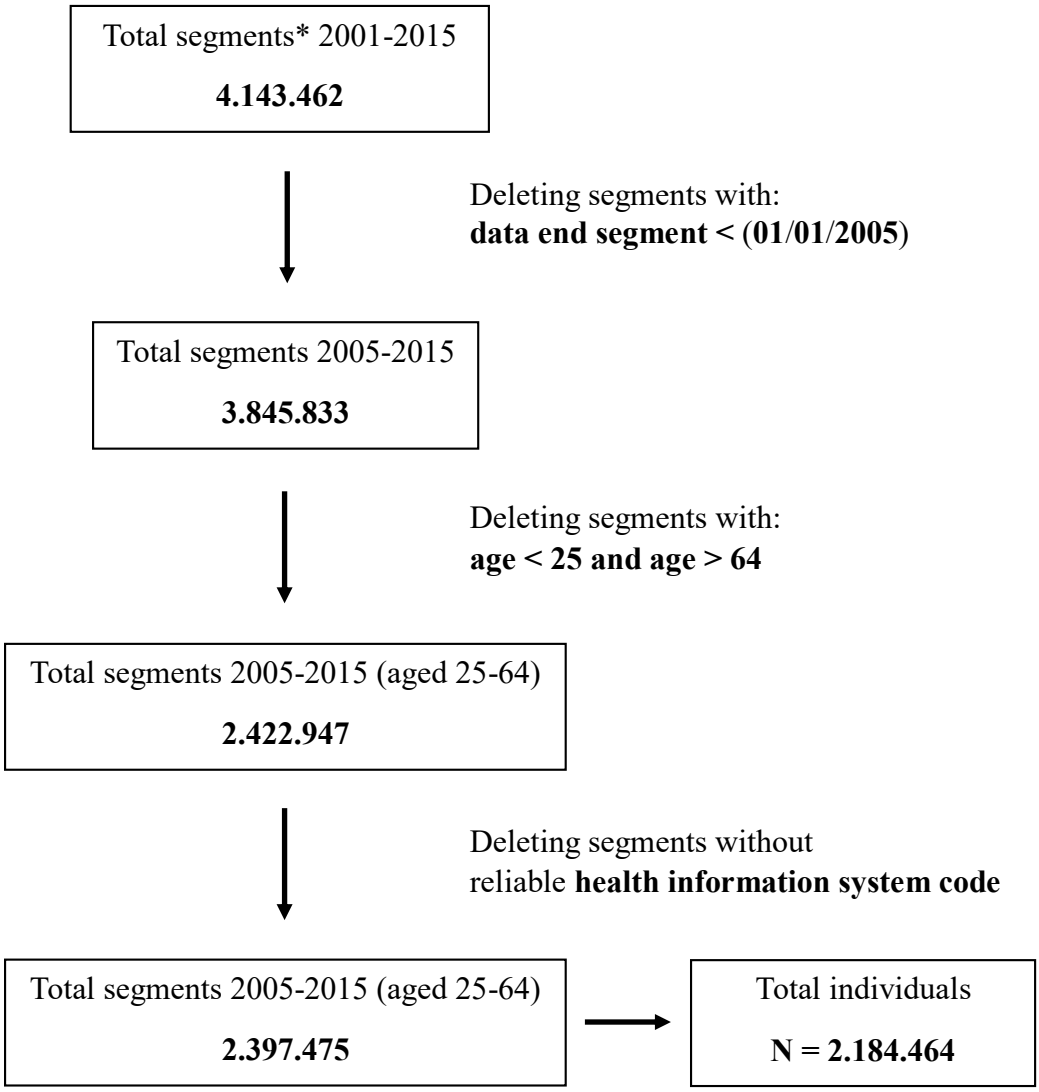
Cohort description

We performed a longitudinal population-based study. We used the Rome Dynamic Longitudinal Study cohort (D-RoLS), part of the Italian Network of Longitudinal Metropolitan studies (IN-liMeS). The cohort is based on the Rome Municipal Register, which provides demographic information for all who have been resident in Rome for at least one day from 2001 to 2015 (4,143,462 segments) (Caranci et al., 2018). Since we had to subsequently link cohort data with the Lazio Health Information System on Emergency Care (HIS-EC), for data quality reasons, we decided to start from 1 January 2005 (3,845,833 segments). We selected residents, who were aged 25 to 64 years in each calendar year, in Rome from 1 January 2005 to 31 December 2015. Entry into the sample can take place for immigration or age (≥ 25 years old). Exit, meanwhile, can come about because of emigration, age (≥ 65 years old), death or for the end of the study (2,422,947 segments). Finally, we excluded all individuals who did not have a reliable Health Information Systems code (1.1%) (2,397,475 segments). This is necessary for the following record linkage with the HIS-EC. The study population (25-64 years) is composed of 2,184,467 individuals (Fig. 3.1).

Outcome

The outcome variable is the number of ED contacts. It is obtained from the HIS-EC, which provides data about all contacts from the Lazio region. After having linked the cohort data with the ED data using an individual anonymised code and ED access date, we counted the number of ED contacts *per* subject. We selected all and specific healthcare areas (coded according to the ICD-9-CM) related to: cardiovascular diseases (CVDs, codes 401-445); to mental disorders (290-319); and to injuries (800-959).

Figure 3.1 - Flow chart of the study population selection



* The segment represents each period in which an individual is resident in the Municipality of Rome.

Exposure and other variables

The exposure variable is the origin area (migrants vs. Italians). This was measured by citizenship at first entry into the cohort. This study defines as migrant those individuals without Italian citizenship, distinguishing further migrants from High Migratory Pressure Countries[32] and migrants from all the other countries, i.e. Highly Developed Countries. Since we are dealing with people resident in Rome, irregular and temporary migrants have not been included in the study.

Time-period (pre-2008: 01/01/2005-31/12/2008, reference category; post-2008: 01/01/2009-31/12/2015) is considered as an effect modifier, while age (25-34 years, reference category; 35-44; 45-54; 55-64), and gender (males as reference category) are considered as confounders.

Statistical analysis

Descriptive analysis

In order to explore changes in the use of emergency service, the first part of the study is a descriptive analysis in which we investigate and compare the pattern of ED use by origin area (Italy, HMPC and HDC). The access rate, in a specific context and time-period, is defined as the ratio between the number of ED contacts and the person-days of the resident in Rome *per* 1000. Crude usage rates (CUR) and direct age-standardized usage rates (SUR) have been computed using the population residing in the Lazio region on 1 January 2014 as the standard population.

[32] Central-Eastern Europe (including Poland and Romania), Africa, Asia (except for Israel and Japan), and Latin America

Regression model

When analysing healthcare use, two important characteristics require attention. The first characteristic is that the outcome (the number of contacts) can take only non-negative integer values. This means that some individuals have no contacts during the period under examination, whereas others have single or multiple contacts.

Since the dependent variable is represented by the number of times that individuals contacted the ED, the Ordinary Least Squares method is inappropriate because data are non-negative integers (Wooldridge, 2002). On this basis, count data models are considered more appropriate techniques than classical linear regression models (Pohlmeier & Ulrich, 1995). Indeed, the Poisson regression model may represent the starting point for estimating the number of contacts; where the number of occurrences of an event are Poisson distributed. In applied work, however, this model is restrictive because it assumes equidispersion, which means, the equality of the mean and variance. If this restriction is violated, the coefficients are consistent, but their standard errors are not (Cameron & Trivedi, 1990). In empirical data concerning economic or health behaviour, this assumption is rarely valid and we usually observe that variance exceeds the mean. This feature, called overdispersion, is a source of inefficiency in the Poisson model. Looking at our data, the mean of the number of ED contacts is 1.14 and the variance is 6.17. This overdispersion might be the result of state dependence, which means that the probability of visiting a doctor or of contacting the ED might be dependent on visits or contacts in the previous days. Thus, overdispersion might, therefore, be the result of a violation of the assumption of independence (Amemiya, 1985).

In order to handle the overdispersed count data, the Negative Binomial regression model (NB) is often proposed. The NB is a generalisation of the Poisson model, since it introduces an individual unobserved effect into the conditional mean (Greene, 2008). This model adds an error term accounting for unobserved heterogeneity among individuals. This is assumed to be

uncorrelated with the covariates and with an exponential form that follows a gamma distribution.

The second characteristic of healthcare use is the decision-making process. In Poisson and Negative Binomial models, also defined as *one-part models*, the individual is, according to Grossman's framework (2017), identified both as the one who makes the decision to contact the doctor and the one who controls medical care choices. However, when the interest is in studying healthcare demands, those models have some shortcomings. Indeed, when it is necessary to study healthcare demands, the decision-making process is regulated by two different steps: in the first the patient decides to access healthcare services; while in the second the doctor determines the treatment and therefore the frequency of subsequent visits. In this framework, the patient is no longer the unique and sovereign decision maker, as he or she transfers to the doctor the responsibility for deciding the type and quantity of medical services on offer. In Poisson and Negative Binomial models, this two-part characteristic is ignored, which may lead to inconsistent parameter estimates and hence to misinterpretation.

There is also a third reason why two-part models offer better techniques for the estimation of healthcare use. Poisson and Negative Binomial models often predict a substantially lower proportion of zeros than is observed in the data (Cameron & Trivedi, 2005). In our study, the number of zero-observations is 2,037,216, taking both periods separately (*pre-2008* and *post 2008*); while the Negative Binomial model predicts only 1,244,069 zero-observations.

In order to take these questions into account, Pohlmeier and Ulrich (1995) proposed a hurdle or a two-part model. This allows us to consider the decision-making process, where the decision to contact health care services and the frequency of use for individuals with non-negative contacts are modelled separately. The first part of the model estimates the propensity to use healthcare services, while the second, using a truncated model, estimates how often an individual with positive counts has visited a doctor. This model, first proposed by Mullahy

(1986), can take several forms. The most frequent models used in the first step are a *probit* or a *logit* model and a *zero-truncated Poisson* or a *zero-truncated Negative Binomial* model (the use depends on the assumptions of the variance) for the second one.

For a general formulation of the hurdle model, let y_i denotes the count variable and $x_i = [x_{i1}, x_{i2}, \dots, x_{ik}]$ a vector of covariates. Assume that f_1 and f_2 are discrete probability functions, where f_1 governs the first part of the model and f_2 governs the second part, then the probability function of the hurdle model is given by:

$$f(y_i|x_i;\beta_1,\beta_2) = \begin{cases} f_1(0|x_i;\beta_1) & if\ y_i = 0 \\ [1 - f_1(0|x_i;\beta_1)] * f_2(y_i|x_i;\beta_2, y_i > 0) & if\ y_i = 1,2,\dots n \end{cases} \quad (2)$$

In this study, a *logit* is run in order to estimate the propensity for being an ED user (zero-hurdle part). The second part (count-part), which is represented by a *zero-truncated Negative Binomial* for handling overdispersed count data, estimates the average number of ED contacts for those with ED experience. In addition, by separating out the decision for any ED contact from the frequency of contacts, it may be possible to assess whether migrant status has its effect largely through the contact decision or through the frequency decision in medical care.

We modelled the interaction between the origin area and the time-period. We considered two-sided p-values less than 0.05 as being statistically significant.

The software SAS 9.4 was used for data management, while all calculations were performed using the software R.

3.5 Results

3.5.1 Descriptive results

The total population is composed of 2,184,467 individuals, who have resided in Rome from 2005 to 2015, and who were aged 25-64 years in each calendar year. Table 1 reports the demographic characteristics of the population (mean age, gender, and origin area) by time-period (pre-2008, post-2008). Respectively in the pre-2008 and in the post-2008 time-period, the average age of individuals was 44.1 years (SD=10.8) and 44.4 (SD=10.7), the proportion of women was 51.8% and 51.2%, and 11.5% (out of 1,737,105 individuals) and 18.1% (out of 2,035,479) were migrants. Most migrants came from Central-Eastern Europe, followed by Asia, Africa, Latin America and HDC (Table 3.1).

From 2005 to 2015, 4,291,795 ED contacts were registered. In the post-2008 period, a decrease in the SUR was detected compared to the pre-2008 numbers for all-cause ED contacts (251‰ vs. 271‰) and injuries (83‰ vs. 93‰). No changes occurred for CVDs and mental disorders (respectively 6‰ and 7‰ for the two time-periods); and some differences by origin area were found (Table 1B in the Appendix B).

Looking at the annual SUR by origin area (ITA, HMPC, HDC), migrants had lower ED use than Italians each year. In the post-2008 period, an overall decrease in all-cause SUR was registered among both Italians and migrants from HMPC, with fluctuations and a peak in 2009 (289‰ among Italians and 214‰ among migrants). A slight increase was, instead, observed among migrants from HDC (Figure 3.2).

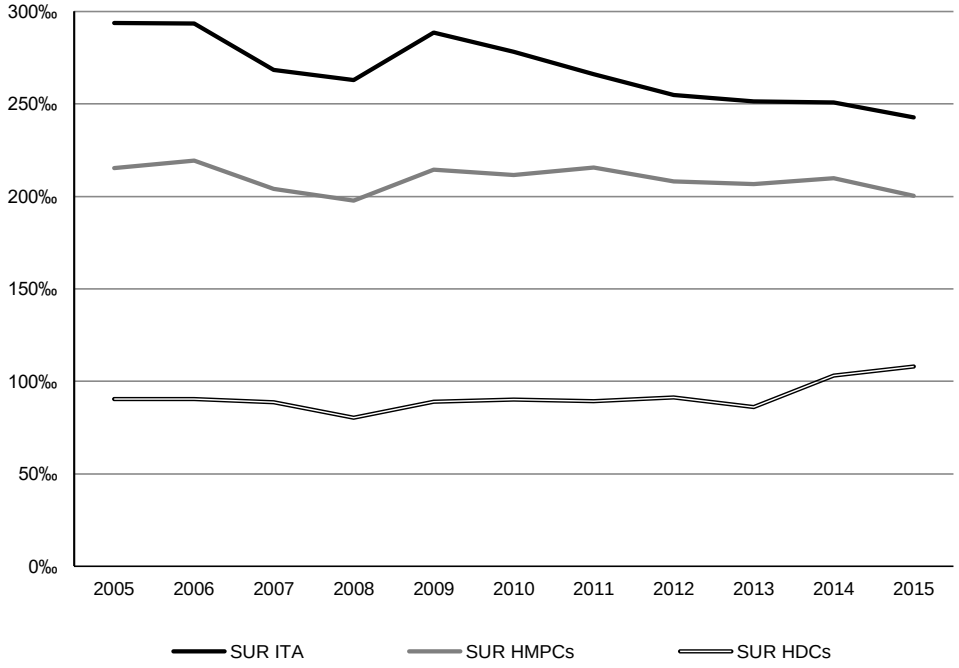
Different patterns were detected for the three selected causes (Figure 3.3). For cardio-vascular causes, an increase of SUR in the post-2008 period was observed both for Italians and migrants, while for the other causes there was a decrease. Only mental disorders and injuries seemed to contribute to the overall decrease in all-cause SUR, and also to the spike in contacts observed for all causes in 2009 (Figure. 3.2).

Table 3.1 - Demographic characteristics of the population residing in Rome aged 25-64 years, by time-period

		Pre-2008		Post-2008	
Total		**1,737,105**	**100**	**2,035,479**	**100**
Mean age *(SD)*		44.1 *(10.8)*		44.4 *(10.7)*	
		N	**%**	**N**	**%**
Gender					
M		837,517	48.2	994,205	48.8
W		899,588	51.8	1,041,274	51.2
Origin area					
Italy		1,537,361	88.5	1,667,303	81.9
HDC		20,554	1.2	27,702	1.4
HMPC		179,190	10.3	340,362	16.7
	of which				
	Africa	26,087	13.1	50,488	13.7
	Latin-America	24,043	12.0	38,861	10.6
	Asia	53,308	26.7	112,804	30.6
	Eastern-Europe	75,752	37.9	138,209	37.6

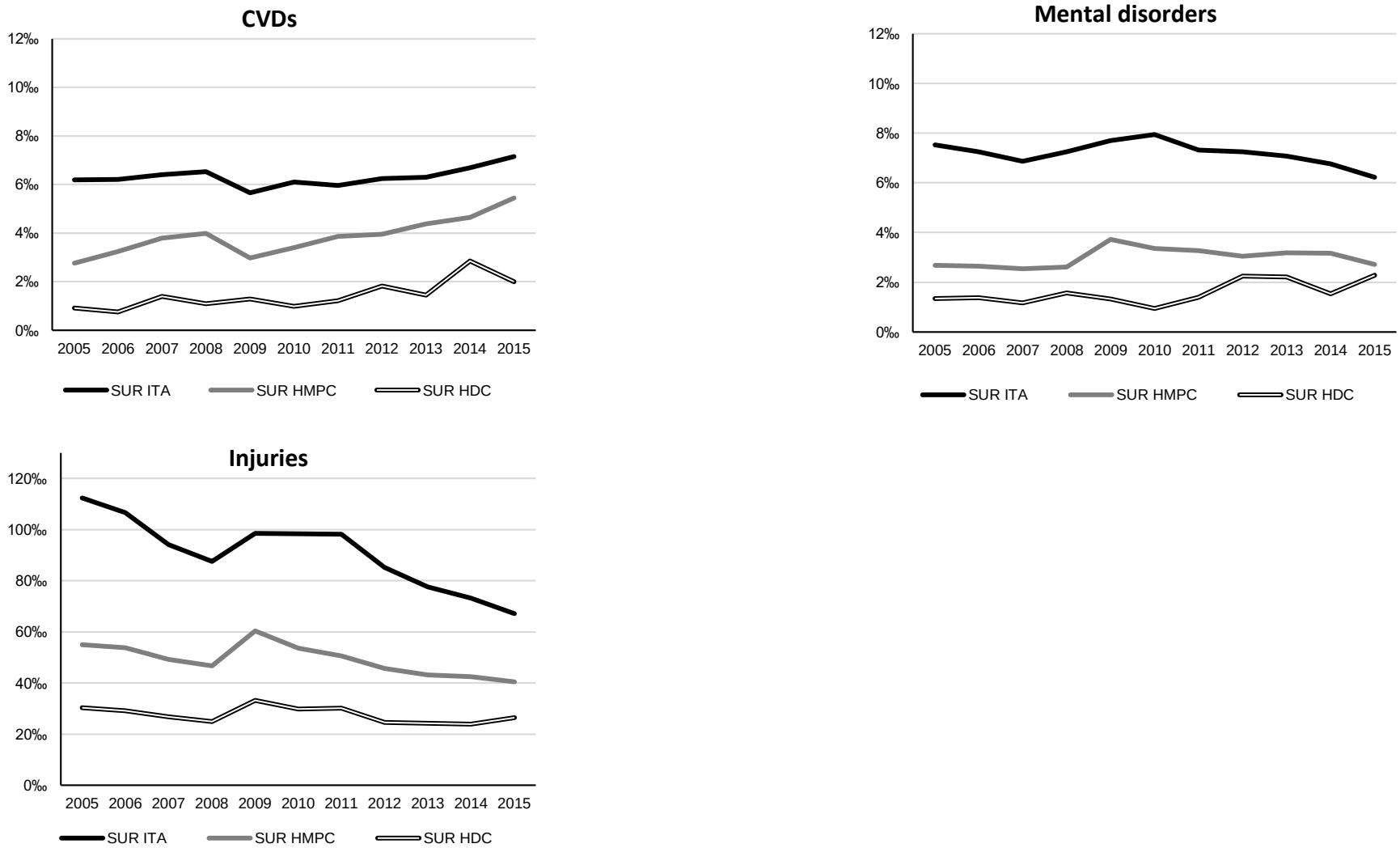
Source: authors' elaboration with Dynamic Rome Longitudinal Study cohort data and the ED Register data (HIS-EC)

Figure 3.2 - Trends of all-cause ED use rates by migrant status of the population residing in Rome aged 25-64 years, from 2005 to 2015 (SUR per 1000)



Source: authors' elaboration with Dynamic Rome Longitudinal Study cohort data and the ED Register data (HIS-EC)

Figure 3.3 - Trends of ED use rates (CVDs, Mental disorders and Injuries) by migrant status of the population residing in Rome aged 25-64 years, from 2005 to 2015 (SUR per 1000)



Source: authors' elaboration with Dynamic Rome Longitudinal Study cohort data and the ED Register data (HIS-EC)

3.5.2 Regression results

3.5.2.1 All-Cause Emergency Department Contacts

Tables 3.2 and 3.3 display Hurdle Model results for ED use according to the origin area, while results distinguishing between Italians, HMPC and HDC are commented on below (See also 2B and 3B in the Appendix B). Regression results for adjusting factors used in the model are presented in Tables 3.2B and 3.3B in the Appendix B.

Regarding all-cause ED rates from 2005 to 2015, all migrant subgroups (zero-part model) were less likely to be an ED user than Italians. The count-part model indicates that Africans (RR = 1.46, 95% CI 1.40-1.52) and Latin Americans (RR = 1.04, 95% CI 1.00-1.08) had higher use rates than Italians, while other groups displayed lower rates.

Compared to the pre-2008 period, in the post-2008 period individuals were more likely to go to the ED (OR = 1.34, 95% CI 1.34-1.35) and the usage rate was lower (RR = 0.96, 95% CI 0.96-0.97).

The interaction between the origin area and the time-period suggests that the effect of time on the propensity of being an ED user was stronger for migrants from Central-Eastern Europe (OR=1.21, 95% CI:1.19-1.23) and weaker for those from Africa (OR=0.80, 95% CI:0.77-0.82) and Asia (OR=0.93, 95% CI:0.91-0.95). The decrease in the ED usage rate did not, meanwhile, change by origin area (Table 3.2).

When migrant status was classified as Italians, HMPCs and HDCs, the propensity to use the ED was always lower for migrants, HDC (OR=0.23, 95% CI:0.22-0.24) and HMPC (OR=0.53, 95% CI:0.52-0.53), though a lower (HDC–RR=0.65, 95% CI:0.61-0.70) or similar (HMPC–RR=1.00, 95% CI:0.98-1.02) ED rate was found compared to Italians (Table 2B in the Appendix B).

Table 3.2 - Odds ratios and rate ratios for the Negative Binomial Hurdle model. All-cause ED contacts by migrant status among residents in Rome aged 25-64 years from 2005 to 2015

	Zero-part model			Count-part model		
	OR		95% CI	RR		95% CI
Origin area						
Italy[a]						
HDC	0.23	***	(0.22-0.24)	0.65	***	(0.61-0.70)
Africa	0.52	***	(0.50-0.53)	1.46	***	(1.40-1.52)
Latin-America	0.72	***	(0.70-0.73)	1.04	*	(1.00-1.08)
Asia	0.43	***	(0.43-0.44)	0.80	***	(0.78-0.83)
Eastern-Europe	0.55	***	(0.54-0.55)	0.96	***	(0.93-0.98)
Time-period						
Pre-2008[a]						
Post-2008	1.34	***	(1.34-1.35)	0.96	***	(0.96-0.97)
Origin area * Time-period						
HDC Post-2008	0.98		(0.93-1.02)	0.94		(0.87-1.02)
Africa Post-2008	0.80	***	(0.77-0.82)	1.00		(0.96-1.05)
Latin-America Post-2008	0.99		(0.96-1.02)	1.01		(0.97-1.06)
Asia Post-2008	0.93	***	(0.91-0.95)	0.99		(0.96-1.03)
Eastern-Europe Post-2008	1.21	***	(1.19-1.23)	0.99		(0.96-1.01)
N observations	*3772584*			*1735368*		

[a] Reference category.
Adjusted for: gender and age.
Zero-part model reports odds ratios for the outcome variable indicating persons without (Y = 0) or with Emergency Department experience (Y = 1, where all values larger than 0 are censored, which means, are fixed at 1), while the Count-part model, which reports rate ratios, models the number of Emergency Department experiences for those with Emergency Department experiences (for those with Y >0).
*Note: The asterisks indicate significance *p < 0.05, **p < 0.01, ***p < 0.001.*

3.5.2.2 Cause-specific Emergency Department Contacts

Regardless of cause, all migrant sub-groups were less likely to be ED users than non-migrants (zero-part model). The count-part model displays that for CVDs, only migrants from HDC registered a lower usage rate (RR=0.77, 95% CI:0.37-1.62). As to mental disorders, lower ED usage rates belonged to Latin Americans (RR=0.41, 95% CI:0.28-0.61), Asians (RR=0.63, 95% CI:0.45-0.88) and Central-Eastern Europeans (RR=0.62, 95% CI:0.50-0.77); while for injuries all migrant sub-groups had lower rates than Italians. In the post-2008 period, there was both an increase in the likelihood of being an ED user (CVDs–OR=1.60, 95% CI:1.57-1.62; Mental disorders–OR=1.31, 95% CI:1.28-1.33; Injuries–OR=1.21, 95% CI:1.20-1.22), and a decrease in ED usage rates (CVDs–RR=0.88, 95% CI:0.85-0.91; Mental disorders–RR=0.91, 95% CI:0.88-0.95; Injuries–RR=0.82, 95% CI:0.81-0.83) was detected for the total population compared to the pre-2008 period. Compared to non-migrants, the interaction between origin area and time-period suggests that, over time, likelihood of being ED users was stronger among Latin Americans (OR=1.26, 95% CI:1.02-1.56) and Central-Eastern Europeans (OR=1.41, 95% CI:1.27-1.56) for CVDs; among Central-Eastern Europeans (OR=1.42, 95% CI:1.29-1.56) for mental disorders; among Latin Americans (OR=1.05, 95% CI:1.00-1.10) and Central-Eastern Europeans (OR=1.20, 95% CI:1.17-1.23) for injuries; whereas it was weaker among Africans (OR=0.81, 95% CI:0.78-0.85) and Asians (OR=0.91, 95% CI:0.88-0.94). Concerning the count-part model, in the post-2008 period, ED usage rates did not change by origin area for CVDs and mental disorders, while for injuries the decrease in ED rates was weaker for Latin-Americans (RR=1.08, 95% CI:1.01-1.16), and stronger for Asians (OR=0.93, 95% CI:0.87-0.99) (Table 3.3).

When migrant status was classified as Italians, HMPC, and HDC, migrants again had lower ED rates, regardless of cause; in the post-2008 period, a higher propensity of being an ED user and a lower ED rate was registered for the whole population. Over time, the propensity

for using the ED was stronger among HMPC migrants for CVDs and mental disorders. Meanwhile, no differences were detected in ED rates (Table 3B in the Appendix B).

Table 3.3 - Odds ratios and rate ratios of the Negative Binomial Hurdle model. ED contacts for CVDs, Mental disorders and Injuries, by migrant status among residents in Rome aged 25-64 years from 2005 to 2015

	CVDs						Mental disorders						Injuries					
	Zero-part model			Count-part model			Zero-part model			Count-part model			Zero-part model			Count-part model		
	OR		95% CI	RR		95% CI	OR		95% CI	RR		95% CI	OR		95% CI	RR		95% CI
Origin area																		
Italy[a]																		
HDC	0.17	***	(0.14-0.22)	0.77	***	(0.37-1.62)	0.22	***	(0.17-0.28)	0.71		(0.39-1.29)	0.25	***	(0.23-0.26)	0.69	***	(0.62-0.77)
Africa	0.47	***	(0.40-0.54)	1.09		(0.75-1.58)	0.47	***	(0.41-0.54)	0.78		(0.56-1.09)	0.42	***	(0.40-0.43)	0.89	***	(0.84-0.95)
Latin-America	0.35	***	(0.29-0.42)	0.97		(0.58-1.62)	0.54	***	(0.47-0.62)	0.41	***	(0.28-0.61)	0.58	***	(0.56-0.60)	0.85	***	(0.80-0.90)
Asia	0.59	***	(0.54-0.65)	1.05		(0.83-1.34)	0.24	***	(0.21-0.28)	0.63	**	(0.45-0.88)	0.31	***	(0.30-0.32)	0.61	***	(0.58-0.65)
Eastern-Europe	0.49	***	(0.45-0.54)	1.19		(0.94-1.51)	0.49	***	(0.45-0.53)	0.62	***	(0.50-0.77)	0.47	***	(0.46-0.48)	0.85	***	(0.82-0.89)
Time-period																		
Pre-2008[a]																		
Post-2008	1.60	***	(1.57-1.62)	0.88	***	(0.85-0.91)	1.31	***	(1.28-1.33)	0.91	***	(0.88-0.95)	1.21	***	(1.20-1.22)	0.82	***	(0.81-0.83)
Origin area * Time-period																		
HDC Post-2008	1.23		(0.92-1.65)	1.07		(0.46-2.49)	0.94		(0.70-1.27)	1.40		(0.69-2.85)	0.99		(0.93-1.07)	0.90		(0.79-1.04)
Africa Post-2008	1.14		(0.96-1.35)	0.86		(0.56-1.31)	0.93		(0.79-1.11)	1.08		(0.73-1.60)	0.81	***	(0.78-0.85)	0.99		(0.93-1.06)
Latin-America Post-2008	1.26	*	(1.02-1.56)	1.01		(0.57-1.80)	1.11		(0.94-1.31)	1.11		(0.70-1.74)	1.05	*	(1.00-1.10)	1.08	*	(1.01-1.16)
Asia Post-2008	1.09		(0.98-1.21)	0.95		(0.72-1.24)	0.95		(0.81-1.12)	0.94		(0.63-1.40)	0.91	***	(0.88-0.94)	0.93	*	(0.87-0.99)
Eastern-Europe Post-2008	1.41	***	(1.27-1.56)	0.82		(0.63-1.07)	1.42	***	(1.29-1.56)	1.10		(0.87-1.39)	1.20	***	(1.17-1.23)	1.00		(0.96-1.04)
N observations	*3772584*			*84610*			*3772584*			*57820*			*3772584*			*882930*		

[a] Reference category
Adjusted for: gender and age.
Zero-part model reports odds ratios for the outcome variable indicating persons without (Y = 0) or with Emergency Department experience (Y = 1, where all values larger than 0 are censored, which means, are fixed at 1), while the Count-part model, which reports rate ratios, models the number of Emergency Department experiences for those with Emergency Department experiences (for those with Y >0).
*Note: The asterisks indicate significance *p < 0.05, **p < 0.01, ***p < 0.001.*

3.6 Discussion

Using the Dynamic Rome Longitudinal population-based cohort linked to Emergency Department data over eleven years, we were able to analyse the ED rate patterns of the Italian and migrant population residing in Rome. By applying the Hurdle model, we took into account the underlying decisional processes related to healthcare usage. Indeed, analysing the propensity to use the ED and the ED rates for all causes, our results confirm the initial hypothesis that migrants use the emergency care less than Italians because migrants have better health. Nevertheless, once they access the emergency care service, migrants have a different usage rate, which varies according to their origin area. Those from HDCs, Asia and Central-Eastern Europe showed a lower use of the emergency service than Italians. Non-European migrants, on the other hand, particularly those from the "global South" (Africans and Latin-Americans), displayed a higher rate of use than non-migrants. These results might reflect an inappropriate use of emergency care by migrants, who tend to use primary (general practitioners) and secondary (specialist visits) care less than non-migrants (Sandvik et al., 2012). Despite our universal National Healthcare System guaranteeing migrants access to emergency care, migrants often have uncertain employment conditions which might mean difficulties in going to the doctor during working hours. As a consequence, some groups of migrants access the ED as a first option (Rué et al., 2008; Rosano, 2018).

Moreover, there may be differences in the health status and severity of illness – perhaps correlated with urgency – between natives and migrants. This might very possibly generate differences in ED use.

Looking at the relations between ED use and the period of use (post-2008 vs. pre-2008), we found, for the whole population, an increase in the likelihood of being an ED user and a decrease in ED rates, with differences among migrant sub-groups, regardless of cause.

The increase in the likelihood of contacting the ED might be related to the economic situation (Hughes & Khaliq, 2014) and to austerity policies. These may have reduced healthcare assistance, either because of the limited availability of health services or because of increased costs (European Commission, 2013), during the Great Recession. Furthermore, the stronger increase in the likelihood of ED use among Latin Americans and Central-Eastern Europeans may support our second hypothesis that migrants' health status worsens over time. This might be due to economic downturns, changes in lifestyles, and to living and working conditions in the host country. These findings are consistent with other studies which suggest that new living conditions and a longer length of stay in the host country negatively influences migrants' health status (De Maio, 2010; Hill et al., 2012; Gimeno-Feliu et al., 2016).

Conversely, as pointed out by some authors (Stuckler et al., 2012; Ásgeirsdóttir et al., 2014), the decrease in ED usage rate experienced by the whole population in the post-2008 period, could be due to the correction of unhealthy habits. This might imply a general improvement in health status. This pattern can also be interpreted by referring to the so called *Thomas effect*[33] (Granados, 2012), generally mentioned in mortality analyses, whereby access to ED decreases with economic contractions, instead of being countercyclical, as expected. In the Italian context, this kind of a decrease is also related to the reorganization of health services to reduce inappropriate emergency care usage (Law 296/2006 art 1 paragraph 796).

We also found that for cardio-vascular, mental disorders and injuries ED usage rate, all migrant sub-groups were less likely to use the emergency care service than Italians. This finding may be due to the healthy migrant effect, the salmon bias, migrants' healthier lifestyles, or to access barriers that migrants have to face (McDonald & Kennedy, 2004; Devillanova & Frattini, 2016), barriers that can limit the access to healthcare services and that may grow during

[33] Dorothy Thomas together with Ogburn William, two American researchers, had already analysed, in the 1920s, the relationship between business cycles and health and mortality.

economic downturns, mainly economic barriers. Actually, access is a multi-dimensional issue. Barriers to access can be found at the level of individuals, health service providers and the health system (*see Paragraph 1.4.2.2*), and they can be affected by public policy, especially fiscal policy - but also social protection, education, employment, transport and regional development policy - beyond the health system. Kyriopoulos et al. (2014), in a study conducted in Greece, found that economic downturns and times of austerity have negative impacts on individuals' access to healthcare services, by increasing economic/financial barriers which can be mainly attributable to income decrease and unemployment. In this regard, the European Commission (2016) affirmed that financial barriers are the largest single driver of unmet need for healthcare in the European Union.

In the Italian context, on the one hand, the economic recession restrains both public and private health sector expenditure, making it difficult to meet the health needs and expectations of the population. On the other hand, the high national debt stock pushes to improve public finances to avoid default, by forcing singular public spending cuts. As said previously, since 2007, regions have started a reorganisation of health services, by introducing a co-payment for visits (around 10 euros) to public and private accredited specialists and a €25 charge for visits by patients aged 14 or older to hospital emergency departments that are deemed inappropriate. Such co-payments were added to existing tariffs, placing a significant additional burden on patients (De Belvis et al., 2012). Busetta et al. (2018) claim that in Italy, many individuals have experienced barriers in access medical care due to unaffordability and unavailability of health services. They also affirm that the situation is especially challenging for migrants.

There are some limitations in our study. Indeed, it is also important to consider the differences in the healthcare use in light of the analyses undertaken, particularly to assess whether confounding may distort the relationship between the migrant status and the ED use. As stated by Credé et al. (2017) in their literature review on "*International migrants' use of*

emergency departments in Europe compared with non-migrants' use: a systematic review", few studies adjusted their analyses other than *age* and *gender*, thus confounding may be present in the result observed. We could not account for socio-economic status, which may be one of such confounder. Being out of the labour force or having a low socio-economic status increases the likelihood of using medical services (Schofield, 1996; Economou et al., 2008; Begley et al., 2011).

In addition, length of stay in the host country may be another important confounder. It may change migrants' healthcare usage patterns due to a deterioration in migrants' health (Cots et al., 2007; De Maio, 2010; Hill et al., 2012; Gimeno-Feliu et al., 2016).

Information on health status may be another confounder that in turn may influence the use of such services (McDonald & Kennedy, 2004; Quevedo & Rubio, 2009).

Another limitation is related to potential exposure misclassification in relation to changes of citizenship over time. This, however, is likely to be negligible because of the low rate of citizenship acquisition registered in Italy (1.1% in 2005 and 2.6% in 2015) (Papavero, 2015). Finally, a source of bias might be the lack of information about ED contacts on the part of Rome residents in other Italian regions. The percentage of residents in Rome who access emergency care in other regions is likely, though, to be very low because the city is located in the centre of Lazio, far away from the regional borders.

This study uses data from the Municipality of Rome and this might affect the external validity of the results because it considered a part of the immigrant population residing in Italy. However, as regards the composition of migrant flows, as showed in Figure 1.7 (see Chapter 1), the distribution of the migrant population in Rome and in Italy is quite similar. In both cases Romanians are the first community (36%), and about 50% of migrants come from Eastern-Europe. The major differences concern migrants from Philippines and Bangladesh who are over-represented in Rome and this might limit the external validity of the results. On the other

hand, the external validity is not affected by the hospitals' profile. Our data come from a variety of hospital profiles (university, private and public hospitals), which reflect the diversity of the Italian healthcare services. As regards the socio-economic position, the external validity is probably restricted to metropolitan areas (e.g. Milan, Venice, Turin, Florence, etc.), which are characterised by job opportunities, services and where migrants can benefit from migrant networks.

To the best of our knowledge, there are only a few studies which analyse ED usage rates taking into account migrants' origin area, with results suggesting different patterns (Nørredam et al., 2004; Rué et al., 2008; De Luca et al., 2013). We took this model forward not only because we considered different migrant subgroups, but also because we showed the importance of separately assessing migrants' ED use by origin area, instead of considering migrants as a unique heterogeneous group. We used a longitudinal population-based approach, which reflects the great dynamism of the population and allowed us to compute unbiased usage rates; these are often difficult to estimate because of the lack of appropriate denominators. Moreover, the abovementioned works consider healthcare use as a one stage decision-process, while in our study the use of the Hurdle model allowed an analysis of the different decision-making processes underlying emergency service use.

These findings draw attention to the contemporary debate on healthcare and international migrants and point to the need for interventions in order to reduce access barriers to health services, e.g. information and educational tools in different languages and appropriate for different cultures. Currently, international migration and migrants' health are two much discussed topics worldwide. However, further research will be necessary, due to the complexity of the issues and the period analysed in this study, which was characterized by: changes in the composition of migration flows; the economic downturn; and healthcare spending cuts. It is to

be hoped that future studies will help us better understand and better explain the differences observed in the healthcare usage patterns of migrants and non-migrants.

CHAPTER 4

Mortality differences between migrants and Italians residing in Rome before and during the Great Recession. A longitudinal cohort study (2001-2015)

4.1 Introduction

To complete the picture on the health of migrants, the last chapter, adopting another longitudinal design from 2001 to 2015, analyses mortality differences between migrants and natives residing in Rome.

In the past 50 years, health improvements have been registered all over Europe. However, there are still many examples of mortality differences by social group (Mesrine et al., 1999; Leclerc & Niedhammer, 2004; Marinacci et al., 2004), by gender (Case & Paxon, 2005; Schünemann et al., 2017) and for migrants compared with host populations (Razum et al., 1998; Khlat & Darmon, 2003; Wallace & Kulu, 2014; 2015; Caselli et al., 2017).

The 2008 Great Recession was particularly severe in southern Europe, where there were big increases in unemployment, as well as generalized banking problems, large public and private debts, and austerity policies. Among other things, the recession caused serious financial issues for public services, including the healthcare sector. Reductions in healthcare spending compromised the quality of services provided, leading to a deterioration in health outcomes (Kentikelenis & Karanikolos, 2014). Moreover, reductions in household budgets due to unemployment, or reductions in pensions and wages, decrease the individual's ability to adopt healthy life-styles and pay for healthcare, again leading to a deterioration in health. This deterioration seems to be particularly evident in countries with weak social protection (Regidor et al., 2016).

In Europe the impact of the Great Recession on health remains controversial and empirical studies on health and mortality differ in their findings (Gerdtham & Rhum, 2006; Karanikolos et al., 2013; Simou & Koutsogeorgou, 2013; De Vogli et al., 2014; Mattei et al., 2014; Granados & Rodriguez, 2015; Ruggeri & Tomassi, 2017; Strumpf et al., 2017). Counter-intuitively, at the macro-level many authors have reported a pro-cyclical effect on general mortality, known as the "Thomas effect", which means mortality goes up with economic expansions and down with contractions (Neumayer, 2004; Ruhm, 2007; Sullivan & Wachter, 2009; Granados & Dieux Roux, 2009; López et al., 2011; Granados, 2012; Rolden et al., 2014; Haaland & Telle, 2015; Stevens et al., 2015). Conversely, at the micro-level some scholars have registered quite the contrary. Whatever the health indicator used, the effect of economic downturns is always associated with a deterioration in health outcomes (Buchmueller et al., 2007; Burgard et al., 2009). In Italy, Egidi and Demuru (2016) claimed that the Great Recession caused a slowdown in mortality improvements.

Regarding differences in mortality between natives and migrants, one consistent finding in the literature relates to the migrant mortality advantage in high income countries. This phenomenon implies that migrants have lower mortality than natives, or at least lower than might be expected given their double disadvantage, as migrants and their relative poverty (Boyd, 1984; Marmot et al., 1984; Razum & Twardella, 2002; Nørredam et al., 2012; Donato et al., 2014).

Although in Italy the number of migrants has constantly increased, reaching a peak of more than five million in 2019 (8.7%), there are few studies on migrant mortality. There are handful of cross-sectional works (Martini et al., 2011; Morandi et al., 2013; Fedeli et al., 2015; Caselli et al., 2017) and only two longitudinal studies (Pacelli et al., 2016; Caranci et al., 2018). As far as we know there are no studies on mortality differences between migrants and non-migrants by birth-cohort before and during the Great Recession.

Furthermore, the abovementioned studies often ignore cohorts/age variations in terms of migrant mortality risk. Statistical models which control for age hide age variations in mortality levels, which means that migrants' mortality advantage over natives is considered constant by age.

This study has two aims. First, we want to analyse differences and changes in all-cause mortality between Italians and migrants residing in Rome before and during the Great Recession (2001-2015) by birth-cohort, comparing three different five-year time-periods: 2001-2005, 2006-2010 and 2011-2015. Second, we want to examine mortality variations across birth-cohorts.

4.2 Literature review

Most studies show a mortality advantage for migrant populations with respect to the statistics for hosts (Aldridge et al., 2018). The hypotheses which can explain such pattern, which have been illustrated in detail in the first chapter, are related to: selection hypotheses (healthy migrant effect and salmon bias); the acculturation process; and the data artefact.

As previously shown (*see paragraph 1.3.5*), in Europe, this pattern was detected in several countries including Belgium (Anson, 2004; Vandenheede et al., 2015), England and Wales (Wallace & Kulu, 2015), France (Khlat & Courbage, 1995; Wallace et al., 2019), Germany (Razum et al., 1998; Ronellenfitsch et al., 2006), the Netherlands (Uitenbroek, 2015) and Spain (Moncho et al., 2015). Similarly, in extra-European high income countries such as New Zealand (Hajat et al., 2010), Canada (DesMeules et al., 2005; Vang et al., 2017) and the US (Abraído-Lanza et al., 1999; Palloni & Arias, 2004) migrants had lower mortality than natives. Other studies, though, found higher mortality rates among migrants as compared to non-migrants (Jamrozik et al., 2001; Gadd et al., 2003; Bos et al., 2004; Albin et al., 2005; Harding et al., 2008). As set out in the first chapter, these studies analysed specific causes of

death, or took into account specific migrant groups. In a recent study published by Oksuzyan et al. (2019), the authors found that in Sweden mortality levels change according to gender and migrants' origin country. An important point to note is that those studies refer to a limited period and that no one has compared different periods of time.

In Italy the number of migrants has quadrupled from 2001 to 2019. But the limited studies we have, show an overall lower mortality in migrant populations with respect to natives (Martini et al., 2011; Morandi et al., 2013; Fedeli et al., 2015; Pacelli et al., 2016; Caselli et al., 2017; Caranci et al., 2018). The aforementioned studies have some shortcomings. They are mainly descriptive and use cross-sectional data: only two of them are longitudinal and only two analyse the recent period. Furthermore, none of these studies consider mortality differences by birth-cohort. Studies on migrants' mortality, generally, do not include age-specific or birth-cohort results. Usually they simply control for age/birth-cohort, producing an average estimate of the death rate across ages, distorting descriptions of the phenomenon. In those studies, migrants' mortality is considered constant at all ages. But some studies show that migrant selection may vary greatly by age (Jass et al., 2004; Jasso et al., 2005). In this context, a study by Guillot et al. (2018) found a U-shaped mortality pattern[34] among migrants in the US, the UK and France. Moreover, authors argued that "if unhealthy remigration is indeed taking place, we expect the declines to be larger at older ages, when increases in morbidity generate a larger pool of migrants potentially subject to this phenomenon" (Guillot et al., 2018, p. 5).

Another important aspect for studying mortality is the study design. In the field of demography, the mortality phenomenon can be analysed using the cross-sectional or period approach, and the longitudinal or cohort approach. On the one hand, the cross-sectional study involves looking at data from a population at one specific point in time. On the other, the most

[34] The U-shape pattern is the result of different mortality levels across different ages. At the aggregate level, migrants often experience excess mortality at young ages, then exhibit a large advantage in adult ages (with the largest advantage around age 45), and finally experience mortality convergence with natives at older ages (Guillot et al., 2018).

straightforward way to understand and to have a closer analysis of the phenomenon and of the relevant population dynamics is to stay as close as possible to real-life experiences and events. In this context, instead of looking at the risk exposure at each age during a single year, we will look at the risk exposure at each age of their lives in a universe of individuals born in the same year (birth-cohort study). As noted by Henry (1959, 1966), and Ryder (1965), the cohort approach has become popular in analysing demographic data. Indeed, Ryder (1965, p. 845) claimed that members of a birth cohort share "a common historical location", since they have experienced similar events. Therefore, in Ryder's terms each cohort has a distinctive composition and character which reflect its own history.

There are several international studies which analyse the mortality phenomenon (Kannisto et al., 1997; Myrskylä, 2010; Zylbersztejn et al., 2018) and migrant mortality (DesMeules et al., 2005; Ronellenfitsch et al., 2006; Deckert et al., 2015; Makarova et al., 2016) using a longitudinal cohort approach. While, as regards the Italian context, as previously mentioned there are only two studies which use a longitudinal study design.

The present study, using a longitudinal cohort study, wants to provide additional evidence on mortality differences between migrants and Italians before and during the Great Recession. By comparing three time-periods, the study analyses the mortality evolution of the adult birth-cohorts over fifteen years. Moreover, it examines birth-cohort variations in migrant mortality to verify whether the migrant mortality advantage is verified across all birth-cohorts. The Municipality of Rome, which registers the highest number of migrants in Italy, offers a relevant and useful context for this question.

4.3 Hypotheses

Given the mortality advantage observed in high-income European countries among migrants, our first hypothesis is that since, in Italy, the migration phenomenon is relatively

recent compared to other European countries, the healthy migrant effect will still be evident. Migrant may benefit, then, from a survival advantage. The analysis over a period of fifteen years allows us to assess changes in mortality pattern by migrant status. We expect to find a decrease in mortality level for Italians, following the pattern of improvement observed in the last years. We also expect to find a decrease in the mortality advantage for migrants because both of: their low socio-economic condition, which persists through the whole period under analysis; and the increase in migrants' length of stay, associated with negative acculturation and assimilation processes, compounded by the economic downturn.

We also expect that the migrant' mortality advantage is larger in those ages characterized by stronger positive selection and where the proportion of recent migrants is higher. In this study since we dealt with residents in Rome, thus with regular rather than irregular migrants, we assume that most were voluntary and positively selected. Furthermore, the analysis excluded children. These generally follow their parents during the migration process. Likewise, we excluded older migrants a very selected population, since unhealthy migrants tend to return to their origin country.

4.4 Ethics statement

The Rome Longitudinal Study is part of the National Statistical Program for the years 2001–2019 and was approved by the Italian Data Protection Authority. Data have been analysed anonymously and results are shown in aggregate form. The Department of Epidemiology of the Lazio Regional Health Service is permitted by the Lazio Committee to manage and to analyse data from regional health information systems for epidemiological purposes.

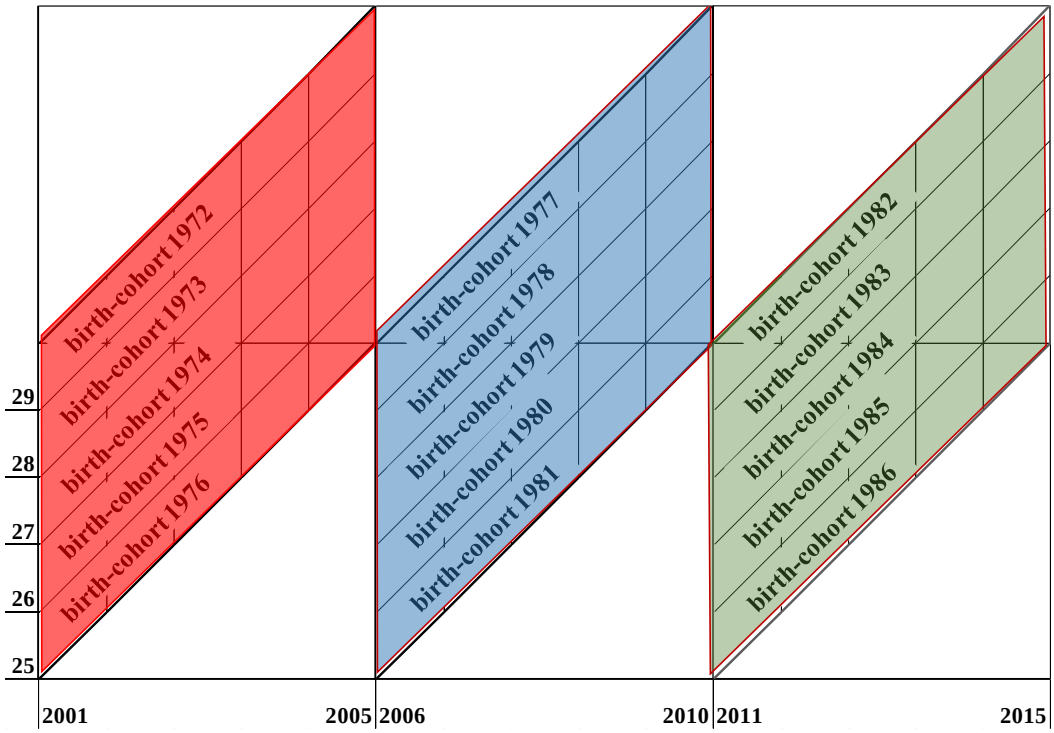
4.5 Data and Methods

Cohort description and study design

We used data from the Rome Dynamic Longitudinal Study cohort (D-RoLS), which is part of the Italian Network of Longitudinal Metropolitan studies (IN-liMeS) (Caranci et al., 2018). The dynamic cohort is based on data from the Municipal Register of Rome, which provides individual demographic information (sex, age, birthdate, birthplace, and "person days" of residence in Rome) for all residents in Rome from 2001 to 2015.

We performed a longitudinal population-based study including those who were residents in Rome for at least one day, from 1st January 2001 or who were subsequently registered in Rome until 31st December 2015. We identified three time-periods (2001-2005, 2006-2010, 2011-2015) allowing for a five year follow up. At the beginning of each time-period, we considered residents in Rome aged 25-64 years. Thus, for the first period we selected those individuals belonging to the birth cohorts from 1937 to 1976; for the second period those from 1942-1981; and for the third one those from 1947-1986. We followed all until the end of each time-period (2,454,355 individuals). Individuals were enrolled at the baseline of each time-period or, for those who entered during the follow-up, whenever they became resident in Rome. We computed person-years at risk from the date of enrolment until death, emigration, or to the end of the follow-up (Fig. 4.1).

Figure 4.1 – Study design



In this figure, the different colours represent different individuals who belong to different birth-cohorts, but who had the same age in different time-periods. For example: considering only the first birth-cohort (the youngest, aged 25-29 years old), the red parallelogram represents all individuals who were between 25 and 29 years old in 2001, who were born between 1972 and 1976; the blue parallelogram represents all individuals who were between 25 and 29 years old in 2006, who were born between 1977 and 1981; the green parallelogram represents all individuals who were between 25 and 29 years old in 2011, who were born between 1982 and 1986. All individuals were followed up until the end of each 5-year time-period. The same was applied for the other birth-cohort groups, up to 64 years old.

Outcome

The outcome variable is all-cause mortality, retrieved by linking the cohort data with the registry of the causes of death (ReNCaM) using an individual anonymised code. The registry contains information about the deaths of all residents in the Lazio region, in which Rome is to be found.

Exposure and other variables

Migrant status is the exposure variable (migrants vs. Italians). This study defined as migrant all individuals born abroad. For more in-depth analyses we classified migrants according to their origin area, distinguishing between migrants coming from High Migratory Pressure Countries (HMPC: Central-Eastern Europe, Africa, Asia – except for Israel and Japan – and Latin America) and migrants coming from all other countries, i.e. Highly Developed Countries (HDC). Italians were the reference category.

The time-period is considered as a potential effect modifier. It took the value *0* from 01/01/2001 to 31/12/2005, *1* from 01/01/2006 to 31/12/2010 and *2* from 01/01/2011 to 31/12/2015.

Gender is a stratification variable.

Statistical analysis

Descriptive analysis

In the descriptive analysis we investigated mortality patterns by time-period (2001-2005, 2006-2010, 2011-2015), considering different birth-cohorts of residents in Rome by gender. Combining death and exposure information (person-years), we computed birth-cohort specific mortality rates by gender, by time-period and by migrant status. Direct birth-cohort standardized death rates were computed as well, using the population figures of those residents

in the Lazio region between 1st January 2006 and 31st December 2010 as the standard population.

Regression analysis

We used a Cox model to examine the influence of the origin area on mortality. This model is widely employed for the analysis of survival in clinical trials and epidemiologic cohort studies. It was originally developed in clinical applications, where individuals are generally followed from the diagnosis of a given disease or treatment until death, remission or relapse (Cox, 1972). In this context, time-scale is the length of follow-up or time-on-study. However, when the time-on-study is not relevant, because it is not supposed to modify an individual's risk, it is more appropriate to use age as the time-scale (Korn et al., 1997). Since, in our study, individuals enter the analysis at the baseline of each time-period or at the date in which they became resident, this method is the most appropriate for our estimates. For our purposes death is the failure event. So individuals enter the analysis at their baseline age (left-truncation) and exit at their failure event or censoring age, emigration, or the end of the follow-up.

To test whether the time-period effect on all-cause mortality differs among migrant subgroups we included the interaction between the origin area and the time-period.

All models reported in this study respect the Cox proportional hazard assumption.

A p-value of 0.1 indicates statistical significance.

The SAS software environment 9.4 was used for data management, and all calculations have been performed using STATA 15.

4.6 Mortality variations by birth-cohort

To analyse birth-cohort variations in migrant mortality and to examine whether there are differences among the three time-periods considered, we selected individuals who belonged to different birth-cohorts (Fig. 4.1). First, we computed birth-cohort adjusted risk ratios for migrants from HMPC using a Poisson model. However, in this context, we assumed that mortality was constant across birth-cohorts, which is similar to the Cox proportional hazard assumption. Thus, after having calculated birth-cohort specific death rates – BCSDR – (${}_nM_x$) by gender, time-period and migrant status, we computed birth-cohort specific mortality ratios (MRR) for migrants from HMPC by dividing the BCSDR for migrants by the corresponding BCSDR for Italians.

$$\text{MRR} = \frac{\text{nMx}^{HMPC}}{\text{nMx}^{Italians}}. \quad (3)$$

The latter were calculated for each five-year birth-cohort group and confidence interval (95%) were computed using a Poisson model.

4.7 Results

4.7.1 Descriptive results

We included 2,454,355 individuals who resided in Rome for at least 1 day from 2001 to 2015; among them, 19.7% were migrants (n=484,421), of whom 257,935 women (53.3%), and 226,486 men (46.7%). Over the study period, we observed 58,637 deaths within 24.6 million person-years; among migrants, 3,766 deaths (6.4% of all deaths) occurred within 3.6 million person-years. Among all women a total of 22,780 deaths were registered within 12.7 million person-years, and among all men 35,857 deaths occurred within 11.9 million person-years. The migrant population came mainly from Central-Eastern-Europe, with an increase from 2.7% (2001-2005) to 7.1% (2011-2015), followed by, Asia, Africa, HDCs and Latin America. As in

the national context, migrants mitigate the ageing of the Roman population: over the study period the median age among migrants was 39.4 years old vs. 43.1 among Italians. (Tab. 4.1 gives detailed information regarding the distribution of the population and deaths. See also Tab. 4.1C in the Appendix C which reports the absolute numbers).

Migrants showed lower BCSDR compared with Italians in each time-period. When comparing individuals of the same age, a trend showing a steady improvement in the birth-cohort specific death rates over the study period was observed only among Italian men, especially at older ages (Fig. 4.2 a). A U-shaped trend showing a recent improvement in mortality after a worsening around 2008 has, meanwhile, been observed among Italian women and all migrant groups (Fig. 4.2 b, c, d, e, f). Overall, women displayed lower birth-cohort specific death rates than men in the time-periods analysed. (Fig. 4.2 d, e, f).

Table 4.1 - Demographic characteristics of migrants and Italians residing in Rome aged 25-64 years, and deaths by time-period

	2001-2005				2006-2010				2011-2015			
	Italians		Migrants		Italians		Migrants		Italians		Migrants	
	Subjects[a]	Deaths[b]	Subjects	Deaths	Subjects	Deaths	Subjects	Deaths	Subjects	Deaths	Subjects	Deaths
Origin Area												
Italy	86.8	95.0	-[c]	-	82.1	93.8	-	-	78.6	91.5	-	-
HDC	-	-	2.8	1.1	-	-	2.9	1.1	-	-	2.6	1.1
HMPC	-	-	10.4	3.9	-	-	15.0	5.1	-	-	18.8	7.4
Africa	-	-	*2.5*	*1.9*	-	-	*2.7*	*1.8*	-	-	*3.2*	*2.0*
Latin America	-	-	*2.2*	*0.6*	-	-	*2.7*	*0.7*	-	-	*2.6*	*1.0*
Asia	-	-	*3.0*	*0.7*	-	-	*4.1*	*1.2*	-	-	*5.9*	*1.8*
Central Eastern-Europe	-	-	*2.7*	*0.7*	-	-	*5.5*	*1.4*	-	-	*7.1*	*2.6*
Gender												
Women	44.0	35.4	7.2	2.3	41.6	36.3	9.8	2.7	40.0	36.3	11.4	3.8
Men	42.7	59.6	6.0	2.6	40.5	57.6	8.1	3.5	38.7	55.2	10.0	4.7
Birth Cohort												
1982-1986	-	-	-	-	-	-	-	-	7.3	1.1	3.2	0.3
1977-1981	-	-	-	-	8.3	1.8	2.9	0.2	8.6	1.8	3.7	0.5
1972-1976	11.3	2.1	2.2	0.2	11.3	2.6	3.2	0.4	11.0	3.3	3.5	0.7
1967-1971	12.6	3.4	2.6	0.4	12.2	4.4	3.2	0.6	11.7	6.0	3.3	0.9
1962-1966	12.9	5.0	2.4	0.4	12.4	7.1	2.7	0.8	12.0	10.6	2.7	1.1
1957-1961	10.9	6.7	1.9	0.5	10.4	9.7	2.2	0.8	10.1	14.8	2.2	1.5
1952-1956	9.7	9.3	1.5	0.6	9.3	14.1	1.7	1.0	9.0	21.1	1.6	1.8
1947-1951	10.0	13.9	1.1	0.7	9.4	21.8	1.2	1.2	8.9	32.8	1.1	1.8
1942-1946	9.4	20.8	0.8	0.8	8.8	32.3	0.8	1.1	-	-	-	-
1937-1941	9.9	34.0	0.7	1.3	-	-	-	-	-	-	-	-

Continued to the next page

Table 4.1 - *(Continued)*

	2001-2005		2006-2010		2011-2015	
Total population[d]	**1,822,603**		**1,842,393**		**1,815,152**	
	Italian	**Foreign**	**Italian**	**Foreign**	**Italian**	**Foreign**
	1,581,282	*241,321*	*1,512,537*	*329,856*	*1,427,233*	*387,919*
Total deaths[d]	**22,214**		**18,440**		**17,983**	
	Italian	**Foreign**	**Italian**	**Foreign**	**Italian**	**Foreign**
	21,113	*1,101*	*17,304*	*1,136*	*16,454*	*1,529*

[a]Subjects in percentages, out of the total population in each time-period: e.g., out of the total population (1,822,603 in 2001-2005) 86.8% are Italians

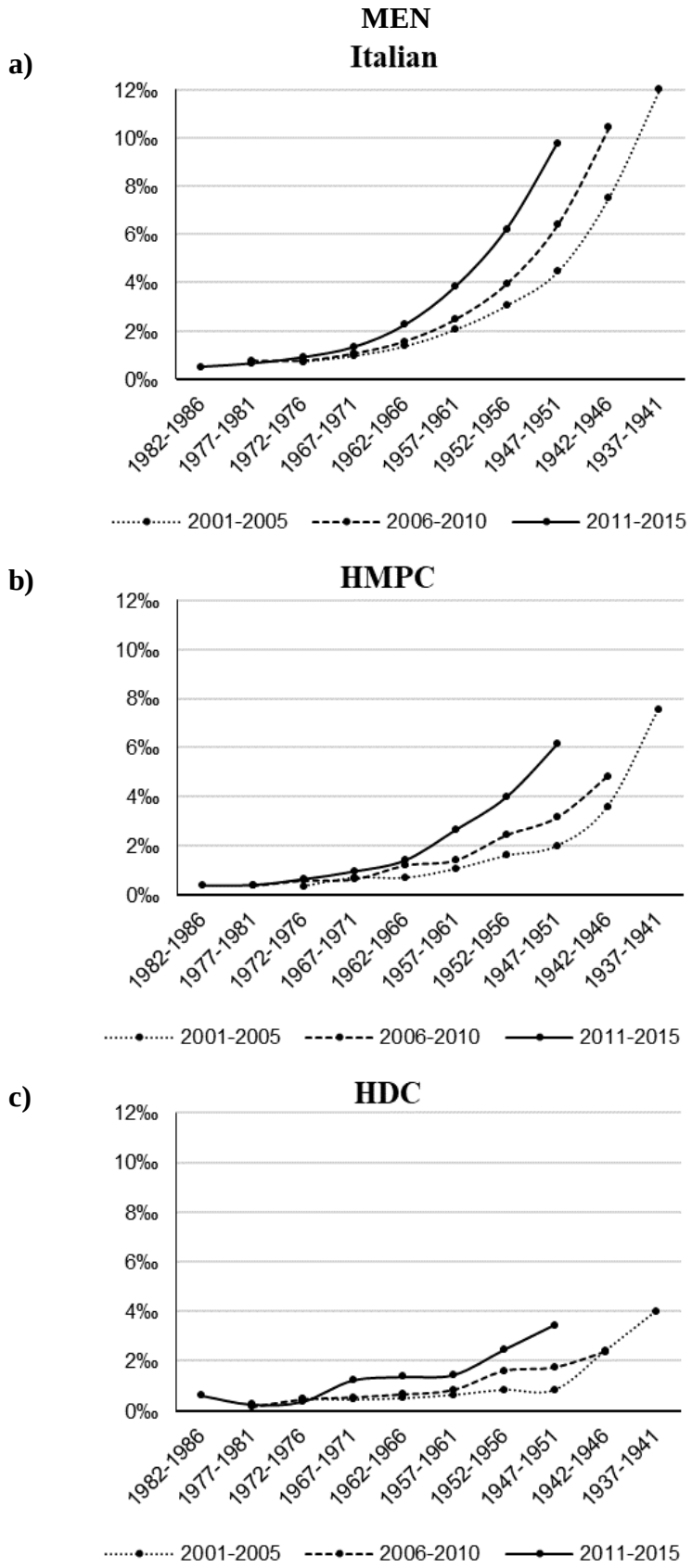
[b]Deaths in percentages, out of the total deaths in each time-period: e.g., out of the total deaths (22,214 in 2001-2005) 95.0% occurred among Italians

[c]Not applicable

[d]In absolute numbers

Source: elaboration of the authors based on Dynamic Rome Longitudinal Study cohort data and the Register of causes of death (ReNCaM)

Figure 4.2 - Birth-cohort specific death rates (BCSDR) by gender, migrant status and time-period. Residents in Rome from 2001 to 2015



Considering the study design (Fig. 4.1), figures 4.2 displays the specific birth-cohort death rates (BCSDR), which represent the death rates of individuals who belong to different birth-cohorts, but who had the same age in different time-periods.

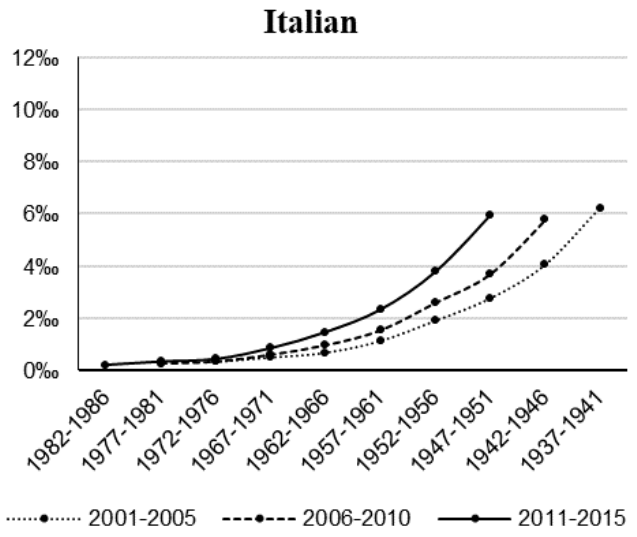
For example: looking at Figure 4.2a, the BCSDR, especially those of the oldest birth-cohorts: 1937-1941 in the 2001-2005 time-period; 1942-1946 in the 2006-10 time-period; and 1947-1951 in 2011-15 time-period, it is possible to note that compared to the BCSDR observed in 2001-2005 time-period of the 1937-1941 cohort, the BCSDR in 2006-10 of the 1942-1946 cohort, and the BCSDR in 2011-15 of the 1947-1951 cohort have decreased, showing an improvement in mortality (Fig. 2a).

Conversely, looking at the same aforementioned BCSDR, for migrants from HMPC and HDC: 1937-1941 in the 2001-2005 time-period; 1942-1946 in the 2006-10 time-period; and 1947-1951 in 2011-15 time-period, it is possible to note that compared to the BCSDR observed in 2001-2005 time-period of the 1937-1941 cohort, the BCSDR of the 1942-1946 in 2006-10 shows an improvement in the death rate. However, the death rate increased again in the last time-period (1947-1951 in 2011-15), showing a worsening of mortality (U-shape pattern) (Fig. 4.2b, 4.2c).

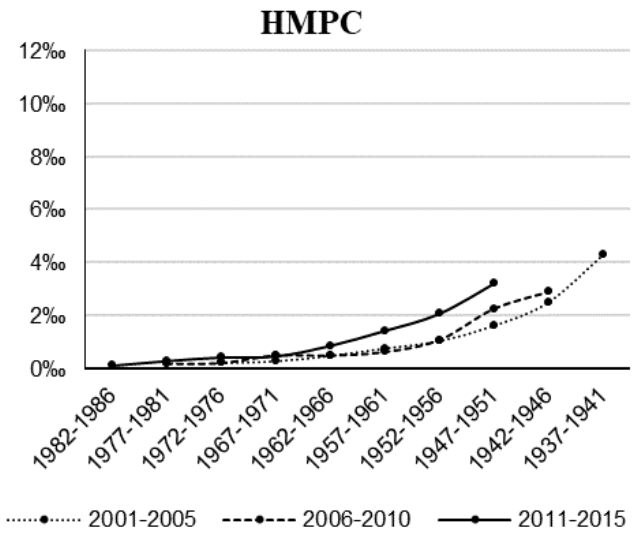
Source: authors' elaboration with Dynamic Rome Longitudinal Study cohort data and the Register of causes of death (ReNCaM).

WOMEN

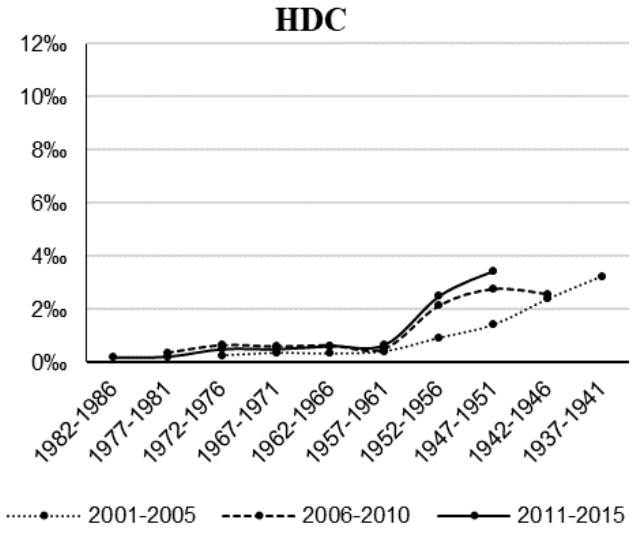
d)



e)



f)



Considering the study design (Fig. 4.1), figures 4.2 displays the specific birth-cohort death rates (BCSDR), which represent the death rates of individuals who belong to different birth-cohorts, but who had the same age in different time-periods.

For example: looking at the oldest BCSDR, for Italian, migrants from HMPC and HDC women (Fig. 4.2d, 4.2e, 4.2f): 1937-1941 in the 2001-2005 time-period; 1942-1946 in the 2006-10 time-period; and 1947-1951 in 2011-15 time-period, compared to the BCSDR observed in 2001-2005 time-period of the 1937-1941, the BCSDR in 2006-10 of the 1942-1946 cohort decreased (improvement in mortality), while the BCSDR in 2011-15 of the 1947-1951 cohort increased again, showing a worsening of mortality (U-shape pattern).

Source: authors' elaboration with Dynamic Rome Longitudinal Study cohort data and the Register of causes of death (ReNCaM).

4.7.2 Regression results for migrants (heterogeneous group) versus natives

Table 4.2 shows the hazard ratios in gender-specific populations considering migrants from different origin areas as a single heterogeneous group. By examining the hazard ratios for migrants relative to those for Italians, we found that, net of all controls, the risk of dying for female (HR=0.61, 95% CI 0.56-0.66) and male (HR=0.49, 95% CI 0.46-0.54) migrants was lower compared to the risk for natives. Compared to the first time-period (2001-2005), results showed lower mortality in the second (2006-2010: Women, HR=0.89, 95% CI 0.86-0.92 -- Men, HR=0.84, 95% CI 0.82-0.86) and third time-period (2011-2015: Women, HR=0.86, 95% CI 0.83-0.89 -- Men, HR=0.77, 95% CI 0.76-0.80) for both genders. The interaction between migrant status and the time-period suggested that in 2011-2015 the effect of time on mortality was less strong on migrant men than the average effect of time on Italians, while there were no differences in 2006-2010. Conversely, among migrant women the effect of time on mortality was stronger in 2006-2010, without differences in the third time-period.

Table 4.2 - Gender-specific all-cause mortality hazard ratios (HR) for migrants in comparison with Italians residing in Rome from 2001 to 2015

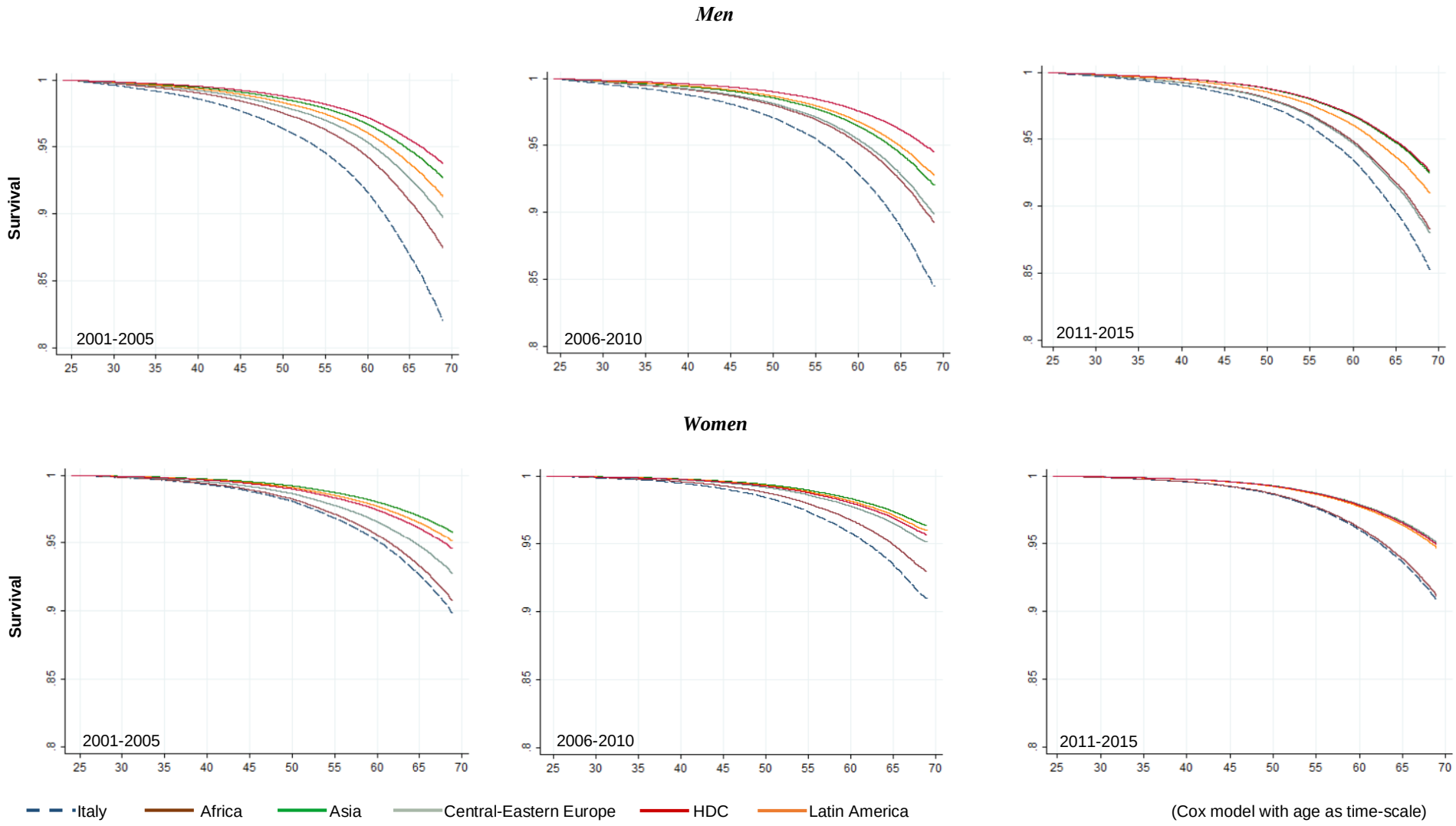
	Men			Women		
	HR		**95% CI**	**HR**		**95% CI**
Migrant status						
Italian	1.00		-	1.00		-
Migrant	0.49	***	(0.455-0.538)	0.61	***	(0.555-0.663)
Time-period						
2006-2010	0.84	***	(0.817-0.860)	0.89	***	(0.859-0.917)
2011-2015	0.77	***	(0.755-0.795)	0.86	***	(0.832-0.888)
Migrant status*Time-period						
Migrant 2006-2010	1.07		(0.950-1.196)	0.84	**	(0.741-0.956)
Migrant 2011-2015	1.26	***	(1.134-1.410)	0.95		(0.842-1.067)

Cox model with age as time-scale.
*Note: The asterisks indicate significance °p <0.1, *p < 0.05, **p < 0.01, ***p < 0.001.*
Source: authors' elaboration with Dynamic Rome Longitudinal Study cohort data and the Register of causes of death (ReNCaM)

4.7.3 Regression results for migrants (by origin area) versus natives

Figure 4.3 shows gender-specific survival estimates by time-period and by origin area. All migrant groups had a survival advantage over Italians (blue dot line) for both men and women, across age and across time-period. The graph also displays changes over time in survival probabilities for the populations considered. Looking at the three time-periods separately, there is a clear improvement of survival for Italians (both male and female) over time, which suggest a lower risk of dying over time. Actually, from the first time-period to the third one, the blue dot line rises, showing an increase in survival probability. Conversely, looking at the coloured solid lines, which represent migrant groups, it is possible to note that the improvement of survival is lower compared to that of Italians. Indeed, the coloured solid lines get closer over time, showing a reduction in the mortality gap between Italians and migrants, in particular among migrant men. In addition, for both men and women (except for African women) the mortality difference between Italians and migrant groups was always statistically significant. Among women, the mortality pattern in the 2011-2015 time-period shows two clusters: Italians and Africans had similar survival probabilities (the survival curves overlap); while Asians, Central-Eastern Europeans, Latin America and HDC had a mortality advantage.

Figure 4.3 - Survival estimates by gender, time-period and origin area. Residents in Rome from 2001 to 2015



Source: authors' elaboration with Dynamic Rome Longitudinal Study cohort data and the Register of causes of death (ReNCaM)

Combining data for the different time-periods we examined gender-specific hazard ratios for each migrant group according to the origin area. Mortality among men from Africa, Asia, Latin America, Central-Eastern Europe and HDC was, respectively, 32%, 61%, 53%, 44% and 67% lower than their Italians counterparts. Mortality among women from Asia, Latin America, Central-Eastern Europe and HDC was, respectively, 59%, 52%, 28% and 48% lower than Italians; while mortality among women from Africa was similar to mortality among Italian women. Compared to 2001-2005, in the second (2006-2010) and third (2011-2015) time-period, a lower risk of dying was observed for the whole population, regardless of gender, with some differences according to migrant origin area. Among men, the interaction between origin area and time-period suggested that the effect of time on their death risk was less strong among Asians, both in the 2006-2010 and in the 2011-2015 period; among Central-Eastern Europeans in the 2011-2015 period; and among migrants from HDC in the 2011-2015 period. Conversely, among women the effect of time on mortality was stronger only among Central-Eastern Europeans in the 2006-2010 and in the 2011-2015 period, while there were no changes in the risk of dying over time, between Italians and all other migrant groups (Tab. 4.3).

Table 4.3 - Gender-specific all-cause mortality hazard ratios (HR) by origin area in comparison with Italians residing in Rome from 2001 to 2015

	Men			Women		
Origin area	**HR**		**95% CI**	**HR**		**95% CI**
Africa	0.68	***	(0.600-0.772)	0.91		(0.780-1.058)
Asia	0.39	***	(0.322-0.478)	0.41	***	(0.321-0.529)
Latin America	0.47	***	(0.367-0.597)	0.48	***	(0.373-0.610)
Central-Eastern Europe	0.56	***	(0.448-0.697)	0.72	**	(0.582-0.902)
HDC	0.33	***	(0.266-0.402)	0.52	***	(0.443-0.615)
Time-period						
2006-2010	0.84	***	(0.818-0.860)	0.89	***	(0.860-0.918)
2011-2015	0.78	***	(0.755-0.795)	0.86	***	(0.832-0.889)
Origin area*Time-period						
Africa 2006	0.99		(0.821-1.192)	0.85		(0.673-1.081)
Africa 2011	1.13		(0.946-1.362)	1.05		(0.838-1.322)
Asia 2006	1.25	*	(0.972-1.614)	0.95		(0.677-1.332)
Asia 2011	1.22	°	(0.956-1.557)	1.24		(0.912-1.681)
Latin America 2006	0.95		(0.664-1.355)	0.91		(0.640-1.288)
Latin America 2011	1.25		(0.905-1.736)	1.15		(0.837-1.575)
Central- Eastern-EU 2006	1.14		(0.866-1.504)	0.73	*	(0.548-0.962)
Central-Eastern EU 2011	1.40	**	(1.087-1.809)	0.71	**	(0.545-0.912)
HDC 2006	1.02		(0.755-1.371)	0.89		(0.697-1.148)
HDC 2011	1.47	**	(1.101-1.953)	1.03		(0.803-1.332)

Cox model with age as time-scale.
*Note: The asterisks indicate significance °p <0.1, *p < 0.05, **p < 0.01, ***p < 0.001.*
Source: authors' elaboration with Dynamic Rome Longitudinal Study cohort data and the Register of causes of death (ReNCaM)

4.7.4 Mortality variations by birth-cohort

Figure 4.4 displays birth-cohort specific mortality ratios and birth-cohort adjusted risk ratio for migrants (HMPC) vs. Italians by gender and time-period. The grey curves represent birth-cohort specific mortality ratios for individuals who belong to different five-year birth-cohort groups (from 1937 to 1976 in the 2001-2005 time-period; from 1942 to 1981 in the 2006-2010 time-period; from 1947 to 1986 in the 2011-2015 time-period). Individuals, belonging to different birth-cohorts, had the same age in the three different time-periods. The red flat dotted line shows the birth-cohort adjusted risk ratio for migrants. However, the dotted line hides mortality variations by birth-cohort. Finally, the black flat line represents natives (reference

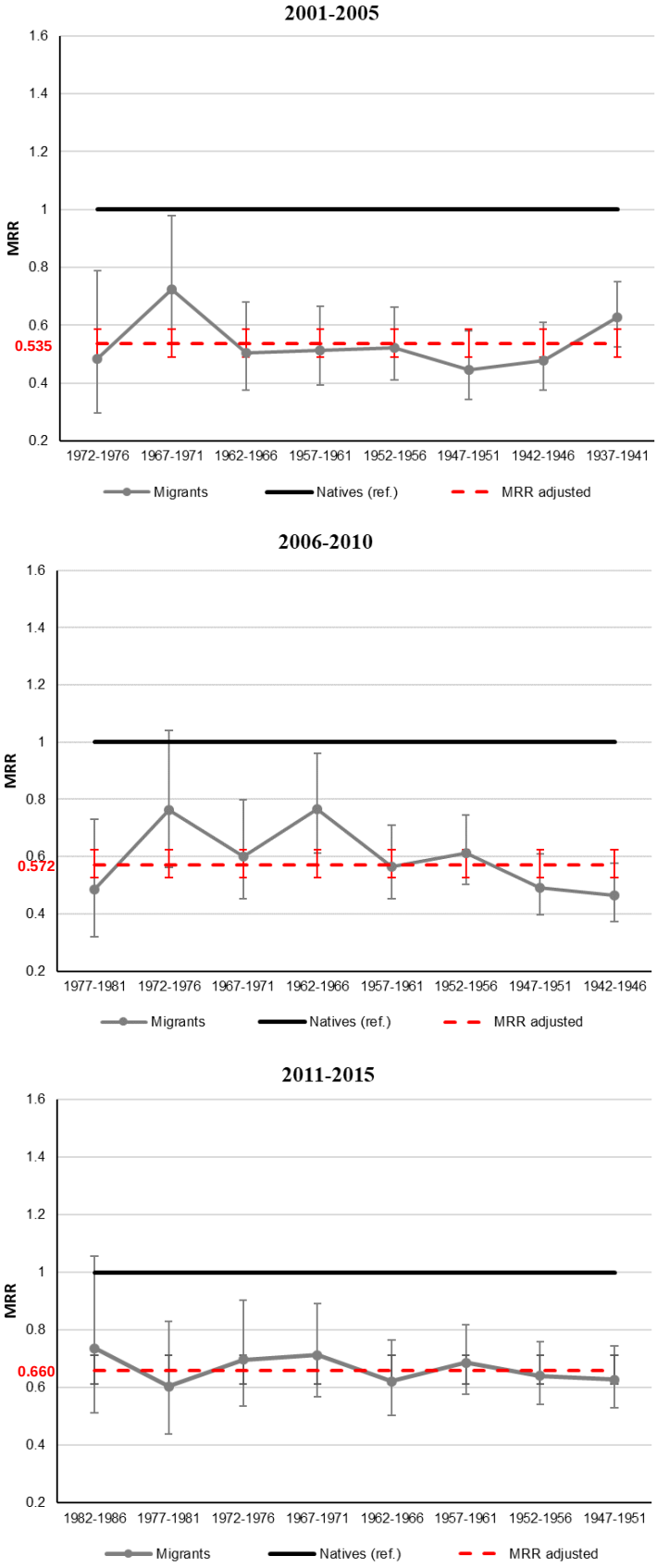
category). Ratios above 1 represent mortality disadvantage for migrants, while ratios below 1 represent a mortality advantage for the same.

The figure confirms that for both genders, from 2001 to 2015, migrants had a significant mortality advantage with respect to Italians: the birth-cohort adjusted risk ratio is below 1 (the red flat dotted line). As explained before, such adjusted risk ratios ignore and hide mortality variations. Indeed, in some points there are ages at which mortality differences between migrants and Italians were not statistically significant. Among men, in the first time-period (2001-2005) migrants at all ages exhibited a mortality advantage with respect to Italians. The same pattern was found in the second (2006-2010) time-period, except for migrants born from 1972 to 1976, who had mortality levels similar to those of Italians (RR=0.76, 95% CI 0.56-1.04). Similarly, in the 2011-2015 time-period only the youngest (from 1982 to 1986) had a level of mortality similar to that of natives (RR=0.74, 95% CI 0.51-1.06), while all other birth-cohort groups of migrants exhibited a mortality advantage. Conversely, among women, mortality variations were stronger, specifically in the younger birth-cohort groups. In the first time-period, those who were born from 1972 to 1976 (RR=0.39, 95% CI 0.39-1.22) and from 1962 to 1966 (RR=0.73, 95% CI 0.51-1.04) showed a level of mortality similar to their Italian counterparts, while at all other ages migrants showed a mortality advantage. In the second and third time-periods mortality differences, between migrants and Italians belonging to the first three birth-cohorts, were not statistically significant, while for all other birth-cohort groups we detected a migrant mortality advantage.

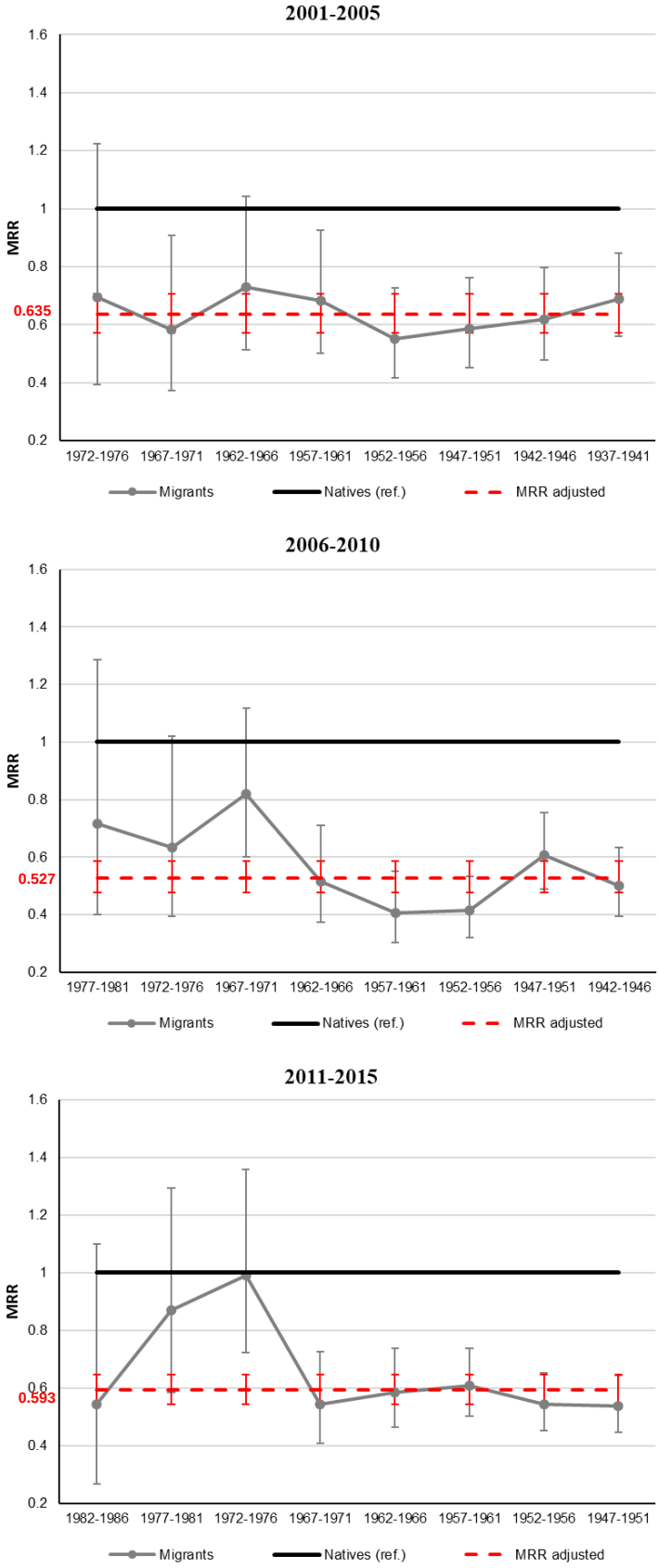
Although these results suggest the existence of mortality variations across birth-cohort groups between migrants and Italians, they do not show significant mortality variations across time-periods for migrants (Fig. 4.4).

Figure 4.4 - Birth-cohort specific and birth-cohort adjusted mortality ratios (migrants vs. Italians) in Rome from 2001 to 2015 by gender and time-period

MEN



WOMEN



Source: authors' elaboration with Dynamic Rome Longitudinal Study cohort data and the Register of causes of death (ReNCaM). (Poisson model).

4.8 Discussion

Using a population-based open cohort design, the present study investigated the association between migrant status and all-cause mortality among Rome residents from 2001 to 2015 by birth-cohort. By comparing three different time-periods, we also analysed changes in mortality patterns before and during the Great Recession. Moreover, this work examined mortality variations by birth-cohort.

In line with other international (Aldridge et al., 2018; Wallace & Kulu, 2014; Ronellenfitsch et al., 2006; Moncho et al., 2015; Anson, 2004; Deboosere & Gadeyne, 2005; Hajat et al., 2010; McDonald & Kennedy, 2004; Choi, 2012) and national (Martini et al., 2011; Morandi et al., 2013; Fedeli et al., 2015; Caranci et al., 2018) studies, the findings support our first hypothesis on the migrant mortality advantage. Compared to the Italian-born population, migrants had significantly lower all-cause mortality, regardless of origin area, and for both genders; except for African women who had similar mortality patterns to Italian women. Migrant advantage in mortality may result from two selection hypotheses. Explanations of this mortality advantage were discussed earlier in the first chapter of the thesis. The first one, known as the healthy migrant effect (Razum et al., 2000; Ullmann et al., 2011), suggests the selection of healthy individuals into migration. The second one, known as the salmon bias (Abraído-Lanza et al., 1999; Razum, 2006), proposes the remigration of unhealthy individuals to their origin country, something particularly important among elderly migrants. However, the remigration of unhealthy individuals to their origin country is hard to test and the few existing studies offer ambiguous results. Nørredam et al. (2014), for instance, found weak support for the remigration bias hypothesis. Studying whether migrants with severe illnesses were more likely to emigrate compared with migrants without severe illnesses, the authors observed a decrease in emigrations as the severity of illness grew. What is more, the data artefact and its reliability should be taken into account (Weitoft et al., 1999; Kibele et al., 2008; Wallace &

Kulu, 2014; Monti et al., 2019). We have delays in registration in municipal registries upon arrival or the final return to the origin country, which can lead to an additional underestimation of migrants' mortality. In a period of economic crisis, the increased mobility of migrants who may leave the host country to look for job opportunities in other countries or re-emigrate to their origin country will perhaps affect the data artefact more strongly (Fedeli at al., 2015).

As expected, we found support for our second hypothesis about mortality changes over time. Overall, we found a lower risk of dying for both genders over time. This pattern reflects the general improvement detected in the last years, resulting in an increase in life expectancy (Felice et al., 2016; Passarino et al., 2016). In addition, whereas during the time period analysed, the Italian economic conjuncture was particularly negative, one would have expected a mortality increase (counter-cyclical effect). The observed pro-cyclical effects (meaning mortality goes up with economic expansions and down with contractions), which is counterintuitive, should be referred to the "Thomas effect" (Granados & Ionides, 2017). In this study, the authors, analysing the relation between mortality and the Great Recession in 27 European countries, found a pro-cyclical oscillation of mortality. An older study by Gerdtham & Rhum (2006), conducted in the OECD countries, showed that death rates tend to rise in periods of economic expansion. The explanation for this pattern is that some important determinants of ill health and death are correlated with economic activity. For example, for trafficking related mortality, economic downturns reduce industrial and commercial traffic, as well as commuting and recreational driving. Furthermore, we must also consider that economic expansion also brings overtime hours and higher intensity work, leading to less time for sleep, physical activity, and social interactions. Atmospheric pollution, social isolation and cigarette smoking also increase in times of economic growth and decrease in recessions (Sterling & Eyer, 1981; Davis et al., 2010; Heutel & Rhum, 2013).

In Italy, the study by Egidi and Demuru (2016), where the authors studied the relationship between the economic crisis and mortality trends at the national level, revealed that the Great Recession had modified and slowed down mortality trends, in particular mortality improvements. In this regard, by a preliminary analysis of this data, the result might suggest a slowdown in mortality improvement. Actually, switching and choosing the 2006-2010 time-period as the reference category, we found that the difference in mortality between the third and the second time-period was smaller than that between the second and the first time-period. Specifically, among men the difference (between the third and the second time-period) was small (HR=0.92, 95% CI 0.90-0.95) and significant (p-value <.001), while among women while the difference was still detectable, it was slight (HR=0.97, 95% CI 0.94-1.00) and only weakly significant (p-value 0.067).

The effect of time detected for the whole population changed according to gender and origin area. Among men, the mortality improvement was less strong for Asians, both in the 2006-2010 and the 2011-2015 time-period; Central-Eastern Europeans in the 2011-2015 time-period; and for migrants from HDC in the 2011-2015 time-period. Even if we could not control for length of stay, we can surmise that this pattern is connected to acculturation, negative health habits and life-styles. It could also be explained by the economic downturn compounding precarious employment conditions and low socio-economic status. Certainly there is evidence that migrant health worsens with longer residence in the host country (Hill, 2012; Loi & Hale, 2019). Conversely, among women we found that mortality improvements were stronger only among Central-Eastern Europeans both in the second (2006-2010) and the third (2011-2015) time-period with respect to the first (2001-2005). No difference was observed for other migrant groups. This trend could be related to EU membership for Poland and the Czech Republic in 2004 and for Romania and Bulgaria in 2007. This modified the composition of migration flows

to Italy, helped along by strong Italian demand for domestic workers and caregivers (Bettin & Cela, 2014)[35].

Another interesting aspect to comment is what happen over time in terms of birth-cohort mortality. Although the overall mortality has declined over time, the rhythm of each specific birth-cohorts have contributed to mortality improvement differs between gender and populations. In further analyses, not reporting in this thesis for sake of simplicity, it has been explored the presence of cohort effects as a possible reason behind the mortality changes. By computing mortality improvement rates, an apparently pattern of mortality improvement was detected in the Italian population (for both time-periods), that might have experienced at all birth-cohorts, a declining or even decreasing mortality, especially among men. Conversely, as regards the migrant population, while from the first to the second time-period a mortality improvement was registered almost for all birth-cohorts (except for the youngest, for both genders), from the second to the third time-period a worsening in mortality was observed especially at the oldest birth-cohorts among men, and at the adult birth-cohorts among women.

Finally, we also found support for our third hypothesis. This study demonstrated that the migrant mortality advantage is far from being constant over age. Actually there are mortality variations by age which are often ignored in the literature about migrant mortality. The only study available which analysed and explained mortality variations by age is that by Guillot et al. (2018). The authors, analysing mortality differences between migrants and natives in France, in the US and in the UK, found similar age patterns for mortality ratios. Indeed, they found excess mortality at younger ages, a large advantage at adult age and finally a migrant-native mortality convergence in the older age brackets. According to them, the most consistent and one of the best explanations for this pattern is the healthy migrant effect. Since migrants are

[35] Since these women migrate in Italy for work, attracted by the domestic labour market, we can expect an important positive selection effect. They arrive in the country in good health (theory of positive health selection).

selected on the basis of their health, they may be healthier, on average, than individuals in their origin country, and they may be healthier than their counterparts in the receiving country. On this basis, migrants represent a creaming off of the healthiest part of the population, and thus their mortality levels are not only affected by working and living conditions in host countries.

This study is not without limitations. We could not take into account some important mortality risk factors, such as education, socio-economic status, and length of stay, which can influence the outcome (Trewin et al., 2017; O'Rand & Lynch, 2018; Montez et al., 2019; Oksuzyan et al., 2019). In addition, further research focused on analysing causes of death would be needed. Studies here would allow for a better description and explanation of mortality differential patterns observed between migrants and non-migrants.

As regards generalizability, the considerations made in the previous chapter hold good here as well. Since the cohort is based on the Municipal Register of Rome, we included only residents, which means only regular migrants, while migrants without residence permits, who represent a particularly vulnerable population, were not included.

If there are drawbacks this study also has, though, important strengths. First, by using a longitudinal approach with an open cohort data we were able to enrol all new entries during the follow up, reflecting the great dynamism of the migrant population. Second, by linking the Municipal Register of Rome to the Register of Causes of Death we computed person-years, allowing us to obtain the person-time at risk and to estimate accurately mortality rates. Finally, since becoming a resident in Rome is not supposed to modify an individual's risk of dying, by implementing a Cox model using age as the time-scale we were able to estimate the individual's risk of dying. Each individual contributes to the death risk only in the age interval in which he/she is exposed to the risk of experiencing the event.

Our study contributes to the Italian literature about migrants' mortality which is still poor. It does so by providing additional evidence on mortality differences between migrants and

Italians during the Great Recession using a birth-cohort approach. Our findings are relevant for contemporary health systems because, for the first time, Italy has to deal with a significant migrant population. Even if the study is context-specific, our analyses rely on the Municipality of Rome which have the highest number of migrants in Italy and, therefore, represent a relevant and useful context for studying this issue, and one useful for health policy makers thinking of migrant mortality trends. Moreover, by analysing a period over fifteen years, from 2001 to 2015, this work helps to better understand mortality trends by birth-cohort and to provide insights into the mortality patterns during the Great Recession.

Given the relevance of international migrations all over Europe, the importance of studying and exploring migrants' health profile is becoming increasingly evident. This is especially true for the implementation of targeted policies addressing migrants' integration. The deterioration in migrant health and the gradual weakening of their mortality advantage is likely to become a public health issue with important consequences for the healthcare system of all European countries.

Further researches focused on analysing causes of death will allow to better describe and explain mortality differentials between migrants and non-migrants. In addition, deep analyses to explore the magnitude of the differences in mortality between time-periods, and to understand the presence of cohort effects are necessary.

CONCLUSION

In recent years, with the increase in international migration to Europe, migrant health has received a good deal of attention in both domestic and international politics, becoming one of the most important issues on the political agenda.

The present thesis aimed at analysing the association between migrant status and health, healthcare use and mortality in the adult population residing in Italy, aged 25-64 years old. In doing so it hoped to overcome some shortcomings in the Italian literature.

In the last twenty years Italy and Rome have experienced a rapid and relevant increase in the number of migrants. There is no question that the Italian and the Roman context (the city with the highest absolute number of migrants, and with the second-highest percentage of migrants out of the total population) are rich in opportunities for both temporary and permanent migrants. What is more, it is important to stress the statistical aspects of migration. During the 1970s and the 1980s, migration was regarded as a transient fact in Italy, while today migration is important enough to affect national statistics.

In recent times, the political debate has focused on the immigrant emergency and on security. The wider perception of migration as a risk, and the manipulation of the fear of migrants in a period of economic difficulty have already led European countries to political choices with international repercussions. There are many episodes which testify to the complex and difficult process of migrant integration. There is “something that is missing” in the social and political context so that the integration process can be carried out and completed. Health has generally been absent from this debate. Indeed, when migration was based on an emergency approach, health could take second place, but due to the structural nature of migration in Italy today, studying and analysing migrant health and mortality has become increasingly important. Indeed, health and mortality represent key elements in the migrant integration process, playing an important role in fertility and social participation.

Understanding the health status and needs of migrants in Europe is crucial for several reasons. First, the right to the highest attainable health is a fundamental right (WHO, 1946) which constitutes one of the underlying values in Europe together with the principle of equity in health (Padilla & Pereira, 2007). Second, the European Union has highlighted the importance of equity, social cohesion, and growth which has put migrant health on the agenda, in order to reduce inequalities in health and to eliminate discriminatory situations (Padilla & Pereira, 2007). Third, migrants constitute approximately 82.3 million equivalents to 11% of the total population in the "old continent" (UN DESA, 2019); thus, contributing significantly to the health status of European countries. Consequently, destination countries face the challenge of providing healthcare to a population with specific characteristics, which may result in new demands in the provision of care.

Although in Italy, the migration phenomenon started during the second half of the 1970s, and the number of migrants has quadrupled from 2001 to 2019, passing from 1.3 million (2.3% of the total population in Italy) to more than 5 million (8.7%) (Istat, 2001, 2019), health is a topic that has never acquired the importance it should have had in the political debate. One should note that the first law on migrant health was developed in 1995. Nevertheless, at the end of 1996, after a judgment of the Constitutional Court, this right disappeared from Italian law. Today, the right to health for migrants is guaranteed by the Turco-Napolitano Law of 1998, later merged into the *Legislative Decree No. 286 of 1998,* ("Testo Unico sull'Immigrazione"), which is still in force. It is, therefore, important to keep in mind that the first political initiatives were developed only in the second half of the 1990s.

Migration is not a new phenomenon, and over time, this kind of international mobility has produced many opportunities, but many challenges as well. Every European country has experienced and continues to experience migration, with differences in terms of time-period, migration flows and drivers. As noted in *Chapter 1* Italy has had different driving factors from

the “old” migration countries (Germany, France and Great Britain), something which makes the Italian case intriguing. In particular, one of the most important aspects of migration in Italy is the plurality of migrant origin countries, the result of the absence of an immigration policy. Other drivers include the support of associations which helped migrants and that created consensus for the approval of specific laws, which led to the adoption of several regularisations. This means a complex sociodemographic composition of migration flows, which involves different health needs, behaviours, cultures and values.

As a result, studying the health of migrants in Italy is far from simple because several factors have to be considered. These factors are referred to as the social determinants of health. Among other factors, migration is considered to be a social determinant of health because it can affect health status. Social determinants of health include environmental, genetic, behavioural, cultural and socioeconomic factors (Dahlgren & Whitehead, 1991). There may be health or mortality inequalities between migrant and host populations, or inequalities in healthcare use based on migrant status. The relationship between migration and health is complex and its impact varies considerably between and within populations. Furthermore, conditions surrounding the migration process may exacerbate vulnerabilities among disadvantaged populations.

From the present work, interesting findings have emerged. Results show that gender differences in health persist among migrants, and that recent migrants have better health than Italians, while long-term migrants, because of a longer duration of stay, tend to lose their health advantage. This advantage deteriorates towards the health level of natives, with small differences by gender (*Chapter 2*). A lower propensity to use the Emergency Departments among migrants was found, with some differences in the frequency according to migrants’ origin country. Something which changes over time, and with some differences within specific migrant groups (*Chapter 3*). Finally, regarding mortality, findings confirm that even in Italy, in

line with other international and national studies, migrants have a significantly lower all-cause mortality compared to Italians. However, a gradual weakening of migrant mortality advantage over natives was also observable, in particular within specific migrant groups. What is more, results suggest that migrant mortality advantage is far from being constant across ages (*Chapter 4*). The literature for countries with a long migratory past gives some sense of the possible risks. Even in Italy, marginalisation and a persistent condition of socioeconomic disadvantage might lead to severe inequality among ethnic minorities, both in the distribution of opportunities or resources and in access to healthcare services. This would have inevitable consequences for health and mortality. This process could counterbalance and damage the health advantage which migrants currently benefit from. Thus, given the complex structure of migration flows, it is necessary to develop and to adopt appropriate policies to meet diversified migrant needs and cultures. In particular, health policies are an important determining factor of healthcare use. They can therefore influence both individual aspects (such as through specific programmes, health knowledge and services or service information issues) and health service providers, in terms of the availability of resources, organisation and financing. The formulation, development and implementation of health policies may be influenced, by the country tradition in terms of immigration and its model of integration. For instance, countries with a long experience in receiving immigrants have formulated and reformulated their policies over time, while countries where this phenomenon is new and relatively recent are in the process of formulating and implementing policies (Cattacin et al., 2007; Fernandes et al., 2007).

In Italy the NHS provides universal coverage free of charge and gives documented migrants the right to access health services under the same conditions as the native population, and coverage for undocumented migrants including urgent care. Furthermore, Italy provides preventive care and treatment for communicable diseases (Marceca et al., 2012).

Although the main objective of the Italian health policies is to improve the health status of migrants, based on equity and equality principles, at the national level more specific objectives do not exist aside from having migrant health included as an area of interest. As previously mentioned, the first political initiatives on migrant health were developed and implemented in the late 1990s and merged into an organic law[36]. It is possible to affirm that the promotion of migrant health policies in Italy is fairly advanced. For instance, the National Health Plan (NHP: 1998-2000) contained a whole chapter on vulnerable groups, including migrants. However, following the regionalisation of the public health service introduced in 2001, the migrant health issue appears to be ambiguously hanging between the powers of the State and those of the Regions. At the regional level objectives include guaranteed access of the migrant population to appropriate healthcare (Biocca et al., 1999). Such division of responsibilities potentially contributes to inequalities both in terms of access to services, and in terms of the health profile of the migrant population between the different Italian regions (Rinaldi et al., 2013).

The most important strategies aimed at protecting migrant health contemplated by the country can be grouped into three distinct fields: (i) actions directed towards facilitating access to services (information, communication and increasing the supply); (ii) actions directed towards improving the quality of health care (adaptation services, professional development and needs assessment); (iii) actions directed towards specific health issues, such as prevention, promotion and healthcare. As regards the first field, in the first years of the 2000s, Italy considered adapting existing programmes to the languages, the social and cultural characteristics of the migrant population, and pointing out access barriers to prevention and treatment services (NHP of the Ministry of Health, 2002). Actions directed at improving access to services include spreading information among immigrants on how the health system works

[36] Legislative Decree No. 286 of 1998, ("Testo Unico sull'Immigrazione")

(e.g., bureaucratic procedures, available services, citizens' rights and duties). Such actions are also meant to improve the communication and interaction between immigrant patients and health professionals, with the inclusion of cultural mediators in health services. In those years, the NHPs also developed and implemented actions aimed at improving the systematic collection of data on the migrant population (ethnicity, country of origin and spoken and written languages) in order to adapt services, and to train professional in cultural diversity (in terms of professional development). Needs assessments for immigrants are meant to generate knowledge in order to respond to and monitor the health needs of the migrant population (incidence and prevalence of disease or social and health determinants). As regards the last field (improvement of specific health issue), in 2005, in the NHP actions addressing specific health issues have been added, such as interventions focused on health problems, including mother and child health and communicable diseases (NHP of the Ministry of Health, 2005). The following NHPs included and still include actions to monitor, prevent and promote migrant health (NHPs of the Ministry of Health from 2007 to 2019). Nevertheless, Italy formulates more specific policies at the regional level only (Biocca et al., 1999) with specific Region Health Plans (RHP, 2002). This seems to indicate that the NHS is not enough to grant a right to healthcare but that in order to guarantee that right it is necessary to modify services so that the access to care becomes a reality. Actions for improving health, access to services and quality of healthcare seem to react to difficulties that have been identified within the immigrant population, which are mainly related to communication, lack of proper information, cultural differences, and inadequate care provision for meeting needs (Scheppers et al., 2006).

In European terms, Italy is progressive in migrant health protection. Its health policy is inclusive and recognizes equal rights and obligations for regular migrants and admits opportunities for health protection and assistance for irregular migrants as well. However, even

in Italy, the move from a care-based approach to wider health promotion is required through cross-sectoral policies according to the aforementioned determinants of health.

Policy development has evolved in parallel with the immigration population growth. Even if in Italy equity remains a principle of the health system, policies addressing specific migrants or ethnic minority groups in current plans are scarce. At this point, it is therefore clear that policies must go beyond improving health services to include the migrant policy measures best suited: to combat social exclusion; as well as to reduce occupational health hazards; to increase the availability of healthy food; to improve knowledge of health risks; to improve working and housing condition; to improve education; and to reduce barriers to the labour market participation.

Inappropriate political choices and decisions may strengthen discrimination, chipping away at the migrant right to health.

This Italian-focused thesis, contributes to the literature on migrant health, healthcare use and mortality by filling several gaps in the literature. The case of Italy is of special interest because it represents a unique case in the European panorama. Indeed, migration is a relatively recent phenomenon, compared to other European countries, and the growth of migrant flows was particularly steep over the last two decades. As the share of migrants increased rapidly, it became crucial to investigate their social and demographic behaviours, such as integration, working conditions, fertility and health. Among all these factors, the latter was largely neglected in demographic research on migration in Italy, whereas, as this thesis proves, inequalities in health, healthcare use and mortality exist between migrants and natives. In addition, the present analysis applied two different data sources (survey data and administrative data) to study the three aforementioned health outcomes. Each of these data sources present some limitations (as carefully noted in the relevant chapters). Therefore, to study and analyse the evolution of migrant health, there is a need to collect population data on migrant status, more detailed

information on migration background from the Italian survey on health, and more detailed information on migrants' education or socioeconomic status from the municipal or health registers. It cannot be denied that the State lacks a comprehensive data collection strategy. On the one hand, the Ministry of Health hardly collects data disseminated at regional level; and inevitably, on the other hand, the Italian National Institute of Statistics analyses not very recent data, which is a significant and notable problem due to the steadily growing migration phenomenon. The current lack of data leads to a shortage of large national cohort studies and international comparisons. To adopt these recommendations, much more work needs to be done. The health challenge to Italy by the migration phenomenon requires prompt actions and interventions at all levels, beyond just a greater awareness of such phenomenon. From a political point of view, in light of the findings of this study, to prevent the risk for migrants of being excluded from the healthcare system, policy-makers should consider two kinds of policies: those that address the needs of recent migrants, and those that address the needs of an ethnically diverse population.

The migration phenomenon will not disappear in the coming years for Italy. It will not only persist, but grow and evolve as these migrants age and develop increasing health demands. The only viable solution to prevent deteriorating health standards for migrants, is for policy to also adapt and evolve in response to this changing phenomenon. Through the design and implementation of effective and targeted policies, to prevent a foreseeable deterioration of the situation which can be avoided.

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Appendix A

Table 1A - Distribution of the population (20-64 years) by duration of stay and by gender, and distribution of the outcomes. Weighted

	Italians				Long-term migrants (> 7 years)				Recent migrants (< 7 years)				Total
	M (N = 31,814)	%	F (N = 31,957)	%	M (N = 2,105)	%	F (N = 2,335)	%	M (N = 835)	%	F (N = 1,108)	%	70,154
Age group													
20-34	8,651	*27.2*	8,283	*25.9*	678	*32.2*	773	*33.1*	475	*56.9*	585	*52.8*	**19,445**
35-49	12,142	*38.2*	12,320	*38.6*	1,051	*49.9*	1,059	*45.4*	301	*36.0*	398	*35.9*	**27,271**
50-64	11,021	*34.6*	11,354	*35.5*	376	*17.9*	503	*21.5*	59	*7.1*	125	*11.3*	**23,438**
Civil status													
Married	16,931	*53.2*	18,537	*58.0*	1,209	*57.4*	1,303	*55.8*	287	*34.4*	539	*48.6*	**38,806**
Divorced	2,521	*7.9*	3,090	*9.7*	257	*12.2*	361	*15.5*	139	*16.6*	200	*18.1*	**6,568**
Single	12,108	*38.1*	9,320	*29.2*	624	*29.6*	575	*24.6*	407	*48.7*	336	*30.3*	**23,370**
Widow	254	*0.8*	1,010	*3.2*	15	*0.7*	96	*4.1*	2	*0.2*	33	*3.0*	**1,410**
Education													
No Education	1,989	*6.3*	2,860	*8.9*	242	*11.5*	221	*9.5*	94	*11.3*	149	*13.4*	**5,555**
Low Education	12,859	*40.4*	11,161	*34.9*	1,030	*48.9*	973	*41.7*	448	*53.7*	468	*42.2*	**26,939**
High Education	12,347	*38.8*	12,276	*38.4*	657	*31.2*	804	*34.4*	225	*26.9*	354	*31.9*	**26,663**
University	4,619	*14.5*	5,660	*17.7*	176	*8.4*	337	*14.4*	68	*8.1*	137	*12.4*	**10,997**

Continue to the next page

Table 1A - *(Continued)*

	Italians				Long-term migrants (> 7 years)				Recent migrants (< 7 years)				Total
	M (N = 31,814)	%	F (N = 31,957)	%	M (N = 2,105)	%	F (N = 2,335)	%	M (N = 835)	%	F (N = 1,108)	%	70,154
Working status													
Employed	22,387	*70.4*	15,781	*49.4*	1,630	*77.4*	1,214	*52.0*	629	*75.3*	501	*45.2*	**42,142**
Homemaker	38	*0.1*	7,142	*22.3*	1	*0.0*	548	*23.5*	0	*0.0*	315	*28.4*	**8,044**
Inactive	5,166	*16.2*	4,932	*15.4*	132	*6.3*	135	*5.8*	29	*3.5*	74	*6.7*	**10,468**
Unemployed	4,223	*13.3*	4,102	*12.8*	342	*16.2*	438	*18.8*	177	*21.2*	218	*19.7*	**9,500**
Nutrition													
Yes	3,866	*12.2*	5,651	*17.7*	177	*8.4*	299	*12.8*	51	*6.1*	101	*9.1*	**10,145**
No	27,948	*87.8*	26,306	*82.3*	1,928	*91.6*	2,036	*87.2*	784	*93.9*	1,007	*90.9*	**60,009**
Smoking													
Yes	10,188	*32.0*	6,487	*20.3*	686	*32.6*	386	*16.5*	262	*31.4*	156	*14.1*	**18,165**
No	21,626	*68.0*	25,470	*79.7*	1,419	*67.4*	1,949	*83.5*	573	*68.6*	952	*85.9*	**51,989**
Physical Activity													
Yes	18,951	*59.6*	17,193	*53.8*	1,008	*47.9*	1,128	*48.3*	355	*42.5*	525	*47.4*	**39,160**
No	12,863	*40.4*	14,764	*46.2*	1,097	*52.1*	1,207	*51.7*	480	*57.5*	583	*52.6*	**30,994**
Area of residence													
North	14,058	*44.2*	13,840	*43.3*	1,343	*63.8*	1,361	*58.3*	441	*52.8*	253	*22.8*	**31,296**
Centre	6,048	*19.0*	6,138	*19.2*	519	*24.7*	653	*28.0*	201	*24.1*	664	*59.9*	**14,223**
South & Isles	11,708	*36.8*	11,979	*37.5*	243	*11.5*	321	*13.7*	193	*23.1*	191	*17.2*	**24635**

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Table 1A - *(Continued)*

	Italians				Long-term migrants (> 7 years)				Recent migrants (> 7 years)				Total
	M (N = 31,814)	**%**	**F (N = 31,957)**	**%**	**M (N = 2,105)**	**%**	**F (N = 2,335)**	**%**	**M (N = 835)**	**%**	**F (N = 1,108)**	**%**	**70,154**
Self-Rated Health													
Bad	6,766	*21.3*	8,693	*27.2*	374	*17.8*	582	*24.9*	93	*11.1*	187	*16.9*	**16,695**
Good	25,048	*78.7*	23,264	*72.8*	1,731	*82.2*	1,753	*75.1*	742	*88.9*	921	*83.1*	**53,459**
Functional limitations													
Yes	6,135	*19.3*	7,560	*23.7*	324	*15.4*	468	*20.0*	81	*9.7*	166	*15.0*	**14,734**
No	25,679	*80.7*	24,397	*76.3*	1,781	*84.6*	1,867	*80.0*	754	*90.3*	942	*85.0*	**55,420**
Chronic Illnesses													
Yes	6,140	*19.3*	7,420	*23.2*	257	*12.2*	401	*17.2*	52	*6.2*	97	*8.8*	**14,367**
No	25,674	*80.7*	24,537	*76.8*	1,848	*87.8*	1,934	*82.8*	783	*93.8*	1,011	*91.2*	**55,787**

Table 2A – Odds ratios of self-rated health, functional limitations and chronic illnesses by gender and by duration of stay compared to natives

Women							*Men*						
					90% CI							90% CI	
	OR		Robust SE	p-value	Lower	Upper		OR		Robust SE	p-value	Lower	Upper
Self-rated health							**Self-rated health**						
Long-term migrant	1.16		0.13	0.169	0.97	1.40	Long-term migrant	0.99		0.15	0.937	0.77	1.26
Recent migrant	0.83		0.12	0.191	0.65	1.05	Recent migrant	0.70	+	0.14	0.071	0.51	0.97
Functional limitations							**Functional limitations**						
Long-term migrant	0.98		0.08	0.782	0.86	1.11	Long-term migrant	0.94		0.08	0.485	0.81	1.09
Recent migrant	0.78	*	0.09	0.033	0.65	0.95	Recent migrant	0.66	**	0.10	0.008	0.51	0.86
Chronic illnesses							**Chronic illnesses**						
Long-term migrant	0.80	**	0.06	<.001	0.71	0.90	Long-term migrant	0.71	***	0.07	<.001	0.61	0.83
Recent migrant	0.43	***	0.06	<.001	0.35	0.54	Recent migrant	0.44	***	0.08	<.001	0.32	0.60

Reference category: Natives.
Adjusted for age, civil status, education, employment status and area of residence. For migrants we also adjusted for area of origin.
Note: The asterisks indicate significance $^{+}p<0.1$ $*p < 0.05$, $**p < 0.01$, $***p < 0.001$

Table 2A.1 – Odds ratios of self-rated health by gender compared to natives

Women							*Men*						
Bad and very bad SRH					**95% CI**		**Bad and very bad SRH**					**95% CI**	
	OR		**Std. Err**	**p-value**	**Lower**	**Upper**		**OR**		**Std. Err**	**p-value**	**Lower**	**Upper**
Migrant status (ref. Natives)							**Migrant status (ref. Natives)**						
Long-term migrants	1.16		0.13	0.169	0.97	1.40	Long-term migrants	0.99		0.15	0.937	0.77	1.26
Recent migrants	0.83		0.12	0.191	0.65	1.05	Recent migrants	0.70	+	0.14	0.071	0.51	0.97
Age	1.05	***	0.00	<.001	1.05	1.06	**Age**	1.06	***	0.00	<.001	1.05	1.06
Civil status (ref. Married)							**Civil status (ref. Married)**						
Divorced	1.22	***	0.06	<.001	1.13	1.32	Divorced	1.05		0.06	0.368	0.96	1.15
Single	1.15	**	0.05	0.001	1.08	1.24	Single	1.11	*	0.05	0.017	1.03	1.19
Widow	1.29	***	0.09	<.001	1.15	1.45	Widow	1.08		0.16	0.615	0.84	1.39
Education (ref. Low Education)							**Education (ref. Low Education)**						
University	0.48	***	0.02	<.001	0.44	0.52	University	0.49	***	0.03	<.001	0.44	0.53
No & 1st Education	1.29	***	0.06	<.001	1.19	1.39	No & 1st Education	1.29	***	0.07	<.001	1.18	1.41
Upper Education	0.71	***	0.02	<.001	0.67	0.75	Upper Education	0.69	***	0.03	<.001	0.65	0.73
Area of origin (ref. Italy)							**Area of origin (ref. Italy)**						
Africa	1.04		0.19	0.812	0.78	1.40	Africa	0.92		0.18	0.660	0.67	1.27
Asia	0.82		0.18	0.372	0.58	1.18	Asia	0.80		0.18	0.327	0.55	1.17
EU	0.87		0.12	0.323	0.69	1.10	EU	1.03		0.20	0.867	0.75	1.42
Latin America	0.95		0.19	0.786	0.69	1.31	Latin America	2.42	**	0.76	0.005	1.44	4.05
Employment status (ref. Employed)							**Employment status (ref. Employed)**						
Homemaker	1.05		0.04	0.202	0.99	1.12	Homemaker	2.74	*	1.19	0.020	1.35	5.58
Inactive	1.29	***	0.06	<.001	1.20	1.38	Inactive	1.55	***	0.07	<.001	1.44	1.66
Unemployed	1.41	***	0.07	<.001	1.31	1.53	Unemployed	1.62	***	0.08	<.001	1.50	1.75
Area of residence (ref. North)							**Area of residence (ref. North)**						
Centre	1.05		0.04	0.245	0.98	1.13	Centre	1.14	**	0.05	0.005	1.06	1.23
South & Isles	1.15	***	0.04	<.001	1.09	1.22	South & Isles	1.18	***	0.04	<.001	1.11	1.25
Intercept	0.03	***	0.00	<.001	0.03	0.04	**Intercept**	0.02	***	0.00	<.001	0.02	0.02

Complete model including all control variables, see table 2A

Table 2A.2 – Odds ratios of functional limitations by gender compared to natives

Women							*Men*						
Functional limitations					**95% CI**		**Functional limitations**					**95% CI**	
	OR		**Std. Err**	**p-value**	**Lower**	**Upper**		**OR**		**Std. Err**	**p-value**	**Lower**	**Upper**
Migrant status (ref. Natives)							**Migrant status (ref. Natives)**						
Long-term migrants	0.98		0.08	0.782	0.86	1.11	Long-term migrants	0.94		0.08	0.485	0.81	1.09
Recent migrants	0.78	*	0.09	0.033	0.65	0.95	Recent migrants	0.66	**	0.10	0.008	0.51	0.86
Age	1.04	***	0.00	<.001	1.04	1.05	**Age**	1.04	***	0.00	<.001	1.04	1.05
Civil status (ref. Married)							**Civil status (ref. Married)**						
Divorced	1.10	+	0.05	0.055	1.01	1.19	Divorced	0.95		0.05	0.364	0.86	1.04
Single	1.06		0.05	0.164	0.99	1.14	Single	1.09	*	0.05	0.049	1.01	1.17
Widow	1.10		0.08	0.179	0.98	1.24	Widow	1.09		0.18	0.615	0.83	1.42
Education (ref. Low Education)							**Education (ref. Low Education)**						
University	0.69	***	0.03	<.001	0.63	0.74	University	0.57	***	0.03	<.001	0.52	0.62
No & 1st Education	1.39	***	0.07	<.001	1.28	1.50	No & 1st Education	1.22	**	0.07	0.001	1.11	1.35
Upper Education	0.77	***	0.03	<.001	0.72	0.82	Upper Education	0.73	***	0.03	<.001	0.69	0.78
Employment status (ref. Employed)							**Employment status (ref. Employed)**						
Homemaker	1.11	*	0.04	0.011	1.04	1.18	Homemaker	1.23		0.56	0.643	0.59	2.60
Inactive	1.56	***	0.07	<.001	1.45	1.68	Inactive	1.95	***	0.08	<.001	1.82	2.09
Unemployed	1.37	***	0.07	<.001	1.26	1.48	Unemployed	1.59	***	0.08	<.001	1.47	1.72
Area of residence (ref. North)							**Area of residence (ref. North)**						
Centre	1.01		0.05	0.778	0.94	1.09	Centre	1.03		0.05	0.492	0.96	1.12
South & Isles	1.10	**	0.04	0.005	1.04	1.16	South & Isles	1.06		0.04	0.123	1.00	1.12
Intercept	0.04	***	0.00	<.001	0.04	0.05	**Intercept**	0.03	***	0.00	<.001	0.03	0.04

Complete model including all control variables, see table 2A

Table 2A.3 – Odds ratios of chronic illnesses by gender compared to natives

Women							*Men*						
Chronic illnesses					**95% CI**		**Chronic illnesses**					**95% CI**	
	OR		**Std. Err**	**p-value**	**Lower**	**Upper**		**OR**		**Std. Err**	**p-value**	**Lower**	**Upper**
Migrant status (ref. Natives)							**Migrant status (ref. Natives)**						
Long-term migrants	0.80	**	0.06	0.002	0.71	0.90	Long-term migrants	0.71	***	0.07	<.001	0.61	0.83
Recent migrants	0.43	***	0.06	<.001	0.35	0.54	Recent migrants	0.44	***	0.08	<.001	0.32	0.60
Age	1.05	***	0.00	<.001	1.04	1.05	**Age**	1.05	***	0.00	<.001	1.05	1.05
Civil status (ref. Married)							**Civil status (ref. Married)**						
Divorced	1.07		0.05	0.167	0.99	1.16	Divorced	0.91	+	0.05	0.094	0.82	1.00
Single	1.08	+	0.05	0.073	1.01	1.16	Single	1.02		0.04	0.691	0.95	1.09
Widow	0.94		0.07	0.390	0.83	1.06	Widow	1.05		0.17	0.773	0.81	1.36
Education (ref. Low Education)							**Education (ref. Low Education)**						
University	0.92	+	0.04	0.080	0.85	0.99	University	0.96		0.05	0.431	0.88	1.05
No & 1st Education	1.17	**	0.06	0.002	1.08	1.27	No & 1st Education	1.04		0.06	0.502	0.94	1.15
Upper Education	0.94	+	0.03	0.108	0.89	1.00	Upper Education	0.92	*	0.04	0.029	0.86	0.98
Employment status (ref. Employed)							**Employment status (ref. Employed)**						
Homemaker	1.03		0.04	0.495	0.96	1.10	Homemaker	1.22		0.54	0.656	0.59	2.52
Inactive	1.42	***	0.06	<.001	1.32	1.52	Inactive	1.83	***	0.08	<.001	1.70	1.97
Unemployed	1.26	***	0.06	<.001	1.16	1.37	Unemployed	1.39	***	0.07	<.001	1.28	1.51
Area of residence (ref. North)							**Area of residence (ref. North)**						
Centre	0.83	***	0.04	<.001	0.78	0.89	Centre	0.86	**	0.04	0.001	0.79	0.93
South & Isles	0.83	***	0.03	<.001	0.78	0.88	South & Isles	0.80	***	0.03	<.001	0.75	0.85
Intercept	0.04	***	0.00	<.001	0.03	0.04	**Intercept**	0.03	***	0.00	<.001	0.02	0.03

Complete model including all control variables, see table 2A

Table 2A.1.1 – Odds ratios for gender differences in SRH by duration of stay

Italians

Bad and Very Bad SRH					**95% CI**	
	OR		**Std. Err**	**p-value**	**Lower**	**Upper**
Gender (ref. Men)						
Women	1.41	***	0.03	<.001	1.35	1.46
Age	1.06	***	0.00	<.001	1.05	1.06
Civil status (ref. Married)						
Divorced	1.14	**	0.04	0.001	1.07	1.21
Single	1.15	***	0.04	<.001	1.09	1.21
Widow	1.23	**	0.08	0.002	1.10	1.37
Education (ref. Low Education)						
University	0.46	***	0.02	<.001	0.43	0.49
No & 1st Education	1.27	***	0.05	<.001	1.20	1.36
Upper Education	0.67	***	0.02	<.001	0.64	0.70
Employment status (ref. Employed)						
Homemaker	1.07	+	0.04	0.082	1.00	1.13
Inactive	1.40	***	0.04	<.001	1.33	1.48
Unemployed	1.50	***	0.05	<.001	1.42	1.60
Area of residence (ref. North)						
Centre	1.11	**	0.04	0.003	1.05	1.18
South & Isles	1.18	***	0.03	<.001	1.13	1.24
Intercept	0.02	***	0.00	<.001	0.02	0.02

Complete model including all control variables, see table 2.1

Long-term migrants

Bad and Very Bad SRH					**95% CI**	
	OR		**Std. Err**	**p-value**	**Lower**	**Upper**
Gender (ref. Men)						
Women	1.44	**	0.16	0.001	1.20	1.73
Age	1.05	***	0.01	<.001	1.04	1.06
Civil status (ref. Married)						
Divorced	1.25		0.17	0.114	0.99	1.57
Single	1.18		0.16	0.228	0.94	1.48
Widow	1.31		0.35	0.298	0.85	2.02
Education (ref. Low Education)						
University	0.80		0.13	0.164	0.61	1.04
No & 1st Education	1.22		0.21	0.246	0.92	1.61
Upper Education	0.99		0.12	0.950	0.81	1.21
Area of origin (ref. Africa)						
Asia	0.78		0.15	0.203	0.57	1.07
EU	0.85		0.14	0.325	0.65	1.11
Latin America	1.09		0.24	0.716	0.75	1.57
No-EU	0.95		0.16	0.753	0.73	1.24
Employment status (ref. Employed)						
Homemaker	1.24		0.19	0.168	0.96	1.60
Inactive	1.74	**	0.34	0.004	1.26	2.39
Unemployed	1.46	**	0.18	0.003	1.19	1.79
Area of residence (ref. North)						
Centre	0.94		0.12	0.609	0.75	1.16
South & Isles	0.98		0.15	0.887	0.76	1.25
Intercept	0.03	***	0.01	<.001	0.02	0.05

Complete model including all control variables, see table 2.1

Recent migrants

Bad and Very Bad SRH	OR		Std. Err	p-value	95% CI Lower	95% CI Upper
Gender (ref. Men)						
Women	1.52	*	0.29	0.030	1.11	2.08
Age	1.04	***	0.01	<.001	1.03	1.06
Civil status (ref. Married)						
Divorced	1.16		0.27	0.522	0.79	1.69
Single	1.01		0.21	0.970	0.71	1.43
Widow	1.04		0.51	0.933	0.47	2.33
Education (ref. Low Education)						
University	1.10		0.34	0.744	0.67	1.82
No & 1st Education	2.34	**	0.62	0.001	1.52	3.62
Upper Education	1.40	+	0.29	0.105	0.99	1.98
Area of origin (ref. Africa)						
Asia	0.94		0.32	0.856	0.54	1.64
EU	1.10		0.29	0.717	0.71	1.70
Latin America	1.97	+	0.71	0.061	1.08	3.57
No-EU	1.16		0.33	0.606	0.72	1.86
Employment status (ref. Employed)						
Homemaker	0.76		0.22	0.331	0.47	1.21
Inactive	1.43		0.47	0.278	0.83	2.45
Unemployed	1.49	+	0.31	0.060	1.05	2.10
Area of residence (ref. North)						
Centre	1.04		0.22	0.854	0.73	1.48
South & Isles	0.99		0.22	0.981	0.69	1.43
Intercept	0.02	***	0.01	<.001	0.01	0.03

Complete model including all control variables, see table 2.1

Table 2A.1.2 – Odds ratios for gender differences in functional limitations by duration of stay

Italians

Functional limitations	OR		Std. Err	p-value	95% CI Lower	95% CI Upper
Gender (ref. Men)						
Women	1.29	***	0.03	<.001	1.24	1.34
Age	1.05	***	0.00	<.001	1.04	1.05
Civil status (ref. Married)						
Divorced	1.07	+	0.04	0.085	1.00	1.14
Single	1.13	***	0.04	<.001	1.07	1.19
Widow	1.09		0.07	0.223	0.97	1.22
Education (ref. Low Education)						
University	0.61	***	0.02	<.001	0.57	0.65
No & 1st Education	1.31	***	0.05	<.001	1.23	1.40
Upper Education	0.72	***	0.02	<.001	0.69	0.75
Employment status (ref. Employed)						
Homemaker	1.11	**	0.04	0.006	1.04	1.18
Inactive	1.70	***	0.05	<.001	1.61	1.79
Unemployed	1.47	***	0.05	<.001	1.39	1.56
Area of residence (ref. North)						
Centre	1.04		0.04	0.217	0.99	1.11
South & Isles	1.13	***	0.03	<.001	1.08	1.18
Intercept	0.03	***	0.00	<.001	0.03	0.03

Complete model including all control variables, see table 2.1

Long-term migrants

Functional limitations					**95% CI**	
	OR		**Std. Err**	**p-value**	**Lower**	**Upper**
Gender (ref. Men)						
Women	1.38	**	0.16	0.004	1.15	1.66
Age	1.03	***	0.01	<.001	1.02	1.04
Civil status (ref. Married)						
Divorced	0.84		0.13	0.261	0.65	1.09
Single	0.93		0.15	0.651	0.72	1.21
Widow	1.33		0.35	0.290	0.86	2.05
Education (ref. Low Education)						
University	0.96		0.17	0.817	0.71	1.29
No & 1st Education	1.17		0.23	0.429	0.85	1.60
Upper Education	1.10		0.15	0.498	0.87	1.38
Area of origin (ref. Africa)						
Asia	0.85		0.20	0.504	0.57	1.26
EU	0.70	+	0.14	0.085	0.50	0.98
Latin America	0.74		0.18	0.227	0.50	1.11
No-EU	0.91		0.18	0.630	0.66	1.25
Employment status (ref. Employed)						
Homemaker	1.23		0.21	0.224	0.93	1.63
Inactive	3.23	***	0.93	<.001	2.01	5.18
Unemployed	1.25		0.18	0.114	0.99	1.57
Area of residence (ref. North)						
Centre	0.81		0.12	0.160	0.64	1.04
South & Isles	0.44	***	0.09	<.001	0.32	0.61
Intercept	0.06	***	0.02	<.001	0.04	0.10

Complete model including all control variables, see table 2.1

Recent migrants

Functional limitations					**95% CI**	
	OR		**Std. Err**	**p-value**	**Lower**	**Upper**
Gender (ref. Men)						
Women	1.38		0.29	0.123	0.98	1.95
Age	1.03	***	0.01	<.001	1.02	1.05
Civil status (ref. Married)						
Divorced	0.92		0.23	0.744	0.62	1.38
Single	0.82		0.19	0.374	0.56	1.19
Widow	0.63		0.35	0.407	0.25	1.57
Education (ref. Low Education)						
University	1.11		0.34	0.740	0.67	1.82
No & 1st Education	1.67	+	0.46	0.063	1.06	2.62
Upper Education	1.45	+	0.31	0.077	1.03	2.06
Area of origin (ref. Africa)						
Asia	0.80		0.26	0.505	0.47	1.38
EU	0.72		0.21	0.258	0.45	1.16
Latin America	1.70		0.60	0.130	0.96	3.02
No-EU	0.76		0.22	0.338	0.48	1.22
Employment status (ref. Employed)						
Homemaker	1.25		0.35	0.432	0.79	1.97
Inactive	1.46		0.47	0.240	0.86	2.49
Unemployed	1.43		0.33	0.123	0.98	2.09
Area of residence (ref. North)						
Centre	1.27		0.30	0.306	0.86	1.87
South & Isles	0.77		0.19	0.299	0.51	1.17
Intercept	0.03	***	0.01	<.001	0.02	0.07

Complete model including all control variables, see table 2.1

Table 2A.1.3 – Odds ratios for gender differences in chronic illnesses by duration of stay

Italians

Chronic illnesses					**95% CI**	
	OR		**Std. Err**	**p-value**	**Lower**	**Upper**
Gender (ref. Men)						
Women	1.27	***	0.03	<.001	1.22	1.32
Age	1.05	***	0.00	<.001	1.05	1.05
Civil status (ref. Married)						
Divorced	1.02		0.04	0.691	0.95	1.08
Single	1.08	*	0.03	0.017	1.02	1.14
Widow	0.95		0.07	0.476	0.85	1.07
Education (ref. Low Education)						
University	0.91	*	0.03	0.014	0.86	0.97
No & 1st Education	1.09	*	0.04	0.035	1.02	1.16
Upper Education	0.91	***	0.02	<.001	0.87	0.95
Employment status (ref. Employed)						
Homemaker	1.05		0.04	0.222	0.98	1.12
Inactive	1.57	***	0.05	<.001	1.49	1.66
Unemployed	1.28	***	0.05	<.001	1.21	1.36
Area of residence (ref. North)						
Centre	0.87	***	0.03	<.001	0.82	0.92
South & Isles	0.84	***	0.02	<.001	0.80	0.88
Intercept	0.03	***	0.00	<.001	0.02	0.03

Complete model including all control variables, see table 2.1

Long-term migrants

Chronic conditions					**95% CI**	
	OR		**Std. Err**	**p-value**	**Lower**	**Upper**
Gender (ref. Men)						
Women	1.51	**	0.18	0.001	1.24	1.84
Age	1.03	***	0.01	<.001	1.02	1.04
Civil status (ref. Married)						
Divorced	0.87		0.14	0.371	0.66	1.13
Single	0.89		0.13	0.417	0.69	1.13
Widow	0.81		0.23	0.472	0.51	1.30
Education (ref. Low Education)						
University	1.33		0.24	0.113	0.99	1.78
No & 1st Education	1.37		0.26	0.106	0.99	1.88
Upper Education	1.37	*	0.20	0.027	1.08	1.74
Area of origin (ref. Africa)						
Asia	0.86		0.18	0.488	0.61	1.22
EU	0.85		0.16	0.396	0.62	1.17
Latin America	1.03		0.23	0.895	0.72	1.48
No-EU	0.88		0.16	0.469	0.65	1.18
Employment status (ref. Employed)						
Homemaker	1.03		0.19	0.874	0.76	1.39
Inactive	3.37	***	0.87	<.001	2.21	5.15
Unemployed	1.44	*	0.20	0.010	1.14	1.81
Area of residence (ref. North)						
Centre	0.61	**	0.10	0.002	0.47	0.80
South & Isles	0.49	***	0.10	<.001	0.35	0.68
Intercept	0.04	***	0.01	<.001	0.02	0.06

Complete model including all control variables, see table 2.1

Recent migrants

Chronic conditions					**95% CI**	
	OR		**Std. Err**	**p-value**	**Lower**	**Upper**
Gender (ref. Men)						
Women	1.09		0.29	0.745	0.71	1.68
Age	1.05	***	0.01	<.001	1.03	1.07
Civil status (ref. Married)						
Divorced	1.04		0.30	0.905	0.64	1.67
Single	0.85		0.25	0.583	0.52	1.39
Widow	0.82		0.47	0.723	0.32	2.09
Education (ref. Low Education)						
University	1.61		0.52	0.142	0.94	2.75
No & 1st Education	1.46		0.48	0.247	0.85	2.51
Upper Education	1.42		0.37	0.177	0.93	2.18
Area of origin (ref. Africa)						
Asia	0.83		0.35	0.669	0.42	1.67
EU	0.95		0.32	0.873	0.54	1.65
Latin America	1.69		0.78	0.253	0.79	3.60
No-EU	1.12		0.38	0.733	0.64	1.96
Employment status (ref. Employed)						
Homemaker	1.64		0.55	0.142	0.94	2.84
Inactive	1.89	+	0.72	0.097	1.01	3.55
Unemployed	2.26	**	0.61	0.002	1.46	3.51
Area of residence (ref. North)						
Centre	0.74		0.21	0.283	0.47	1.17
South & Isles	0.52	*	0.17	0.047	0.31	0.89
Intercept	0.01	***	0.00	<.001	0.00	0.02

Complete model including all control variables, see table 2.1

Table 3A - Predicted probabilities of self-rated health, functional limitations and chronic illnesses by duration of stay and gender

Probability of declaring bad or very bad "Self-rated health"

	Predicted probability	p-value	90% CI Lower	90% CI Upper
Italian M	0.21	<.001	*0.207*	*0.215*
Italian W	0.27	<.001	*0.261*	*0.270*
[a]L.T. migrant M	0.21	<.001	*0.190*	*0.230*
L.T. migrant W	0.28	<.001	*0.263*	*0.302*
[b]Rec. migrant M	0.16	<.001	*0.131*	*0.191*
Rec. migrant W	0.23	<.001	*0.197*	*0.253*

Probability of declaring at least one "Functional limitations" in the last 6 months

	Predicted probability	p-value	90% CI Lower	90% CI Upper
Italian M	0.19	<.001	*0.188*	*0.196*
Italian W	0.23	<.001	*0.226*	*0.234*
L.T. migrant M	0.18	<.001	*0.163*	*0.202*
L.T. migrant W	0.23	<.001	*0.207*	*0.248*
Rec. migrant M	0.14	<.001	*0.109*	*0.166*
Rec. migrant W	0.19	<.001	*0.167*	*0.221*

Probability of declaring at least one "Chronic illnesses"

	Predicted probability	p-value	90% CI Lower	90% CI Upper
Italian M	0.19	<.001	*0.187*	*0.195*
Italian W	0.23	<.001	*0.223*	*0.232*
L.T. migrant M	0.14	<.001	*0.127*	*0.162*
L.T. migrant W	0.19	<.001	*0.177*	*0.212*
Rec. migrant M	0.09	<.001	*0.069*	*0.120*
Rec. migrant W	0.12	<.001	*0.099*	*0.142*

Note:

[a]L.T. migrants → Long-term migrants

[b]Rec. migrant → Recent migrants

Appendix B

Table 1B. Number of ED contacts (N) and Standardized Usage Rates (SUR) for the population residing in Rome aged 25-64 years, by time-period and specific-cause

	Pre-2008											
	All-cause			CVDs			Mental disorders			Injuries		
	N	%	SUR x1000	N	%	SUR x1000	N	%	SUR x1000	N	%	SUR x1000
Total	**1,637,551**	**100**	**271**	**38,620**	**2.4**	**6**	**38,826**	**2.4**	**7**	**551,798**	**33.7**	**93**
Origin country												
Italy	1,510,893	92.3	279	37,005	95.8	6	37,164	95.7	7	520,153	94.3	99
HDC	6,078	0.4	87	72	0.2	1	89	0.2	1	1,823	0.3	28
HMPC	120,580	7.4	207	1,543	4.0	3	1,573	4.1	3	29,822	5.4	
of which												
Africa	21,143	1.3	236	231	0.6	3	274	0.7	3	4,804	0.9	51
Asia	28,733	1.8	155	584	1.5	3	276	0.7	1	6,416	1.2	34
Latin-America	20,667	1.3	246	133	0.3	2	249	0.6	3	4,995	0.9	57
Central-Eastern Europe	50,037	3.1	229	595	1.5	4	774	2.0	3	13,607	2.5	57

	Post-2008											
	All-cause			CVDs			Mental disorders			Injuries		
	N	%	SUR x1000	N	%	SUR x1000	N	%	SUR x1000	N	%	SUR x1000
Total	**2,654,244**	**100**	**251**	**72,472**	**2.7**	**6**	**64,704**	**2.4**	**7**	**786,208**	**29.6**	**83**
Origin country												
Italy	2,311,510	87.1	261	66,348	91.5	6	59,560	92.0	7	710,904	90.4	85
HDC	11,311	0.4	93	207	0.3	2	194	0.3	2	3,006	0.4	28
HMPC	331,423	12.5	208	5,917	8.2	4	4,950	7.7	3	72,298	9.2	44
of which												
Africa	50,321	1.9	243	793	1.1	4	736	1.1	3	9,844	1.3	43
Asia	80,809	3.0	161	2,063	2.8	4	726	1.1	1	15,462	2.0	30
Latin-America	48,332	1.8	251	476	0.7	3	604	0.9	3	10,788	1.4	57
Central-Eastern Europe	151,961	5.7	222	2,585	3.6	4	2,884	4.5	4	36,204	4.6	52

Source: authors' elaboration with Dynamic Rome Longitudinal Study cohort data and the ED Register data (HIS-EC)

Table 2B. Odds ratios and rate ratios for the Negative Binomial Hurdle model. All-cause ED contacts by migrant status among residents in Rome aged 25-64 years from 2005 to 2015

	Zero-part model			Count-part model		
	OR		95% CI	RR		95% CI
Origin area						
Italy[a]						
HDC	0.23	***	(0.22-0.24)	0.65	***	(0.61-0.70)
HMPC	0.53	***	(0.52-0.53)	1.00		(0.98-1.02)
Gender						
Man[a]						
Woman	1.03	***	(1.03-1.04)	1.06	***	(1.05-1.06)
Age group						
25-34[a]						
35-44	1.35	***	(1.34-1.36)	0.86	***	(0.85-0.86)
45-54	1.05	***	(1.04-1.06)	0.69	***	(0.68-0.70)
55-64	0.79	***	(0.79-0.80)	0.67	***	(0.66-0.68)
Time-period						
Pre-2008[a]						
Post-2008	1.34	***	(1.34-1.35)	0.96	***	(0.96-0.97)
Origin area * Time-period						
HDC Post-2008	0.98		(0.93-1.02)	0.94		(0.87-1.02)
HMPC Post-2008	1.01		(1.00-1.02)	0.98	*	(0.96-0.99)
N observations	*3772584*			*1735368*		

[a] *Reference category*

Zero-part model reports odds ratios for the outcome variable indicating persons without (Y = 0) or with Emergency Department experience (Y = 1, where all values larger than 0 are censored, which means, are fixed at 1), while the Count-part model, which reports rate ratios, models the number of Emergency Department experiences for those with Emergency Department experiences (for those with Y >0).

*Note: The asterisks indicate significance *p < 0.05, **p < 0.01, ***p < 0.001.*

Table 3B. Odds ratios and rate ratios of the Negative Binomial Hurdle model. ED contacts for CVDs, Mental disorders and Injuries, by migrant status among residents in Rome aged 25-64 years from 2005 to 2015

	CVDs						Mental disorders						Injuries					
	Zero-part model			Count-part model			Zero-part model			Count-part model			Zero-part model			Count-part model		
	OR		95% CI	RR		95% CI	OR		95% CI	RR		95% CI	OR		95% CI	RR		95% CI
Origin area																		
Italy[a]																		
HDC	0.17	***	(0.14-0.22)	0.78		(0.37-1.63)	0.22	***	(0.17-0.28)	0.71		(0.39-1.29)	0.25	***	(0.23-0.26)	0.69	***	(0.62-0.77)
HMPC	0.50	***	(0.47-0.53)	1.10		(0.95-1.28)	0.42	***	(0.40-0.45)	0.61	***	(0.53-0.71)	0.43	***	(0.42-0.43)	0.80	***	(0.78-0.82)
Gender																		
Man[a]																		
Woman	0.60	***	(0.59-0.61)	0.86	***	(0.83-0.89)	1.15	***	(1.13-1.17)	0.76	***	(0.73-0.79)	0.72	***	(0.72-0.73)	0.72	***	(0.71-0.72)
Age_group																		
25-34[a]																		
35-44	2.67	***	(2.60-2.75)	1.27	***	(1.18-1.37)	1.05	***	(1.03-1.07)	1.13	***	(1.08-1.18)	0.98	***	(0.98-0.99)	0.90	***	(0.88-0.90)
45-54	5.64	***	(5.49-5.78)	1.67	***	(1.55-1.79)	0.91	***	(0.89-0.93)	1.08	**	(1.03-1.14)	0.91	***	(0.91-0.92)	0.83	***	(0.83-0.84)
55-64	6.69	***	(6.52-6.87)	2.22	***	(2.07-2.39)	0.51	***	(0.49-0.52)	0.93	*	(0.88-1.00)	0.56	***	(0.55-0.56)	0.77	***	(0.76-0.77)
Time-period																		
Pre-2008[a]																		
Post-2008	1.60	***	(1.57-1.62)	0.88	***	(0.85-0.91)	1.31	***	(1.28-1.33)	0.91	***	(0.88-0.95)	1.21	***	(1.20-1.22)	0.82	***	(0.81-0.83)
Origin area * Time-period																		
HDC Post-2008	1.23		(0.92-1.65)	1.07		(0.46-2.48)	0.94		(0.70-1.28)	1.40		(0.69-2.84)	0.99		(0.93-1.07)	0.90		(0.79-1.04)
HMPC Post-2008	1.24	***	(1.16-1.32)	0.89		(0.75-1.05)	1.17	***	(1.09-1.26)	1.08		(0.91-1.27)	1.01		(1.00-1.03)	0.99		(0.97-1.03)
N observations	*3772584*			*84610*			*3772584*			*57820*			*3772584*			*882930*		

[a] *Reference category*

Zero-part model reports odds ratios for the outcome variable indicating persons without (Y = 0) or with Emergency Department experience (Y = 1, where all values larger than 0 are censored, which means, are fixed at 1), while the Count-part model, which reports rate ratios, models the number of Emergency Department experiences for those with Emergency Department experiences (for those with Y >0).

*Note: The asterisks indicate significance *p < 0.05, **p < 0.01, ***p < 0.001.*

Table 3.2B. Odds ratios and rate ratios for the Negative Binomial Hurdle model. All-cause ED contacts by migrant status among residents in Rome aged 25-64 years from 2005 to 2015

	Zero-part model			Count-part model		
	OR		95% CI	RR		95% CI
Intercept	0.77	***	(0.77-0.78)	0.00	***	(0.00-0.00)
Origin area						
Italy	1.00			1.00		
HDC	0.23	***	(0.22-0.24)	0.65	***	(0.61-0.70)
Africa	0.52	***	(0.50-0.53)	1.46	***	(1.40-1.52)
Latin-America	0.72	***	(0.70-0.73)	1.04	*	(1.00-1.08)
Asia	0.43	***	(0.43-0.44)	0.80	***	(0.78-0.83)
Eastern-Europe	0.55	***	(0.54-0.55)	0.96	***	(0.93-0.98)
Gender						
Man	1.00			1.00		
Woman vs Man	1.02	***	(1.01-1.02)	1.06	***	(1.05-1.06)
Age group						
25-34	1.00			1.00		
35-44	1.35	***	(1.34-1.36)	0.86	***	(0.85-0.86)
45-54	1.05	***	(1.04-1.05)	0.69	***	(0.68-0.69)
55-64	0.79	***	(0.78-0.79)	0.67	***	(0.66-0.68)
Time-period						
Pre-2008	1.00			1.00		
Post-2008	1.34	***	(1.34-1.35)	0.96	***	(0.96-0.97)
Origin area * Time-period						
HDC Post-2008	0.98		(0.93-1.02)	0.94		(0.87-1.02)
Africa Post-2008	0.80	***	(0.77-0.82)	1.00		(0.96-1.05)
Latin-America Post-2008	0.99		(0.96-1.02)	1.01		(0.97-1.06)
Asia Post-2008	0.93	***	(0.91-0.95)	0.99		(0.96-1.03)
Eastern-Europe Post-2008	1.21	***	(1.19-1.23)	0.99		(0.96-1.01)

Complete model including all control variables, see table 3.2

Table 3.3B. Odds ratios and rate ratios of the Negative Binomial Hurdle model. ED contacts for CVDs, Mental disorders and Injuries, by migrant status among residents in Rome aged 25-64 years from 2005 to 2015

	CVDs						Mental disorders						Injuries					
	Zero-part model			Count-part model			Zero-part model			Count-part model			Zero-part model			Count-part model		
	OR		95% CI	RR		95% CI	OR		95% CI	RR		95% CI	OR		95% CI	RR		95% CI
Origin area																		
Italy	1.00			1.00			1.00			1.00			1.00			1.00		
HDC	0.17	***	(0.14-0.22)	0.77	***	(0.37-1.62)	0.22	***	(0.17-0.28)	0.71		(0.39-1.29)	0.25	***	(0.23-0.26)	0.69	***	(0.62-0.77)
Africa	0.47	***	(0.40-0.54)	1.09		(0.75-1.58)	0.47	***	(0.41-0.54)	0.78		(0.56-1.09)	0.42	***	(0.40-0.43)	0.89	***	(0.84-0.95)
Latin-America	0.35	***	(0.29-0.42)	0.97		(0.58-1.62)	0.54	***	(0.47-0.62)	0.41	***	(0.28-0.61)	0.58	***	(0.56-0.60)	0.85	***	(0.80-0.90)
Asia	0.59	***	(0.54-0.65)	1.05		(0.83-1.34)	0.24	***	(0.21-0.28)	0.63	**	(0.45-0.88)	0.31	***	(0.30-0.32)	0.61	***	(0.58-0.65)
Eastern-Europe	0.49	***	(0.45-0.54)	1.19		(0.94-1.51)	0.49	***	(0.45-0.53)	0.62	***	(0.50-0.77)	0.47	***	(0.46-0.48)	0.85	***	(0.82-0.89)
Gender																		
Man	1.00			1.00			1.00			1.00			1.00			1.00		
Woman	0.60	***	(0.59-0.61)	0.86	***	(0.83-0.89)	1.13	***	(1.12-1.15)	0.76	***	(0.73-0.79)	0.72	***	(0.71-0.72)	0.72	***	(0.71-0.72)
Age_group																		
25-34	1.00			1.00			1.00			1.00			1.00			1.00		
35-44	1.67	***	(2.60-2.75)	1.37	***	(1.18-1.37)	1.05	***	(1.03-1.07)	1.13	***	(1.08-1.18)	0.98	***	(0.98-0.99)	0.89	***	(0.88-0.90)
45-54	2.64	***	(5.49-5.79)	1.79	***	(1.55-1.79)	0.91	***	(0.89-0.93)	1.08	**	(1.03-1.13)	0.91	***	(0.90-0.92)	0.83	***	(0.83-0.84)
55-64	4.69	***	(6.52-6.87)	2.39	***	(2.07-2.39)	0.51	***	(0.49-0.52)	0.94	*	(0.88-1.00)	0.56	***	(0.55-0.56)	0.77	***	(0.76-0.77)
Time-period																		
Pre-2008	1.00			1.00			1.00			1.00			1.00			1.00		
Post-2008	1.60	***	(1.57-1.62)	0.88	***	(0.85-0.91)	1.31	***	(1.28-1.33)	0.91	***	(0.88-0.95)	1.21	***	(1.20-1.22)	0.82	***	(0.81-0.83)
Origin area * Time-period																		
HDC Post-2008	1.23		(0.92-1.65)	1.07		(0.46-2.49)	0.94		(0.70-1.27)	1.40		(0.69-2.85)	0.99		(0.93-1.07)	0.90		(0.79-1.04)
Africa Post-2008	1.14		(0.96-1.35)	0.86		(0.56-1.31)	0.93		(0.79-1.11)	1.08		(0.73-1.60)	0.81	***	(0.78-0.85)	0.99		(0.93-1.06)
Latin-America Post-2008	1.26	*	(1.02-1.56)	1.01		(0.57-1.80)	1.11		(0.94-1.31)	1.11		(0.70-1.74)	1.05	*	(1.00-1.10)	1.08	*	(1.01-1.16)
Asia Post-2008	1.09		(0.98-1.21)	0.95		(0.72-1.24)	0.95		(0.81-1.12)	0.94		(0.63-1.40)	0.91	***	(0.88-0.94)	0.93	*	(0.87-0.99)
Eastern-Europe Post-2008	1.41	***	(1.27-1.56)	0.82		(0.63-1.07)	1.42	***	(1.29-1.56)	1.10		(0.87-1.39)	1.20	***	(1.17-1.23)	1.00		(0.96-1.04)

Complete model including all control variables, see table 3.3

Appendix C

Table 4.1C - Demographic characteristics of the population residing in Rome aged 25-64 years, by time-period

	2001-2005										
	Foreign		DX		Italian		DX		Total	DX	
	N	%[a]	N	%[b]	N	%	N	%	N	N	%
Total	**241,321**	**13.2**	**1101**	**5.0**	**1,581,282**	**86.8**	**21113**	**95.0**	**1,822,603**	**22,214**	
Origin Area											
ITA					1,581,282	86.8	21,113	95.0	1,581,282	21,113	95.0
HDC	51,128	2.8	235	1.1	-	-	-	-	51,128	235	1.1
HMPC	190,193	10.4	866	3.9	-	-	-	-	190,193	866	3.9
of which											
Africa	*45,453*	*2.5*	*415*	*1.9*	-	-	-	-	*45,453*	*415*	*1.9*
Latin America	*39,652*	*2.2*	*129*	*0.6*	-	-	-	-	*39,652*	*129*	*0.6*
Asia	*55,011*	*3.0*	*162*	*0.7*	-	-	-	-	*55,011*	*162*	*0.7*
Eastern-Europe	*50,077*	*2.7*	*160*	*0.7*	-	-	-	-	*50,077*	*160*	*0.7*
Sex											
W	131,869	7.2	520	2.3	802,331	44.0	7873	35.4	934,200	8,393	37.8
M	109,452	6.0	581	2.6	778,951	42.7	13240	59.6	888,403	13,821	62.2
Birth Cohort											
1982-1986											
1977-1981											
1972-1976	40,084	2.2	38	0.2	205,802	11.3	470	2.1	245,886	508	2.3
1967-1971	47,380	2.6	82	0.4	229,896	12.6	748	3.4	277,276	830	3.7
1962-1966	43,058	2.4	95	0.4	235,826	12.9	1,107	5.0	278,884	1,202	5.4
1957-1961	35,148	1.9	120	0.5	197,936	10.9	1,479	6.7	233,084	1,599	7.2
1952-1956	27,692	1.5	144	0.6	177,671	9.7	2,074	9.3	205,363	2,218	10.0
1947-1951	20,241	1.1	146	0.7	181,634	10.0	3,077	13.9	201,875	3,223	14.5
1942-1946	14,905	0.8	187	0.8	171,996	9.4	4,615	20.8	186,901	4,802	21.6
1937-1941	12,813	0.7	289	1.3	180,521	9.9	7,543	34.0	193,334	7,832	35.3

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Table 4.1C - *(Continued)*

	2006-2010										
	Foreign		**DX**		**Italian**		**DX**		**Total**	**DX**	
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**N**	**%**
Total	**329,856**	**17.9**	**1,136**	**6.2**	**1,512,537**	**82.1**	**17,304**	**93.8**	**1,842,393**	**18,440**	**329,856**
Origin Area											
ITA					1,512,537	82.1			1,512,537	17,304	93.8
HDC	53,522	2.9	195	1.1	-	-	-	-	53,522	195	1.1
HMPC	276,334	15.0	941	5.1	-	-	-	-	276,334	941	5.1
of which											
Africa	*50,123*	*2.7*	*327*	*1.8*	-	-	-	-	*50,123*	*327*	*1.8*
Latin America	*50,505*	*2.7*	*120*	*0.7*	-	-	-	-	*50,505*	*120*	*0.7*
Asia	*75,104*	*4.1*	*227*	*1.2*	-	-	-	-	*75,104*	*227*	*1.2*
Eastern-Europe	*100,602*	*5.5*	*267*	*1.4*	-	-	-	-	*100,602*	*267*	*1.4*
Sex											
W	180,749	9.8	493	2.7	767,099	41.6	6,687	36.3	947,848	7,180	38.9
M	149,107	8.1	643	3.5	745,438	40.5	10,617	57.6	894,545	11,260	61.1
Birth Cohort											
1982-1986											
1977-1981	53,130	2.9	39	0.2	152,604	8.3	323	1.8	205,734	362	2.0
1972-1976	58,037	3.2	73	0.4	207,282	11.3	481	2.6	265,319	554	3.0
1967-1971	59,139	3.2	115	0.6	223,930	12.2	816	4.4	283,069	931	5.0
1962-1966	50,119	2.7	147	0.8	228,695	12.4	1,317	7.1	278,814	1,464	7.9
1957-1961	41,139	2.2	149	0.8	191,917	10.4	1,782	9.7	233,056	1,931	10.5
1952-1956	31,287	1.7	190	1.0	171,709	9.3	2,605	14.1	202,996	2,795	15.2
1947-1951	21,758	1.2	215	1.2	173,893	9.4	4,029	21.8	195,651	4,244	23.0
1942-1946	15,247	0.8	208	1.1	162,507	8.8	5,951	32.3	177,754	6,159	33.4
1937-1941											

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Table 4.1C - *(Continued)*

	2011-2015										
	Foreign		**DX**		**Italian**		**DX**		**Total**	**DX**	
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**N**	**%**
Total	**387,919**	**100**	**1,529**	**8.5**	**1,427,233**	**100**	**16,454**	**91.5**	**1,815,152**	**17,983**	**387,919**
Origin Area											
ITA					1,427,233	78.6	16,454	91.5	1,427,233	16,454	91.5
HDC	47,408	2.6	203	1.1	-	-	-	-	47,408	203	1.1
HMPC	340,511	18.8	1,326	7.4	-	-	-	-	340,511	1,326	7.4
of which											
Africa	*57,499*	*3.2*	364	*2.0*	-	-	-	-	*57,499*	*364*	*2.0*
Latin America	*46,912*	*2.6*	182	*1.0*	-	-	-	-	*46,912*	*182*	*1.0*
Asia	*107,841*	*5.9*	316	*1.8*	-	-	-	-	*107,841*	*316*	*1.8*
Eastern-Europe	*128,259*	*7.1*	464	*2.6*	-	-	-	-	*128,259*	*464*	*2.6*
Sex											
W	206,046	11.4	686	3.8	725,543	40.0	6,521	36.3	931,589	7,207	40.1
M	181,873	10.0	843	4.7	701,690	38.7	9,933	55.2	883,563	10,776	59.9
Birth Cohort											
1982-1986	57,851	3.2	50	0.3	132,258	7.3	200	1.1	190,109	250	1.4
1977-1981	66,492	3.7	81	0.5	155,962	8.6	329	1.8	222,454	410	2.3
1972-1976	63,609	3.5	125	0.7	199,920	11.0	598	3.3	263,529	723	4.0
1967-1971	60,442	3.3	163	0.9	213,033	11.7	1,076	6.0	273,475	1,239	6.9
1962-1966	49,514	2.7	203	1.1	218,145	12.0	1,903	10.6	267,659	2,106	11.7
1957-1961	40,445	2.2	276	1.5	182,855	10.1	2,655	14.8	223,300	2,931	16.3
1952-1956	29,668	1.6	315	1.8	162,666	9.0	3,803	21.1	192,334	4,118	22.9
1947-1951	19,898	1.1	316	1.8	162,394	8.9	5,890	32.8	182,292	6,206	34.5
1942-1946											
1937-1941											

[a]*Subjects in percentages out of the total population*
[b]*Deaths in percentages out of all deaths*