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A descriptive analysis of the visits to the ED of the Northern African population

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Abstract

This study focuses on the analysis of Big Data obtained from the Emergency Departments (EDs) of five hospitals located in the metropolitan area of Rome, Italy. The

analysis of ICD9-CM discharge diagnoses shows clear differences between the Italian population and the North African population and confirms that many of the dynamics and health conditions regarding migrants are due to the inappropriate use of health services and, eventually, of the EDs. Our results afford indication about how we could identify shortcomings and critical issues within the primary care system and, more generally, in the management of psycho-social and socio-economic support for immigrant populations.

Introduction

This study focuses on the analysis of Big Data obtained from the Emergency Departments (EDs) in five hospitals located in the metropolitan area of Rome, Italy. Well enough aware that changes occurring in the use of healthcare services by the population are more explicitly expressed in and by frequency of accesses in ED, the Authors believe that the use of Big Data could provide useful indicators to build and plan actions that might carry out decisional support in order to avoid the turning of ED into the epicentre of National Healthcare System [1]. The current increase seen in healthcare inequality, as well as the global increase of the burden of chronic diseases and the complexity of their management in a context of increasing socio-economic hardship, together with socio-demographic changes and immigration, are all components that contribute to the need of a strong understanding of the gears that drive the National Healthcare System. In fact, access to ED – and therefore the requests made to Emergency Services by the general population – largely depends on satisfactory access to Primary Care Services, as well as the distribution of risk factors regarding acute and chronic diseases, along with trauma, mental illnesses and finally, the percentage of socially and economically vulnerable individuals living in a given area [2]. Focusing Big Data on the analysis of pathologies-related ED accesses trends by non-Italian citizens, we are able to observe and perhaps better understand the healthcare needs of the immigrant population in Italy. For this study, we focused our analysis on the North African Nations (specifically from: Morocco, Algeria, Tunisia, Egypt and Libya), that in 2015 in Italy were 13.3% of the total foreign resident population (669.014 citizens) ([3]Dossier Statistico Immigrazione – Report on Immigration Statistics, 2016). The Italian political-regulatory approach regarding the foreign population provides for the full inclusion of immigrants in the system of health protection and guarantee of this right, on equal terms and opportunities with the Italian citizens. In addition, the right to health care has also been extended to those who live in Italy in conditions of legal irregularity

(Temporarily Present Foreigners – or under the Italian acronym "STP"), who are guaranteed, in addition to urgent care, even standard healthcare provision and preventive medical and healthcare programs. The study of immigrants accesses in ED, therefore, allows us to observe not only the regular foreign population, but also the whole range of people who are irregularly (or illegally) in Italy, who in many aspects are difficult to trace or describe. Moreover, through the analysis of the accesses and use of the ED by non-Italian citizens, we can understand the actual impact of the legislation on a specific group of immigrant population in Italy. This type of analysis becomes more significant in that we now face changes in migratory patterns: migration today is more related to circumstances that induce populations to leave their areas of origin than to factors that attract them to their destinations. This could lead – and we are currently seeing the initial impact – to a more loosely presence of new migrants in Italy, represented by people who are no longer necessarily interested in establishing in the country [4]. On one hand, Italy is managing an advanced phase of integration, showed by a large number of people with long-term residency permits, families reconciliations and the growing acquisitions of citizenship. On the other hand, the nation is facing the emergence of new incoming immigrants, increasingly motivated by the search for international protection rather structured or organized immigration projects. From this point of view, the analysis of the EDs accesses allows us to obtain a fairly faithful description of the health demands of individuals who pass through or remain in the city of Rome [5]. The use of Big Data can certainly improve the global Health Care System, however, even more, using this amount of data within an interdisciplinary perspective, might act as a compass for adequate health planning, facilitating development in view of evidence-based healthcare systems.

Methods

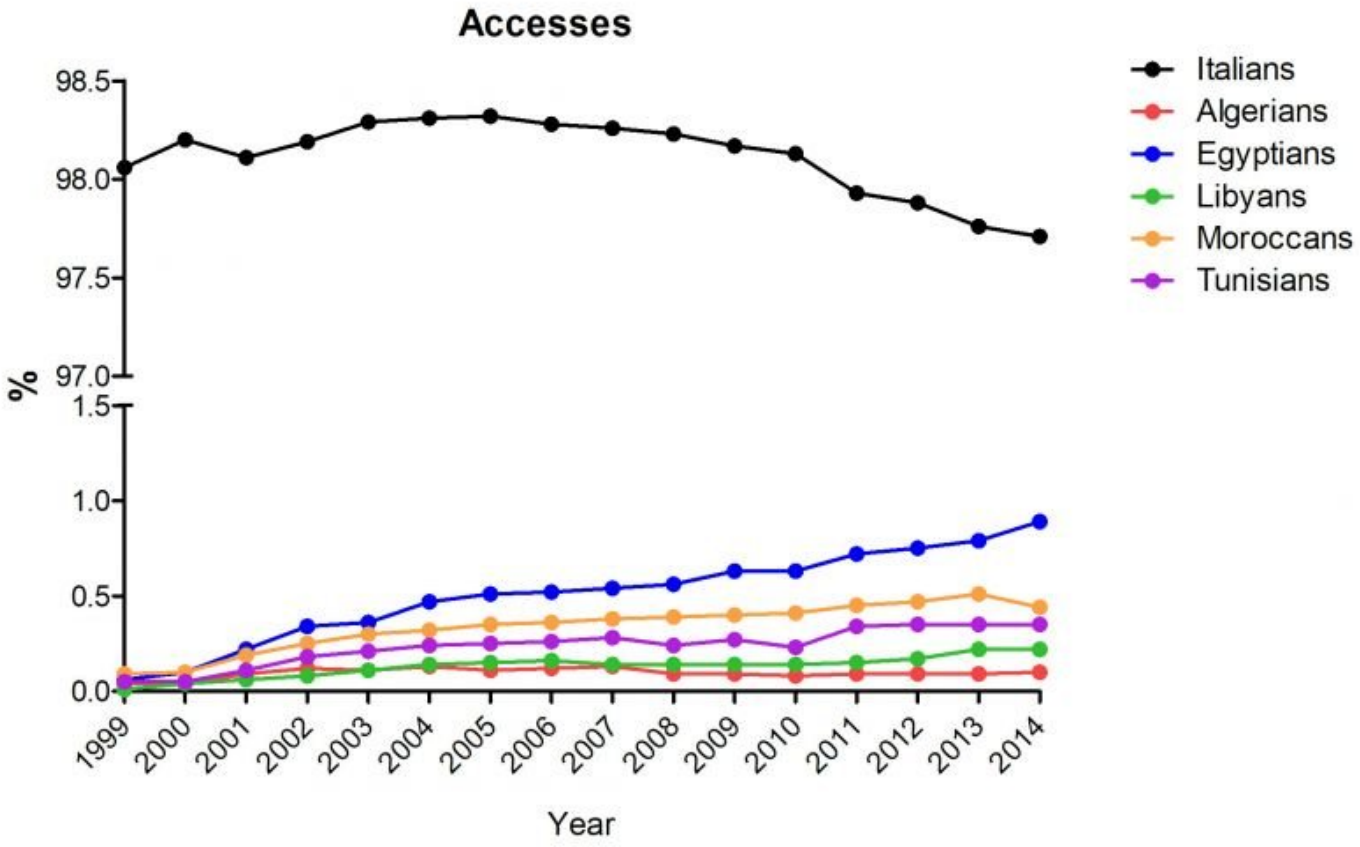
Data on EDs accesses from 1999 to 2014 in Umberto I University Hospital, San Giovanni Hospital, San Camillo Hospital, Tor Vergata University Hospital and Pertini Hospital were retrieved from the information system "Gestione Informazione Pronto Soccorso Emergenza" (GIPSE), that records the information on patient charts and the entire route within the Emergency Department (ED), from triage to discharge. Through the nationality variable, the accesses were grouped into: Italians, Algerians, Egyptians, Libyans, Moroccans and Tunisians. The descriptive statistics of accesses for year, gender, age, and main diagnostic category by ICD9-CM, triage, and outcomes were

calculated for each population. Statistical analysis were performed using Stata 15.1 (Statacorp LP, 4905 Lakeway Drive, College Station, Texas 77845 USA).

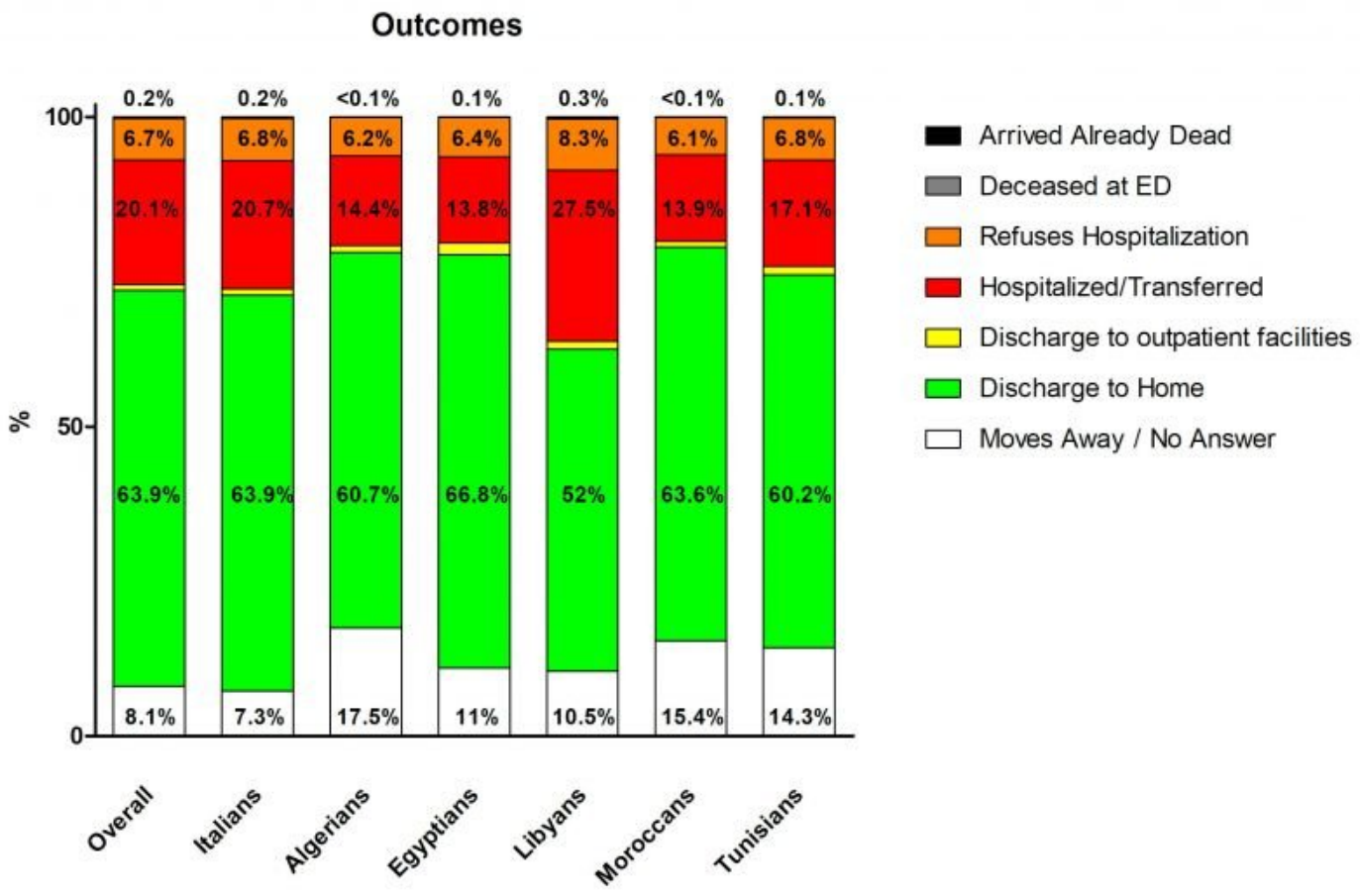
Results

From 1999 to 2014, 6.108.744 patients accessed the ED of the five hospitals (Umberto I, Tor Vergata, San Giovanni, San Camillo-Forlanini and Pertini). Of these, 5,150,377 patients were Italians (84.3%), North Africans were 73.025 (1.2%), other foreign people were 653.618 (10.7%), Italians born abroad were 159.561 (2.6%) stateless were 4.404 (0.1%) and patients with no nationality indicated were 67.759 (1.11%). Italians born abroad were separated from Italians because it was impossible to distinguish between foreigners who have acquired residence and Italian citizens born abroad.

Over the years, Italians accesses to ED were essentially stable, going from 98.1% in 1999 to 97.7% in 2014. The trend of the accesses of the Northern African populations, excepting for Libyans, was quite similar, showing a sharply increasing trend during the period 1999-2003 and then, a more slightly increasing trend until 2014, except for Algerians that instead had a decrease until the end of the study period. Libyans showed a completely different trend: a first period, from 1999 to 2004 with a sharply increasing trend, then a slightly decreasing one until 2010, and after that point again a growing trend till 2014 (Fig 1).



During the period 1999-2014, the overall prevalence of TRIAGE codes was 13.1% for white codes; 69.4% for green codes; 15.6% of yellow codes; and 1.9% for red code. Codes prevalence for the Italian population was very similar to overall prevalence, while the one of Northern Africans was slightly different. Algerians, Egyptians, and Moroccans presented similar frequencies of triage codes, with a higher prevalence of white codes and a lower prevalence for most urgent conditions (i.e. yellow and red codes) than Italians, while Tunisians had a higher prevalence of red codes than Italians. Libyans showed a peculiar pattern, having lesser white codes prevalence (10.1%) and higher level of yellow and red codes (22.2% and 3.2%, respectively) than the other populations (Fig. 2)



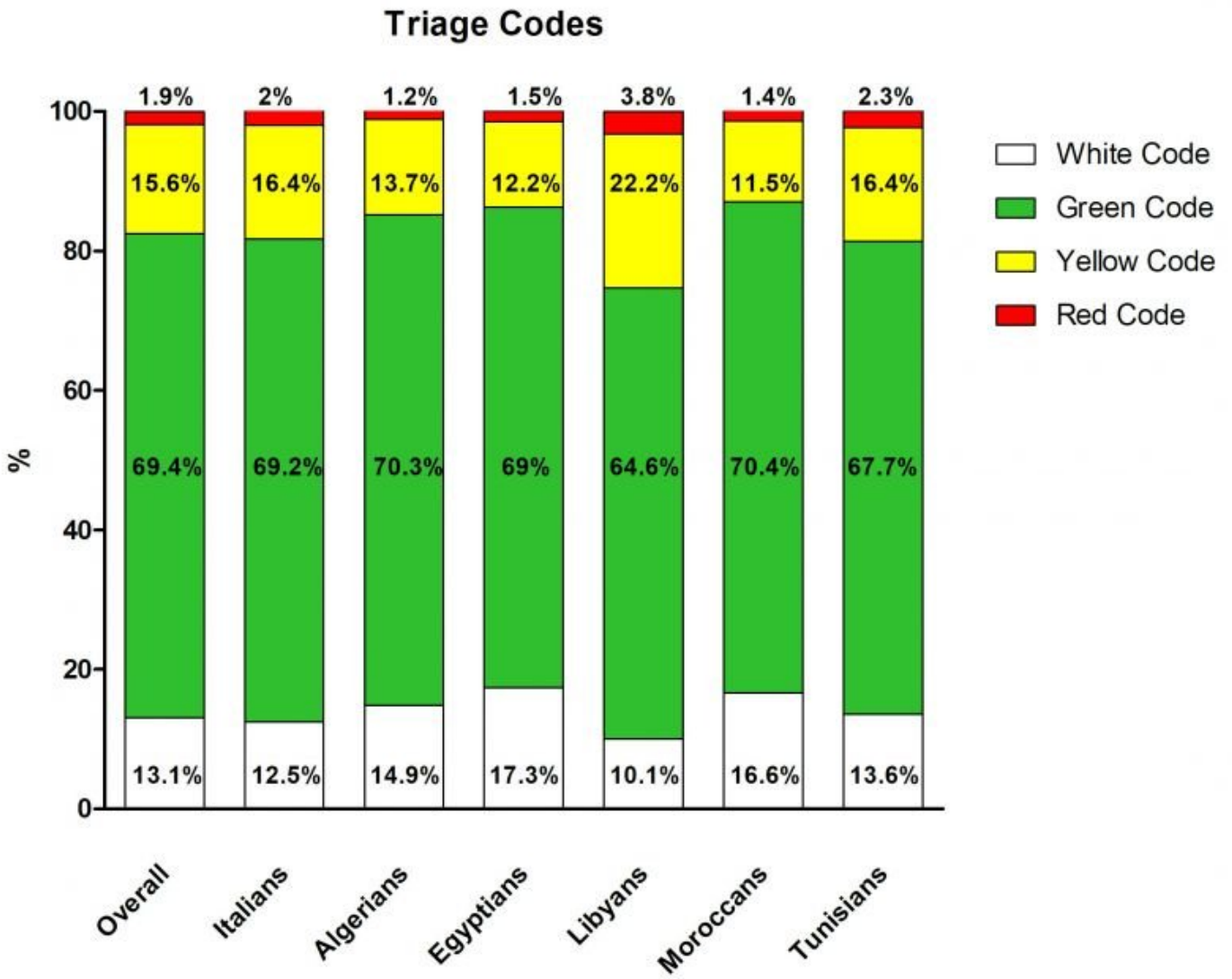
As regards the ICD9-CM diagnoses categories, overall the most frequent was “Injury and Poisoning” (group 17:320-389), that was responsible for the 33.3% of the accesses, followed by “Symptoms, signs, and Ill-defined conditions” (18.9%); “Diseases of the Nervous System and Sense Organs” (9.5%); “Diseases of the Respiratory System” (6.4%), “Diseases of the Circulatory System” (6.3%); “Diseases of the Musculoskeletal System and Connective Tissue” (4.8%), “Diseases of the Digestive System” (3.8%), “Complications of Pregnancy, Childbirth and the Puerperium” (3.3%), “Diseases of the Genitourinary System” (2.8%) and “Mental Disorders” (2.3%), while the remaining presented very low percentages. Italians percentages are absolutely comparable to totals for each diagnosis group. For “Injury and poisoning” category Algerians had the highest percentage (33.9), which is very close to Italians (33.3%), while the rest of Northern Africans varied from the about 27% of Egyptians and Libyans, whom had the lowest percentages, to the 33.9% of Algerians, which had the highest occurrence of these diagnoses category. About “Symptoms, signs, and Ill-defined conditions” Libyans had the highest occurrence (24.1%), while Algerians had the lowest (17.1%), For the “Diseases of the Nervous System and Sense Organs” category all the Northern Africans had an homogeneous behaviour, with a lower prevalence compared to Italians (9.6%), going from 6.2% of Algerians and Tunisians to 8.1% of Moroccans. About the diagnosis category

"Diseases of the Respiratory System" Libyans and Italians were similar, showing the lowest values (6.2% and 6.4%, respectively), while the range of the rest went from 7.9% of Tunisians to 9.0% of Algerians. Evaluating differences in the group of "Diseases of the Circulatory System" we found that Libyans had a very higher percentage (8.6%) respect to other populations, where Italians had 6.4% and the rest of Northern Africans varied from 1.8% of Moroccans to 4.5% of Tunisians. Also for "Diseases of Musculoskeletal System and Connective Tissue" Italians and Libyans presented the lowest values (4.8% and 5.0%), while the others varied from 6.2% of Moroccans and Tunisians to 6.7% of Egyptians. In "Diseases of the Digestive System" there were not important differences. Libyans showed lower values in the category "Complications of Pregnancy, Childbirth and the Puerperium" (2.4%), while Moroccans and Algerians had the highest ones (5.4% and 4.7%, respectively). Absolutely no differences emerged in the category "Diseases of the Genitourinary System" (range 2.6-3.3%). About "Mental Disorders" category Algerians and Tunisians showed a higher value (5.4% and 5.0%, respectively) than the other populations, which varied from 1.7% of Egyptians to 4.3% of Moroccans.

Looking at other diagnosis categories emerged some other differences, even if the percentages in general are very low. It is the case of Egyptians whom distinguished from others for the category "Persons without reported diagnosis encountered during examination and investigation of individuals and populations", for which had 4.1%, while the rest, Italians included, varied from the 0.4% of Libyans to 1.5% of Tunisians. Libyans showed the lowest values in the group of "Infectious and Parasitic Diseases", where they had 0.9% while all the rest varied from 1.3 of Tunisians to 1.8% of Algerians and also in the group "Persons encountering health services in circumstances related to reproduction and development" were they had 1.2%, while the remaining varied from 1.5% of Tunisians to 3.2% of Moroccans. Libyans had higher percentages in: "Neoplasms" with the 2.0% while the others varied from 0.4% of Algerians to 1.0% of Italians, "Endocrine, Nutritional and Metabolic diseases and Immunity Disorders" (1.2%), while the rest went from 0.5 of Moroccans and 0.7% of Algerians and also in "Diseases of the Blood and Blood-forming Organs" (Libyans 1.1%, where the rest varied from 0.3% of Moroccans and 0.6% of Italians and Tunisians). For all the others diagnosis categories all the populations were absolutely comparable, having not significant differences in percentages (Data not shown).

Outcomes at the ED were grouped in seven categories: "Doesn't answer or left" (8.1%); "Discharged to home (63.9%); "Discharged to ambulatory care" (1%); "Reject the hospitalization" (6.7%); "Hospitalized or transferred to other structure" (20.1%); "Died in ER" (0.2%); "Dead on arrival" (0.1%). The percentages of the outcomes of the Italian citizens

were similar to the overall prevalence, while Northern Africans showed some differences. In particular, all Northern Africans showed higher values for “Doesn’t answer or left”, ranging from the about 10% of Libyans and Egyptians to the 17.5% of Tunisians. Libyans showed the lowest prevalence of “Discharged at home” (52%) and the highest prevalence of “Reject hospitalization” (8.3%) while the other population did not differ greatly from the overall prevalence (60.2%-66.8% and 6.1%-6.8%, respectively). All North Africa population had lower prevalence of “Hospitalized or transferred to other structure” (from 13.8% of Egyptian to 17.1% of Tunisians), with the exception of Libyans that again presented the highest prevalence among all groups (27.5%). The categories “Died at ER” and “Dead on arrival” there were not great differences among the populations (0-0.3% and 0-0.1%, respectively). (Fig. 3)



Discussion

Despite the differences emerged among the countries of origin, the analysis in this study shows a general increasing trend of ED using by the North African population, over the years. This should lead to greater investments in terms of research and public health measures. Along general lines, the analysis of triage codes assigned to ED patients showed for the entire North Africa populations a higher percentage of not urgent codes (white codes) compared to the Italian population, and generally a lower percentage of codes that require urgent care (yellow and red codes) [6]. The analysis of ICD9-CM discharge diagnoses showed clear differences between the Italian population and the North African population. In particular, the latter shows a higher prevalence of diseases regarding the respiratory system, the musculoskeletal system, pregnancy complications and mental disorders. In addition, the inappropriate use of the ED, which clearly emerges from the analysis of the outcomes, is of considerable interest to nationwide healthcare. Along with administrative and bureaucratic aspects, various factors influence access to Health Care Services: heterogeneity of health services and lack of knowledge of local services; differences in individual physical and psychological characteristics; linguistic and cultural barriers.

Furthermore, socio-economic vulnerability that often exacerbates the potential of integration and therefore the possibility to communicate correctly with the community-based services have a noteworthy effect on access to healthcare services [7]. These obstacles likely contribute to an improper use of emergency services by immigrants, which goes hand in hand with seldom-used preventive care and primary care (e.g. family doctors) services. Policies and practices aimed to strengthening the performance of primary care for immigrants and refugees, fall under a broad range of migrant-sensitive healthcare policies. Primary care is probably the most appropriate level of action for immigrant population. The possibility to access this level of care by the foreign population in the host country is currently quite difficult for immigrants and refugees in particular [8]. In this regard, it is interesting to note that the higher frequencies detected concern specifically the complications during pregnancy, childbirth, puerperium and respiratory illnesses, most of which are avoidable if treated at a community-based level. It is also quite evident that the geographical area of origin represents the variable that most characterizes the differences found between Italians and foreigners from North Africa, in particular with regard to the Libyan population, for whom we believe it will be necessary to pursue a more comprehensive studies that could help to better unify the data concerning the trend of migratory flows with those concerning behaviour towards healthcare services use. Literature dealing with the health of migrants has often focused on immediate emergencies arising from

migration and immigration [9], structuring policies that have been limited to targeted interventions for specific diseases or conditions, while a more comprehensive approach in terms of policies must be developed. As clearly seen in the reported picture of North African population data in the five hospitals of Rome, there is no clear definition of emergencies requiring intervention on a specific disease and condition, but rather an implementation and strengthening of primary care for the immigrant population. Policies aimed to improving access, quality, organization and efficiency of primary care should be implemented during the arrival phase at the destination country as well as in the following period.

Many of the dynamics and health conditions regarding migrants are due to the inappropriateness of their use of the ED, offering indications on how we could identify inadequacies and critical issues within the primary care system and, more generally, in the management of psycho-social and socio-economic support for this part of the population.

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