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## Infectious and dermatological diseases among arriving migrants on the Italian coasts

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**Background:** Since 2008 Italy has been the destination of the 'central Mediterranean route', used by migrants to reach Europe. The aim of this study is to describe demographic characteristics and health problems of migrants at the time of arrival on the Italian coasts, focussing on dermatological and infectious diseases. **Methods:** Cross-sectional study of data routinely collected ( $n = 6, 188$ ) by the National Institute for Health Migration and Poverty (INMP) in the centres for migrants of Lampedusa and Trapani-Milo (2015–16). Logistic models were performed to identify factors associated with scabies, varicella and the occurrence of two or more not related diagnosis. **Results:** The average age was 21.6 years; 83.5% of the patients were males. The most frequent countries of origin were Eritrea, Nigeria, and Somalia. The most frequent diagnosis was scabies (58% of patients), skin infections, pediculosis and dermatitis; respiratory infections and varicella were the most represented infectious diseases. The diagnosis of scabies was more probable among Somalis (OR: 11.60) and Eritreans (OR: 10.05); the diagnosis of varicella was more probable among Ghanaians (OR: 13.58) and Nigerians (OR: 9.79). Somalis (OR: 4.10) and Eritreans (OR: 3.32) were the patients more likely to receive two or more diagnosis. **Conclusions:** The majority of the diseases affecting migrants is in most cases, related to the migration experience and is likely not to represent a major threat for public health. Up-to-date information regarding the burden of diseases is needed in order to identify the health needs of incoming migrants and to arrange the appropriate response in terms of health services provision.

## Introduction

Since 2008 Italy has been at the centre of the migration crisis, being the destination of the so-called 'central Mediterranean route' used by migrants to reach Europe from the Libyan, Tunisian and Egyptian coasts.<sup>1,2</sup>

Before 2012, most migrants who arrived in Italy were from North Africa. In the following years, migrants crossing the Central Mediterranean sea increased in number. As a consequence of the rapid changes in geo-political scenarios and the worsening of conflicts in the North Africans and Middle East countries, the migrants' nationalities composition changed mainly due to the increase of Syrians and Eritreans. In 2015 the Eastern Mediterranean route became predominant, mainly used by

Syrians, leading to a drop of the arrivals in Italy to about 150 000. Eritreans, Nigerians and Somalis accounted for the biggest share of the Mediterranean flow. In 2016 there was a rise of about 18%: more than 180 000 migrants reached the Italian coasts, the highest number ever observed. Nigerians counted for the biggest part, followed by people from Eritrea and Guinea. The percentage of Somalis dropped down and contextually Bangladeshi people increased. This trend has been confirmed in the first 6 months of 2017.<sup>1,3–5</sup>

It is important to say that before being able to cross the sea, migrants are gathered in Libya by well-established smuggling networks, as documented by several reports. In Libya they are systematically exposed to the risk of arbitrary and indefinite detention; the suspension of human rights and the very poor hygienic and unhealthy conditions in most camps have been reported.<sup>6,7</sup>

Since 2001 Italy has developed a unique system for the reception of migrants, based on a national ‘burden sharing’ strategy between central government and regional authorities. A main change in the reception organization was introduced by the EU regulation on the hotspots, which established very first reception centres where all migrants should be conducted after the rescue. The hotspots were assumed as an initiative to assist frontline states to identify, register and fingerprint.<sup>8,9</sup> They are settled in the main places of disembarkation and the length of stay of the migrants is supposed to be of 2–3 days. After this very first reception phase people are transferred to other centres located on the national territory.<sup>10–12</sup>

In Italy, starting from the end of 2015, three existing governmental centres for migrants were converted into hotspots: the First Aid and Reception Centre (CSPA) of Lampedusa, the Centre for Identification and Expulsion (CIE) of Trapani-Milo and the CSPA of Pozzallo. In addition a hotspot was opened in Taranto.<sup>8</sup>

The National Institute for Health Migration and Poverty (INMP) is the Italian reference centre for migrants’ health and for the contrast of socioeconomic inequalities in health; since 2008, it is engaged in projects aimed to provide health care to migrants reaching the Italian coasts.

The high number of arrivals urges for a comprehensive organizational commitment for the competent authorities in order to recognize the health needs of the migrants and provide them with proper medical and psychological assistance, avoiding by doing so the major public health concerns.<sup>13,14</sup> Nevertheless, only few studies have systematically investigated the health conditions of migrant at the moment of arrival and the reasons for hospital referral.<sup>15–21</sup>

The objective of this study is to describe the demographic characteristics and main health problems of migrants at the time of arrival on the Italian coasts, focussing on dermatological and infectious diseases diagnosed during the consultation at the INMP clinics.

## Methods

The study has been realized using the cross-sectional routine data collected in the years 2015 and 2016 by the INMP, which was working into the governmental centres of Lampedusa and Trapani-Milo (only in 2016). During this biennium, INMP provided health care through multidisciplinary teams, composed by a dermatologist, an infectious diseases specialist, a paediatrician, an adolescence psychologist and two transcultural mediators. Those groups of professionals were meant to be an integration and a support to the health assistance normally provided by the managing bodies of the centres as far as dermatological, infectious diseases and paediatric issues were concerned. All patients arriving in the centres were both routinely and on demand visited by the local general doctor and then referred to the INMP clinic room if there was the suspicious of a dermatological or infectious disease. The INMP team was then able to provide specialist consultations, to follow-up visited patients, to give indications for treatment, further examinations or even referral to the hospital. Consent for registration and use of data was obtained from every patient. Minors’ consent was obtained through their parents or local authorities in charge, if unaccompanied.

Data were derived from an electronic database routinely filled out by the INMP medical staff at every visit. Information about country of origin and age was provided by the patient and cross-checked with the reports of Italian Authorities (Immigration Police). Diagnoses were made on the base of clinical assessments, point-of-care and laboratory tests when needed. Information about the diagnoses of the patients who required hospitalization were obtained through contacts with the reference hospitals. Diseases were categorized according to the ICD9 system. Data collected

refer to the following periods: (i) 4 May–30 November 2015, INMP clinic in the CSPA of Lampedusa; (ii) 18 April–31 December 2016, INMP clinic in the hotspot of Lampedusa; (iii) 26 April–31 December 2016, INMP clinic in the hotspot of Trapani-Milo.

The study population was composed by all migrants visited by the INMP teams during the three study periods. The analysis included all patients of whom information about demographic characteristics and diagnosis was confirmed.

Diagnoses of scabies and varicella, the most frequent detected, were analysed in detail to investigate possible association with nationality, sex and age. Moreover, we investigated the probability to detect two or more not related diseases (excluding fever and itching), in order to identify the most vulnerable patients.

Frequencies and percentages were calculated to describe the distribution of the study population’s characteristics. Multivariate logistic regression models were performed to identify the factors potentially associated with the presence of scabies and varicella as well as to test the probability to detect two or more not related diseases, taking into account age, gender, location, year and country of origin.

The statistical analyses were performed using Stata 13 software.

## Results

In the study periods, 14 728 clinical examinations have been performed, for a total of 7946 patients. For the purpose of the study the analysis were limited to 6188 patients of whom we could collect confirmed data about age, sex, nationality and diagnosis.

Table 1 shows the countries of origin of the patients classified by location. The five most frequent countries of origin were Eritrea, Nigeria, Somalia, Guinea and Ivory Coast. Eritreans and Nigerians represented >50% of the migrants. Eritrean nationality was the most numerous one in both 2015 (46% of the total in Lampedusa) and in the hotspot of Trapani-Milo in 2016 (31.7%). Between 2015 and 2016 we registered a drop of the numbers of Somali patients (about 50%) and a rise of patients coming from Guinea, Ivory Coast, Gambia and Senegal.

Overall, 83.5% of the patients were males. The nationalities with the greatest presence of women were Syrian (34.7%) and Nigerian (33.8%) (data not shown).

**Table 1** Distribution by nationalities, location and year of the patients visited by the INMP group in the centres of Lampedusa and Trapani-Milo (2015–16)

Country	Lampedusa 2015		Lampedusa 2016		Trapani 2016		Total	
	n	%	n	%	n	%	n	%
Eritrea	1053	46.1	204	11.2	660	31.7	1917	31.0
Nigeria	318	13.9	344	18.8	502	24.1	1164	18.8
Somalia	352	15.4	120	6.6	177	8.5	649	10.5
Guinea	34	1.5	222	12.2	152	7.3	408	6.6
Ivory Coast	46	2.0	175	9.6	145	7.0	366	5.9
Gambia	87	3.8	175	9.6	59	2.8	321	5.2
Senegal	71	3.1	144	7.9	65	3.1	280	4.5
Mali	70	3.1	121	6.6	72	3.5	263	4.2
Ghana	45	2.0	46	2.5	42	2.0	133	2.1
Sudan	43	1.9	41	2.2	43	2.1	127	2.1
Ethiopia	32	1.4	42	2.3	38	1.8	112	1.8
Bangladesh	19	0.8	54	3.0	14	0.7	87	1.4
Cameroon	6	0.3	30	1.6	25	1.2	61	1.0
Syria	25	1.1	13	0.7	11	0.5	49	0.8
Others	79	3.5	94	5.2	78	3.7	251	4.1
Total	2280	100	1825	100	2083	100	6188	100

**Table 2** Diagnoses of the patients visited by the INMP group in the centres of Lampedusa and Trapani-Milo (2015–16)

Diagnosis	n	%*
Scabies	3589	58.0
Skin and soft tissues infections	636	10.3
Itch (unknown origin)	553	8.9
Pediculosis (head lice)	547	8.8
Dermatitis	466	7.5
Respiratory infections	194	3.1
Fever (unknown origin)	171	2.8
Varicella	142	2.3
Insect bites	121	2.0
Burns	93	1.5
Skin mycoses	84	1.4
Gastrointestinal infections	60	0.9
Urogenital bacterial infections	45	0.7
Human herpes simplex	30	0.4
Urogenital candidiasis	19	0.3
Warts	18	0.3
Otitis	18	0.3
Lichen	17	0.3
Malaria	16	0.3
Urticaria	17	0.3
Borrelia infections	7	0.1
Molluscum contagiosum	7	0.1
Conjunctivitis	6	0.1
HIV	5	0.1
Psoriasis	6	0.1
Acute lymphadenitis	5	0.1
Herpes zoster infections	4	0.1
Active tuberculosis	4	0.1

The percentages were calculated on the total of 6188 patients

The average age of patients was 21.6 years ( $\pm 7.3$ ) and there were no significant differences among nationalities. The minors were 1, 093 (17.7%), and 72.7% of them were males. The nationalities with the biggest proportion of minors were Syria (55.1%) and Somalia (26.3%) (data not shown).

Table 2 shows the frequency of dermatological and infectious diagnoses. Almost 60% of the patients ( $n = 3, 589$ ) received a diagnosis of scabies. Most of cases were observed among patients coming from Eritrea (36.8%), Nigeria (14.2%) and Somalia (12.8%). Cutaneous infections, pediculosis and dermatitis were the other most frequent diagnoses. Among infectious diseases the group concerning the respiratory system (bronchitis, pneumonia, tonsillitis) was the most frequent one, followed by varicella, gastrointestinal and urogenital infections.

Concerning varicella, all 142 detected cases were clinically diagnosed. About 90% of them were observed among patients coming from Nigeria (48.6%), Eritrea (33.1%) and Ghana (7.0%).

Overall, 16 cases of malaria were reported. All diagnoses were first detected by rapid diagnostic tests in the centres and then referred to hospitals for confirmation and treatment. Eight patients were from Eritrea, six from Somalia and two from Guinea. Thirteen of the confirmed cases were detected in the centre of Lampedusa in 2015. Regarding the species of *Plasmodium*, we observed three *P. vivax*, one *P. malariae*, six *P. ovale* and six *P. falciparum* (two patients from Guinea, one from Somalia and two from Eritrea).

The four cases of active pulmonary tuberculosis (two from Somalia and two from Eritrea) were suspected in the centres and then referred to the hospitals for microbiological and radiological investigations; three of them resulted sputum positive.

In 2015, in the centre of Lampedusa, we observed one case of infection by *Borellia duttoni* in an Eritrean boy and six cases of *Borellia recurrentis* infection. The six patients diagnosed with louse borne recurrentis fever (LBRF) were all Somali men, disembarked in

Lampedusa at the end of October. One of the patients were transferred to the hospital of Palermo were the diagnosis of LBRF was performed by microscopic blood examination. The blood specimens of the other five patients resulted positive for the presence of spirochete, identified as *B. recurrentis* at the molecular investigations performed in the same hospital.

Figure 1 shows the results of a multivariate logistic regression model performed to evaluate the factors associated with the probability of being diagnosed with scabies or varicella. We observed that the odd to receive a diagnosis of scabies increased by 3% for each age year. Males had a higher probability than women to be affected (OR: 2.77). Patients originating from Somalia (OR: 11.60), Eritrea (OR: 10.05) and Ethiopia (OR: 7.71) had the highest probability to receive a diagnosis of scabies, but people arrived from Nigeria, Guinea, Ivory Coast, Gambia, Senegal, Mali, Ghana and Sudan were at risk of scabies too. In 2016, the probability of a diagnosis of scabies was significantly higher if compared with the year before, both in the centres of Lampedusa (OR: 2.87) and in Trapani-Milo (OR: 4.57).

The odd to receive a diagnosis of varicella decreased by 2% for each age year (OR: 0.98). Some nationalities like Ghana (OR: 13.58), Nigeria (OR: 9.79), Eritrea (OR: 5.36) and Sudan (OR: 4.03) were associated with a higher probability of a diagnosis of varicella. In 2016, the probability of a diagnosis of varicella was significantly higher if compared with the year before, both in the centre of Lampedusa (OR 4.39) and in Trapani-Milo (OR 2.39).

Figure 2 shows the results of the regression analysis of the probability of being diagnosed with two or more not related diseases. The probability decreased by almost 3% for each age year, while no differences were found by gender. Somalis (OR: 4.10) and Eritreans (OR: 3.32) were the patients more likely to receive two or more diagnoses. The probability was lower in 2016 if compared with 2015, both in the centre of Lampedusa (OR: 0.80) and in Trapani-Milo (OR: 0.41).

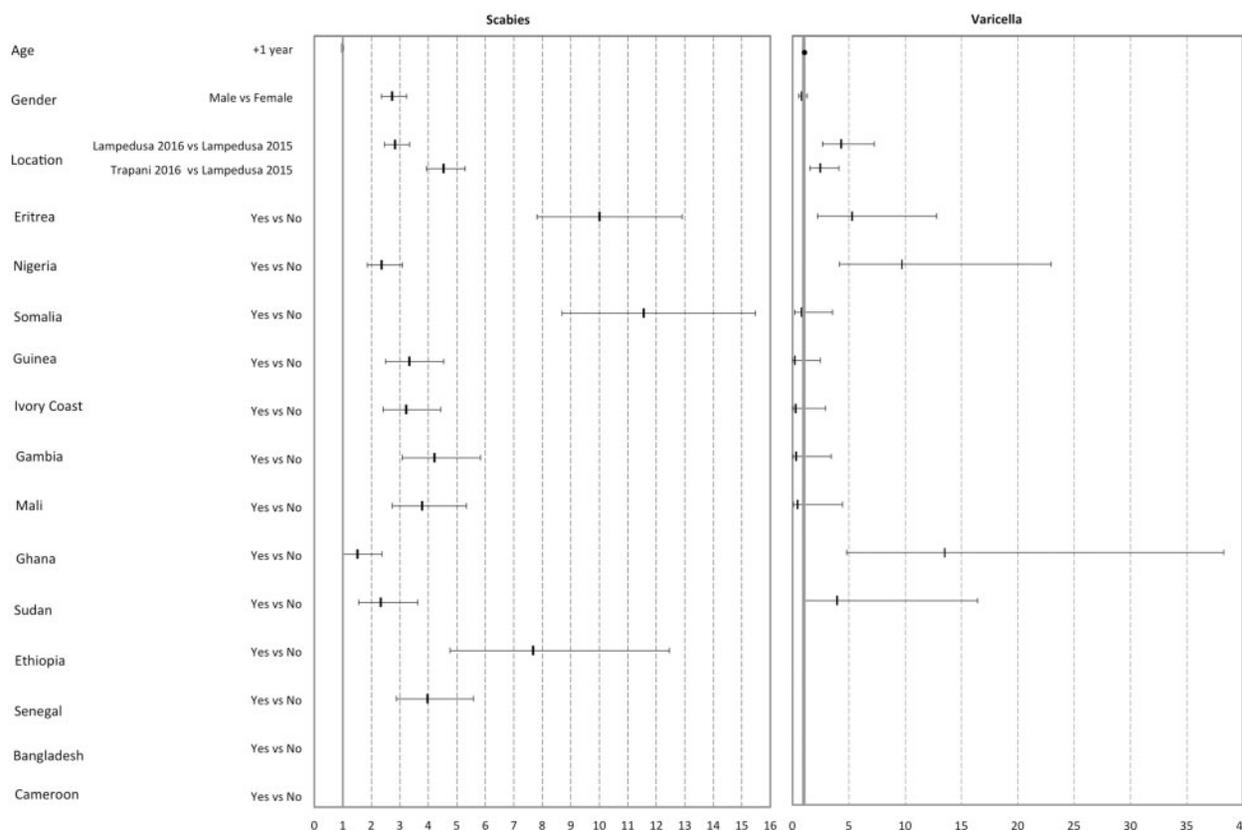
## Discussion

The paper describes the characteristics of the migrants observed by INMP teams in the centres of Lampedusa and Trapani-Milo between 2015 and 2016. The data registered show a dynamic population, whose change in provenience reflects the evolution of the general population of migrants reaching Italian coast in those years.<sup>2,3,5</sup>

The patients were young, mostly men, and the majority of the diagnoses were dermatological, such as scabies, skins infections and dermatitis of various origins. Respiratory infections and varicella were the most represented infectious diseases, commonly related to the hard conditions experienced during the journey and the permanence in overcrowded places. We also diagnosed 16 cases of malaria, 7 cases of *Borrelia* infection and 4 cases of active tuberculosis.

Migrants from different nationality resulted to have different risk of being diagnosed with some diseases. Diagnosis of scabies was most probable among Eritreans and Somalis and varicella among Nigerians and Ghanaians. The probability of being diagnosed with two or more diseases resulted to be noteworthy higher for Eritreans and Somalis. In addition, most of the few cases of malaria and tuberculosis were diagnosed among Eritrean and Somali patients and the cases of LBRF were all detected among Somalis.

In the same years numerous other clusters of LBRF interesting Somali and Eritrean patients were described in Italy and other European countries.<sup>22–29</sup> Diseases like scabies and LBRF, the latter transmitted by body lice, are typically associated with long permanence in conditions of poor hygiene, crowd, poverty and detentions.<sup>6,7,30–32</sup> Taking all these elements together it is possible to hypothesize that people coming from the Horn of Africa, mainly Eritrea and Somalia, showed to belong to a more vulnerable subset



**Figure 1** Factors associated with the probability of diagnosis of scabies and varicella. Odds ratios and 95% CIs from multivariate logistic regression models

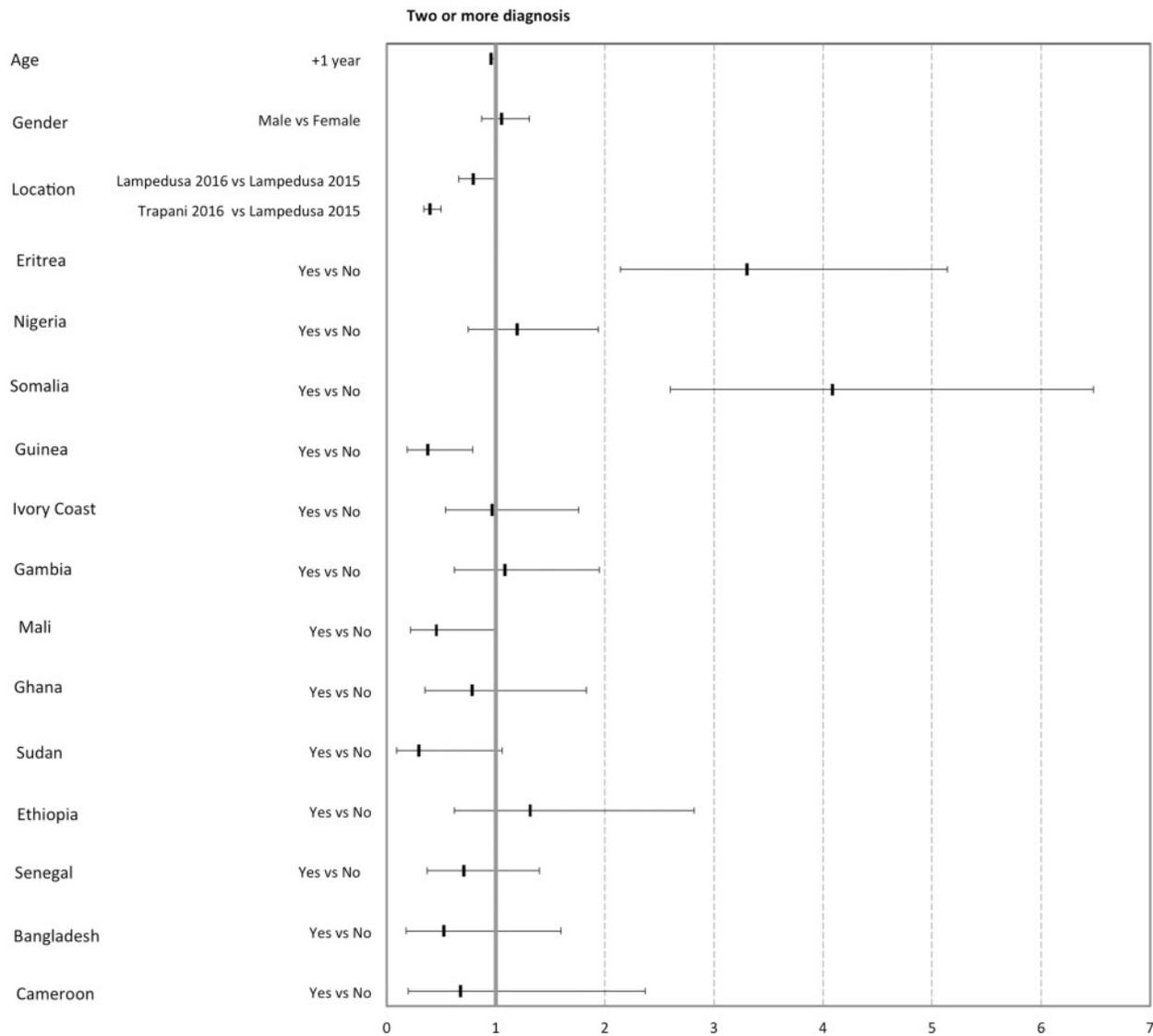
of migrants, requiring bigger attention and effort in terms of health care delivery.

Nigerians and Ghanaians resulted to be the most affected by varicella. Vaccination coverage is reported to be lower for migrant groups in many studies and well-documented outbreaks of vaccine-preventable diseases, such as measles or varicella, have been described among migrants and refugees.<sup>33,34</sup> Varicella susceptibility is reported to be higher in older age and in those originating from countries with tropical climates,<sup>33</sup> which is in line with our findings. Access to vaccination programmes should be implemented, in accordance to the national guidelines and with a particular attention to the prevalence of diseases in the countries of origin.<sup>34,35</sup>

Few other studies focussed on the health conditions of arriving migrants: they show a population of young adults with no major health problems except for, in most of the cases, the morbidity related to the migration experience.<sup>15–21</sup> A retrospective study performed in the *Médecine Sans Frontières* clinic in the harbour of Augusta—Italy, showed that cardiovascular and metabolic chronic diseases, respiratory, gastrointestinal and gynaeco-obstetrical problems were more frequent in migrants from Near-East, while skin diseases and unspecific complaints such as headache were more frequent among African patients.<sup>15</sup> Another study conducted in Lampedusa, mainly on patients from Sub-Saharan Africa, showed that infectious diseases accounted for just 1% of the total; the most common diseases were respiratory infections, with few cases of active tuberculosis and malaria.<sup>16</sup> Furthermore, the reports of Firenze and Pasta regarding the access respectively to emergency and hospital care of recently arrived migrants, showed that the most common causes were gynaecological diseases, trauma, thermoregulatory affections and gastrointestinal complaints.<sup>17,18</sup>

The two years experience of the INMP reveals and confirms that the majority of the diseases showed by migrants at the time of arrival did not represent, so far, a major threat for public health. This finding is also highlighted by the two reports of the Istituto Superiore di Sanità (ISS) and the Local Health Unit of Arezzo (Tuscany) regarding the ‘syndromic surveillance system’ that was implemented in Italy in 2011 as a tool for the rapid detection of the potential public health emergencies among incoming migrants.<sup>19,20</sup> However, first reception centres should implement an adequate strategy of addressing the health needs of the arriving people, including healthcare personnel training, implementation of standardized diagnostic and treatment protocols for the most common diseases, as well as a standardized system of patient’s health data recording and referral. Malaria and tuberculosis, diseases that could possibly represent a critical challenge for non-specialized personnel, urge the need of acknowledged and adapted guidelines, in order to define a standard of care and minimize the difference of approach and the risks throughout the national territory.<sup>30,35</sup> On this regard, the INMP together with ISS and the Italian Society for Migration Medicine, has recently developed guidelines concerning health checks for migrants on arrival and while hosted in reception centres.<sup>35</sup>

In the subsequent phase of reception, according to the guidelines, migrants should undergo screening tests for parasitic diseases, such as schistosomiasis and strongyloidiasis, latent tubercular infection, HIV, HBV, HCV, syphilis and other sexually transmitted diseases. The screening of those diseases, which can be present even in the absence of symptoms and represent an underestimated burden, is indicated when adequate diagnostic and therapeutic strategies are accessible, feasible and acceptable for the patients.<sup>35</sup>



**Figure 2** Factors associated with the probability of being diagnosed with two or more not related diseases. Odds ratios and 95% CIs from multivariate logistic regression models

At the end of 2015 the centres of Lampedusa and Trapani-Milo were converted into hotspots. The different context between the reception centre and the hotspot, such as the shorter permanence of the migrants in the latter, could partly explain the bigger share of scabies cases in 2016 compared with 2015. At the very beginning of their permanence in the centres, all migrants undergo a general medical visit, aimed at identifying possible communicable diseases, such as scabies, often already present at the arrival. The shorter permanence in the hotspot makes the possibility of being diagnosed with other diseases less likely. This underlines the necessity of an integrated system of reception, which could assure an efficient health information flow, and a constant attention to the medical needs through all the structures involved.<sup>8</sup>

To our knowledge, the present is one of the few studies assessing the health status of migrants at the time of their arrival on the Italian coasts, and the first study that tries to depict the vulnerability profile of different groups of migrants. A major strength of the study is the large amount of migrants included and the focus on possible associations between certain health conditions and countries of origin. On the contrary, a limitation is the collection of data regarding only dermatological and infectious diseases, because of the specific task and composition of the

INMP. Further studies should focus on a more comprehensive spectrum of diseases; moreover more detailed socio-demographic data and information on the journey of the migrants should be collected.

In conclusion, although the results of the study show that the risk of communicable diseases and vaccine-preventable diseases is low for both incoming migrants and European population, public health authorities should address the potential threat associated with the increasing flow of arrivals from high-risk countries.<sup>13,14,35</sup> Moreover, Italian and European authorities should be aware of the fact that the change of geo-political scenarios in countries with high migration pressure, the exacerbations of conflicts and the evolution of internal and external migration policies, have heavy implications on the modification of the nationality composition of the migrants. All these elements contribute to a change in the health needs, requiring a timely and appropriate response in terms of health care services and reception strategies. Finally, setting up an integrated information system regarding the burden of illnesses and the constant changing profile of migrants is essential to monitor effectively their health status and the impact on national health care systems.

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### Key points

- The impact of the migrants' arrival on the Italian coasts requires a complex organizational task aimed to identify their health needs.
- We found that the most frequent dermatological diagnosis were scabies (58% of the patients), skin infections, pediculosis and dermatitis; among infectious pathologies respiratory diseases and varicella were the most represented.
- The risk of some specific diseases resulted to be heterogeneous among countries of origin.
- The majority of the diseases affecting migrants at the time of arrival are, in most cases, related to the migration experience and do not represent a major concern for public health.

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## Hepatitis B in Moroccan-Dutch: a qualitative study into determinants of screening participation

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**Background:** Chronic hepatitis B (HBV) leads to an increased risk for liver cirrhosis and liver cancer. In the Netherlands, chronic HBV prevalence in the general population is 0.20%, but 3.77% in first generation immigrants. Our aim was to identify determinants associated with the intention to participate in HBV testing among first generation Moroccan immigrants, one of the two largest immigrant groups targeted for screening. **Methods:** Semi-structured interviews were held with first ( $n = 9$ ) and second generation ( $n = 10$ ) Moroccan-Dutch immigrants, since second generation immigrants frequently act as their parents' brokers in healthcare. **Results:** Most participants had little knowledge about hepatitis B, but had a positive attitude towards screening. Facilitators for screening intention were perceived susceptibility to and severity of disease, positive attitude regarding prevention, wishing to know their hepatitis B status and to prevent potential hepatitis B transmission to others. Additional cultural facilitators included fear (of developing cancer), and existing high health care utilization; a religious facilitator was the responsibility for one's own health and that of others. Barriers included lack of awareness and knowledge, practical issues, not having symptoms, negative attitude regarding prevention, fear about the test result and low-risk perception. A cultural barrier was shame and stigma, and a religious barrier was fatalism. **Conclusion:** We identified important facilitators and barriers, which we found, can be interpreted differently. Specific and accurate information should be provided, accompanied by strategies to address shame and stigma, in which Islamic religious leaders could play a role in bringing information across.

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