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Infectious risk profile and strategies for prevention and control of outbreaks in refugee, asylum seekers and migrant populations in EU/EEA countries: a systematic narrative review of evidences

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Parole chiave: Salute globale; centri per migranti; rifugi; malattie prevenibili da vaccino; immunizzazione; screening; prevenzione

Abstract

Introduction. *The recent surge in migration to and within the European Union and European Economic Area has brought the development of migration policy, including health policy, to the forefront of regional priorities. While migrants, in general, do not pose a health threat to the host population, specific subgroups of migrants, including refugees, asylum seekers, and irregular migrants, are particularly vulnerable to infectious diseases. To support public health policies in this area, the Emergency Preparedness and Management' working group of the Italian Society of Hygiene, Preventive Medicine and Public Health has conducted a systematic narrative review with the aim to comprehensively analyze the infectious disease risk within the refugee and asylum seeker populations in EU, EEA, and EU-applicant countries.*

Methods. *Forty-two studies were systematically selected from scientific articles in the MEDLINE/PubMed database from January 1, 2008, to June 1, 2023. The infectious risk associated with each infectious disease among refugees and asylum seekers, as well as the strategies to prevent and control outbreaks, was collected from all available studies.*

Results. *The congregate living conditions in refugee camps, transit centers, and temporary housing facilities make this population*

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particularly vulnerable to infectious diseases. As such, implementing stringent hygiene and preventive measures is critical to safeguarding the health of refugees and reducing the risk of outbreaks that may affect both the refugee population and the host communities.

Conclusion. *Effective vaccination and preventive strategies for migrants, refugees, and asylum seekers are vital for public health and the well-being of these populations. They should be delivered as part of universal health care. By addressing barriers and implementing tailored programs, we can ensure equitable access to vaccines and protect the health of these vulnerable individuals.*

Introduction

The surge in migration to and within the European Union and European Economic Area (EU/EEA) has brought the development of migration policy, including health policy, to the forefront of regional priorities (1). By the end of 2022, the global population of forcibly displaced individuals increased by 21%, reaching an estimated 108.4 million (2). This accounts for 3.6% of the world's population and marks a threefold increase over the past five decades (3). Notably, middle- and high- income countries hosted 33% of the world's refugees and those in need of international protection (4).

EU countries serve as crucial transit hubs and corridors for migrants, particularly those from the Middle East, Asia, and Africa. Notably, these migration flows traverse the Mediterranean routes, with a notable increase in the number of migrants arriving in Europe, primarily through the Central Mediterranean route (from Africa to Italy) and the Eastern Mediterranean route (from the Middle East to Greece). This increase raises concerns that the usual epidemiological patterns of infectious diseases observed in Europe could be influenced (3, 5).

In this context, a migrant is defined as an individual who resides in a country, either temporarily or permanently, away from their usual residence for at least a year (1). While migrants do not usually pose a health threat to the host population, specific subgroups of migrants, including refugees, asylum seekers, and irregular migrants, could be particularly vulnerable to infectious diseases. Refugees, asylum seekers, and irregular migrants are distinct categories of individuals who are often associated with migration and displacement. Refugees are individuals who have fled their home countries due to a well-founded fear of persecution based on factors such as race, religion, nationality, political opinion, or membership in a particular social group. They seek refuge in another country and may be granted asylum, which provides legal protection and assistance. Asylum seekers are individuals who have applied for asylum in a foreign country but have not yet been granted refugee status. They are seeking international protection because they fear persecution in their home countries. During the asylum application process, they await a decision on whether they will be recognized as refugees and receive the associated legal protection. Irregular migrants, often referred to as undocumented or illegal migrants, are individuals who enter or stay in a country without the required legal authorization or in violation of immigration laws. Their migration status is irregular because it does not conform to the legal requirements of the destination country. This category includes individuals who may have overstayed visas, entered the country without proper documentation, or used unauthorized means to migrate. In several EU/EEA countries, these subgroups are disproportionately affected by infectious diseases such as tuberculosis, HIV, and hepatitis B and C (1).

Asylum seekers and refugees may carry an infectious risk influenced by various factors. Primarily, their living conditions, particularly in refugee camps or temporary shelters, often feature overcrowding and limited access to proper sanitation and healthcare facilities. These conditions create an environment conducive to the spread of infectious diseases, including respiratory infections and diarrheal diseases. Additionally, many asylum seekers and refugees originate from regions where specific infectious diseases are more prevalent or endemic. This includes countries burdened by tuberculosis, malaria, poliomyelitis, and other vaccine-preventable diseases.

Consequently, there is a potential for these diseases to be introduced into the host countries (6-8).

From a public health perspective, it is imperative to adequately manage the potential infectious risk among groups of migrants. These populations require access to healthcare services, including vaccinations and regular health check-ups, to prevent, detect, and treat infectious diseases. The public health infrastructure in host countries must be prepared to address the unique challenges posed by these populations, such as language barriers and cultural differences (9-11).

In Italy, this issue holds particular significance due to emergency concerns and political debate surrounding the topic. To support public health policies in this area, the "Emergency Preparedness and Management" working group of the Italian Society of Hygiene, Preventive Medicine and Public Health (S.It.I.) has conducted a systematic narrative review with the aim to comprehensively analyze the infectious disease risk within the refugee and asylum seeker populations in EU/EEA, and EU-applicant countries (12). Migration, driven by various complex factors, presents unique challenges in public health and epidemiology. One focal point of this research is to assess the prevalence and transmission patterns of infectious diseases within refugee and asylum seeker communities. Such an analysis is vital for recognizing potential infection hotspots and developing targeted interventions. In addition to identifying the health risks, this study will explore strategies and recommendations for disease prevention and outbreak control to propose practical, evidence-based strategies for safeguarding their health and preventing potential disease outbreaks. The objective is to establish a comprehensive framework encompassing immunization campaigns, routine healthcare access, sanitation and hygiene measures, and early detection systems. These strategies not only protect the health of the refugee and asylum seeker populations but also serve as a safeguard for the broader community. Furthermore, as the global landscape is witnessing increased forced migration due to conflicts and other crises, the importance of this study extends to predicting future trends. With ongoing wars in Ukraine, Middle East, and other regions, European countries are likely to witness a growing influx of migrants, further emphasizing the significance of understanding and addressing the health needs of these populations.

Methods

The systematic review protocol followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist (13). The population, intervention, comparison, and outcome (PICO) framework was used to formulate the review question. The question was "Infectious risks and prevention strategies for refugees and asylum seekers."

Search strategy and selection criteria. MEDLINE/PubMed was systematically searched. Research articles, brief reports, letters, and editorials published between January 1, 2008, and June 1, 2023, were included in our search. The chosen time span was intended to ensure a time interval that allows for a comprehensive view of the topic. The following terms were used for the search strategy: ("biological risk" OR "infectious disease*" OR "hepatitis B" OR "hepatitis C" OR "HIV" OR "tuberculosis" OR "measles" OR "mumps" OR "rubella" OR "influenza" OR "COVID-19" OR "pertussis" OR "coronavirus" OR "HCV" OR "HBV" OR "hepatitis A" OR "HAV" OR "SARS-CoV-2") AND ("migrant*" OR "refuge*" OR "displaced person*" OR "fugitive*" OR "asylum seeker*") AND ("prevention strateg*" OR "control strateg*" OR "outbreak control" OR "epidemic control" OR "outbreak*"). Studies in English with full text were included. Abstracts without full-text, reviews, meta-analyses, clinical trials, and all studies focusing on issues unrelated to the purpose of this review (e.g., psychiatric diseases, chronic conditions, etc.) were excluded (Table 1). When necessary, study authors were contacted to obtain additional information. The list of papers was screened by title and/or abstract independently by the members of the Working Group

Table 1 - Inclusion and exclusion criteria.

Inclusion criteria	Exclusion criteria
English language	Abstracts without full text
Full text	Systematic reviews
Studies set in EU, EEA, and EU-applicant countries	Meta-analysis
	Clinical trials
	Out-of-scope papers

who applied the predefined inclusion/exclusion criteria; discrepancies were recorded and resolved by consensus by two authors (FPB and ST).

Data Extraction. The members of the Working Group reviewed all relevant studies and extracted data, then organized them in a dataset with their respective characteristics to compile qualitative results. The extracted data included the publication year, origin and type of migrant population, host country, and the specific vaccination or infectious disease under analysis (Table 2). Any discrepancies were resolved through consensus by two authors (FPB and ST).

The infectious risk associated with each infectious disease among refugees and asylum seekers, as well as the strategies to prevent and control outbreaks, was collected from all available studies. The respective findings were then compared, with particular attention to the evidence presented in several of the included papers. Furthermore, a focus on vaccination strategies to reduce this risk was also addressed. These topics were elaborated based on information from the included studies and synthesized within the systematic review section.

Results

Identification of relevant studies. The flowchart, constructed following the PRISMA guidance (13) (Figure 1), illustrates the article selection process. Based on the previously mentioned search strategy, we identified 703 articles in MEDLINE/PubMed, and an additional five records were located through citation searching. Consequently, we had 708 studies that met the initial screening. Following the application of inclusion criteria, 56 studies remained eligible. Among these, four were excluded due to an unclear definition of the study population, three because they were literature reviews, three because they were conducted outside of EU/EEA countries, two because they were not in English, and two because of unavailability of full-text. As a result, 42 studies were deemed eligible (14-55) (Table 2). In total, 666 studies did not meet the inclusion criteria and were subsequently excluded.

Findings

In this section, we synthesize the main quantitative evidence extracted from the included studies, describing the primary pathologies in alphabetical order.

COVID-19

The vulnerability of asylum seekers and migrants' reception centers to COVID-19 outbreaks has been previously stressed, and it is reasonably due to factors such as overcrowded living conditions, limited awareness of COVID-19 prevention measures,

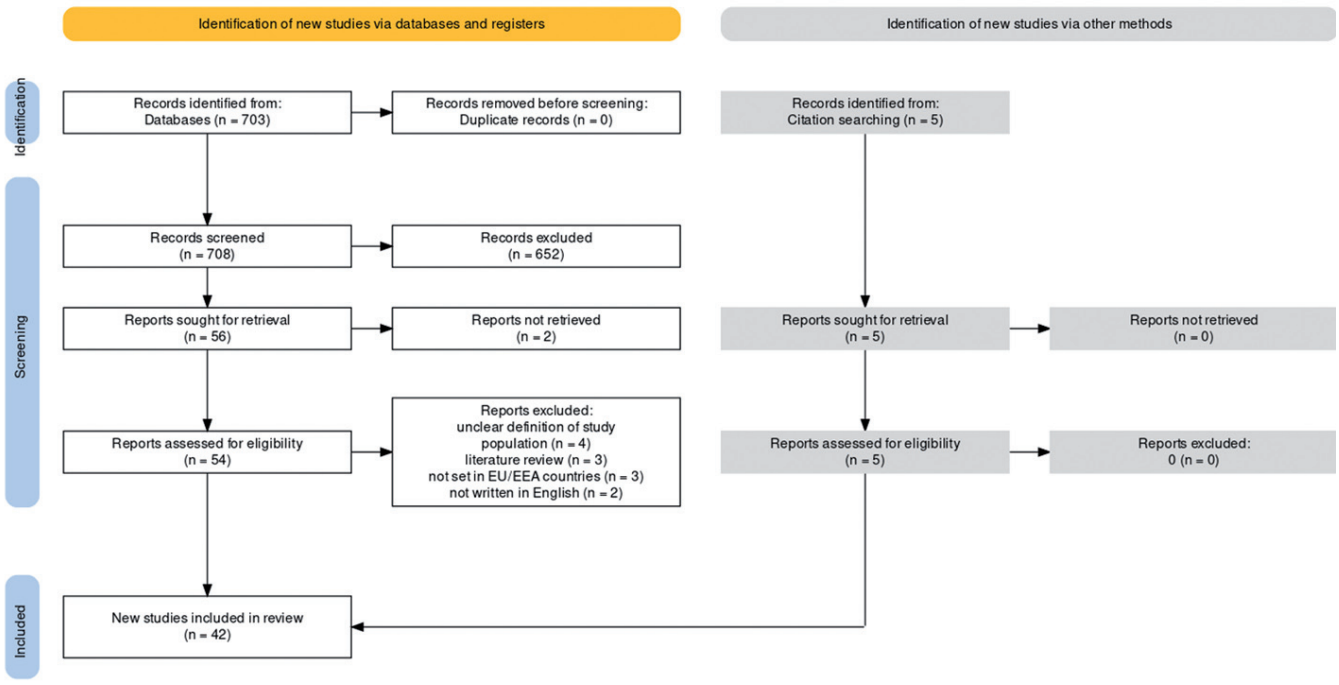

Figure 1 - Flowchart of the bibliographic research.

Table 2 - Characteristics of the selected studies included in the systematic review.

Author	Year	Population	Country	Infectious disease(s)	Country of origin
Schultze T	2023	Refugees	Germany	Multidrug-resistant bacteria	Ukraine
Solomos Z	2023	Refugees	Greece	COVID-19	Afghanistan, Syria, Iraq, and African countries
Badenschier F	2022	Asylum seekers and refugees	Germany	Diphtheria	Syria, Afghanistan, Tunisia, Yemen
Creutz I	2022	Asylum seekers and refugees	Germany	Multidrug-resistant bacteria	Middle East
Louka C	2022	Asylum seekers and refugees	Greece	Scabies	n.r.
Mellou K	2022	Vulnerable migrants	Greece	COVID-19	sub-Saharan African countries
Troiano G	2022	Refugees	Italy	Vaccine-preventable diseases	Ukraine
Fabris S	2021	Asylum seekers and refugees	Italy	COVID-19	North Africa, the Gulf of Guinea, the Horn of Africa, Syria, Pakistan, and Bangladesh
Kondilis E	2021	Asylum seekers and refugees	Greece	COVID-19	n.r.
Le Bihan C	2021	Asylum seekers and refugees	France	COVID	n.r.
Norman FF	2021	Irregular migrants and refugees	Spain	MMRV, HAV, HBV, HCV, HIV	Africa, Latin America, and other
Sisti LG	2021	Asylum seekers and refugees	Italy	COVID-19	Nigeria, Pakistan, Gambia, Bangladesh, Senegal
Turunen T	2021	Refugees	Finland	COVID-19	n.r.
Bosetti P	2020	Refugees	Turkey	Measles	Syria
Donisi A	2020	Asylum seekers	Italy	Tuberculosis, HBV, HIV, HCV, syphilis	Africa, Asia
Gilman RT	2020	Refugees	Greece	COVID-19	n.r.
Grecchi C	2020	Asylum seekers	Italy	Tuberculosis	Africa, South East Asia, Mediterranean area, and other
Padovese V	2020	Asylum seekers, refugees, subsidiary protection	Malta	Sexually transmitted diseases	Asia, Africa, South America
Pogka V	2020	Refugees	Greece	Measles	Afghanistan, Syria, Iran, Iraq, and other
El-Khatib Z	2019	Asylum seekers	Austria	syndromic surveillance	Afghanistan, Syria, Iraq, Iran, Pakistan, and other
Giambi C	2019	Irregular migrants, refugees, and asylum seekers	Croatia, Greece, Italy, Malta, Portugal, Slovenia	Vaccine-preventable diseases	n.r.
Ackermann N	2018	Asylum seekers	Germany	Tuberculosis, HIV, HBV, Helminthic infections	Africa, Asia, Est Europe
Alberer M	2018	Asylum seekers and refugees	Germany	Hepatitis B, hepatitis C, HIV, scabies, tuberculosis	Syria, Afghanistan, Eritrea, Nigeria, Sierra Leone, Somalia
Buonfrate D	2018	Asylum seekers	Italy	Tuberculosis, Helminthic infections, syphilis, HIV, HBV, HCV	Sub-Saharan Africa, Asia, North Africa
Ceccarelli G	2018	Asylum seekers	Italy	Measles	Eritrea, Nigeria, Gambia, Senegal, Mali, Pakistan, Bangladesh
Ciccozzi M	2018	Asylum seekers	Italy	Herpesviruses	Pakistan, Bangladesh, Nigeria, and other
Collin SM	2018	Undocumented migrants	EU/EEA countries	Tuberculosis	n.r.

Ehlkes L	2018	Asylum seekers	Germany	Enteric pathogens	Syria, Afghanistan, Iraq, Albania, Kosovo, other
Freidl GS	2018	Asylum seekers	Netherlands	MMRV, diphtheria, tetanus, polio, HAV, HBV	Syria, Afghanistan, Eritrea, Ethiopia, Iran, Iraq
Kloning T	2018	Refugees and undocumented migrants	Germany	HAV, HBV, HCV, HIV, syphilis, tuberculosis	Somalia, Eritrea, Afghanistan, Syria, other
Rojek AM	2018	Refugees and undocumented migrants	Greece	Syndromic surveillance	n.r.
Sarma N	2018	Asylum seekers, refugees, and irregular migrants	Germany	Syndromic surveillance	Syria, Afghanistan, Iraq, Albania, Kosovo, other
Walker TM	2018	Refugees	Germany	Tuberculosis	Horn of Africa
Mellou K	2017	Asylum seekers and refugees	Greece	Hepatitis A	Syria, other
Michaelis K	2017	Asylum seekers and refugees	Germany	Hepatitis A	n.r.
Vairo F	2017	Asylum seekers	Italy	Varicella zoster	Eritrea, Nigeria, Gambia, Senegal, Mali, Pakistan, Bangladesh, other
Coppola N	2015	Undocumented migrants and refugees	Italy	HBV, HCV, HIV	Africa, Asia, Eastern Europe
Germinario C	2015	Asylum seekers	Italy	Tuberculosis, HBV, HIV, HCV, poliomyelitis, vaccine-preventable diseases, syndromic surveillance	Africa, other
Pace-Asciak A	2013	Undocumented migrants	Malta	Tuberculosis	Sub-Saharan Africa, Northern Africa, Western Asia, Southern Asia
Takla A	2012	Asylum seeker	Germany	Measles	Afghanistan, Serbia, Macedonia, Iraq, Iran, Syria, Turkey, and other
Riccardo F	2011	Refugees	Italy	Syndromic surveillance	North Africa
Schmid D	2008	Refugees	Austria	Tuberculosis	Chechen Republic

n.r.= not reported

language barriers, and social gatherings within these centers (19, 21, 22, 25). The risk of COVID-19 among refugees has been the subject of scrutiny by two studies. Sisti et al. (25) found that the incidence of COVID-19 within the reception system was similar to that in the resident Italian population during the same period. Migrants had lower comorbidity rates but a higher likelihood of requiring hospitalization, likely due to the precautionary measures taken by the facility staff and the potential unfamiliarity of health professionals with the migrants' complete medical histories. In contrast, Kondilis et al. (22) reported notably high COVID-19 transmission rates among asylum seekers and refugees residing in reception centers and refugee settlements in Greece compared to the general Greek population.

These studies have provided valuable insights into managing COVID-19 outbreaks in such settings. Mass screening has proven to be a valuable tool for creating a comprehensive overview of suspected outbreaks, including identifying asymptomatic or presymptomatic carriers of the virus (15, 21, 23, 26). To enhance adherence to COVID-19 public health guidelines and prevention measures, the living conditions within these facilities should be improved (22). Potential improvements include reducing overcrowding, dividing camps into sectors, enhancing sanitation services, and ensuring access to necessities like food and medical care (19, 29). Authors have advocated for the fair and equal application of quarantine and lockdown measures without discrimination while striving to avoid mass quarantine when feasible due to its associated health risks for vulnerable populations (15, 22, 26, 29). Individuals in quarantine should receive comprehensive support, including healthcare, social and psychosocial assistance, and access to fundamental requirements such as food and water.

Furthermore, authors have stressed the importance of providing consistent primary healthcare for marginalized migrants, which has been associated with reduced morbidity and mortality (15, 21, 23). Recommendations include the daily presence of

medical personnel, daily patient monitoring, early medical interventions, and selective transfers to tertiary centers (15). It is also advisable to strengthen epidemiological surveillance systems to more effectively record COVID-19 cases, hospitalizations, and fatalities among refugees, asylum seekers, and other migrants in host countries. Establishing a robust system for public data sharing with an emphasis on transparency and timeliness has been highlighted (21, 22). Moreover, ensuring equal access to COVID-19 vaccines for refugees and asylum seekers is a critical consideration (22, 25, 26).

These strategies necessitate social and political measures to reduce SARS-CoV-2 incidence and the risk of viral spread within this population (23). Cultural background and the heterogeneity of the sheltered population should be taken into account when designing and implementing prevention strategies. Using geospatial epidemiology to identify case clusters and investigate local risk factors is essential, given that specific ethnic groups are more susceptible to clustering, posing a significant risk for infection (21). Local governments should implement cross-disciplinary strategies that provide culturally sensitive medical and sanitary support for COVID-19 diagnosis and management, treating outbreaks among asylum seekers and refugees with the same urgency as any other population while considering the vulnerabilities of the elderly and other high-risk groups (26).

Diphtheria

Moderate to high levels of susceptibility among refugees and asylum seekers (19-35%) were observed, particularly among migrants from Afghanistan (42). Notably, Badenschier et al. (16) documented an outbreak of diphtheria cases among migrants from Syria, Afghanistan, Tunisia, and Yemen in Germany. This outbreak started in July 2022 and persisted until at least October 2022, primarily manifesting as cutaneous diphtheria, a less severe form of the disease affecting the skin. However, two secondary cases of respiratory diphtheria were also reported. The authors explored various factors that could have contributed to the outbreak, including (i) an increase in diphtheria incidence in the migrants' countries of origin, (ii) a rise in the number of migrants arriving in the host country, (iii) potential diagnostic biases stemming from heightened skin lesion evaluations following the monkeypox outbreak, and (iv) human-to-human transmission in reception centers in Germany. Several recommendations were outlined to prevent and manage these outbreaks, including (i) identifying the outbreak's source(s), (ii) conducting active case identification in the host country, other destination nations, and countries along the Balkan route, and (iii) implementing infection prevention and control measures, such as targeted and efficient vaccination campaigns (16, 42).

Hepatitis A

Three studies assessed the seroprevalence of hepatitis A virus (HAV) among migrants and refugees, revealing susceptibility rates ranging from 7 to 16% (24, 42, 43).

Two outbreaks of HAV among asylum seekers were reported in the literature (47, 48). These outbreaks posed significant challenges to control due to overcrowding and suboptimal sanitation conditions in the refugee camps, difficulties in identifying and tracing close contacts, and the high mobility of the refugee population. Michaelis et al. (48) noted that the impact of hepatitis A was disproportionately high among asylum-seeking children and adolescents. This discrepancy was attributed to the limited opportunity for young individuals from non-endemic regions to develop natural immunity to HAV, unlike adults from high-endemic areas. The outbreaks were effectively contained through an intensified surveillance system, prompt vaccination of contacts, and the implementation of enhanced hygiene standards within the camps. Enhanced housing conditions (including reducing overcrowding and enhancing sanitation and hygiene standards) were essential to mitigating the transmission of hepatitis A. The authors also proposed conducting information campaigns to raise awareness about the risks of HAV infection and preventive measures. The comprehensive adherence of the entire refugee child population, ranging from 1 to 14 years, to Greece's routine national childhood immunization program as a long-term goal was proposed by Mellou et al. (47).

Measles, Mumps, Rubella, Varicella zoster (MMRV) virus

Several authors (24, 42) found gaps in seroprevalence for rubella, measles, and mumps among refugees and asylum seekers, with over 6-12% of screened subjects potentially susceptible to these diseases. They also found that women of childbearing age constituted a high-risk group, with suboptimal seroprevalence rates for these viral infections. The authors recommended a focus not only on immunization programs for recently arrived undocumented migrants but also on involving

more established migrant populations in older age groups, who may have been previously unvaccinated or exhibited evidence of waning immunity (24, 42).

In this light, to prevent outbreaks in asylum seekers' centers, improved screening and vaccination strategies are necessary for migrants, especially those from specific geographical regions and women of childbearing age. Takla et al. (53) compared two containment strategies for addressing measles outbreaks in asylum shelters that hosted refugees from various countries. The two strategies under consideration were serological testing with selective vaccination and immediate mass vaccination. The researchers found that serological testing with selective vaccination was a more time-consuming and expensive approach when compared to immediate mass vaccination. On the other hand, mass vaccination appeared to be more effective in preventing secondary cases, especially in situations with limited personnel and infrastructure resources. This method was also deemed safe and efficient, even for individuals who had previously received measles vaccinations. Furthermore, the study suggested that implementing routine vaccination upon initial intake could be instrumental in averting future outbreaks in such settings. Similar conclusions have been reached by Vairo et al. (49), who described a Varicella zoster virus outbreak in an asylum seeker center in Italy. The authors highlighted that chickenpox history is not the optimal method to identify susceptible individuals, proposing a universal screening of all individuals, regardless of history status, and the vaccine for susceptible. Both studies highlighted the role of national and local surveillance systems for reception centers for migrants in early detection and response to communicable disease outbreaks and the value of a coordinated response integrating collective housing facilities, public health authorities, reference laboratories, and high-level specialist hospitals (49, 53).

Several studies evaluated the risk of introducing the measles wild virus from various countries into a highly-vaccinated nation. Pogka et al. (32) suggested multiple introductions of the measles virus from other European countries, contributing to establishing a reservoir within the Greek population. Bosetti et al. (27) proposed a mathematical model to investigate the impact of social integration on measles risk in Turkey. According to the researchers' estimates, because of suboptimal vaccination during the past civil war, Syrian refugees hosted in Turkey displayed a considerably large fraction of individuals who were susceptible to measles. They found that high levels of mixing between Syrian refugees and Turkish citizens had been highly beneficial in drastically reducing the potential spatial spread of measles and the incidence of measles in both the refugee and host populations. This was because the high immunization coverage among Turkish citizens helped shield Syrian refugees from infection.

These studies also noted that the proportion of patients not tested for Varicella zoster virus (VZV) immunity ranged from 4% to 28%, possibly due to excluding patients who reported a previous history of natural infection.

As a recommendation, the authors suggested that host countries should intensify their vaccination program to target more vulnerable populations and provide the measles, mumps, and rubella vaccine for children and adults, both for migrants and the hosting population (27, 32). Regardless of that, Ceccarelli et al. (38) suggested implementing a screening specifically for individuals arriving from countries with low second-dose vaccine coverage or in situations where data on the second dose administration are unavailable. Moreover, the authors provided evidence that social integration of refugees and maximizing their dispersal had been effective countermeasures in reducing the risk of measles epidemics in host countries (27, 32, 38).

Multidrug-resistant bacteria

Schultze et al. (14) investigated the prevalence of multidrug-resistant Gram-negative bacteria (including carbapenem-resistant bacteria) in Ukrainian patients admitted to a university hospital in Germany. The study found that the carriage prevalence of carbapenem-resistant bacteria in Ukrainian patients was high (9.7%), significantly higher than the prevalence in non-Ukrainian patients (0.79%). The prevalence of carbapenem-resistant bacteria in Ukrainian patients was likely attributable to various factors, including a high background prevalence of antimicrobial resistances, and the ongoing war in Ukraine, which disrupted public health services and led to an increased and empiric antibiotic usage, often based on drugs available on spot rather than on more appropriate ones. The study's authors concluded that additional measures were necessary to prevent the transmission of carbapenem-resistant bacteria from Ukrainian patients to others in hospitals. These measures should include screening Ukrainian patients for carbapenem-resistant bacteria upon admission, isolating those who test positive, and implementing rigorous infection

control protocols in hospitals. They recommended that hospitals implement infection control measures to prevent the spread of these bacteria, such as screening Ukrainian patients for carbapenem-resistant bacteria upon admission and isolating those who are positive.

Creutz et al. (17) screened 161 refugees residing in accommodations in Germany to assess nasal carriage of Staphylococcus aureus. The isolates underwent examination for resistance and virulence characteristics, phenotypically and through whole-genome data analysis. The results showed that 5.6% of the refugees were carriers of S. aureus, with 2.5% being carriers of methicillin-resistant S. aureus. The identification of strains originating from the Middle East supported the hypothesis that these strains traveled with the refugees and persisted despite changes in the living conditions of the host population.

Poliomyelitis

Germinario et al. (51) assessed the presence of wild poliovirus or Sabin-like poliovirus in stool samples periodically collected from refugees hosted in Italy. The examination of the 152 stool samples revealed no presence of enterovirus.

Seroprevalence for all three poliovirus types ranged from 88% to 99% for polio type 1, 90% to 99% for polio type 2, and 76% to 89% for polio type 3 (42, 51). Freidl et al. (42) reported lower seroprevalence for polio type 3 in Iraq (76%) and Eritrea (78%). When stratified by age group, only two subgroups fell below the threshold: 26-35-year-olds from Iraq (63% polio type 3) and Eritrea (71% polio type 3).

Scabies and pediculosis

Since the beginning of the migratory crisis in early 2010s, scabies and pediculosis emerged as one of the most frequently reported infectious diseases among refugees and asylum seekers living in reception camps (18, 36). This high prevalence was attributed to various factors, including (i) crowded living conditions in refugee camps and reception centers, (ii) the rapid turnover of populations within these facilities, increasing the risk of reinfestations and outbreaks, and (iii) seasonality of infectious diseases, with a higher incidence during the winter months due to close interpersonal contact in refugee camps (18). The authors underscored the necessity of improving living conditions and healthcare access for refugees and asylum seekers. They emphasized the importance of continuous and systematic data collection regarding infectious diseases among refugee and asylum populations. Louka et al. (18) recommended the consideration of mass drug administration (MDA) as a strategy to alleviate the burden of scabies among refugees and asylum seekers. MDA involves the administration of medication to an entire population group, regardless of their infection status, as individual case management may not always be effective.

Ackermann et al. (35) reported 40 cases of Louse-borne relapsing fever (LBRF), caused by Borrelia recurrentis and transmitted by the body louse Pediculus humanus humanus, among asylum seekers hosted in Germany. This pathogen is endemic in the Horn of Africa and is linked to extreme poverty, wars, and civil unrest. Risk factors, such as low socioeconomic status, overcrowding, and limited personal hygiene facilities, facilitate its transmission, particularly in refugee camps and shelters.

Sexually transmitted diseases

Six studies (24, 28, 35, 37, 50, 51) have assessed the seroprevalence of hepatits B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV) among migrants and refugees. The seroprevalence of HBV surface antigen carriers ranged from 6% to 11% (24,28,35,37,50,51). Notably, around 50% to 80% of the tested migrants were found to be susceptible to HBV (24, 42, 43). This susceptibility likely reflects previous vaccination strategies that primarily targeted high-risk groups, in contrast to recent national programs that advocate universal vaccination from birth. The seroprevalence rate for HCV ranged from 0.9% to 2% (24, 28, 37, 50, 51). Calculated seroprevalence rates for HIV ranged from 0.3% to 6% overall, with higher rates among males (24, 28, 35, 37, 50, 51). Additionally, syphilis had a prevalence ranging from 1% to 4.5% (28, 37, 43).

Padovese et al. (31) examined migrants' access to sexual health services in Malta and assessed their susceptibility to sexually transmitted infections (STIs). The migrant cohort primarily consisted of young, unmarried men from Africa or South-East Asia. The study revealed that migrants were sexually active and engaged in high-risk behaviors related to STIs, with a significant lack of knowledge about these infections. Consequently, a substantial proportion of migrants, 73.3% among males and 71% among females were diagnosed with STIs. Various comprehensive prevention measures were suggested. These include screening, providing access to pre-exposure prophylaxis for migrants at a significant risk of HIV infection, and ensuring access to antiretroviral treatment regardless of

migrants' legal status (31). Assessing the HBV status and vaccinating susceptible individuals was also recommended (24, 42, 43). To raise awareness among migrants regarding STI risks and testing, community-based education interventions should be implemented. These interventions encompass the distribution of multilingual educational materials in reception centers and culturally sensitive information sessions targeting various migrant groups (24, 31, 42, 43). Furthermore, STI prevention strategies within migrant communities should be closely intertwined with interventions aimed at addressing issues such as human trafficking, Female Genital Mutilation (FGM), and other forms of sexual and gender-based violence (S/GBV) or exploitation (24, 31). The confluence of these concerns underscores the pivotal role of healthcare staff in the early identification of victims among migrant patients seeking sexual health services. To enhance this capability, specialized staff training, along with improved access to interpretation and intercultural mediation services, would be instrumental in preventing and combating S/GBV within the migrant population.

Syndromic surveillance

The syndromic surveillance system is described as a valuable tool for monitoring the health of asylum-seeking refugees and preventing the spread of infectious diseases. Its implementation is instrumental during large refugee influx, enabling the identification and response to potential public health threats (33, 44, 45, 51, 54). This system provides flexible and rapid surveillance within migrant accommodations integrated with medical services. It can detect over 400 statistical signals, primarily related to five syndromes: suspected acute upper respiratory tract infections, rash without fever, suspected acute lower respiratory tract infections, watery diarrhea, and skin, soft tissue, or bone abnormalities. The system triggers prompt public health actions, including investigations of alerts, exclusion of individuals suspected of being contagious from crowded activities, and referrals to specialized secondary healthcare for adequate treatment. The importance of communication among stakeholders and sharing best practices is emphasized (45).

Several studies evidenced that the results of syndromic surveillance showed that the migration flow was not associated with an increased risk of communicable disease transmission in hosting countries (51, 54). Nevertheless, in a study by Rojek et al. (44), the clinical characterization and documentation of medical syndromes among patients in refugee camps were evaluated. It was noted that incomplete clinical assessments presented challenges in identifying patients with syndromes under surveillance. Case records lacking comprehensive information could hinder outbreak teams' ability to investigate and verify cases. Communication difficulties and interruptions during consultations in busy clinics were identified as potential factors affecting comprehensive patient evaluation. The study suggests that improving the performance of syndromic surveillance in humanitarian settings can be achieved by enhancing the documentation of clinical information obtained during patient consultations and by improving clinicians' understanding and utilization of surveillance tools, such as case definitions for syndromes under surveillance.

As evidenced by El-Khatib et al. (33), systematic data collection on the health of asylum seekers is limited in the EU/EEA, necessitating enhancements in national health surveillance systems and innovative health surveillance methods for monitoring asylum seekers' health.

Tuberculosis

Several studies have drawn attention to the risk of tuberculosis (TB) among migrants and the host population. Pace-Asciak et al. (52) screened 4,570 undocumented migrants in Malta using chest X-rays (CXR), finding that around 3.5% of them had CXR results suggesting potential TB. Of these, approximately 12.5% were diagnosed with active TB cases. Through both active and passive surveillance, a total of 33 active TB cases were identified among these immigrants, resulting in a reported TB incidence of 390 cases per 100,000 individuals among immigrants, in stark contrast to the 2.1 cases per 100,000 incidence rate among those born in Malta. Studies focused on screening programs for latent tuberculosis infection (LTBI) revealed a TB prevalence ranging from 1% to 14.5% and an LTBI prevalence ranging from 4% to 44% (28, 30, 35, 37, 43, 51).

Moreover, two studies (46, 55) documented the risk of multidrug-resistant tuberculosis (MDR-TB) outbreaks among refugees, even among HIV-seronegative individuals. Schmid et al. (55) highlighted that the multidrug-resistant tuberculosis outbreak was facilitated by deficiencies in case management by Austrian health authorities, such as the index case not initially receiving directly observed therapy in an outpatient setting and being lost to follow-up for four months. Furthermore, this individual received an inappropriate anti-tuberculosis regimen for MDR-TB

for four weeks.

All authors stressed that these findings underscore the necessity of strengthening the TB control programs in host countries. In particular, 25% of the EU/EEA interviewees in the study conducted by Collin MS et al. reported that inadequate systems for TB control program monitoring and evaluation were identified as factors impeding TB control, emphasizing the importance of improving monitoring and evaluation processes (40). Implementing evidence-based national TB guidelines that regulate treatment monitoring, contact investigation procedures, and interprovincial communication is essential. Despite the benefits of entry screening and follow-up (30), immigrants face an elevated risk of developing TB for several years after their arrival (52). Unfortunately, the relative inaccessibility of services due to information gaps, language barriers, and cultural differences can lead to diagnostic delays. Other perceived obstacles include issues related to care recipients (e.g., lack of TB knowledge, treatment seeking/adherence), care providers (including the need for specialist training of nurses and doctors), and health system constraints (e.g., funding and communication between healthcare and social care systems) (40). To address these challenges, it is crucial to raise awareness about TB among migrants and general practitioners (52). Providing migrants with linguistically appropriate information on TB, community health centers, and culturally sensitive healthcare facilities, possibly through cultural mediators, is strongly recommended.

Additionally, to control multidrug-resistant tuberculosis outbreaks, national guidelines for the programmatic management of drug-resistant TB, HIV testing, tuberculin skin tests, and interferon-gamma release assay (IGRA) tests are essential components of the screening policy for immigrants (40, 55). Moreover, New technologies are crucial in controlling multi-drug resistant tuberculosis outbreaks. Specifically, the molecular epidemiological approach that synthesizes whole-genome sequencing data with epidemiological information has proven instrumental in more effectively identifying and managing MDR-TB outbreaks (46). Strengthening the laboratory network and improving surveillance were also highlighted (40, 55).

Other infectious diseases

Ciccozzi et al. (39) focus on an outbreak of acute febrile syndrome that affected 22 refugees residing at the Asylum Seekers Centre in Italy. The study identified a potential respiratory-transmitted cause for the outbreak and concurrent reactivation of multiple herpesviruses. The epidemiological investigation revealed that the rapid spread of the epidemic was facilitated by patients being housed in adjacent rooms or even sharing the same room. Based on the evidence, preventive measures for infection control were instituted, demonstrating a commendable approach to outbreak management. The authors underscored the significance of microbiological surveillance in enhancing public health standards and recommended its continued use.

Ehlkes et al. (41) recommend the ongoing screening of one stool sample from asymptomatic children, adolescents, asylum seekers, and refugees. These groups exhibit a higher prevalence of enteric pathogens and are less likely to adhere to hand hygiene and other infection prevention measures. Additionally, specific helminth infestations can have severe consequences in children, making targeted screening valuable. Continuous testing for enteric pathogens in a representative subsample of all newly arrived asylum seekers will be essential to adapt to changing migration patterns and associated risks (37, 41). These studies also indicated that the import of enteric bacteria by newly arrived asylum seekers has had a minimal impact on the public health of the host population (35, 37, 41). Specifically, from January 2015 to May 2016, Ehlkes et al. (41) tested 23,410 stool samples, revealing a prevalence of 0.2% for Salmonella spp., 2.4% for helminth infestation, 0.2% for E. vermicularis, 0.3% for Hymenolepis nana, with 47 cases of schistosomiasis, and none tested positive for Shigella spp.

Freidl et al. (42) reported a tetanus seroprevalence among refugees ranging from 96% to 100%, except for participants from Eritrea (86%). Among Eritreans, the lowest tetanus seroprevalence was observed in the age group of 36-45 years, which was 79%.

Prevention of vaccine-preventable diseases

Most authors widely recommend vaccination in refugees and asylum seekers for vaccine-preventable diseases. This is crucial to protect the health of refugees and prevent potential disease outbreaks in both refugee populations and host communities.

Troiano et al. (20) analyzed the characteristics of Ukrainian minor refugees accessing the Rozzano Vaccination Center (northern Italy). The authors observed high rejection rates for certain vaccines, with the HPV vaccine having a 100% rejection rate, followed by measles, mumps, rubella (63%), and meningococcus C (61%). Factors contributing

to vaccine hesitancy included concerns about side effects, lack of information, and doubts about vaccine efficacy. The authors' findings suggest that more needs to be done to address the factors that are preventing Ukrainian refugees from getting vaccinated. This could include providing culturally appropriate information about vaccines, addressing language barriers, and building trust in the Italian healthcare system. Additionally, the study's authors suggest that the Italian government should consider implementing mandatory vaccination for refugees against certain vaccine-preventable diseases, such as measles, mumps, and rubella. This would help to protect refugees from these diseases and reduce the risk of outbreaks in the Italian population.

Germinario et al. (51) described an immunization protocol applied to children refugees and asylum seekers hosted in a refugee center in Apulia (southern Italy). Following this protocol, healthcare workers, in collaboration with cultural mediators, reviewed the health records of the children and inquired about their prior vaccinations. The immunization schedule of the child's home country, obtained from the WHO guidelines, was also examined. Subsequently, an individualized vaccination plan was established for each child. If there were any uncertainties, serological tests for hepatitis B, measles, rubella, and varicella were conducted. One hundred twenty-nine migrants received appropriate vaccination, according to the Apulian immunization schedule.

Regarding vaccination policy among EU/EEA countries, Giambi et al. (34) evaluated the migrant vaccination strategies, comparing them between six European countries (Croatia, Greece, Italy, Malta, Slovenia, and Portugal). While they vary across the six surveyed EU countries, they generally align with WHO (56) and ECDC guidelines (1, 57, 58). Nevertheless, a detailed examination of these strategies has highlighted areas of concern. Several strategies were suggested by the authors, including (i) the establishment of protocols for tracking migrants' immunization records within and across countries to prevent vaccine shortages or duplications, (ii) the promotion of collaboration among public health authorities from different nations to establish shared procedures for data exchange, (iii) the development of migrant-friendly approaches to enhance and supervise vaccination accessibility at the community level, and (iv) the gathering data on vaccination coverage among migrant populations (34).

Conclusions

The displacement of refugees and asylum seekers has intensified in recent years due to conflicts, natural disasters, and economic hardships. The congregate living conditions in refugee camps, transit centers, and temporary housing facilities make this population particularly vulnerable to infectious diseases. As such, the implementation of stringent hygiene and preventive measures is critical to safeguarding the health of refugees and reducing the risk of outbreaks that may affect both the refugee population and the host communities (59).

Maintaining adequate hygiene and sanitation in refugee camps is essential to prevent the outbreaks and spread of infectious diseases. Overcrowding, limited sanitation facilities, and inadequate access to clean water are common challenges refugees face. Hygiene measures must include regular handwashing with soap and clean water, providing safe food, proper waste disposal to prevent environmental contamination, ensuring access to clean drinking water sources, and sanitary facilities that are functional, private, and culturally appropriate (60). Moreover, it is essential to educate refugees on personal hygiene through health education programs, posters, and other materials (61). In the same area, it is crucial to vector control through insecticide spraying, the use of mosquito nets, and the removal of standing water; indeed, mosquitoes, flies, and other insects can transmit diseases such as malaria, dengue fever, Chikungunya, West Nile Virus, Zika, and yellow fever (62).

Timely and accurate surveillance of infectious diseases in refugee camps is essential for early detection and response. Surveillance should include prompt reporting of suspected cases, diagnostic testing and contact tracing, comprehensive data collection, rapid isolation of affected individuals, and data-driven public health policies and resource allocation. Surveillance systems should be sensitive and specific to identify even small outbreaks of infectious diseases. Data collected from surveillance systems should be analyzed regularly to identify patterns of spread of infectious diseases (63). As reported by the ECDC, completeness, and timeliness of reporting are essential aspects of the surveillance system. Completeness should be reviewed weekly, and if a reporting unit is not submitting data daily, healthcare providers in that unit should be contacted to request missing data promptly. Missing a day of reporting can disrupt baseline data for threshold calculations, necessitating a whole week's data to restore it, making 100%

completeness a recommended goal. Timeliness should also be evaluated weekly, considering predefined targets for the number of reports from each unit. In cases of repeated delays, the coordinating team should contact healthcare providers to ensure daily reporting as per the surveillance protocol. The specific timeliness targets, such as 48 hours, should be set by the implementing country, balancing field constraints with surveillance objectives (64). Public health authorities, such as the Health Prevention Departments in Italy, must develop expertise and adapt organizational models to ensure effective surveillance activities. The evolving nature of health threats requires a proactive approach to surveillance, necessitating continuous skill development and organizational flexibility to meet the demands of the ever-changing health landscape.

Mass screening and isolation appear to be proactive strategies for the prevention and control of infectious diseases within refugee and asylum seeker populations. Mass screening emerges as a crucial tool in identifying infections, especially in crowded and often resource-constrained refugee settings. It is critical in early detection, timely intervention, and safeguarding public health. As the global refugee crisis persists, it is imperative to prioritize mass screening as part of comprehensive public health strategies for this vulnerable group, thereby ensuring a healthier and more secure future for all (65). It offers several advantages, including (i) the identification of infections at an early stage in order to facilitate timely medical intervention, reducing the risk of complications and transmission, (ii) contact tracing, and (iii) implementation of preventive measures to contain outbreaks (66, 67), even if some authors report that it may infringe upon fundamental rights of those screened, thus creating an ethical dilemma (68). The ECDC reported that it is likely to be effective and cost-effective to screen child, adolescent, and adult migrants for active TB and LTBI, HIV, HCV, HBV, strongyloidiasis, and schistosomiasis, especially considering newly arrived migrants (1). In particular, screening for active TB and LTBI can be effective and cost-effective depending on the setting, target group, and screening approach, with the best potential results achieved if screening is restricted to high-risk groups and/or to migrants from high-burden countries (69).

Isolation is a critical measure to control the spread of infectious diseases within refugee camps. It helps prevent the spread of infectious diseases, safeguarding the affected individuals and the broader camp community and allowing the early identification of infected individuals. Moreover, Isolation allows for timely medical care and reduces severe outcomes (29). Well-structured isolation procedures should incorporate the following key components: (i) early Identification, (ii) dedicated facilities and isolated areas or units within the camp for individuals with suspected or confirmed infections, (iii) medical care, including access to healthcare providers, and (iv) resource allocation, ensuring an adequate supply of medical equipment and supplies for isolates. On this topic, specific guidelines have been published by the ECDC and WHO regarding the prevention and control of COVID-19 in migrant and refugee reception and detention centers. Both institutions reported that there is no evidence that quarantining whole camps effectively limits transmission of SARS-CoV-2 in settings of reception and detention or provides any additional protective effects for the general population outside those that could be achieved by conventional containment and protection measures (70, 71).

Central to this effort is the promotion of vaccinations for vaccine-preventable diseases, which plays a pivotal role in disease prevention and control. Vaccination is a cornerstone of preventive healthcare. Ensuring that refugees have access to vaccinations against vaccine-preventable diseases is crucial. These vaccinations not only protect the health of the refugees themselves but also contribute to herd immunity, reducing the risk of disease outbreaks in the host community (72). As reported by the literature, refugees and asylum seekers show moderate-high levels of serosusceptibility to several vaccine-preventable diseases, including measles, mumps, rubella, varicella zoster, hepatitis A and B (24). Moreover, several outbreaks of hepatitis A, measles, and diphtheria have been described (15, 16, 47, 48). Therefore, vaccination programs in refugee camps should be comprehensive and include all the recommended vaccines for the age group. Vaccines should be provided free of charge and should be accessible to all refugees. Tailoring vaccination programs to the specific needs of displaced populations is essential, consisting of a risk assessment, timely immunization, and catch-up vaccination. The risk assessment consists of identifying high-risk groups based on the migrants' origin and the prevalence of diseases in their home countries (1). Between 2012 and 2013, Ukraine had vaccination coverage of 76% (DPT3 - Diphtheria-tetanus-pertussis 3rd dose), dramatically dropping to 23% in 2014 due to the conflict in Donbass. This low vaccination coverage was further exacerbated by ongoing conflict and displacement in the East, leading

to the confirmation of vaccine-derived poliovirus and increased cases of infectious diseases like rubella, pertussis, and mumps (20). Vaccines should be administered promptly upon arrival, as many migrants may lack adequate immunization records. There is no need for serological screening as there are no risks associated with vaccinating individuals who have previously received vaccines. Access to catch-up vaccination should be ensured for individuals who have missed previous immunization schedules. Finally, it is recommended to provide migrants with documentation of the vaccination intervention.

The measures described above must be optimized for the difficulties related to the population under analysis. All these measures should be culturally sensitive and inclusive. Refugees and migrants may have different cultural beliefs about health and disease, and these beliefs should be considered when designing surveillance systems. They should be tailored to the specific needs of the refugee population (73). The types of infectious diseases that are a risk in a particular refugee population will vary depending on the country of origin of the refugees, their travel history, and the conditions in the refugee camp. To overcome these barriers, effective communication should be empowered, including the development of information materials in multiple languages and the encouragement of cooperation between host countries and organizations working with migrants (74, 75). In this context, public health authorities, particularly the Local Health Units, should avail themselves of cultural mediators and specific personnel with skills to effectively communicate with these at-risk populations. Moreover, healthcare providers should be culturally sensitive, understand potential cultural concerns, and preferably speak migrants' languages (76). Furthermore, to ensure equitable access, financial barriers should be removed (77, 78). One significant challenge in this context is vaccine hesitancy among refugees, influenced by various factors, including lack of available information in the native language of the immigrants' country of origin, vaccine safety concerns or lack of awareness, logistical difficulties, and fear of legal consequences (79-81). Addressing these concerns necessitates culturally sensitive communication tailored to the diverse backgrounds of the refugee population, as well as measures to overcome language barriers and enhance trust in the local healthcare system (20).

European governments have a responsibility to ensure the health of all people, including migrants. This encompasses taking steps to prevent the spread of infectious diseases. European governments can take many steps to help prevent the spread of infectious diseases in the migrant population, including providing access to vaccination, implementing surveillance programs, and providing access to quality healthcare (82). Significant policy disparities exist throughout Europe concerning vaccination strategies for both adult and child migrants. To enhance vaccine delivery and uptake in diverse migrant populations across the region, there should be an increased focus on disseminating migrant-specific guidance to frontline healthcare professionals (83). Moreover, governments and institutions should identify efficient ways of conveying recommendations to develop more effective health-related risk communication to vulnerable groups of migrants (84). The protection of health in the migrant population is essential for the health of the host population because infectious diseases can easily spread from one population to another. For example, public health institutions must remain vigilant for the potential reemergence of poliomyelitis virus 1 until it is completely eradicated. Reserves of OPV vaccine are readily available in case the wild virus is reintroduced within European territory (85). When migrants are healthy, they are less likely to spread infectious diseases to the host population. In addition, protecting the health of the migrant population is a matter of fairness and social justice. All people, regardless of their immigration status, have the right to be healthy (86).

In addition to the steps mentioned above, European governments should also interact with international organizations and Non-Governmental Organizations (NGOs) to ensure the protection and safeguarding of the health of migrants. International organizations, such as the World Health Organization (WHO) and the United Nations High Commissioner for Refugees (UNHCR), have developed guidelines and recommendations for the prevention and control of infectious diseases in migrant populations (87, 88). European governments should use these guidelines to develop their policies and programs. NGOs, such as Médecins Sans Frontières (MSF) and Doctors Without Borders (DWB), provide direct healthcare services to migrants. European governments should work with NGOs to ensure migrants access quality healthcare, including preventive care. By working with international organizations and NGOs, European governments can help to ensure that migrants have access to the healthcare they need to stay healthy.

The study has several limitations, such as a restricted analysis of existing literature and a lack of robust quantitative data sources, which prevented a

meta-analysis. One major limitation is the reliance on a single digital archive (MEDLINE/Pubmed). This choice was made due to the need for a rapid review, given the ongoing Russo-Ukrainian and Israeli-Palestinian conflicts, as well as the urgency to provide an updated perspective on the prevention and control of infectious diseases among refugees and asylum seekers. However, despite these limitations, this study is noteworthy for offering the most comprehensive overview of the topic to date and addressing various aspects of prevention. Furthermore, the selected studies encompass several EU/EEA countries, providing a nearly complete picture of the situation in Europe. Additionally, the study specifically examines the impact of the COVID-19 pandemic on the health of refugees, migrants, and asylum seekers.

In essence, protecting migrant health has far-reaching implications for public health. It is not only a matter of humanitarian responsibility but a strategic approach to ensuring the well-being and resilience of host communities and addressing global health concerns. Public health policies and actions that prioritize migrant health are essential for building healthier, more resilient, and inclusive societies. The health of populations is a significant focus of the UN Sustainable Development Goals. Goal 10 explicitly targets migration and calls for the medical and scientific community to understand the complex dynamics of migration. This requires a trans-disciplinary approach that combines humanitarian, economic, sociological, and public health perspectives. Accessing and improving basic rights, including healthcare, along transit routes is a definite priority (89).

The significance of this study is further highlighted in the context of the ongoing conflicts in Ukraine and Palestine. European countries are already witnessing the migration of individuals fleeing from these conflict zones, and it is expected that these flows will increase. From a public health perspective, understanding the factors influencing infectious disease risk and the role of vaccination and preventive measures is of paramount importance in addressing the health needs of these vulnerable populations and safeguarding the broader public health of the host nations (90).

Effective vaccination and preventive strategies for migrants, refugees, and asylum seekers are vital for public health and the well-being of these populations. They should be delivered as part of universal healthcare system (91). By reducing barriers and implementing tailored programs, we can ensure equitable access to vaccines and protect the health of these vulnerable individuals.

Abbreviations
ECDC: European Centre for Disease Prevention and Control
WHO: World Health Organization
UNHCR: United Nations High Commissioner for Refugees

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Riassunto

Profilo di rischio infettivo e strategie per la prevenzione e il controllo dei focolai epidemici tra rifugiati, richiedenti asilo e migranti nei Paesi dell'UE/EEA: una revisione sistematica delle evidenze

Introduzione. L'incremento recente della migrazione verso e all'interno dell'Unione Europea e dell'Area Economica Europea ha portato le politiche migratorie, comprese quella sanitarie, al centro delle priorità dei singoli Paesi membri. Mentre i migranti, in generale, non costituiscono una minaccia per la salute della popolazione ospitante, specifici sottogruppi, tra cui i rifugiati, i richiedenti asilo e i migranti irregolari, possono essere particolarmente vulnerabili alle malattie infettive. Per sostenere le politiche di sanità pubblica in questo settore, il gruppo di lavoro "Prevenzione e gestione delle emergenze" della Società Italiana di Igiene, Medicina Preventiva e Sanità Pubblica ha condotto una revisione sistematica narrativa con l'obiettivo di definire il rischio di malattie infettive nelle popolazioni di rifugiati e richiedenti asilo nei Paesi dell'UE, EEA e candidati all'UE.

Metodi. Quarantadue studi sono stati selezionati sistematicamente da articoli scientifici estratti dal database MEDLINE/PubMed dal 1° gennaio 2008 al 1° giugno 2023. Il rischio infettivo associato a ciascuna malattia infettiva tra rifugiati e richiedenti asilo, nonché le strategie per prevenire e controllare i focolai epidemici, sono stati raccolti da tutti gli studi inclusi nella review.

Risultati. Le condizioni di vita congregata nei campi profughi, nei centri di transito e nelle strutture abitative temporanee rendono la popolazione in studio particolarmente vulnerabile alle malattie infettive. Pertanto, è fondamentale attuare misure igieniche e preventive rigorose per salvaguardare la salute dei rifugiati e ridurre il rischio di focolai che potrebbero interessare sia la popolazione rifugiata che le comunità ospitanti.

Conclusioni. Strategie di vaccinazione efficaci e misure preventive per migranti, rifugiati e richiedenti asilo sono vitali per la salute pubblica e il benessere di queste popolazioni. Esse dovrebbero essere fornite come parte dell'assistenza sanitaria universale. Definendo le barriere alle misure di prevenzione e attuando programmi mirati, possiamo garantire un accesso equo ai vaccini e alle cure e proteggere la salute di questa popolazione particolarmente vulnerabile.

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