

*Brief Original Article*

## Vaccination campaign strategies in recently arrived migrants: experience of an Italian reception centre

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### Abstract

**Introduction:** Control of vaccine preventable diseases, while constituting a priority of European health policies, is challenged by migrations from countries with suboptimal levels of immunization coverage. We report here two different types of vaccination campaign strategy in one of the bigger Italian asylum seekers' centres. The vaccination service staff of the local national health institute came monthly during the first three years of observation, while in the last year, the vaccinations were offered directly upon arrival of migrants in the asylum seekers' centre. **Methodology:** we performed a descriptive cross-sectional study that analysed data collected from the database of the internal healthcare facility and ARVA Target tool, regarding vaccinations performed from 2013 to 2017 in the asylum seekers' centre.

**Results:** In the four years of observation period the asylum seekers centre hosted 3941 migrants. Among them, 85% were vaccinated during their stay, for a total of 4252 vaccinations administered, covering 95% of minors and 85% of adults. During the study period, there was an important increase from an average of 10.5% of migrants vaccinated in the first three years to 66% in the last year, when vaccines were delivered directly upon arrival in the centre.

**Conclusions:** To improve the rate of immunization in migrants, the first requirement is a strong collaboration with the local vaccine services and the second, vaccinations must be carried out when migrants arrive at the asylum seekers' centre, avoiding any delay.

**Key words:** vaccine; immunization rate; migrants; vaccination strategies.

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### Introduction

According to United Nations (UN) agencies, there are currently around 25 million refugees, the highest known total to date, over half of whom are under the age of 18 [1]. Only 15% are hosted in developing countries, Europe (EU) in particular hosts 2.5 million of them. Fifty-seven percent of refugees came from three countries: Syria, Afghanistan and South Sudan. During 2017, 1.9 million new asylum applications were recorded in the world; the main industrialized countries

who received them were: USA, Germany and Italy. Italy remained the third-largest recipient of asylum claims in 2017, with 126,500 new applications, a small increase compared with 123,000 in 2016 [1]. Nigerians, followed by Bangladeshi and Pakistanis were the main recorded nationalities. From 2013 to 2017, Italy received 422,100 Asylum seekers' applications [1].

This high rate of migration is an underlying factor in the emergence of public health threats and risks that must be managed globally. In spite of the common

perception of an association between migration and the importation of infectious diseases, there is no systematic association [2,3].

Control of vaccine preventable diseases is a priority in the EU/EEA. In developing countries there is often sub-optimal vaccine coverage, as shown by small studies [4-6]. Equitable access to vaccination is the main objective of the European Vaccine Action Plan (EVAP) 2015–2020. The Plan urges all countries in the region to scale up efforts to ensure the eligibility and access of refugees, migrants, international travellers and marginalised communities to culturally appropriate vaccination services and information, in order to meet the GVAP (Global Vaccine Action Plan) [7].

We report here on the vaccination campaign in one of the bigger Italian accommodation centres (900 places) for asylum seekers (ASC), between 1<sup>st</sup> of April 2013 and 31<sup>st</sup> of March 2017, in Castelnuovo di Porto, close to Rome.

## Methodology

The present work is a descriptive cross sectional study that analyses data collected from the database of the internal healthcare facility (IHF) and ARVA Target tool (integrated and computerized system for the management of vaccination registry, produced by Theorematica srl, (Rome, Italy) and adopted by the Regional Sanitary System of Latium (Italy), (<https://www.theorematica.it/dettataglio-soluzioni.php?codice=6>). We collected data on nationality, age, gender, time of arrival, types of vaccinations administered, number of doses, and adverse events.

Regarding the vaccinations administered, the minors received: hexavalent combination vaccine “Infanrix Hexa” (GlaxoSmithKline Biologicals s.a., Rixensart, Belgium) and “Hexyon” (Sanofi Pasteur Europe, Lyon, France); measles, mumps, rubella and varicella vaccine “Priorix Tetra” (GlaxoSmithKline Biologicals s.a., Rixensart, Belgium) and “ProQuad” (Merck & Co., Inc., West Point, PA, USA); pneumococcal vaccine “Prevenar 13” (Pfizer Inc., NY, NY, USA); meningococcal C vaccine “Menjugate” (Novartis Pharmaceuticals Canada Inc, Dorval, Quebec, Canada) and “Meningitec” (Wyeth Pharmaceuticals - New Lane, Havant, UK); hepatitis B vaccine “Engerix B 10 µg/0,5 mL” (GlaxoSmithKline Biologicals s.a., Rixensart, Belgium); diphtheria, tetanus, pertussis and inactivated poliomyelitis vaccine “Tetravac” (Sanofi Pasteur Europe, Lyon, France) and “Tetraxim” (Sanofi Pasteur Europe, Lyon, France); poliomyelitis vaccine “Imovax Polio” (Sanofi Pasteur

Europe, Lyon, France); vaccinations against Human papilloma virus “Gardasil” (Merck & Co., Inc., West Point, PA, USA). The adults received Measles Mumps Rubella Varicella vaccine “ProQuad” (Merck & Co., Inc., West Point, PA, USA); polio vaccine “Imovax Polio” (Sanofi Pasteur Europe, Lyon, France); varicella zoster virus “Varivax” (Merck & Co., Inc., West Point, PA, USA) “Varilrix” (GlaxoSmithKline Biologicals s.a., Rixensart, Belgium); pneumococcus “Prevenar 13” (Pfizer Inc. NY, NY, USA); diphtheria, tetanus, pertussis and inactivated poliomyelitis vaccine “PolioBoostrix” (GlaxoSmithKline Biologicals, s.a., Rixensart Belgium); hepatitis B vaccine “Engerix B 20 µg/0,5 mL” (GlaxoSmithKline Biologicals s.a., Rixensart Belgium).

ASC is a residential institution, hosting a semi-open community of recently arrived migrants applying for asylum status. There is a degree of homogeneity among people living at the ASC, with the majority coming from Sub-Saharan Africa.

The ASC has an outpatient IHF devoted to the protection of migrant health. The clinic is led by consultant physicians accredited in internal medicine and infectious diseases. The team also includes six nurses, four psychologists and six cultural mediators. The clinic is open 24/7/365.

## Medical management and vaccinations

The health management strategy of individual people and public health is based on a screening visit on arrival. Also, mandatory and volunteer vaccination programs are active for both the paediatric and adult populations. Epidemiological monitoring and microbiological surveillance are usually performed to identify potential outbreaks and avoid them [8,9].

In Italy, Immunization Plans are issued by the Italian Ministry of Health and immunization programs are managed within the National Health Service (NHS). Italian Regions are responsible for planning and implementing healthcare services on the basis of goals set and funds allocated by the NHS. At regional level, local public health companies (ASLs) apply the regional immunization plan and schedule on the territory. [10,11]

In order to allow the largest number of migrants to access vaccinations, the vaccination service staff of the relevant ASL (formally named Rome-F) came monthly to the ASC in 2013, 2014 and 2015 and the first months of 2016 to perform the immunizations required by the current regulations, according to the age, national/regional immunization prevention plan, and vaccinations required by Italian law for migrants

[12,13]. During the last year of the study, from the 1<sup>st</sup> of April 2016, the vaccinations were delivered directly by the physicians of the IHF upon arrival of the migrants, under the supervision of ASL Rome-F.

Through interviews with parents, the vaccination status of children and their timeliness was studied. If parents provided vaccination documentation, the missing cycles were completed according to the Italian schedule. Adults underwent polio vaccination; pneumococcal vaccination was administered to people with chronic diseases. Moreover, seasonal flu vaccination and post exposure tetanus vaccination were offered. Linguistic and cultural mediators were used to adequately inform patients and request informed consent for vaccinations.

## Results

### *Study population and immunization programs*

During the study period, the ASC hosted 3941 migrants, 90% of whom came from Africa and the remainder from Asia; 3% were minors (118) and 6% (236) were female. Of these migrants, 85% (3361 persons) were vaccinated during their stay, for a total of 4252 vaccinations administered.

Among minors, 95% (112) were vaccinated. The median age was 5 years old (range 3 months - 16 years). In particular, 84% of minors vaccinated (94) underwent hexavalent vaccination (diphtheria, tetanus, pertussis, poliomyelitis, Hemophilus influenza, hepatitis B) (Table 1) while 100% (112) underwent MMRV (Measles, Mumps, Rubella and Varicella) vaccine, 94% (106) Pneumococcal vaccination; 86% (97) meningococcal C vaccine; 53% (60) hepatitis B vaccine; 31% (35) diphtheria, tetanus, acellular pertussis and inactivated poliomyelitis vaccine; and 6% (7) Poliomyelitis vaccine. Moreover, 10 vaccinations against human papilloma virus were administered. No adverse events were reported.

Among adults, 85% (3249) were vaccinated. Among these, 94% (3066) received Polio vaccine, followed by varicella zoster virus 4.5% (149), pneumococcus 3.1% (101, and 1% (32), diphtheria, tetanus, acellular pertussis and inactivated poliomyelitis vaccine 1<sup>st</sup> dose (Table 1). No adverse events were reported. All migrants were provided with documentation about administered vaccinations.

### *Immunization strategies*

As previously reported, in the last year of study, the strategy adopted to offer vaccinations was changed from a “monthly appointment” directly managed by the staff of ASL Rome-F to a single “on arrival appointment” managed by the physicians of the IHF, under the supervision of ASL Rome-F.

Interestingly, there was an increase in the percentage of vaccinations during the years of observation: in the 1<sup>st</sup> and 2<sup>nd</sup> years, the percentage was 6%, in the 3<sup>rd</sup>, 21% and in the 4<sup>th</sup>, 67% were observed (Figure 1A). Moreover, there was an increase in the percentage of migrants vaccinated during the study period: in the 1<sup>st</sup> year, 3%, in the 2<sup>nd</sup> year, 6.2%, in the 3<sup>rd</sup>, 22.5% and in the 4<sup>th</sup>, 66.3% were recorded (Figure 1B).

### *Regional epidemics preventable by vaccination and consequent local outbreaks at the ASC*

In December 2015 and May 2016, there was a varicella outbreak in the ASC, with 41 cases [14]; of 1248 individuals tested (most of them from East Africa) a seroprevalence of Varicella Zoster IgG of 87% was found. During the outbreak, 47% of susceptible persons were vaccinated against Varicella [14].

Moreover, although there was a measles outbreak in Italy in 2016/2017, apparently no cases appeared in the ASC [5]. No measles vaccinations were administered in

**Table 1.** Number of vaccinated migrant adults and children and types of vaccination given.

Type of vaccine	Minors			Adults		
	First dose	Second dose	Third dose	First dose	Second dose	Third dose
Hexavalent*	94	58	23	-	-	-
MMRV**	112	33	-	1	-	-
<i>Pneumococcal</i>	106	46	14	101	1	-
<i>Meningococcal C</i>	97	-	-	2	-	-
Hepatitis B	60	40	8	18	7	1
DTaP*** and inactivated Poliomyelitis	35	15	11	39	-	-
<i>Poliomyelitis</i>	7	6	3	3,066	19	1
Human Papilloma Virus	10	4	-	-	-	-
Varicella Zoster Virus	-	-	-	149	64	1

\* Diphtheria, tetanus, pertussis, poliomyelitis, Haemophilus influenza B, hepatitis B; \*\* MMRV: Measles, Mumps, Rubella and Varicella; \*\*\*DTaP Diphtheria, Tetanus, acellular Pertussis.

our centre during the Italian outbreaks and the prevalence of migrants with positive result for measles IgG antibodies ranged between 79.9% and 100% [5].

Finally, providing seasonal flu vaccinations avoided outbreaks of influenza in the ASC community.

**Discussion**

The decline of immunization rates in countries of origin of migrants and refugees, often due to war and civil unrest that influence the implementation of vaccination strategies, together with the risks related to their journeys (malnutrition, unsanitary conditions), may threaten migrants’ health and increase the risk of vaccine-preventable diseases circulating in Europe.

A report from WHO exploring the provision of immunization services to migrants and refugees in the WHO European Region states that less than a third of

countries in the region had specific directives on immunization of migrants in their national programs [15].

Italian law states that in absence of a vaccination report, all migrants have to be considered Polio receptive and have to be vaccinated. The Italian Guideline on Border Control suggests assessing the vaccination status of migrants and refugees arriving in Europe through their documentation, but most newly arrived migrants did not have documentation on previous vaccinations [16]. Then migrants should be considered unvaccinated and, thus, should be vaccinated in accordance to the local recommended schedule.

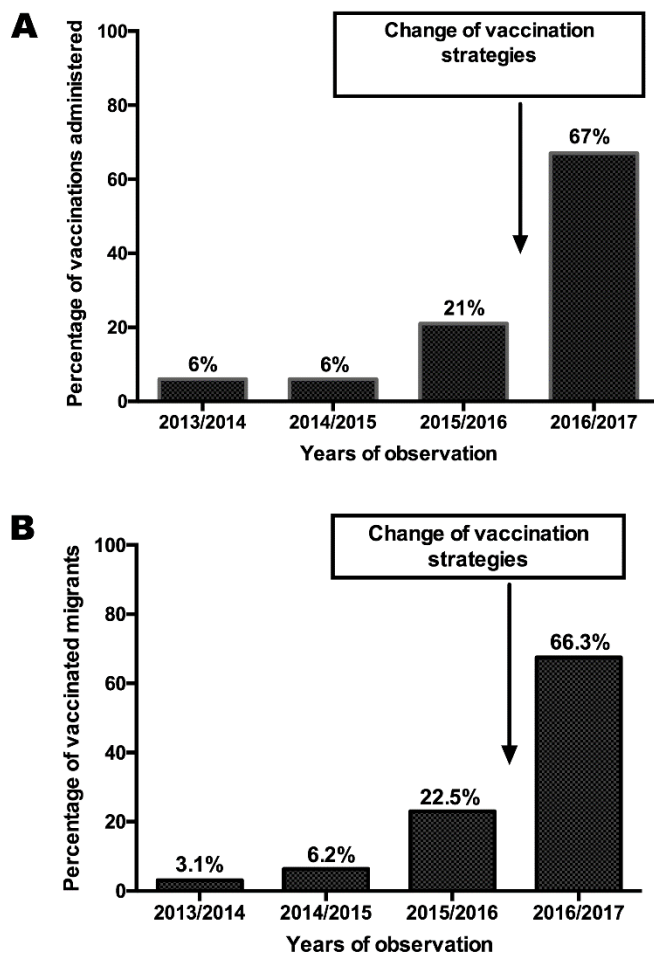
Italian guideline on migrants suggests offering vaccinations against Polio, MMRV (excluding pregnancy women), diphtheritis, tetanus and pertussis to all adult migrants, while children have to be vaccinated according to the Italian immunization schedule [16]. The international agencies supported this approach, indeed UNICEF, WHO and UNHCR recommended to vaccinate migrants, avoiding delays, without the need to carry out serological tests to evaluate antibody levels, in accordance with the immunization schedule of the hosting country, and to provide migrants with documentation of the vaccinations administered, in order to avoid duplications [17].

In our study we describe two types of vaccination strategy in an ASC close to Rome, which hosted 3941 migrants between 1<sup>st</sup> of April 2013 and 31<sup>st</sup> of March 2017. In the first three years of observation, the vaccination service staff of the local national health institute came monthly to the ASC, while in the last year, vaccinations were offered directly upon the arrival of migrants by the IHF of the ASC.

In our study period, an overall rate of vaccination of 85% was found. A higher rate was observed in the last year, when immunizations began to be offered directly on arrival at the ASC, avoiding any delay. Moreover, as there was a clear indication regarding Poliovirus in 2014, this rate of administration of this vaccine was higher. Our vaccination campaign allowed us to circumvent critical points of access to vaccination for migrants. Indeed, screening services for vaccination are often not easily accessible or focused on migrants’ needs; moreover, migrants often refuse vaccination and registration by medical authorities for fear of legal consequences [18].

From a public health point of view, vaccination campaigns, supported by surveillance programs, in populations hosted in ASC are a top priority:

**Figure 1.** The increase in percentage of vaccinations (A) and percentage of vaccinated migrants (B) during the years of observation. The arrow shows the moment of the change of vaccinations strategies, from vaccinations administered monthly by a doctor from local vaccination services to vaccinations administered upon arrival of migrants in ASC by a physician of the centre’s IHC.



vaccinations against communicable disease are a fundamental tool to limit the risk of outbreak of communicable and vaccine-preventable diseases within the migrant communities hosted in reception centres. In fact, in these places, where migrants live in small and often overpopulated spaces, the risk of micro-epidemics is amplified. As reported, our results showed a limited frequency of outbreaks of vaccine-preventable infections within the ASC within the five years of observation.

This work has several limitations: I) the levels of migrant immunization coverage were not known before and after the vaccination sessions; II) not all vaccination schedules were completed, as a result of either the patient's non-compliance, or short stay at the ASC; III) in adults the vaccination sessions were essentially limited to Polio, the remaining vaccinations were linked to epidemic events or post-exposure prophylaxis.

### Conclusion

The knowledge of the level of migrant immunization coverage [19] and the effective improvement of vaccination strategies (such as a strong collaboration with the local vaccine services and vaccinations provided in the asylum seekers centre upon arrival), are two of the key approaches to establish prevention policies and limit the risk of outbreaks in host countries.

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