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Description of a migrant pediatric population visiting the Toulouse Children's Hospital emergency department

Short title: Description of a migrant pediatric population visiting an emergency department

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Conflict of interest: None

Abstract

Background: Today, one in eight migrants and one in two refugees are children. Since this population has been less studied than the adult population, there is little data available on the state of health of this pediatric migrant population and the reasons they seek care. **Objective:** The objective of this study was to describe the sociodemographic and medical characteristics of a pediatric migrant population visiting an emergency department in order to better understand their specific needs.

Materials and Methods: This was a retrospective observational study using data from medical records and social surveys of migrant children who had visited the Toulouse pediatric emergency department between 1 January 2018 and 31 December 2018.

Results: A total of 203 migrant children, i.e., 344 emergency visits, were analyzed. The average age of the children was 3.3 years old. More than half (58.1%) of the children were from Eastern Europe; 71% visited due to infectious pathologies. The severity of the reasons for visiting (90% of the reasons for visiting had a CCMU (Clinical Classification of Emergency Patients) of 1 or 2) and the hospitalization rate (9%) were not higher in the pediatric migrant population than in the general pediatric population. We discovered associated diagnoses (e.g., scabies, anemia, oral and dental disorders) in connection with migration and/or the resulting vulnerability. There was a language barrier in 78% of the visits analyzed with underuse of professional interpreting (7%).

Conclusion: Because of the journey they make, migrant children are likely to have specific health needs and require dedicated care.

Keywords: Migrant pediatric population; emergency department

1. Introduction

Today, one in eight migrants and one in two refugees are children [1, 2]. In 2018, the number of refugees and people displaced by conflict, natural disasters, and climate change was at its highest level: 25.9 and 41.3 million, respectively [3]. In the past 10 years the number of refugee children has more than doubled, with more than half of the 25.9 million refugees being children [4, 5]. In 2018, European countries recorded some 602,920 new asylum seekers. Nearly a third of them (32%) were children (191,360) [1]. A migrant is defined as "any person who leaves their usual place of residence to settle temporarily or permanently and for various reasons, either in another region within the same country, or in another country, crossing an international border." It is a generic term not defined in international law [6]. A refugee is an asylum seeker that has fled his or her home country (in order to escape war, persecution, or natural disaster) and has a "well-founded fear of persecution" if they return home. Refugee status is granted when an asylum seeker has been acknowledged as a refugee according to the United Nations Refugee Convention. A refugee has completed the asylum process when they have been granted a residence permit [1]. Many publications and recommendations use the terms "asylum-seeking," "refugee," "displaced," and "migrant" interchangeably. For this study we altered and adapted the definition of "migrant child" given by international migration organizations (Guerreiro et al. 2009), which includes children aged 0–18 years:

- "first-generation migrants": children, either accompanied by their parents or not, "who are outside the territory of the State of which they are nationals or citizens" and seeking asylum in France.

- "second-generation migrants": children born in France with or without French nationality and whose parents are migrants regardless of their legal status (legal status: asylum seekers, refugees, undocumented, etc.) [7, 8]. Unaccompanied children will be referred to in the study as "unaccompanied minors": as defined by the United Nations High Commissioner for Refugees (UNHCR), "an unaccompanied child is a person who is under the age of eighteen, unless, under the law applicable to the child, majority is attained earlier" and who is "separated from both parents and is not being cared for by an adult who by law or custom has responsibility to do

so." International migration is a determinant of health and social well-being [9]. In 2011, Zimmerman et al. broke down migrants' journeys into five phases: a "pre-migratory" phase preceding the "travel" phase, a "post-migratory phase in the destination country", sometimes with a "return phase" and/or an "interception phase" [10]. The health status of a migrant person is a reflection of the individual health needs accumulated since birth and during the migratory journey until arrival in the country of destination [11]. Most of the available literature on access to healthcare and the health status of migrants in host countries focuses on the adult population. Studies show that migrant children and adolescents generally adapt and integrate well into the host country, especially if they have a supportive environment and if they can easily access education and the healthcare system [11]. Very few studies are available on the state of health of the migrant pediatric population, particularly in the French population. A meta-analysis published in 2012 on the health status of migrant children by Jaeger et al. highlights that, given the context of migration, migrant children are likely to have, in addition to the health needs of a developing child, specific health needs that require special attention and the establishment of personalized pediatric care and targeted prevention [12]. Other studies report differences in the health status of migrant children from birth: children born to immigrant mothers have a higher incidence of neonatal death, stillbirth, premature birth, and low birth weight [13]. In older children, higher rates of certain infectious diseases [14,15], anemia, and genetic disorders of the red blood cells [15], dental caries [12], malnutrition (undernutrition, overweight, obesity) have been described [16, 17]. Refugee and resettlement experiences may impact critical stages of the child's intellectual, social, emotional, and physical development [1]. Higher rates of certain mental disorders have also been reported [18, 19]. France is a country with a long history of migration: 31.9% of the children born in France in 2018 have one or two parents who were born abroad [20]. In 2018, France recorded 123,625 asylum applications; 22,630 requests (18.3%) related to minors. Of these, 742 were unaccompanied minors [21]. Several studies have shown that emergency services are often used by migrants as a gateway entry to the healthcare system, given their easy access at any time or place, the absence of administrative barriers, and the absence of up-front medical costs [22-24]. Based on the observed increase in the population of migrant children in Toulouse over the past several years, and the absence of a dedicated care pathway or of standardized care available, we conducted a descriptive study on the pediatric migrant population visiting the emergency department (ED) of Toulouse's Children's Hospital. The main objective of the study was to describe the medical and sociodemographic characteristics of this population and, secondly, to assess their specific needs.

2. Materiel and methods

2.1 Study type

This was a retrospective descriptive epidemiological study conducted at Toulouse University Hospital's Children's Hospital.

2.2 Study population

2.2.1 Inclusion criteria

Included in the study were 0- to 18-year-old "migrant" children who visited the ED between 1 January and 31 December 2018, with a completed social survey on one of the emergency visits.

2.3 Data collection method

The sociodemographic data gathered during the social survey carried out during or after the consultation (face-to-face and/or telephone) were extracted from hard copies of archived files for the year 2018. All the data concerning the child and the characteristics of his or her visit to the ED were collected from ED reports [2] computerized using Urqual[®] software. To identify the data on migrants' journeys, the child's hospitalization and/or consultation reports available and computerized on ORBIS[®] software were analyzed. In order to simplify the interpretation of data concerning pathologies, these were standardized using a simplified thesaurus from the International Classification of Diseases (ICD-10). Data from the 2018 annual report by the *Observatoire Régional des Urgences Occitanie* (Regional Observatory of EDs in Southern France) on ED activity in the Toulouse University Hospital were used to compare the data in the sample with data from the general pediatric population.

2.4 Regulatory and ethics issues

The data to be used were collected anonymously using Microsoft EXCEL[®] software. A letter of declaration was sent to the CNIL (*Commission nationale de l'informatique et des libertés*; French data protection authority), receipt number 2216371 v 0.

2.5 Data analysis methods

The statistical analysis was performed by the Research Methods Support Unit (RMSU). For the qualitative variables, we present the results in the following format: Total number (N), absolute number (number of cases n for the category concerned), and relative number (percentage (% = n/N for the category concerned)).

For quantitative variables, the results are presented in the following format: mean (m), standard deviation (SD), median [3], quartiles (Q1, Q3), and range. To compare the quantitative variables (age, duration of visit) with the values found in the ORU database of the same year, we compared a bilateral Student *t*-test with a theoretical value, after checking the conditions of application. To compare the quantitative variables (age, duration of visit) with the values found in the ORU database of the same year, we used a bilateral chi-square test after checking the application conditions, or Fisher's exact test if required. A *p*-value <5% was considered significant.

3. Results

3.1 Description of the population

3.1.1 Number of patients included

In 2018, the ED of Toulouse University Hospital's Children's Hospital recorded 51,981 visits. The present study included 203 migrant children from 2018, which corresponded to 344 emergency room visits. The maximum number of visits per child was seven. The number of visits per child in the general population was not available. The majority of children (84.7%) only visited the pediatric ED once or twice in 2018. There was an equal distribution of visits over the days of the week and the times of day for both the migrant population and the general population.

3.1.2 Characteristics of the population

The gender ratio was 1.3 (56% boys) compared to 1.2 for the general pediatric population visiting the pediatric ED in Toulouse in 2018. The average age was 3.3 years (SD, 3.7). Migrant children were significantly younger than other children visiting the ED (median, 5.3 years; *p*-value <0.001). The parents' and children's country of origin and birth are summarized in **Table 1**.

The country of origin was the same for both parents in all cases. The three most frequent nationalities were, in order; Albanian (28.4%), Bulgarian (10.7%), and Syrian (9.2%). For the children's country of origin, 53 cases (14.4%) were missing. There were 91 visits by second-generation migrant children (26.5% born in France to migrant parents) and 200 visits by first-generation migrant children (58.2% born outside of France to migrant parents). This second group included two 14-year-old unaccompanied minors from Guinea.

Length of stay, housing conditions, family composition, language barrier, and method of translation used are reported in **Table 2**. Of the migrant children visiting the ED, 93% reported not having a family physician during administrative ED registration.

3.2 Care and outcome

3.2.1 Length of visit

The average length of visit was 3.9 h (SD, 3.3), which is slightly longer than for the total number of visits (median, 3.5; $p < 0.025$).

3.2.2 Reasons for consultation

The reason for consultation was acute for 329 visits (95.6%), chronic with acute exacerbation for seven visits (2.0%) and chronic without acute exacerbation for eight visits (2.3%). In this study, we found that in eight children migration was motivated by the child's health condition: sickle cell disease (Mali), osteosarcoma (Senegal), leukemia (Bulgaria), liver tumor (Romania), craniopharyngioma (Georgia), dialyzed prune belly syndrome (South Africa), Lobstein's disease (Albania), and congenital heart disease (Georgia). Chronic pathologies with acute exacerbation were: three cases of sickle cell crisis, acute renal failure in a child with prune belly syndrome, an episode of hemoptysis in a child with a history of tuberculosis, a seizure in a context of craniopharyngioma, and a case of myelomeningocele bleeding. The Clinical Classification of Emergency Patients (CCMU) are summarized in **Table 3**.

3.2.3 Paraclinical examinations carried out during the visit

An imaging procedure was required in 15.4% ($n=53$) of the visits: abdominal ultrasound ($n=6$), chest radiology ($n=30$), bone radiology ($n=13$), brain scan ($n=5$), abdominal x-ray ($n=3$), and joint ultrasound ($n=1$). Of the visits by migrant children 25.2% ($n=87$) involved a biological assessment, with 48.3% ($n=42$) external assessments (CRP micro-method) and 51.7% ($n=45$) standard assessments. For five visits the external assessment was supplemented by a standard assessment: 2.6% ($n=9$) of the visits involved an additional assessment adapted to the context of migration with findings of malaria in three of the children, tuberculosis (RBC and radiology) in one child, hepatitis B and HIV in six of the children, and parasites in two of them. This evaluation was carried out without necessarily being related to the reason for the consultation but in the context of migration.

3.2.4 Diagnoses at discharge for migrant children visiting the emergency department of the Toulouse Children's Hospital

On all of the visits, we noted the pathologies that could be linked to migration and/or the resulting precariousness (main and secondary diagnoses combined) (**Table 4**): six diagnoses of scabies, one of ringworm, 16 oral disorders (dental caries, dental abscess, periodontal disease), one of anemia, one of pericardial effusion, three breaks in the growth chart, two psychiatric disorders (such as behavioral disorders and eating disorders), and one old burn that became superinfected. We found that delayed vaccination was noted in the medical observation for 36 visits and there was a total absence of vaccination in seven children. The number and type of vaccine missing was not specified. Concerning the future of the children, 9% were hospitalized compared to 14.5% in the general population.

4. DISCUSSION

One strength of this study was that it described for the first time in France the sociodemographic characteristics and the reasons for seeking care within a population of migrant children visiting the ED. This study has several limitations. First of all, our sample of children was only representative of the migrant population in and around Toulouse. However, from one city to another or from one region to another, because of the heterogeneity in the migrant population the sociodemographic characteristics of migrants can be very different. The use of social survey data was the only way to gain retrospective access to the sociodemographic characteristics of the population but did not allow the inclusion of all migrant children who consulted the ED during the year 2018 but only those who had undergone a social survey.

In this study, only two children were unaccompanied minors. The under-representation of unaccompanied minors in the present study can be explained by the age limit set at 15 years for admission to the pediatric ED, while 88% of unaccompanied minors identified in France in 2018 were between 16 and 18 and only 5.2% were under 14 [21]. The majority of migrant children were from Eastern Europe (58.1%). The proportion of visits by children from first-generation migrants was higher than second-generation migrants (58% versus 26%). Similarly, the majority of visits were families having recently arrived in France (less than 1 month for 15% of visits and less than 1 year for 48% of visits). These differences can be explained by the fact that by being born in France, second-generation migrant children have faster access to social rights and better knowledge of the care pathway than a newly arrived child. Similarly, for a family living in France for a longer time it is easier to seek care from places other than the ED (more often eligible for rights, better knowledge of the care system) [25].

Acute symptoms accounted for 329 visits (95.6%). The majority of children consulted for infectious pathologies (71.51%), led by ENT and upper respiratory infections (37.79%) and digestive infections (13.08%). These figures are in line with those of the study carried out on the migrant population receiving consultations at the delocalized branch of the *Permanence d'Accès aux Soins de Santé de Calais* (Calais continuous access to health care system) conducted in 2017, which found that 68.75% of 0- to 9-year-olds received consultations for infectious pathologies. Unlike several studies conducted on adult migrant populations, the hospitalization rate (9%) was lower than for the general population (14.6%) and the severity of the reasons for consultation was not higher among migrant children: 90% of the reasons for consultation were classed as CCMU 1 or 2 compared to 87% in the general population [26,27]. These differences may be related to a poor understanding of the host country's health system, which leads to a preference for seeking care in the ED, and to the fact that access to emergency rooms is not limited by the lack of social security coverage. Similar results were found in the meta-analysis carried out by Jaeger et al. (2012) on the Swiss pediatric migrant population [12]. However, in our observation, these data should be qualified by the existence of a significant selection bias. Direct admissions for resuscitation by the SAMU (French emergency services) (primary or secondary transfer), and therefore migrant children in the most serious state of health, were not counted in emergency visits.

In 78% of the medical observations analyzed, the issue of a language barrier was found during the medical interview. The average duration of the visits was also slightly longer than for all visits (3.9 h versus 3.3 h) and this can be explained in part by this language barrier making medical consultation more complicated. An official interpreter was present in only 7.4% of the visits. However, for several years the ED has had access to interpreting services 24 h a day, 7 days a week, via two telephone platforms, but this service is still underused by caregivers. This tool is costly, but the presence of a language barrier during the caregiver–patient exchanges decreases the quality of care, increases the number of hospitalizations, the risk of adverse events and fatal consequences both in the hospital environment and in primary healthcare [11, 24]. These results show the need for awareness-raising and prior training for carers on the regular use of interpreting.

We found in our population, as in the studies by Jaeger et al. [12] and by Baauw et al. [15], several associated secondary diagnoses, which can be linked to migration and/or to the vulnerability that results from it: scabies, oral disorders, schistosomiasis, anemia, weight loss, and psychiatric disorders. For 43 visits, there was a delay or a total absence of vaccination but the number and type of vaccines missing was not specified. The retrospective nature of this study, along with the absence of a systematic collection of these data, did not allow for a precise

assessment of the children's state of health and probably underestimates the prevalence of these pathologies. Our study needs to be supplemented by a study aimed at answering this question.

Furthermore, studies have shown that the lower family socioeconomic status among immigrants has a significant impact on their children's health and development [28-31]. In our study, 30.5% of the families declared at registration that they were homeless, 2% lived in a squat, 20.1% gave the address of emergency accommodation, and 21.2% gave the address of an administrative domiciliation service. These difficulties in accessing housing for migrants, including children, have been confirmed by several reports at the local and national level [32]. The main reason for consultation was related to these housing difficulties for 11 visits (3.19%). The lack of data did not allow us to make a complete evaluation of the links between these housing difficulties found and the reasons for consultations, their seriousness, the length of hospitalization, and the notion of precariousness.

The orientation of this population towards adapted structures after the visit to the emergency room is necessary in order to catch up on vaccination and follow these children up, paying particular attention to the child's development. Children under 6 years of age can be referred to the *Protection Maternelle Infantile* (PMI) and older children to dedicated consultations such as those offered in the Permanence of Access to Mother and Child Health Care (PASS). These medicosocial services play an important role in the opening of social rights, which then allows integration into the standard healthcare system. Recently, the French National Authority for Health (HAS) issued recommendations on catching up on vaccinations for migrants and children at risk of neurodevelopmental disorders [32,33].

5. Conclusion

A systematic dedicated consultation, outside the context of the ED, would be better able to identify each person's individual health needs. It would speed up access to common rights, allowing for better screening and preventative action according to each migratory journey. This consultation could be based on the practical recommendations for the medical management of children made by the European Academy of Paediatrics, published in 2019 [34], and the HAS recommendations [32, 33].

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Table 1 Parents' country of origin and children's country of birth

	Parents' country of origin		Children's country of birth	
	<i>n</i>	%	<i>n</i>	%
Western Europe	1	0.3	101	29.4
Eastern Europe	200	58.1	119	34.6
North Africa	36	10.4	32	9.3
Middle East	47	13.7	16	4.7
Africa (outside of North Africa)	43	12.5	22	6.3
America	1	0.3	1	0.3
Not specified	16	4.7	53	14.4

Table 2 Length of stay, housing conditions, family composition, language barrier, method of translation used

	<i>n</i>	%
Length of time in France		
Less than 1 month	38	15.9
1 month to 1 year	179	47.9
More than 1 year	22	9.2
Not specified	105	
Housing conditions		
Homeless	105	3.5
Squat	7	2.0
Caravan	7	2.0
Association	1	0.3
Own home	70	20.4
Public emergency accommodation	55	12.2
<i>Forum Réfugié</i> (NGO) administrative domiciliation	43	12.5
<i>Croix-Rouge française</i> (NGO) administrative domiciliation	30	8.7
Reception center for asylum seekers	26	7.6
Number of children (siblings)		
1	105	36.0
2	101	34.6
3	53	18.2
4	24	8.2
5+	9	3.1
Not specified	52	
Accompanied to France by		
Both parents	265	83.9
Mother only	36	11.4
Father only	9	2.9
Aunt	3	1.0
Other family member	1	0.3
Unaccompanied foreign minors	2	0.6
Not specified	28	
Language barrier		
Yes	219	77.7
No	63	22.3
Method of translation		
None	28	25.9
Accredited translator	8	7.4
Telephone translator	10	9.3
Doctor	13	12.0
Other caregiver	2	1.9
Relative, adult	32	29.6

Relative, child	5	4.6
Google translate, translation software	10	9.3
Not specified	111	

Table 3: CCMU* classification and types of emergency

CCMU	Visits** <i>n</i> (%)	Migrants <i>n</i> (%)	% Vis- its	% Boys	Age (years)	Duration (h)	% Hospitalization
1	18,201 (36%)	197 (59%)	1.08%	55.3%	2.7	3.1	0%
2	25,514 (51%)	104 (31%)	0.41%	52.9%	3.9	5.1	15.5%
3	5767 (12%)	33 (10%)	0.57%	63.6%	4.9	5.3	48.5%
4	234 (1%)	1 (0%)	0.43%	-	-	-	-
5	14 (0%)	0 (0%)	0%	-	-	-	-
P	298 (1%)	0 (0%)	0%	-	-	-	-
NG	1826	9			2.3	3.1	0%
Type of emergency							
Medical, surgical	31,607 (63%)	291 (85%)	0.92%	55.7%	3.0	3.9	9%
Trauma	16,627 (33%)	29 (8%)	0.17%	51.7%	5.8	3.6	17.2%
Psychiatric	856 (2%)	0 (0%)	0%	-	-	-	-
Other/ran away	703 (1%)	11 (3%)	1.56%	81.8%	3.1	2.9	0%
Toxicology	258 (1%)	4 (1%)	1.55%	75%	4.2	4.2	25%
Not given	17	9		44.4%	2.4	4.7	0%

CCMU* (*classification clinique médicale des urgences*): French medical classification of the degree of severity, clinical classification of emergency department patients: CCMU 1: stable situation, abstention from complementary diagnostic or therapeutic acts; CCMU 2: stable presentation, requiring a complementary diagnostic or therapeutic act; CCMU 3: presentation likely to deteriorate without life-threatening prognosis; CCMU 4: prognosis committed, no immediate resuscitation maneuver; CCMU 5: prognosis committed, perform immediate resuscitation maneuver. CCMU P: patient with psychological or psychiatric problems dominant in the absence of any unstable somatic pathology. Visits**: general pediatric population visiting the pediatric ED in Toulouse in 2018

Table 4: Principal and secondary diagnoses at discharge for children visiting the emergency department at the Toulouse Children's Hospital

	Main diagnoses (N = 344) n (%)	Secondary diagnoses (N=344) n (%)
Infectious pathologies:	246 (71.51%)	
Infectious diseases (general)	21 (6.10%)	
Upper respiratory tract infections/ENT*	130 (37.79%)	
Lower respiratory tract infections	20 (5.81%)	
Digestive/parasitic infections	45 (13.08%)	
Urinary tract infections	6 (1.74%)	
Localized skin infections or infections with skin-related symptoms	24 (6.97%)	2 (0.58%)
Other pathologies:	122 (36.26%)	
Cardiac pathologies	1 (0.29%)	3 (0.87%)
Oral and dental	6 (1.74%)	10 (2.90%)
Other dermatological pathologies	10 (2.9%)	1 (0.29%)
Digestive pathologies	15 (4.36%)	2 (0.58%)
Hematological pathologies	3 (0.87%)	1 (0.29%)
Neurological pathologies	7 (2.03%)	1 (0.29%)
Newborn pathologies	7 (2.03%)	
Ophthalmological pathologies	8 (2.3%)	
Other ENT* pathologies	1 (0.29%)	
Nontraumatic osteoarticular pathologies	2 (0.58%)	
Psychiatric pathologies	0 (0.0%)	2 (0.58%)
Respiratory pathologies	11 (3.19%)	
Toxicological pathologies	3 (0.87%)	
Traumatic pathologies	33 (9.59%)	1 (0.29%)
Uro-nephrological pathology	4 (1.16%)	
General pathologies not classified elsewhere	3 (0.87%)	
Social problem	11 (3.19%)	
No diagnosis (ran away before consultation)	9 (2.61%)	9 (2.61%)

*ENT: ear–nose–throat