

BMJ Open A refugee camp in the centre of Europe: clinical characteristics of asylum seekers arriving in Brussels

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ABSTRACT

Background: In the summer of 2015, the exodus of Syrian war refugees and saturation of refugee camps in neighbouring countries led to the influx of asylum-seekers in European countries, including Belgium. This study aims to describe the demographic and clinical characteristics of asylum seekers who arrived in a huddled refugee camp, in the centre of a well-developed country with all medical facilities.

Methods: Using a descriptive cross-sectional study design, physicians of Médecins du Monde prospectively registered age, gender, origin, medical symptoms and diagnoses of all patients presenting to an erected field hospital in Brussels in September 2015. Diagnoses were post hoc categorised according to the International Classification of Diseases.

Results: Of 4037 patients examined in the field hospital, 3907 were included and analysed for this study. Over 11% of patients suffered from injuries, but these were outnumbered by the proportion of patients with respiratory (36%), dental (9%), skin (9%) and digestive (8%) diagnoses. More than 49% had features of infections at the time of the consultation.

Conclusions: Asylum seekers arriving in a refugee camp in Brussels after a long and hazardous journey suffer mostly from respiratory, dental, skin and digestive diseases. Still, one in seven suffers from injury. These findings, consistent with other reports, should be anticipated when composing emergency medical teams and interagency emergency health or similar kits to be used in a field hospital, even in a Western European country.

Trial registration number: ISRCTN13523620, Results.

INTRODUCTION

Background/rationale

Persons fleeing their home country are considered ‘asylum seekers’ until a contracting state is willing to provide the official status of ‘refugee’ as disclosed in the Geneva Convention on Refugees.¹

The continuing exodus from Middle East countries, driven by the Syrian civil war and overcrowding of refugee camps in neighbouring

Strengths and limitations of this study

- This study includes a considerable number of well documented complaints and physicians’ diagnoses in asylum seekers arriving in Western Europe.
- A literature search reveals that epidemiological studies on health problems of asylum seekers in Europe are very scarce, and have not been reported in such detail before.
- The study included only patients self-presenting or referred by outpatient assistance teams to the field hospital in the autumn of 2015, preventing extrapolation to all asylum seekers, and other seasons.
- A number of diagnoses remained tentative, since laboratory and imaging tests were unavailable, and patient anonymity prevented longitudinal follow-up.
- The lack of uniform standards to collect symptoms and diagnoses makes comparison with other data sets challenging.

countries, forced asylum seekers using any conveyance fleeing towards the European Union. In the summer of 2015, the number of asylum seekers in Belgium increased considerably.²

People applying for asylum need to register at the Belgian Immigration Office in the centre of Brussels, a necessary step before being entitled to shelter, clothing, food and (medical) assistance. A high daily influx of asylum seekers and a limitation to a maximum of 250 registrations per workday created an accumulation of hundreds, not yet included in the asylum procedure, camping in a park in front of the Belgian Immigration Office. In a spontaneous humanitarian response, volunteers of the ad hoc ‘Belgian Civilian Platform’ organised an improvised shelter camp and provided clothing and food.

The Belgian branch of the independent international non-governmental organisation Médecins du Monde (MdM) erected a field



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hospital in the camp. MdM provided free medical care, psychological and social support, and sanitary facilities to over 4000 asylum seekers in September 2015.

Of 5512 requests for asylum registered at the Belgian Immigration Office in September 2015, 482 (9%) were from unaccompanied minors and only 628 were granted asylum. The other applicants were either formally rejected (3526 cases), postponed (748 cases) or definitively refused (610 cases). The latter received an order to leave the territory.² Belgium accepted 0.8% of all asylum seekers reaching Europe in 2015.³

A prerequisite to adopting any evidence-based approach in humanitarian assistance is to assemble solid evidence from results of relevant empirical studies.⁴ Collecting reliable data will always be difficult in emergency situations, as healthcare providers prioritise treating patients over documenting and control groups are usually not available.⁴⁻⁶

Reports on refugee camp patients vary widely in methodology, points of interest and are often expert opinions or undocumented statements. Most focus on communicable diseases (vector-borne, airborne, foodborne, blood borne and waterborne diseases and infections) such as tuberculosis, malaria and HIV/AIDS, or elucidate immediate effects of disasters (estimated numbers of dead, injured and displaced) and late consequences such as outbreaks, epidemics and mental health problems.⁶⁻¹⁰ As in every refugee or internally displaced persons camp around the world—usually in third world countries—specific patterns of pathology are to be expected (especially respiratory, gastrointestinal and skin infections), secondary to poor sanitary conditions and overcrowding, as well as increase of non-communicable diseases (malnutrition, cancer, chronic lung diseases) and comorbidities (especially diabetes and hypertension) imposing vulnerability due to interruption of care, and psychosocial disorders following violence, journeys in austere circumstances, and the settlement in a new, sometimes hostile environment.^{8 11-13} A literature search reveals that epidemiological studies on health problems of asylum seekers in Europe are scarce, and that they have been conducted in a wide variety of settings (hospital, asylum home, refugee camp, governmental structures) and have highlighted different issues (hygiene, infectious diseases, chronic health problems, mental health, unaccompanied minors), but never provided a comprehensive and complete overview.^{8 9 14-17} Yet it is estimated that one in six refugees has a physical health problem severe enough to affect their life, and two-thirds have experienced anxiety or depression.¹⁸

Objectives

This study aims to document demographics of asylum seekers who arrived in a refugee camp in Brussels in September 2015; to describe symptoms, comorbidities, diagnoses and diagnosis categories of patients presenting to a field hospital in a refugee camp, set up in a

Western European capital; and to formulate recommendations for future relief operations.

MATERIALS AND METHODS

Study design

A retrospective descriptive cross-sectional sample analysis was performed on prospectively obtained medical records, collected by MdM from 5 September to 5 October 2015. This time interval corresponds to the period that the refugee camp and field hospital were present in Brussels.

Setting

Within the refugee camp, MdM erected a level I medical field hospital, consisting of units for 24/7 ambulatory healthcare and psychosocial support.¹⁹ The MdM volunteer team comprised over 400 certified physicians, nurses, pharmacists, logisticians and interpreters. MdM registered all volunteers and verified their diploma and license to work in Belgium. An outpatient assistance team with a physician, a nurse and an interpreter provided on-the-spot healthcare for patients not able to leave their tents, or referred them to the field hospital for further care when necessary.

Registration on admission and basic triage in urgent and less urgent patients was performed by trained nurses. Each patient was subsequently interviewed and examined by physicians, with competent interpreters present during all clinical encounters. Diagnoses were based on the patients' complaints, symptoms and physical examination, as MdM had limited access to diagnostic capability. Patients were treated on the spot if appropriate, vaccinated when needed and received explanations in their own language. Supplies were retrieved from the MdM stockpile and donations. Patients requiring emergency care, laboratory tests, medical imaging or hospitalisation were transferred to hospitals in the Brussels area. Patients requiring follow-up were requested to re-present to the field hospital or referred to primary or dental care facilities, or newborn consultations, with referral letters.

Participants

All patients presenting spontaneously to the field hospital or examined by the outpatient assistance teams were eligible for inclusion. Patients with missing date of presentation, chief complaint or single primary diagnosis were excluded afterwards. Patients in Belgium are legally considered 'minor' when younger than 18 years and 'child' when younger than 15 years.

Variables

A prospectively designed template was used to register data for all patients: age, gender, country of origin (the country the patient was born in, or lived in before fleeing home for the first time), date of arrival in Belgium, whether and when patients had requested or

received an appointment at the Belgian Immigration Office or were already officially registered as asylum seeker, location of shelter, all physical and mental symptoms, the 'chief complaint' and all pre-existing comorbidities.^{20 21} One primary diagnosis per patient was recorded according to a list of 50 possible diagnoses, adapted from case descriptions in the WHO 'Communicable disease control in emergencies' field manual, the Sphere Project Handbook and a template used in previous humanitarian operations.^{20 22 23} Post hoc, trained physicians classified these diagnoses into categories, adapted from International Classification of Diseases Tenth Edition (ICD-10) as described in [table 2](#).²⁴ All patients with clinical signs of local or generalised infection were classified as a subgroup of 'infectious diseases'. Finally, referral was recorded.

Data sources

MdM trained all personnel in collecting data, which were anonymised according to the Helsinki Declaration, and introduced in an Excel database.⁵ A data sharing and research collaboration agreement was signed between MdM and the Research Group on Emergency and Disaster Medicine, Vrije Universiteit Brussel, Belgium.

Bias

Data were recorded by different healthcare providers, and the anonymous records did not allow distinguishing patients possibly inserted twice, potentially introducing a sampling bias. Diagnoses were classified post hoc, possibly introducing a categorisation bias.

Statistical methods

Patients with missing or unreadable data were excluded. Descriptive statistics for discrete outcome variables were presented as frequencies (n), proportions (%) and for quantitative variables (age, number of patients) as measures of central tendency and dispersion (median, range, IQR). The analyses were broken down for age categories (<5, 5–14 and >15 years), gender and period (weeks).

Multiple logistic regression analysis was performed to identify factors associated with the asylum seekers' health problems, by using 'infection' as an outcome variable, by using origin (other vs Syria, Iraq, Morocco and Afghanistan), age category (0–15, >15 years), gender, arrival time in Belgium, asylum state and shelter location as predictors. Analyses were carried out by using IBM SPSS V.23.0. All tests were performed using an α -level of 0.05.

RESULTS

Participants

MdM examined 4037 patients in total, with a median of 137 per day (range 23–199) as shown in online supplementary figure S1. After exclusion of 130 incomplete forms, 3907 patients were included and analysed.

Descriptive data

Of all included patients, 3355 (86%) were male, 510 (13%) female and the gender of 42 (0.8%) was unknown. Median age was 28 years (range 0–93; IQR 12). As [figure 1](#) and online supplementary figure S2 illustrate: 78% (n=3049) were adult men, 9% (n=355) adult women and over 10% (n=391) minors, of whom 303 were children (8%), including 149 (4%) aged 5–14 and 153 (4%) aged under five. The age of 86 (2%) adults and children was unknown. The outpatient

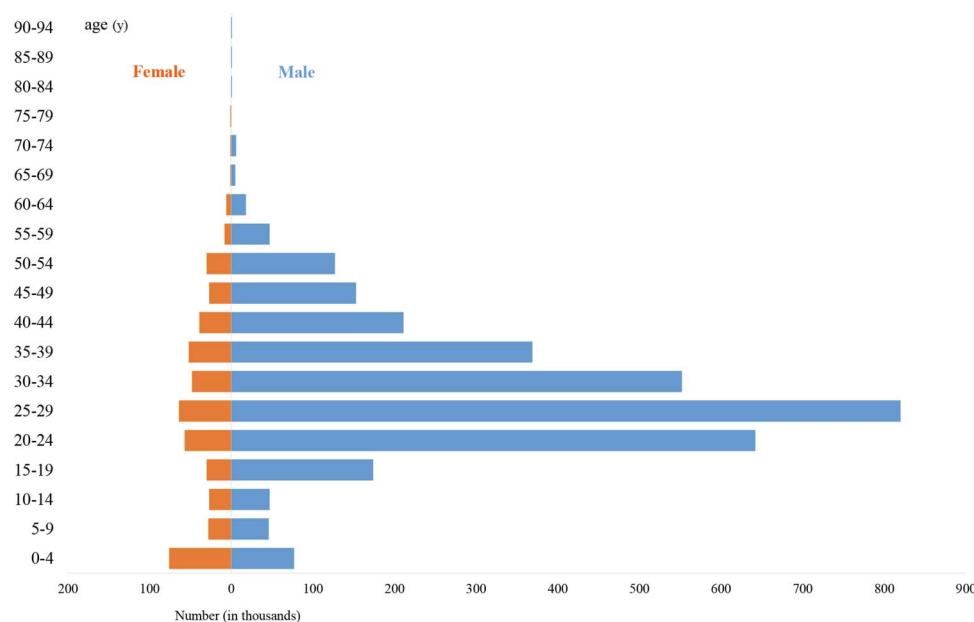


Figure 1 Age distribution of patients by gender.

assistance teams provided care to 46 patients (1.18%) of whom two had to be referred for advanced care.

The region of origin is presented in [figure 2](#). Patients came from 63 different countries (as presented in online supplementary figure S3), but most were from Iraq (n=1950/3778; 52%), Syria (n=737; 20%), Morocco (n=365; 10%), Afghanistan (n=117; 3%) and Palestine (n=96; 3%). Some 1% (n=42) were stateless or came from other continents.

The time interval between arrival in Belgium and consultation, the state of asylum procedure and location of shelter are presented in [table 1](#).

Outcome data

A total of 5768 symptoms (106 different types) were recorded: 2486 patients (64%) had one single symptom, 1039 (27%) expressed two, 320 (8%) three and 61 (2%) four or more symptoms.

The most common symptoms were: cough (n=619/3907; 16%), sore throat (n=590/15%), tooth pain (n=406; 10%), rhinorrhoea (n=397; 10%), headache (n=374; 10%), limb pain (n=248/6%), skin wounds (n=236; 6%), influenza-like symptoms (n=154; 4%), accidental trauma (n=151; 4%), lack of chronic medication (n=138; 4%) and abdominal pain (n=130; 3%). Some 3% reported fever (n=101), 2% anxiety (n=82) and more than 3% (n=126) re-presented for follow-up.

Categorised according to ICD-10, 56% of all patients expressed respiratory symptoms (n=2198), 12% had digestive symptoms (n=482), 12% had musculoskeletal symptoms (n=458), 11% were injured (n=429), 11% had neurological symptoms (n=427), 10% had skin problems (n=406) and 10% expressed dental symptoms (n=406).²⁴ All other categories represented <5% of all patients.

More than 7% of patients reported comorbidities (n=279), most commonly arterial hypertension (n=103)

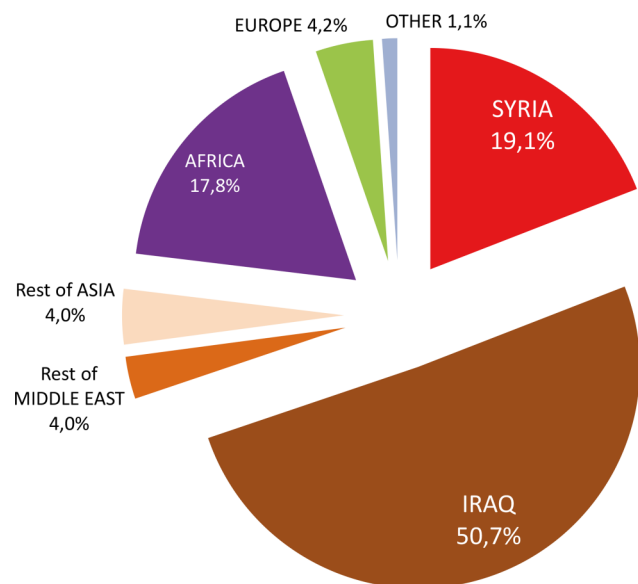


Figure 2 Countries and regions of origin of asylum seekers.

Table 1 Demographic and social details of the sample

	n	Per cent
Time interval of arrival in Belgium		
0–7 days	2251	57.6
8–31 days	629	17.7
32–365 days	338	8.7
>365 days	240	6.1
Unknown	386	9.9
Asylum procedure		
Appointment at BIO to start procedure	1292	33.1
No appointment at BIO to start procedure	1006	25.7
Asylum procedure initiated, waiting for decision	167	4.3
Asylum request denied	69	2.3
Not applicable	91	2.3
Unknown	1282	32.8
Location of accommodation		
Brussels refugee camp (tents)	2209	57.8
Other refugee camps	495	13.0
Governmental asylum seeker centres	362	9.3
Open air	77	2.0
Relatives and friends	29	0.7
Foster family	17	0.4
Other	51	1.3
Unknown	576	14.7

BIO, Belgian Immigration Office.

and/or diabetes (n=96). Patients also reported asthma (n=19), old fractures (n=15), epilepsy (n=14), rheumatism (n=10), recent delivery (n=7), neoplasms (n=6), gastrointestinal (n=5), genitourinary (n=4) or mental disorders (n=3).

Of patients with interrupted maintenance treatment (n=138), 72 had comorbidities: diabetes (24), hypertension (14), asthma (12), epilepsy (8), psychiatric disorders (2) and withdrawal (2). Seven reported lost eyewear, while six infants lacked paediatric formula.

Main results

As represented in [figure 3](#) and [table 2](#), the most common primary diagnoses consisted of upper respiratory tract infections (31%), dental caries (8%), skin infections (8%), gastroenteritis (7%), skin wounds and burns (6%), musculoskeletal disorders (6%) and accidental trauma (6%). Mental disorders were present in 2%. No patient died, one was resuscitated and 35 (1%) were victims of intentional violence in their country of origin, or during the journey to Brussels. Two women had just delivered, and five parents presented with newborn babies.

[Table 2](#) and [figure 4](#) indicate the distribution of diagnostic categories. The most frequent were respiratory disorders (35.5%), far ahead of injury (11.6%), dental (9.5%), skin (8.6%), digestive (7.8%) and musculoskeletal diagnoses (6.1%). In 19 cases (0.5%), there was no

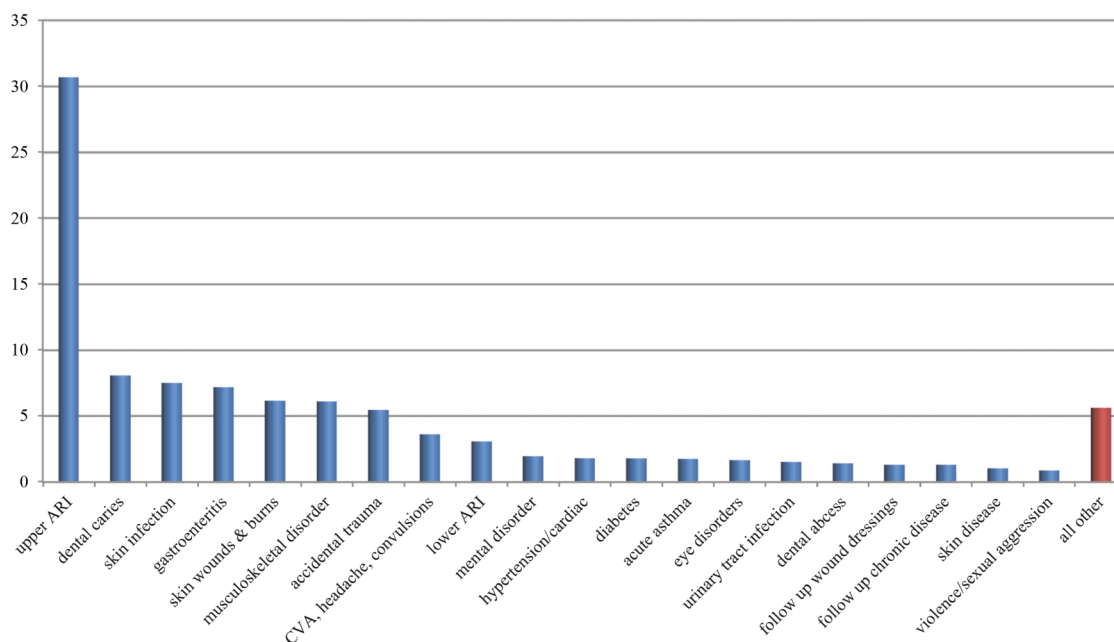


Figure 3 Twenty most common primary diagnoses observed in asylum seekers (%).

actual medical or mental diagnosis, but the patient requested personal attention or sought assistance for social problems.

Analysis of the distribution of diagnostic categories per week did not reveal any considerable changes over time.

Subgroup analyses

Features of infection were found in 1900 (49%) patients, with an even higher frequency (63%) in children younger than 5 years.

The multiple logistic regression analysis in table 3 shows that asylum seekers from Syria and Iraq, and children have a higher risk for infection. We did not detect any other significant risk factors.

Children aged under 5 years represented 4% of the population, with equally distributed gender and a median age of two (range 0–5; IQR 3). The majority originated from Middle East countries (n=118; 77%), median time in Belgium was 3 days (range 0–1500; IQR 9) and most took shelter in tents (n=94;61%). The distribution of diagnostic categories indicates that 50% had respiratory diseases (n=76), 20% digestive disorders (n=30), 14% skin disorders (n=21) and 7% suffered from injuries (n=10). Five (3%) were newborns of whom one had to be hospitalised for bronchiolitis with severe dyspnoea.

Patients were asked to re-present for follow-up in 3% cases (n=121) to the field hospital, and in 4% (n=152) to ambulant consultations, mainly for arterial tension and blood glucose measurements. Referrals were organised for 412 patients (11%): 205 to dentists (5%), 117 (3%) to emergency departments, 70 to psychotherapists (2%) and 20 (0.5%) to mother and newborn care

consultations. Children younger than 5 years were referred 27 times (18% of young children): 15 to ambulant follow-up, 6 to newborn consultations and 2 each to emergency departments, dentists and psychiatrists.

DISCUSSION

Key results

Most asylum seekers arriving in Brussels were young men, in contrast to the usual population distribution in internally displaced persons and refugee camps (50% children, 30% women and 20% men).²² The shortest route between Syria and Brussels is 4000 km, unsuited for children, women and older men, who rather remained in refugee camps near their country of origin.^{11 25–28}

Almost half of the asylum seekers, and two-thirds of children younger than 5 years suffered from infections. The multiple logistic regression analysis suggests that asylum seekers from Syria and Iraq, and children have a higher risk of infection. Also, the Immigration Office registration delay postponed entitlement to shelter, food and (medical) assistance, and the encampment in austere conditions possibly contributed to the large proportion of infections.^{12 14 29}

The overwhelming presence of (mostly upper) acute respiratory infections (ARI) is consistent with existing reports as visualised in table 4.^{8 11 15 16 20 25 30} A possible explanation is that most people from the Middle East and Africa arrived in autumn, in a cold and rainy environment, and were confronted with the typical respiratory viruses of Western Europe they were never exposed to before.^{14 29} Owing to huddling in refugee camps, and many patients coughing, these viruses spread rapidly.¹⁴

Table 2 Diagnostic categories, primary diagnoses and case descriptions

Category	n	Per cent	Primary diagnosis	n	Per cent	Case descriptions
No diagnosis	19	0.5	No medical diagnosis	19	0.5	Social problem, attention seeker
Respiratory	1388	35.5	Upper respiratory tract infection	1199	30.7	Ear, nose, throat, sinus, larynx infections, influenza (upper ARI)
			Lower respiratory tract infection	120	3.1	Dyspnoea, and raised respiratory rate, signs of lower ARI
			Asthma exacerbation	69	1.8	Wheezing and/or respiratory oppression
Eye and Adnexa	67	1.7	Eye disorder	65	1.7	Eye infection and irritation
			Vision problem	2	0.1	Diminished or troubled vision, blindness
Dental	372	9.5	Dental abscess	56	1.4	Clinical suspicion of dental abscess
			Dental caries	316	8.1	Caries with or without pain
Digestive	303	7.8	Watery diarrhoea/abdominal	281	7.2	Loose stools, vomiting, abdominal pain, intestinal parasitosis
			Bloody diarrhoea	5	0.1	Loose stools with visible blood (suspicion of dysentery)
			Malnutrition	15	0.4	Clinical, weight/height >70% or MUAC <110/160 (child/adult)
			Cholera	0	0.0	Severe dehydrating diarrhoea/confirmed case in a non-endemic area
			Jaundice	2	0.1	Acute onset of icterus (skin, conjunctivae, urine)
Neurological	142	3.6	Suspected meningitis	1	0.0	Fever and clinical signs of meningeal irritation
			Flaccid paralysis	0	0.0	Paralysis in children of ≥1 limb, incl. Guillain-Barré or any polio suspicion
			CVA, headache, convulsions	141	3.6	Headache, convulsions, stroke, coma
Genitourinary	97	2.5	Sexual transmittable disease	19	0.5	Suspected STD, vaginal infections with fluor, genital infection
			Urinary tract infection	59	1.5	Dysuria, alguria, pollakisuria, with/without fever, flank pain, or + dipstick
Peripartum	28	0.7	Gynaecological disorder	19	0.5	Irregular menses, breast problems, vaginal bleeding, abortion
			Neonatal illness	1	0.0	Newborns with problems
			Neonatal tetanus	0	0.0	Neonate not sucking/crying normally, rigidity, convulsions
			Healthy newborn baby	4	0.1	Healthy baby <3 weeks old
			Delivery	2	0.1	Mother: imminent delivery or postpartum (<3 weeks)
Skin	335	8.6	(presumed) pregnant	21	0.5	Suspected or confirmed pregnancy
			Skin infection	294	7.5	Redness, pain, abcedation with signs of local infection
			Skin affection	41	1.0	Redness, xerosis, urticaria, psoriasis without infection
General	154	3.9	Surgical cases other than trauma	24	0.6	Herniations, swollen testicles, cysts, haemorrhoids,...
			Fever of unknown origin	9	0.2	>37.5°C axillary or > 38.0°C rectal, without specific diagnosis
			Malaria	0	0.0	Confirmed or suspected malaria, simple or serious
			Measles	0	0.0	Fever and clinical suspicion of measles (vaccinated or not)
			Clinical anaemia	3	0.1	History, pallor, weakness
			Diabetes	70	1.8	Diabetes as main problem, or crisis/ketoacidosis
			Other	35	0.9	All that is not classified elsewhere
			Intoxication	8	0.2	Suspected or confirmed substance abuse
			Neoplasm	5	0.1	Suspected or confirmed oncological disease
			Mental	76	1.9	Mental disorder
Violence	35	0.9	Trauma from aggression	34	0.9	Trauma due to intentional individual injury including rape
			CBRN	1	0.0	Injury from chemical/biological/radiological/nuclear assaults
Injury	454	11.6	Accidental trauma	213	5.5	Accidental trauma from incident, accident (non-violent trauma)
			Acute wounds	241	6.2	Non-intentional acute skin wounds, burns
Musculoskeletal	239	6.1	Musculoskeletal disorder	239	6.1	Non-traumatic pain (muscles, back, pelvic belt, joints), rheumatic
Circulatory	71	1.8	Hypertension/cardiac disorder	71	1.8	Symptomatic hypertension, palpitations, angina pectoris

Continued

Table 2 Continued

Category	n	Per cent	Primary diagnosis	n	Per cent	Case descriptions
Fatality	1	0.0	Resuscitation	1	0.0	Any condition requiring resuscitation of vital functions
			Death	0	0.0	Deceased patients
Follow-up cases	126	3.2	Follow-up wound dressings	57	1.5	Follow-up of wound dressings and injections/vaccinations
			Follow-up fractures and casts	18	0.4	Follow-up old fractures and casts cases
			Follow-up other	51	1.3	Follow-up of chronic illness, other cases
TOTAL	3907	100	Total	3907	100	
Subanalysis			Infectious cases	1900	48.6	All cases with features of infection

+, positive; ARI, acute respiratory infection; CBRN, chemical-burns-radiological-nuclear incidents; CVA, cerebrovascular accident; Incl, including; MUAC, middle upper arm circumference; PTSD, post-traumatic stress disorder; STD, sexually transmitted disease.

This carries a possible burden, as ARIs are a major cause of morbidity and mortality among displaced people.³⁰

Contrarily, the same conditions did not result in a similar spread of intestinal, genitourinary or eye infections, as is usually seen in internally displaced persons or refugee camps.^{15 20 28 29} This was possibly owing to appropriate management of sanitary facilities by MdM.

The important share of dental problems is unusually high for any refugee camp, but consistent with other reports on Syrian refugees.^{11 16 31} It must be considered that most patients were Iraqi who already fled their country after the 2002 invasion to become refugees in Syria, where access to dental or any healthcare was limited.^{11 32} Their long, exhausting travel with limited healthcare facilities might have contributed to transform caries into dental abscesses.

While undertaking their journey, many of the asylum seekers halted in several different camps along the way, sleeping in any fleabag they could find, possibly resulting in the many scabies infections observed.^{8 14 15 28} The proportion of skin infections is consistent with available European reports, but higher than seen in other internally displaced persons and refugee populations analysed the same way.^{8 15 20}

Violent trauma, injuries and musculoskeletal problems were present in almost 20% of the asylum seekers, with a wide variety of causes: accidental trauma was usually from falls, not always related to the journey; acute wounds were either blisters on feet from walking long distances, or infected wounds caused by barbed wire.³³ The musculoskeletal issues—back and limb pain in young men—were often related to the journey as well.^{8 12 15 25} The number of war-related injuries was limited; most had been treated long before arrival in Brussels.²⁵

The proportion of mental disorders was rather low (2%), in contrast to other studies reporting incidences of up to one-third.^{8 12 27 34 35} Even though MdM provided a separate tent (with sufficient privacy and constant availability of interpreters), it is still possible that language barriers, limited time per consultation and the fact that most patients were young men from Middle East countries—not easily expressing emotions to strangers in tents—might have contributed to this low proportion. We do suspect under-reporting of mental problems, as MdM recorded more use of secondary psychological consultations in the field hospital than was registered in this study.

We did not detect a changing pattern of diagnostic categories over time, possibly because the population of the camp was replaced regularly with new arrivals.

Referral to EDs was needed in 3% of the consultations, for varying reasons: suspected fractures, stitches (as stitching in field hospitals encompasses risks of wound infection), pneumonia, confusion and convulsions or syncope, oncological patients who ran out of maintenance treatment. Many referrals were made to dentists' offices, as well as to psychiatrists-psychologist

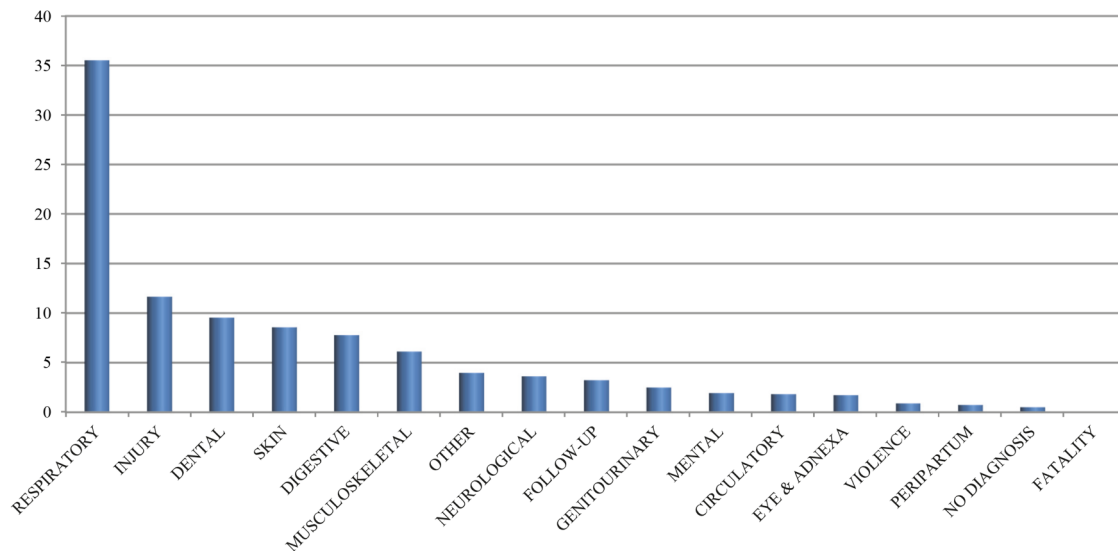


Figure 4 Proportion of diagnostic categories observed in asylum seekers (%).

Table 3 Predictive factors for infectious diseases from a multiple logistic regression analysis

	OR	95% CI of OR		p Value
		Lower	Upper	
Origin (reference: other countries)				
Syria	1.91	1.54	2.38	<0.0001
Iraq	1.85	1.54	2.21	<0.0001
Morocco	0.99	0.76	1.29	0.95
Afghanistan	1.42	0.95	2.12	0.09
Gender (reference: male)				
Female	0.77	0.63	0.95	0.01
Age (reference ≥ 15 years)				
<15 years	1.64	1.28	2.10	<0.0001

when signs of post-traumatic stress disorder were present. Referrals to ambulant consultations were ordinarily for deregulated diabetes and arterial hypertension.

The prevalence of 7% of non-communicable chronic diseases (mainly diabetes, hypertension and asthma) found in this study population was lower than the range in earlier reports, possibly due to the limited number of aged asylum seekers.²⁶ Some 138 patients (4%) lacked maintenance treatment medication, of whom 72 had chronic comorbidities like diabetes and hypertension, and were therefore at risk for deregulation of their clinical condition. For these patients, MdM provided all necessary medication and materials (like insulin, β blockers, puffs, blood glucose meters, urine ketone strips) and provided follow-up or referral.

Nineteen patients (0.5%) did not get a specific medical diagnosis, but were categorised as seeking attention for their distressing situation or looking for non-medical support.

Long-term conditions (including vector-borne and blood borne infections such as leishmaniasis, malaria,

hepatitis B and *Helicobacter pylori*) may have been under-presented or under-diagnosed, as healthcare providers focused more on identifying acute conditions.

It is difficult to draw conclusions from this study about the importation of communicable diseases, one of the mythical concerns raised about immigrants.^{8 12 14} Belgium screens asylum seekers for tuberculosis, but not for HIV, measles, polio or pertussis, diseases usually quoted in the context of refugees.^{8 15 29 32 36} Whenever suspicion was raised, patients were transferred to hospitals for investigation. None of these tests yielded positive results in September 2015.

Limitations and strengths

This study has several limitations. The study included only patients self-presenting or referred by outpatient assistance teams to the field hospital in the autumn of 2015, preventing extrapolation to all asylum seekers, and other seasons. A number of diagnoses remained tentative, since laboratory and imaging tests were unavailable. Patient anonymity prevented longitudinal follow-up. The lack of uniform standards to collect symptoms and diagnoses makes comparison with other data sets challenging.^{6 7}

The strength of this study is the considerable number of well-documented symptoms and physician diagnoses in asylum seekers arriving in Western Europe. To the best of our knowledge, this has not been reported in such detail before. Since Belgium registered 5512 asylum seekers in September 2015, this study sample is of considerable proportion.²

Interpretation

Asylum seekers arriving in a refugee camp in Brussels after a long and hazardous journey suffer mostly from respiratory, dental, skin and digestive diseases, and one of seven is injured. Half of this population shows

Table 4 Comparison of proportional ranges found in other studies on RC and IDP populations (%)

Study	Situation	Eye and adnexa											Infectious cases	NCD	Number
		Respiratory	Dental	Digestive	Genitorurinary	Skin	Mental	Violence	Injury	Musculoskeletal	Circulatory				
This study	RC in Brussels	35.5	1.7	9.5	7.8	2.5	8.6	1.9	0.9	12.5	6.1	1.8	48.6	7.0	3907
Ranges in literature		3–56	2–12	4–21	4–12	3–8	2–9	0–38	0–3	1–39	0–15	1–22	6–90	2–50	
Alberer <i>et al</i> ¹⁵	RC in Germany	23.0	3.6	3.5	9.7	5.3	7.7	1.1			7.7	2.2	39.9	2.6	548
Marquard <i>et al</i> ¹⁶	Refugee minors in Germany			20.6				13.7					58.8	<2.0	102
Bischoff <i>et al</i> ⁸	Refugees in Switzerland	14.1					8.8	13.7		8.6	14.5	4.4	6.3		979
Escobio <i>et al</i> ²⁵	MSF on Balkan route	25.0								30.0					3500
Mateen <i>et al</i> ¹¹	Refugees in Jordan	11.0	10.0	12.1		3.0		1.3	3.4		9.0	22.0	<7.0	11–22	7642
McKenzie <i>et al</i> ³⁴	Refugees in Jordan							1.8							2526
Doocy <i>et al</i> ²⁶	Refugees in Jordan													50.3	1550
Gammouh <i>et al</i> ²⁷	Jordan RC							29.5						30.3	765
UNHCR ²⁸	RC in Jordan	29.7	2.2	2.7	5.6		3.5	1.3	0.5	4.3		5.3	72.1	21.8	694 280
UNHCR ²⁸	RC in Iraq	56.4	3.3		11.7	4.7	4.8	0.5	0.2	2.2	0.1	3.2	89.6	7.4	127 401
UNHCR ²⁸	RC in Lebanon	27.1			4.5	3.0	4.6	1.4	0.1	0.9		2.0	89.3	8.3	52 060
North and Pfefferbaum ³⁵	Review mental health*							11–38							222 studies
Bellos <i>et al</i> ³⁰	Review ARI in crises*	3–55													36 studies
Calvasina <i>et al</i> ³¹	Immigrants in Canada*			9.4											2126
van Berlaer <i>et al</i> ²⁰	FH and IDP in Haiti*	16.5	4.2		10.7	6.8	4.0	2.5	0.0	38.7		1.7	37.8	3.3	2795

*Studies on IDP and refugees not from the Syrian crisis.

ARI, acute respiratory infections; FH, field hospital; IDP, internally displaced persons; MSF, Médecins Sans Frontières; NCD, non-communicable diseases; RC, refugee camp.

features of infection, with asylum seekers from Syria and Iraq, and children being most vulnerable.

The high proportion of respiratory diseases, as in any internally displaced persons or refugee camp worldwide, urges to take ARI preventive measures: adequate shelter, overcrowding reduction, malnutrition prevention and treatment, and scaling up vaccination coverage, in order to meet the Health 2020 policy framework goals.^{29 30} Adequate sanitary facilities are imperative to prevent the spread of infections. Early and resolute healthcare may avoid short-term and long-term complications of infectious, dental, mental and mother and child problems, which otherwise could lead to higher healthcare expenditure for the hosting population.^{12 25}

In emergency medical teams treating asylum seekers, there is an early role for general and emergency physicians, paediatricians, gynaecologists, midwives, dentists and interpreters.^{11 16 30–32} Scaling up with diabetes and hypertension specialists and psychologists is recommended.^{6 8 12 26 27 34 35} In our experience, it is much easier to recruit volunteers for the initial emergency part.

Generalisability

The results of this study can help to better organise healthcare for asylum seekers residing in camps, particularly with respect to the composition of the medical assistance teams and the medical resources.^{6 7} However, in order to meet the specific and changing needs of asylum seekers arriving in Europe, more research is needed to compare and confirm our findings.

The development of a standardised template to prospectively collect and subsequently analyse and report health might make a substantial contribution to provide the evidence base for the effectiveness and efficiency of the preparation, management and mitigation of humanitarian emergencies.^{4 6 7 21}

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