

Quantitative survey on health and violence endured by refugees during their journey and in Calais, France

Malika Bouhenia^{a,*}, Jihane Ben Farhat^a, Matthew E. Coldiron^a, Saif Abdallah^a, Delphine Visentin^b,
Michaël Neuman^c, Mathilde Berthelot^b, Klaudia Porten^a and Sandra Cohuet^a

^aEpicentre, 8 rue Saint-Sabin, Paris, France; ^bMédecins Sans Frontières, Operational Center Paris, Paris, France; ^cMédecins Sans Frontières, Centre de Réflexion sur l'Action et les Saviors Humanitaires, Paris, France

*Corresponding author: Tel: +33 1 40 21 55 55; E-mail: malika.bouhenia@epicentre.msf.org

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Background: In 2015, more than 1 million refugees arrived in Europe. During their travels, refugees often face harsh conditions, violence and torture in transit countries, but there is a lack of quantitative evidence on their experiences. We present the results of a retrospective survey among refugees in the 'Jungle' of Calais, France, to document their health problems and the violence they endured during their journeys.

Methods: We conducted a cross-sectional population-based survey in November and December 2015. The sample size was set at 402 individuals, and geospatial simple random sampling was used. We collected data on demographics, routes travelled, health status, violence and future plans.

Results: Departures from the country of origin increased beginning in September 2015. Sixty-one percent of respondents reported having at least one health problem, especially while in Calais. Overall, 65.6% (95% CI 60.3–70.6) experienced at least one violent event en route; 81.5% of refugees wanted to go to the UK.

Conclusions: This first quantitative survey conducted among refugees in Europe provides important socio-demographic data on refugees living in Calais and describes the high rate of violence they encountered during their journeys. Similar documentation should be repeated throughout Europe in order to better respond to the needs of this vulnerable population.

Keywords: Refugees, Emigrants and immigrants, Health status, Violence, Exposure to violence, Europe, European Union

Introduction

In 2015, an estimated 63.5 million persons were refugees or displaced,¹ including approximately 1 million who arrived in Europe during what has been called the continent's 'migrant crisis'. On their journeys to Europe, refugees have faced harsh conditions. Some have been forcibly detained in transit countries, and violence, including sexual violence and torture, is common. During this mass movement, the European Union (EU) and its member states have left the vast majority of individuals arriving in its territory in precarious living conditions, with little material, medical or legal assistance. Some states have chosen to close their borders, while others have increased the use of immigration detention and have maintained unacceptable living conditions in transit centres.² In addition to being potential human rights violations (UN Universal Declaration of Human Rights,

1948; European Convention on Human Rights; 1951 Refugee Convention), such situations may have a negative impact on individual health and access to health care.

A majority of refugees are young and generally in good health at the time of departure from their home countries.³ However, their health is affected by their dangerous journeys. The most common illnesses include respiratory, dermatological, trauma-related and gastrointestinal conditions.⁴ In addition, many are psychologically vulnerable due to trauma, torture and stays in detention or refugee camps with poor living conditions.⁵ These health problems are aggravated by poor access to care, often due to obstacles such as fear of detection, language barriers, transport issues and fear of racism.⁶ Since refugees are restricted by their legal status, their exposure to violence and health problems, two major humanitarian concerns, remains undocumented.

Since the beginning of the crisis, Médecins Sans Frontières (MSF) has opened operations in several European countries as well as search and rescue operations in the Mediterranean. One such project has been started in Calais in northern France, close to the Euro Tunnel, where around 6000 refugees lived in October 2015. They were gathered in a disordered camp known as the 'Jungle', where, according to the French administrative high court, living conditions were likely to expose refugees to 'inhuman or degrading treatment'.⁷ The site was a former industrial waste zone, lying below sea level in a flood-prone area 7 km from downtown Calais. In September 2015, MSF joined other organizations and began providing free medical and psychological care, as well as waste management and provision of sanitary facilities (toilets and showers) at the site.

The 'European refugee crisis' has represented a major challenge to public health. Better understanding of refugees' health problems, including the violence that they have experienced and potential mental health problems that they have suffered, is essential for providing appropriate services for those who have arrived. Reliable documentation of refugees' journeys would help in-country actors to adapt or open new programmes and could provide significant evidence for advocacy. Some qualitative studies and interviews have been performed, but to date there is a lack of quantitative evidence. Here we present the results of a retrospective survey among refugees of the Jungle of Calais, the goals of which were to document the health and access to care of refugees during their journeys, map the routes taken to arrive in France, describe the violence they endured and document their future plans.

Methods

Study setting and definitions

We conducted a cross-sectional survey in the Jungle, the camp described above. For the purposes of this study, a refugee was defined as a person living in the Jungle who had fled his country of origin, regardless of the official political status afforded to that person. Of note, women and children arriving in the Jungle were moved by the local authorities to a separate off-site facility. We attempted to perform this survey in the facility, but the non-response rate was 50% due to the sensitivity of the questions; results from the off-site facility are not presented here.

Sampling strategy and recruitment

The target population included all individuals residing in the Jungle at the time of the survey. The inclusion criteria were residence in the Jungle at the time of the survey and provision of oral informed consent by the participant or their guardian. There were no exclusions based on age, gender or ethnicity. The camp was mapped and a set of randomly selected global positioning system (GPS) points was overlaid on a satellite image. Points that lay on a shelter were retained and later visited. Survey staff used hand-held GPS devices to locate the selected shelters. In each shelter, one inhabitant was randomly selected for participation in the survey using a random numbers table. Each participant, after providing oral consent, was interviewed in person in his own language. If the residents of a selected shelter were not present at the time of the visit, three additional attempts were made to visit the same shelter. Replacement

shelters and individuals were used if the shelter was unoccupied or if the potential interviewee declined to participate in the survey.

Sample size

The target sample size was calculated to describe a prevalence of any health problem since departure from the country of origin of 50%, with a precision of 95% and an alpha error of 0.05. After allowing for a 10% non-response rate, the target sample size was set at 402 individuals.

Data collection

Data were collected between 24 November and 7 December 2015. The survey was conducted by pairs of interviewers, each interviewer speaking at least one of the several languages spoken in the Jungle. No Tigrinya speakers were able to be recruited to the study team, therefore potential participants speaking only Tigrinya were not able to be included in the survey. Face-to-face interviews were conducted in Arabic, Dari, Pashtu, Urdu, French, Farsi, Kurdish and Amharic, using standardized questionnaires.

We collected data on participants' sociodemographic characteristics; the various steps of their journey, including dates of arrival and departure in each transit country; their health status and access to care along their route; any violent events they experienced along the route and their future plans. The number and type of health problems and violent events were captured by participant self-reports for each transit country (home countries were excluded). When participants responded that they had experienced any health problems or violence, they were asked to describe what happened and the interviewer classified their responses using a standardized list. No nominative data were collected.

Statistical analyses

Means, medians and weighted proportions were used to describe the dataset. Rates were calculated as events per person-time. All data were collected on tablet computers using ODK software (KoBoCollect 2015, KoBoToolbox, Harvard Humanitarian Initiative, Cambridge, MA, USA) and analyses were performed with Stata 13 (StataCorp, College Station, TX, USA).

Ethics statement

The study protocol was reviewed and approved by the Comité de Protection des Personnes of Saint-Germain-en-Laye, France. Oral informed consent was obtained from participants or from a guardian if the participant was less than 15 years of age. To maintain privacy, individual interviews were carried out in a separate area within the shelter or near to it. Anyone requiring medical assistance was immediately referred to a doctor in the MSF clinic, regardless of participation status.

Results

Refugee characteristics

In total, 462 persons were visited, of whom 24 declined participation and 13 were unable to participate because they

spoke only Tigrinya (non-participation rate 8.0%). The population was largely male (95%) and young (median age 25 years [IQR 21–30]); only 4% were less than 15 years of age. A majority of the sample was single (67.8% (95% CI 62.6–72.6) and 95.1% (95% CI 91.8–97.1) had no children present in the Jungle. Sixty percent (95% CI 54.2–65.3) had completed at least a secondary education. Participants' occupations in their home countries are presented along with other characteristics in Table 1.

Origins and routes

Refugees mostly came from East Africa, Central Asia and the Middle East, with Sudanese, Afghans, Iraqis and Iranians representing the largest nationalities present at the time of the survey (Table 2). Overall, 13% (95% CI 10.1–17.6) were Kurdish, 75% of whom were Iraqi. On a subnational level, many participants identified as being from areas experiencing active conflicts. For example, 80% of Sudanese came from Darfur, 78% of Syrians were from either Deraa or Aleppo, 44% of Afghans were

from Pashto tribal areas and 30% of Iraqis were from Kirkuk or Mosul.

Departure dates from the country of origin ranged from November 2000 to November 2015, but a majority of refugees left their countries between June 2015 and September 2015 (Figure 1). Sudanese people left their country fairly consistently beginning in June 2014, while a wave of refugees from Afghanistan, Iraq and Iran started leaving in May 2015 (Figure 1). When the routes taken by the refugees are plotted onto a map, two main itineraries are seen (Figure 2), the first starting from Sudan and the Horn of Africa, passing through Libya and into Italy, and the second passing from South Asia and the Middle East through Turkey, the Balkans and Germany (Figure 2).

Overall, 77.4% (95% CI 72.4–81.7) arrived in Calais after 1 September 2015. The length of time in transit varied significantly by continent of origin. The overall median length of journey was 100 d (IQR 41–498), but for refugees coming from Africa, it was 399 d (IQR 110–741), significantly longer than those coming from the Middle East (46 d [IQR 20–96]) or Asia (90 d [IQR 54–372]).

Table 1. Sociodemographic characteristics of survey participants stratified by age, the Jungle, Calais, France, November–December 2015

	Age		Total (N=425), % (CI)
	<25 years (N=179), % (CI)	≥25 years (N=246), % (CI)	
Male	92.2 (86.5–95.5)	96.9 (93.8–98.5)	95.0 (92.3–96.8)
Marital status			
Single	89.9 (84.4–93.6)	52.5 (45.4–59.5)	67.8 (62.6–72.6)
Married	10.1 (6.4–15.5)	46.1 (39.2–53.3)	31.4 (26.7–36.5)
Divorced	—	0.9 (0.2–3.8)	0.5 (0.1–2.2)
Widowed	—	0.3 (0.5–2.6)	0.3 (0.0–1.6)
Number of children in Calais			
0	97.3 (90.8–99.2)	93.4 (88.9–96.2)	95.1 (91.8–97.1)
1–2	0.7 (1.1–3.3)	5.0 (2.6–9.7)	3.3 (1.7–6.1)
>2	1.9 (0.4–9.6)	1.4 (0.6–3.5)	1.6 (0.6–4.1)
Occupation in the country of origin			
Student	31.9 (24.8–40.1)	10.4 (6.8–15.9)	19.2 (15.4–23.8)
Retail	11.2 (7.1–17.1)	19.0 (14.0–25.2)	15.7 (12.3–20.0)
Agriculture	10.4 (6.2–17.0)	15.2 (10.7–21.3)	13.3 (9.9–17.6)
Construction	7.7 (4.1–14.0)	11 (7.1–16.7)	9.6 (6.7–13.6)
Engineering/IT	3.3 (1.1–9.4)	4.6 (2.4–8.9)	4.1 (2.3–7.2)
Teacher	1.6 (0.4–6.3)	3.4 (1.8–6.5)	2.7 (1.5–4.9)
Soldier/Police	2.3 (0.9–6.0)	2.7 (1.3–5.7)	2.6 (1.4–4.6)
Medical	0	1.1 (0.4–3.5)	0.7 (0.2–2.0)
None	19.9 (13.8–27.2)	11.7 (7.6–17.4)	15.0 (11.4–19.6)
Other*	11.5 (7.4–17.4)	20.8 (15.6–27.1)	17.0 (13.3–21.3)
Highest level of education			
None	24.4 (17.6–32.8)	16.0 (11.6–21.6)	19.4 (15.4–24.2)
Primary	23.5 (17.6–30.7)	18.8 (13.1–26.1)	20.7 (16.4–25.7)
Secondary	34.5 (27.1–42.8)	35.3 (28.7–42.5)	35.0 (30.0–40.3)
Tertiary	17.6 (11.9–25.3)	29.9 (23.8–36.8)	24.9 (20.5–29.9)
Arrived in Calais after 1 September 2015	83.6 (76.4–88.9)	73.1 (66.2–79.0)	77.4 (72.4–81.7)

*Mostly drivers and unskilled workers. IT: information technology.

Table 2. Country of origin of survey participants, the Jungle, Calais, France, November–December 2015

Country of origin	Total, % (CI)
Sudan	33.3 (28.0–39.1)
Afghanistan	18.3 (14.5–22.7)
Iraq*	12.8 (9.4–17.2)
Iran*	11.5 (8.4–15.6)
Syria	7.3 (4.9–10.7)
Eritrea	6.9 (4.7–10.0)
Pakistan	3.0 (1.6–5.6)
Ethiopia	1.7 (0.8–3.6)
Egypt	0.7 (0.2–2.2)
Kuwait	0.4 (0.1–4.6)
Other	3.2 (1.9–5.3)

*In total, 13.4% (95% CI 10.1–17.6) of refugees were Kurdish; 74.6% of them were from Iraq.

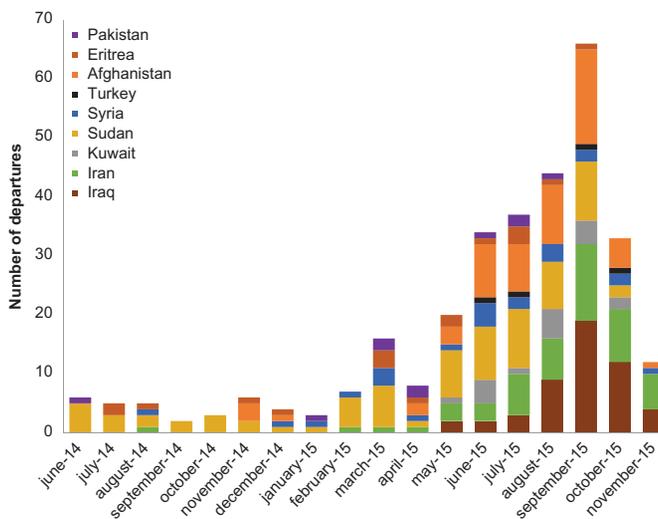


Figure 1. Date of departure from country of origin, refugees in the Jungle, Calais, France, November–December 2015.

This difference is largely due to long stays in Libya, where the median length of stay was 180 d (IQR 60–490). In all other transit countries, the median amount of time spent in the country was less than 10 d. The median length of stay in the Jungle was relatively short, at 58 d (IQR 28–90). Figure 3 shows the dates of arrival of the refugees in Calais, starting in February 2015, with a peak observed in October 2015.

Medical problems

During the journey and in Calais, 61.4% (95% CI 56.1–66.4) of refugees reported having at least one medical problem and 16.6% (95% CI 12.9–21.0) had multiple health complaints (Table 3). Among all refugees, 62.3% (95% CI 55.0–69.0) had at

least one medical problem in Calais and 8.4% (95% CI 5.1–12.7) in Libya. Among refugees reporting at least one medical problem, 44.4% (95% CI 37.6–51.4) reported an upper respiratory condition (e.g., common cold, pharyngitis, laryngitis), 19.1% (95% CI 14.3–25.0) had a lower respiratory tract infection (e.g., pneumonia, bronchitis) and 6.6% (95% CI 3.4–12.5) had a traumatic injury. Throughout their journeys, access to care was problematic and varied depending on location: 39.9% (95% CI 31.0–48.2) of those who reported a medical problem while in Calais did not have access to care (Table 3).

Violence

Overall, 65.6% (95% CI 60.3–70.6) reported experiencing at least one act of violence during their journey or in Calais (Table 4) and 28.5% (95% CI 23.8–33.6) encountered multiple violent events. Among those who reported at least one violent event, 30.8% (95% CI 25.1–37.2) reported at least one act of violence in Libya and 25.3% (95% CI 19.9–31.6) in Calais. The most common type of violence reported was assault and battery (45.7% [95% CI 39.9–52.2]), while 26.9% (95% CI 21.4–33.4) reported facing tear gas and 14.2% (95% CI 10.1–19.6) reported experiencing repeated violence with forced detention. Reported types of violence differed by country: tear gas was most common in Calais and repeated violence with forced detention was common in Libya. Detention was a common practice in many transit countries (Figure 4). Figure 5 presents the rate of reported violent events experienced per 100 person-days, illustrating that in some transit countries, although the stays were relatively brief, passage through the country was marked by a particularly high rate of violence, especially in the Balkans and Eastern Europe.

Planned next steps

In total, 91.7% of refugees had not applied for asylum in the Schengen Zone of Europe, 1.6% (95% CI 0.6–4.2) had been afforded asylum, 5.4% (95% CI 3.1–9.1) were awaiting a ruling and 0.6% (95% CI 0.2–1.8) had been rejected. Overall, 71.0% (95% CI 65.4–76.0) reported not knowing how to ask for asylum in France and 82% (95% CI 76.3–85.8) wanted to try to go to the UK, of whom 51.5% (95% CI 45.4–57.6) had at least one close relative there (Table 5).

Discussion

To our knowledge, this is the first quantitative study undertaken in Europe aimed at describing the origin and paths of refugees, with particular attention on the incidence of violence along their routes to Europe. We have described the residents of the Jungle outside of Calais in November–December 2015. The camp’s population was largely young men, many of whom came from regions of their countries experiencing armed conflict. Perhaps because of their youth, the health problems they have experienced along the way have been relatively minor, although their access to care has been limited. We have also described the pervasive violence experienced by these refugees during their voyages.

According to the United Nations High Commissioner on Refugees (UNHCR), Syrians, Afghans and Somalis are the three

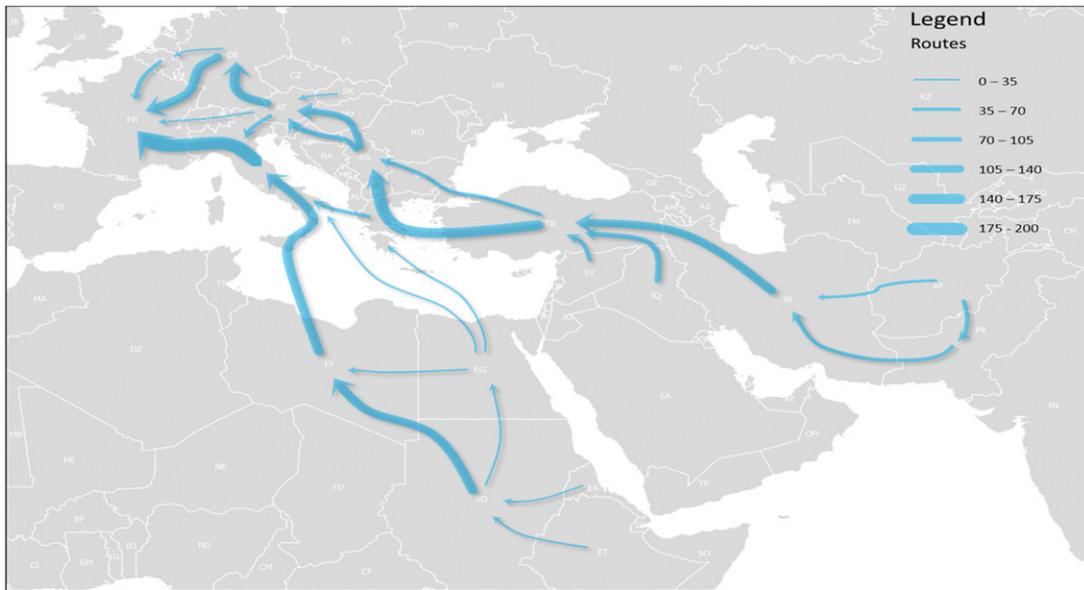


Figure 2. Route taken by refugees to reach Calais, Calais, France, November–December 2015.

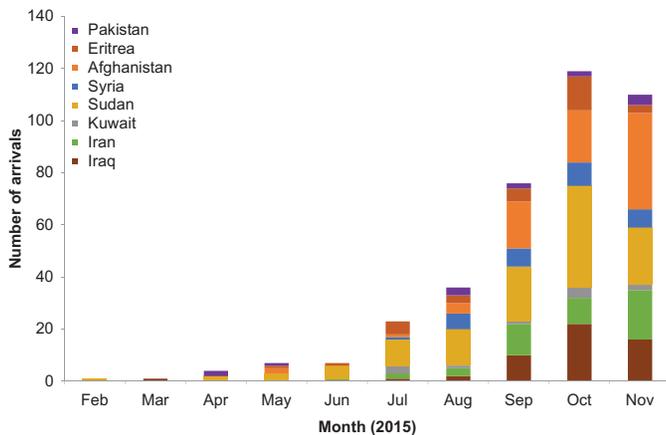


Figure 3. Date of refugee arrival in the Jungle, Calais, France, November–December 2015.

largest groups arriving in Europe,¹ so the refugees arriving in the Jungle are not representative of all refugees arriving in Europe. Regarding the low number of Syrians, this could be explained by their preference for Germany, obviating the need to pass through Calais, which is a transit hub to the UK. Formal temporary housing centres also have more space dedicated for Syrians, 97% of whose refugee applications were accepted in 2015.⁸

An added value of our results is the description of the origin of refugees at a subnational level. Not only did most refugees come from the top 10 refugee-producing countries, but we were also able to show that they largely came from conflict areas, such as the Sudanese from Darfur, where since 2003, crimes against humanity have been perpetrated; Afghans who came from Pashto tribal areas, where there is a strong presence of the Taliban; or Iraqis, who mostly came from cities in Kurdistan beset by conflict with the Islamic State (Kirkuk and

Mosul). As no census of the population of Calais exists, this study is the first to provide information on the origins of refugees. Our findings contradict the popular myth that most refugees come for economic reasons, thus advocating for the protection needs of this population.

Analysis of departures and arrivals highlights that there was a peak of departures in September 2015, largely from South Asia and the Middle East that led to a peak of arrivals in Calais in October 2015. This is consistent with estimations of the French police in Calais (4500–6000 people as of October 2015) and also with UNHCR estimations that the number of people crossing the Mediterranean increased 40-fold between January and October.⁹ The land routes tended to be quicker and follow major roads throughout Turkey, the Balkans and Central Europe. Many refugees originating from Sudan and the Horn of Africa were forced to pass through Libya and then cross the Mediterranean in boats. Delays in Libya led to significantly longer total journey times. Most refugees crossed Europe rapidly, although many had left their countries of origin before the ‘domino effect’ of border closures in Europe (Hungary closed its border with Serbia on 16 September 2015, and a joint decision on 18 November 2015 of Slovenia, Croatia and Serbia allowed only Syrians, Afghans and Iraqis to enter).² The sudden influx of refugees is indicative of a humanitarian crisis and requires European countries to take responsibility for providing medical and social assistance to this population.

The main objective of this survey was to assess the health status of refugees during their journey and, while two-thirds of people reported at least one health problem, most conditions should be considered minor. This observation should not be confused with what is generally referred to as the ‘healthy immigrant effect’, suggesting that immigrants are healthier than the population of host countries; instead, it reflects the fact that refugees in Calais are a young population who need to be in good health to be able to reach Calais after the long journeys described.¹⁰ Of note, conditions commonly reported among refugees on arrival

Table 3. Reported main medical problems encountered by refugees after departure from their homes, the Jungle, Calais, France, November–December 2015

	% (CI)
Reported at least one medical problem during the journey	61.4 (56.1–66.4)
If yes, where?	
Calais	62.3 (55.0–69.0)
Libya	8.4 (5.1–13.5)
Greece	7.7 (4.6–12.7)
France (not Calais)	7.5 (4.6–12.1)
Turkey	7.1 (4.6–10.9)
If yes, type of medical problem?	
Upper respiratory	44.4 (37.6–51.4)
Lower respiratory	19.1 (14.3–25.0)
Gastrointestinal	7.4 (4.6–11.9)
Trauma	6.6 (3.4–12.5)
Non-access to health care*	
Libya	69.2 (38.9–88.8)
Turkey	74.2 (48.3–89.9)
Greece	54.1 (26.8–79.1)
France	41.3 (18.5–68.5)
Calais	39.3 (31.0–48.2)

*Non-exclusive, categories do not add–100%.

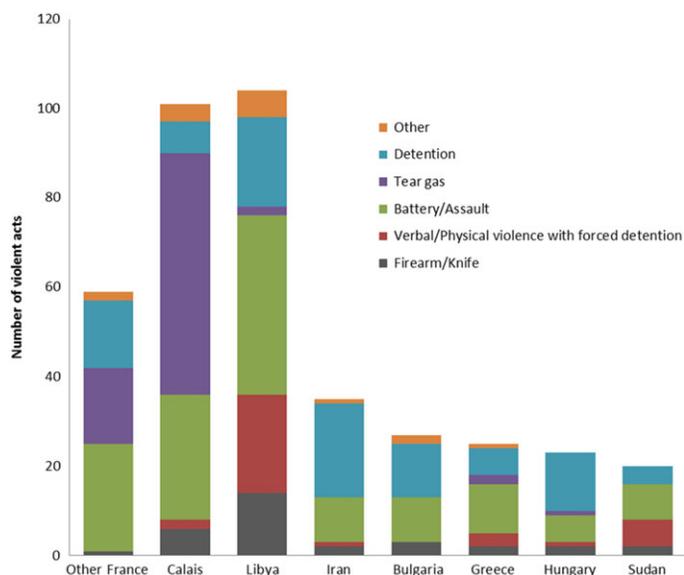
in transit countries (e.g., hypoglycaemia, minor injuries) were not reported.³ Relatively few medical problems were reported in Libya, considering the long stay and difficult living conditions there, which could be because respondents tended to mention their most recent health problems. Our findings concerning the type of medical problems encountered is consistent with observations of MSF clinics in Greece and Serbia where around 40% of consultations were respiratory infections and 10–15% were traumas.¹¹ Mental health problems such as post-traumatic disorders and depression were not reported. However, under-reporting may be an issue, as participants may not consider this a health problem. Moreover, we did not actively screen for mental health disorders, as there was insufficient capacity to provide adequate follow-up when the survey was conducted.

Our description of reported violence is highly detailed in terms of time and place, but also in terms of the type of violence experienced. Several hotspots were prominent: the number of violent events reported in Libya was quite high and included many occurrences of repeated violence with forced detention, but the rate of violence was comparatively low because of the long stays. This stands in contrast to several countries in the Balkans and Central Europe, where the rates of violence per person-time were the highest over the entire journey. In these highly violent environments, refugees' stays were brief. While the poor living conditions in the Jungle have been well described, it may come as a surprise that the absolute number of violent events reported in the camp itself was quite high and the majority were due to tear gas fired by police forces. These findings suggest that refugees constitute a

Table 4. Type and place of violence during the journey, the Jungle, Calais, France, November–December 2015

	% (CI)
Violence encountered at least once during the journey and in Calais	65.6 (60.3–70.6)
If yes, where*	
Libya	30.8 (25.1–37.2)
Calais	25.3 (19.9–31.6)
Iran	9.9 (6.4–14.9)
Sudan	8.2 (5.0–13.2)
Bulgaria	6.9 (4.4–10.7)
Type of violence*	
Assault and battery	45.7 (39.3–52.2)
Detention	35.8 (29.6–42.5)
Tear gas	26.9 (21.4–33.4)
Repeated violence with forced detention	14.2 (10.1–19.6)

*Non-exclusive, categories do not add –100%.

**Figure 4.** Type of violence in selected countries, refugees in the Jungle, Calais, Other France, November–December 2015.

vulnerable population experiencing often-ignored high rates of violence. This should be brought to the attention of political and medical authorities as well as the general public. Mental health care, with particular attention to post-traumatic stress, disorder, should be integrated in services provided to refugees.

Most refugees in Calais see France only as a transit country, as their goal is to reach the UK, even though only half of them have close family ties there. While the French Office for Protection of Refugees and Stateless Persons reports a 33.3% increase in accepted asylum applications between 2014 and 2015,¹² we have documented an extremely low rate of asylum applications among the study population. This is probably due

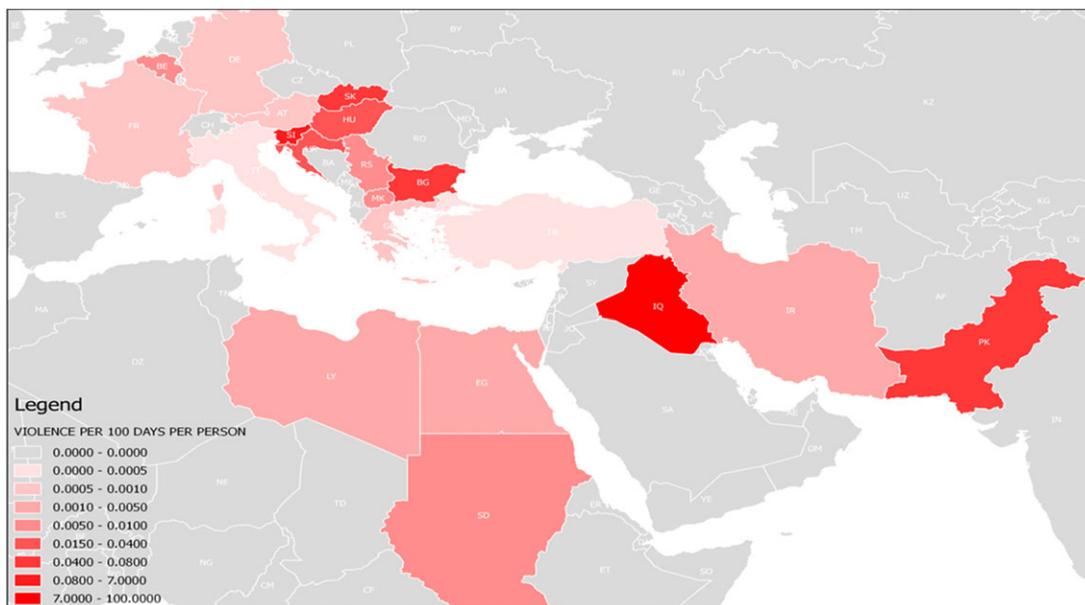


Figure 5. Reported violent events experienced per 100 person-days in crossed countries, refugees in the Jungle, Calais, France, November-December 2015.

Table 5. Planned next steps, the Jungle, Calais, France, November-December 2015

	Total, % (CI)
Know how to apply for asylum in France	
Yes	29.0 (24.0–34.6)
Application for asylum (N=425)	
Yes	8.3 (5.5–12.3)
If yes, in which country?	
France	79.4 (60.3–90.7)
Italy	8.6 (2.8–23.5)
Malta	2.7 (0.3–18)
Other	9.3 (2.7–27.7)
Asylum (N=425)	
Asylum given	1.6 (0.6–4.2)
Awaiting ruling	5.4 (3.1–9.1)
Asylum rejected	0.6 (0.2–1.8)
Planned next steps (N=425)	
Stay in France	12.0 (8.6–16.4)
Go to England	81.5 (76.3–85.8)
Other	6.5 (3.9–10.7)
Among those who want to go to England, having family member in England (N=355)	
Yes	51.5 (45.4–57.6)

to the fact that many participants were determined to continue across the English Channel.

Today, the Jungle has been dismantled, most refugees were transferred to refugee centres across France and some children were relocated to the UK.¹³ This study describes the unknown

population of the Jungle and helps actors like MSF understand refugee health needs in Europe and adapt their programme in the different countries where they are involved. Furthermore, the data on violence demonstrate to European countries the obligation of providing humanitarian protection and the need for practitioners to assess mental health in their programmes.

One of the major limitations of this survey is that the proportion of women included was very small. We were unable to conduct the survey successfully in the separate facility housing women and children, so our results cannot be considered representative of women and children refugees in Calais. This is important because by November 2015, women and children comprised up to 42% of the population transiting from Turkey to Greece and through the western Balkans (18% and 24%, respectively).¹⁴ This may have led to an under-reporting of sexual violence, especially considering qualitative evidence reported elsewhere,¹⁵ which in any case may have been difficult for participants to discuss in the setting of a cross-sectional survey. Secondly, we were forced to exclude a small number of Eritreans who spoke exclusively Tigrinya. However, the majority of Eritreans spoke Arabic or English and were interviewed in these languages. Imprecisions regarding the dates of certain events could have led to misclassification bias. Self-reporting of health problems might have led to misclassification or underestimation; however, our main findings are consistent with studies on migration and health.

Conclusion

To our knowledge, this is the first quantitative survey conducted among refugees in Europe. It provides important sociodemographic data on refugees living in Calais. More importantly, it describes in detail the heterogeneous paths of refugees and the high rates of violence they encountered during their journeys. The survey also highlights that the majority of refugees left areas of

active conflict, fleeing shelling and unsafe living conditions. As with any study that addresses such complex and sensitive issues, there may have been some under-reporting of important events, but the trends are nonetheless clear. To better respond to the needs of this vulnerable population, continued documentation of refugee health, mental health and violence encountered in transit should be repeated frequently throughout Europe.

Authors' contributions: MBo, JB, SC and KP conceived the study. MBo, JB and SC designed the study protocol. MBo and SA carried out the field assessment. JB and MBo carried out the analysis of data. MBo and JB drafted the manuscript. DV and MBe provided support during the assessment. MEC, MN and SC critically revised the manuscript for intellectual content. KP and SC were responsible for the survey. All authors read and approved the final manuscript. MBo is the guarantor of this paper.

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