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**ABSTRACT** This report aims to describe the epidemiologic findings of the workload associated with paediatric consultation of the Moroccan Military field hospital in the Gaza Strip. The patient Administration System and Biostatistics Activity database was reviewed and queried for all patients. 

**RÉSUMÉ** Le présent rapport a pour objectif de décrire les résultats épidémiologiques découplant de l’étude de la charge de travail associée aux consultations pédiatriques de l’hôpital de
Introduction

On 14 November 2012 the Israeli army launched the largest military attack recorded since 2009, Operation Pillar. According to a report from the UN Office of Humanitarian Affairs, many civilians were wounded on both sides: 160 Palestinians were killed, among them 33 children, 13 women and 3 journalists, while 4 Israeli civilians and 2 soldiers were killed (1).

The rationale behind setting up the Moroccan military field hospital in the Gaza Strip was to provide medical assistance to the Palestinian people affected by the conflict and to complement existing medical structures. The Moroccan field hospital is a medical–surgical hospital, equipped with specialized medical units of the Royal Armed Forces and Moroccan civilian physicians and paramedics. Paediatric care consisted of providing patients with general physical examination, primary treatment, thoracic radiography, drugs/medication, diapers and milk free of charge.

In war zones such as the Gaza Strip, children are the most vulnerable, and often account for the heaviest losses in numbers of dead and injured and in psychological damage. In view of the
importance of measuring the extent of such situations, this report aims to inform on the number of cases of each condition diagnosed, detailed by age and sex, which will help in predicting needs for any interventions in future missions.

It should be noted that in 2012 a similar humanitarian initiative was carried out in Jordan, the Moroccan field hospital in the Zaatar refugee camp (2,3).

**Methods**

We carried out a descriptive qualitative study based on the patient administration system and biostatistics activity database that was reviewed for all patients ≤ 15 years of age who attended the Moroccan army field hospital in the Gaza Strip between November 2012 to February 2013. The hospital was deployed 48 hours after the start of the ceasefire between Palestinian organizations and Israel.

During the mission, data on all patients who attended the military field hospital during the study period were recorded in a database maintained by an agent of the Patient Administration Systems and Biostatistics Activity. This held information on all patients aged ≤ 15 years who attended the hospital. The database was reviewed each day by the doctor responsible for the accurate registry of data. All relevant information on the patients gathered in the consultation and in conversation with the parents was reported. This was summarized at the end of each day and recorded in the database by the agent responsible and double-checked by the consulting doctor.

Prior to any admission, the patients and/or their parents were asked if they would consent to sharing information anonymously on age, sex, date of examination and diagnosis and answers to questions relevant to the diagnosis. All patients agreed to the request.

In order to represent the epidemiological profile in the Gaza Strip, and more specifically the patients attending the Moroccan military field hospital during the period of the mission, all the patients aged ≤ 15 years (7420) were considered as the population of the current study. This profile was compiled using spreadsheet data summary (MS Excel, 2016), and designed as a descriptive and quantitative study. This study is a retrospective one, conducted over a 70-day period from November 2012 to February 2013, covering all children admitted in the paediatric unit. However, psychiatric diseases and paediatric surgery were beyond the scope of the study.
All ethical considerations were taken into account (respect of persons, benefit of the patients and justice).

**Results**

A total of 37,227 patients consulted the field hospital, of whom 7,420 (19.9%) were children aged ≤ 15 years. Our data for each patient documented age, sex and diagnosis. More than half the patients were female, 3,952 (56.1%), a sex ratio of 1:0.71. The median age was 3 years; 15.1% were aged under 28 days, 30.6% were aged 28 days to 1 year, and 48.3% were aged ≥ 2 years.

Most of the children admitted had pulmonary diseases (37.4%), mainly influenza-like illness (67.0%), with 20.0% having infections of lower respiratory tract. Asthma and broncholaveolitis accounted for 5% each, while the rest was admitted for allergic rhinitis (Table 2).

Nearly a quarter of admission were for gastroenterology (23.1%), with around half of these affected by parasitic infections and intestinal worms and around one-fifth diagnosed with gastroenteritis/diarrhoea (Table 2). Oxyuriasis was by far the dominant condition under the parasitic infections and intestinal worms classification, with 591 cases, followed by 169 cases of amoebiasis, and 30 cases of Blastocystis hominis. We found a small number of parasitic coinfections (Table 3).

Of the 7,420 patients admitted to the hospital, 1,201 had ear, nose and throat conditions (16.2%). Angina-pharyngitis affected two-thirds of the cases and 20.0% were sinusitis-related (Table 2).

Colic accounted for almost half the neonatological disease cases, while around one-third were attributed to neonatal infection and 13.0% were for jaundice (Table 2).

Only 5.7% of the consultations resulted in a diagnosis of dermatologic disease. Half these patients presented with diaper rash, and about a third were diagnosed with eruptive fever (Table 2).

Febrile convulsion were the most common neurologic conditions seen, with 37.5% of the 136 patients, followed by a 19.1% presenting with epilepsy. Some 32 cases were suspected...
meningitis and were transferred to Al Quds Hospital (Table 2).

The remaining sets of diagnosis are nephrology, haematology and other diseases with 405, 115 and 45 cases respectively. There was a relatively high demand for milk and diapers: they were asked for in 1 in 5 consultations (1549).

From our conversations with the patients and their parents, we estimated 72% of the children were experiencing second hand smoking.

**Discussion**

Paediatric patients accounted for 19.9% of all hospital consultations to the military treatment facilities in Gaza strip between November 2012 and February 2013. The most common diagnoses were for pulmonary and gastroenterology diseases, with high frequencies of influenza-like illness, lower and upper respiratory tract infection and digestive parasitic infections.

It is worth noting that in a similar humanitarian action deployed by the Moroccan Military field Hospital in Zaatari Camp, the epidemiological profile of Syrian refugee children shows dehydration as the primary reason for admission (64%), followed by urinary infections (15%) then pulmonary diseases (10%) (2). In a similar study by Benjelloun et al. in the Zaatari Camp, asthma was the most prevalent disease in males under age 18 years (3).

We are the first humanitarian mission to publish on the epidemiological profile of the Gaza Strip. However, in order to understand the situation and to put our results into perspective, it must be remembered that the Gaza Strip is a very small area of land (360 km²), housing a population of 1.8 million, where 43.2% are under 14 years old, and the median age is 18.4 years, ranking Gaza as one of the most densely populated places on earth (4). Given that the birth rate is 32.2 births/1000 population, a total fertility rate of 4.42 children born/woman, and the mother’s average age at first birth is 19 years old, it is clear that paediatric care is greatly needed.

Passive smoking is an important issue as well in the Gaza Strip. In fact, we estimated 72% of the children in our sample experienced second hand smoking. Smoking prevalence in Gaza is 13.7% (5). In Zaatari Refugee Camp, Benjelloun et al. reported 70% of the pedantic patients who consulted for pulmonary disease were exposed to smoking (3).
One of the results of our analysis shows a high number of cases related to parasitic infections, with an overall prevalence of 11.1%. The study by Al-Shawa on the prevalence of intestinal parasites in different provinces of Gaza found 20.00% in Rafah camp, 19.97% in the mid zone, 18.96% in Khan Yonis, 17.14% in the North and a low prevalence in Gaza of 15.05% (6). In a 2008 study by Abu Amra et al., the total coliform contamination reached 22% in wells and 25% in water supplies, exceeding World Health Organization recommendations. Waterborne diseases are frequent because of poor chlorination, and irregular water supply, which is the case for the infrastructure in Gaza (7).

This introduces the quality of the sanitation system infrastructure: a partially functioning wastewater treatment system, an overloaded capacity and no disposal management has led to the use of some coastal sites for waste disposal and landfill (6,8), therefore affecting the sand beach and seawater quality. Gaza beach is the only recreational site in this area, making it a hazard, and a 2005 study showed higher levels of fecal coliform in sand than in seawater (8).

While some parasitic infections are not pathologic or even clinically evident, a number can lead to significant long-term morbidity or mortality. Examples include hookworm infestation causing severe anaemia and malnutrition; Ascaris infections causing small bowel obstruction; Schistosoma causing periportal hypertension; and Strongyloides causing acute hyperinfection syndrome in immunosuppressed patients (9). Early detection is key in this vulnerable population to prevent complications as well as to minimize any possible exposure of the greater Gaza public to nonendemic infections.

In 2014, the blockade imposed by the Israeli army on Palestine left at least 21% of the inhabitants of Gaza in extreme poverty, and led to malnutrition and more restrictions in the trade in goods (10). Additionally, the estimated impact of the 2007–2010 economic blockade was a 30% loss in welfare and a large decline in labour productivity (11). This partially explains the high demands for milk and diapers, 1549 demands during our military field mission.

Our study is the first to depict the epidemiological profile in the Gaza Strip, and it benefited from the willingness of the Palestinian authorities and people to provide the necessary data for the study. Although, all available paediatric data were used, there is a need for a more comprehensive study and this should include an epidemiological profile of all admissions (adults, other field hospitals, etc.) and go deeper into explaining the patterns observed, if any. The lack of similar published studies on paediatric care in war zones makes it more difficult to reveal patterns.
Marked by a fragile geopolitical setting, very weak infrastructure, and scarce human, financial and technical resources, the situation in Gaza warrants more attention, particularly aimed at children and adolescents. In fact, the high numbers of admissions in the paediatric unit highlight the essential role of paediatricians in war zones and the delicate state of children’s health.

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**References**


10. OMS soixante–septième assemblée mondiale de la sante. Situation sanitaire dans le territoire palestinien occupé, y compris Jérusalem-Est, et dans le Golan syrien occupé, Point 19