

# CLINICAL SOCIAL WORK AND HEALTH INTERVENTION

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## Original Articles

**IMPORTED TROPICAL DISEASES IN INTERNATIONAL TRAVELERS AND MIGRANTS BETWEEN 2000-2012: OVERVIEW OF 179 CASES IN A SINGLE TRAVEL CLINIC**

**COMMONEST PARASITIC INFECTIONS IN MIGRANTS FROM MIDDLE EAST CROSSING SCHENGEN BORDER AND COMPARISON TO GENERAL POPULATION IN EAST SLOVAKIA AND TO SLUM POPULATION OF ECONOMIC REFUGEES TO NAIROBI**

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**Monothematic Issue:**  
Migrant and Refugee Health and Social Work

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Suzan Dudo, Erbil, Iraq  
Hajj Peri, Aleppo, Syria  
György Herdics, Vamoszabadi, Hungary

Dedicated to prof. Marian Karvaj's 60th birthday.

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## Guest Editorial

Migrant Crisis in Mediterranean Europe expanding to whole EU is currently a burning issue in Social pathology in Europe. Health consequences are a logical problem subsequently following the largest Migrant and Refugee Event since Holocaust. The current issue of this Journal presents original articles on migrant Social Pathology and Refugee Health from the beginning (Iraq, Syria, etc.) to central Europe through their via dolorosa (Greece, Hungary). Another group of papers result original research among displaced population in Central Africa (Rwanda, DRC, Burundi, Kenya, Sudan). We hope that the Crisis will terminate soon and this special issue on Migrants and Refugees will be the last issue on this topic.

Vladimir Krcmery  
György Herdics  
*Guest Editors*





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## Few words from the Edition in Chief

This journal brings authentic experiences of our social workers, doctors and teachers working for the International Scientific Group of Applied Preventive Medicine I-GAP Vienna in Austria, where we have been preparing students for the social practise over a number of years. Our goal is to create an appropriate studying programme for social workers, a programme which would help them to fully develop their knowledge, skills and qualification. The quality level in social work studying programme is increasing along with the growing demand for social workers.

Students want to grasp both: theoretical knowledge and also the practical models used in social work. And it is our obligation to present and help students understand the theory of social work as well as showing them how to use these theoretical findings in evaluating the current social situation, setting the right goals and planning their projects.

This is a multidimensional process including integration on many levels. Students must respect client's individuality, value the social work and ethics. They must be attentive to their client's problems and do their best in applying their theoretical knowledge into practice.

It is a challenge to deliver all this to our students. That is also why we have decided to start publishing our journal. We prefer to use the term 'clinical social work' rather than social work even though the second term mentioned is more common. There is some tension in the profession of a social worker coming from the incongruity about the aim of the actual social work practice. The question is whether its mission is a global change of society or an individual change within families. What we can agree on, is that our commitment is to help people reducing and solving the problems which result from their unfortunate social conditions. We believe that it is not only our professional but also ethical responsibility to provide therapeutic help to individual and families whose lives have been marked with serious social difficulties.

Finding answers and solutions to these problems should be a part of a free and independent discussion forum within this journal. We would like to encourage you – social workers, students, teachers and all who are interested, to express your opinions and ideas by publishing in our journal. Also, there is an individual category for students' projects.

In the past few years there have been a lot of talks about the language suitable for use in the field of the social work. According to Freud, a client may be understood as a patient and a therapist is to be seen as a doctor. Terminology used to describe the relationship between the two also depends on theoretical approach. Different theories use different vocabulary as you can see also on the pages of our journal.

Specialization of clinical social work programmes provides a wide range of education. We are determined to pass our knowledge to the students and train their skills so they can one day become professionals in the field of social work. Lately, we have been witnessing some crisis in the development of theories and methods used in clinical social work. All the contributions in this journal are expressing efforts to improve the current state. This issue of CWS Journal brings articles about social work, psychology and other social sciences.

Michael Olah  
Peter G. Fedor-Freybergh  
*Edition of journal*



# Imported tropical diseases in international travelers and migrants between 2000-2012: overview of 179 cases in a single travel clinic

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Original Articles

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## Key words:

imported tropical diseases, travel medicine

## Abstract:

The aim of this survey is to assess and discuss spectrum of tropical diseases among travelers and migrants from topics to Slovakia within last 12 years. The commonest imported tropical diseases within last 12 years were malaria, amebiasis, dengue and cutaneous larva migrans, followed by giardiasis. Commonest place of travel was India and Kenya.

## Introduction

Imported tropical diseases and/or parasitic diseases central to Europe are emerging. The reason is not only increasing travel to tropical and subtropical regions but also increasing number of migrants and refugees (Askling 2005, Baker 2006, CDC 2014, Clerinx 2011, Conolly 2005). Coming to Slovakia from Middle East in 2010. The aim of the study is to describe our 13 years experience in a Mahmal Travel Clinic, referral centre for imported tropical infections.

## Patients and Methods

The group of patients consists of holiday or business travelers who returned from tropical regions and in 2000-2012 visited the clinic of tropical diseases in Bratislava where a diagnosis was made according to anamnesis, clinical and laboratory tests, including rapid diagnostic tests for malaria and dengue, parasitologic exam of the stool and urine, cultivation tests were done for bacteriology and parasitology in the Laboratory Medirex and HPL Bratislava and Laboratory of tropical microbiology in Slo-

vak Tropical Institute Bratislava, Slovakia. Imported tropical diseases and/or parasitic diseases central to Europe are emerging. The reason is not only increasing travel to tropical and subtropical regions but also increasing number of migrants and refugees

## Results and Discussion

### A. Diagnosed imported infections in returning travelers and migrants between 2000 – 2012

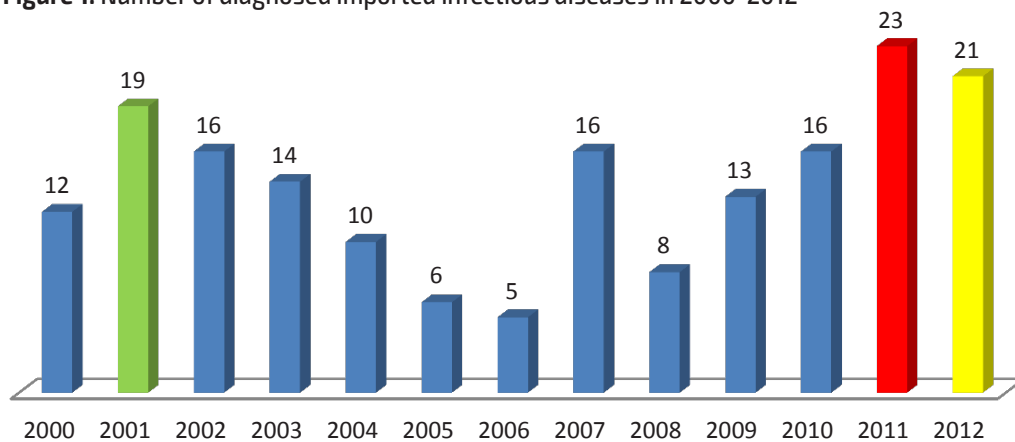
179 cases of imported infectious diseases (ID) in returning travellers have been diagnosed between January 1<sup>st</sup> 2000 to December 31 2012. Most diseases were diagnosed in 2011 (23 cases of ID), in 2012 it was diagnosed 21 cases of imported ID, in 2001 19 cases, in 2002, 2007 and 2010 16 cases, in 2003 14 cases, and in 2009 it was diagnosed 13 cases, during the year 2000 12 cases, in 2004 10 cases, in 2008 we recorded 8 cases, in 2005 it was 6 cases, and in 2006 we recorded less diagnosed cases of imported ID, only 5.

ing 21.79%. The second most commonly diagnosed disease was amoebiasis, which occurred in 19 cases (10.62%), we recorded 18 cases of dengue hemorrhagic fever, and 18 cases of cutanea larvae migrans. Giardiasis, we confirmed in 17 cases, Blastocystis hominis infection was recorded in 12 cases, salmonellosis was diagnosed in 7 cases. HBsAg positivity was confirmed in 5 cases as well as Trachoma and Shigellosis. 4 cases of paratyphoid fever were diagnosed and also schistosomiasis. Scabies and hepatitis A was diagnosed in 3 cases. Longitudinal distribution of diagnosed imported ID in 2000-2012 is shown in Figure 3.

### C. Geographical distribution of imported infectious diseases in 2000 – 2012

Slovak Travelers who presented themselves at on the Clinicfor visited within last 13 years 62 countries. The largest number of infectious diseases were diagnosed after returning from India recorded in 22 cases followed by Kenya with 17 cases. Other

**Figure 1:** Number of diagnosed imported infectious diseases in 2000-2012



### B. Spectrum of diagnosed imported ID

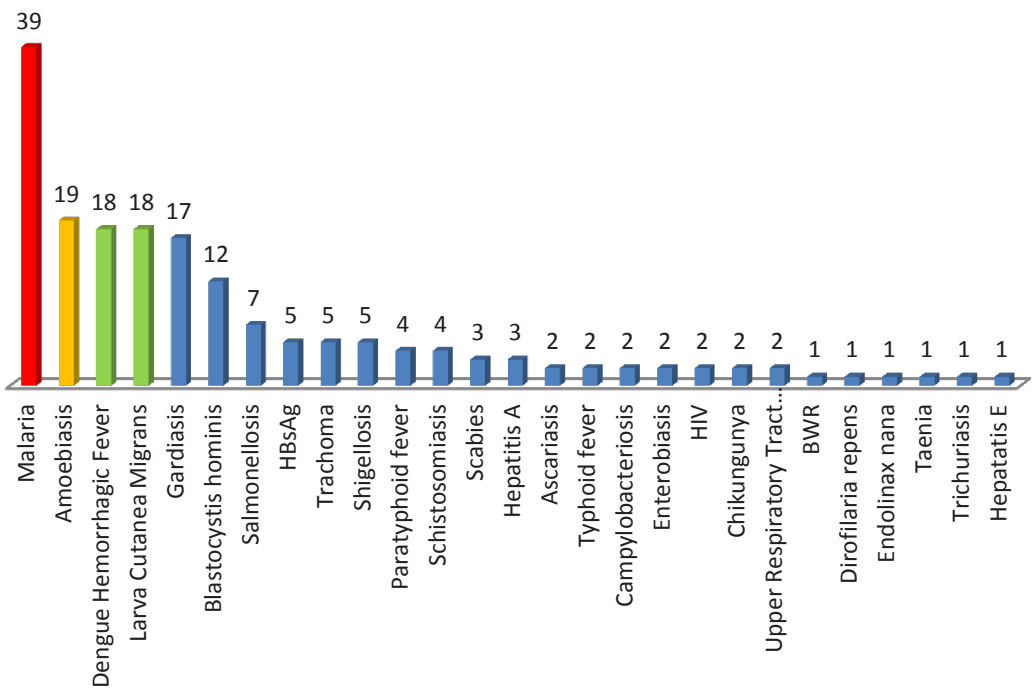
There were 27 different imported tropical ID diagnosed within 13 years (Figure 2). The most commonly diagnosed infectious disease was malaria (39 cases) represent-

cases are in Figure 4 and included Nigeria in 15 patients, Ethiopia and Thailand in 8 cases, Indonesia in 7 cases, Democratic Republic of Congo in 6 cases, 4 cases of the disease after returning from the Philippines,

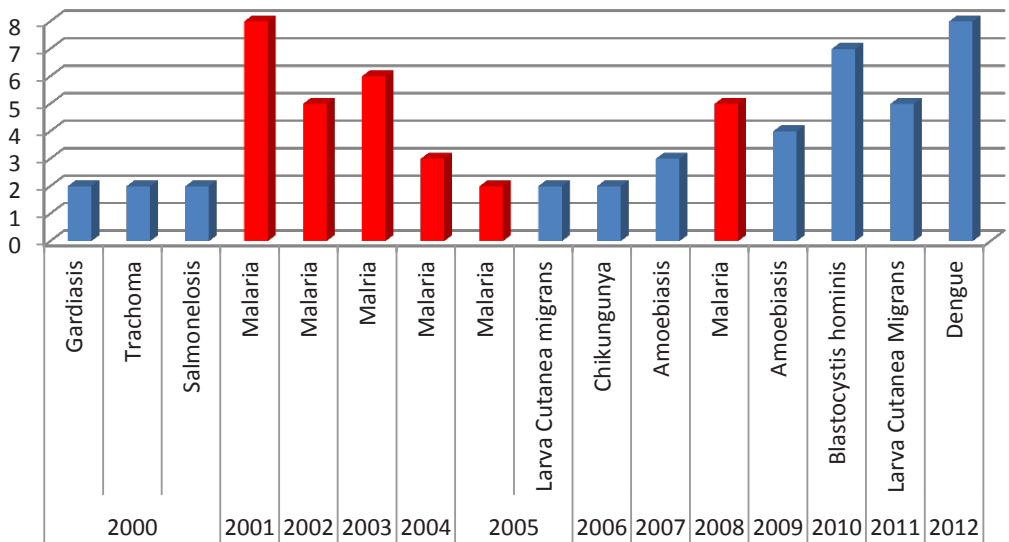
Cambodia, Libya, 3 cases in travelers who visited Angola, China, Egypt, Iraq, Cuba, Mexico, Peru, Turkey, Venezuela, Uganda,

Vietnam. 2 cases were diagnosed in travelers who have returned from Brazil, Chad, Iran, Malaysia, Maldives, from Mauritius,

**Figure 2: Spectrum of imported tropical infectious diseases in returning travelers in 2000-2012**



**Figure 3: Longitudinal distribution of imported infectious diseases in returning travelers in 2000-2012**

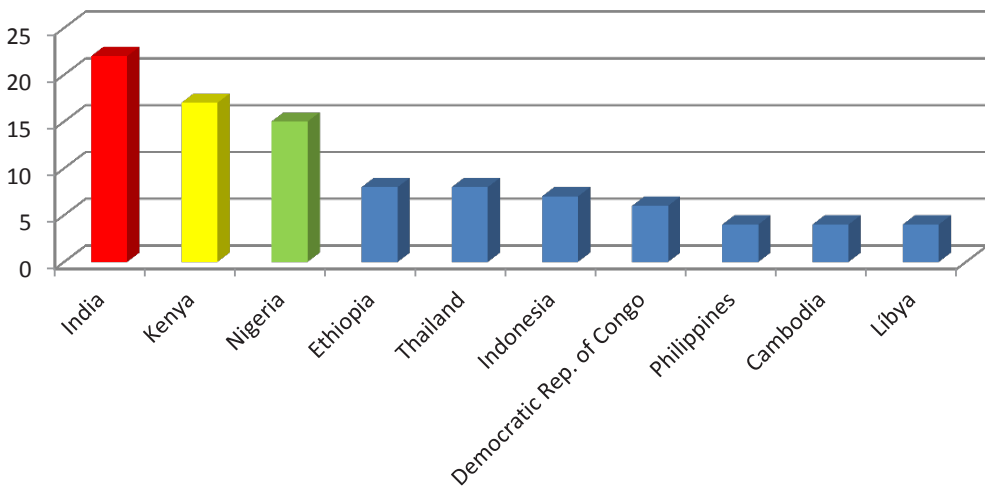


Nepal, Pakistan, Sudan and Taiwan. After returning from other destinations such as Belgium, Borneo, Columbia, Montenegro, Ecuador, Gabon, Ghana, Israel, Jamaica, Japan, Cameroon, Latvia, Morocco, Mozambique, Nicaragua, Portugal, Equatorial Guinea, Senegal, distribute, Rwanda, Central African Republic, Spain, Tanzania, Togo, Tunisia, Kazakhstan, Zambia, Zanzibar and Zimbabwe 1 case was detected.

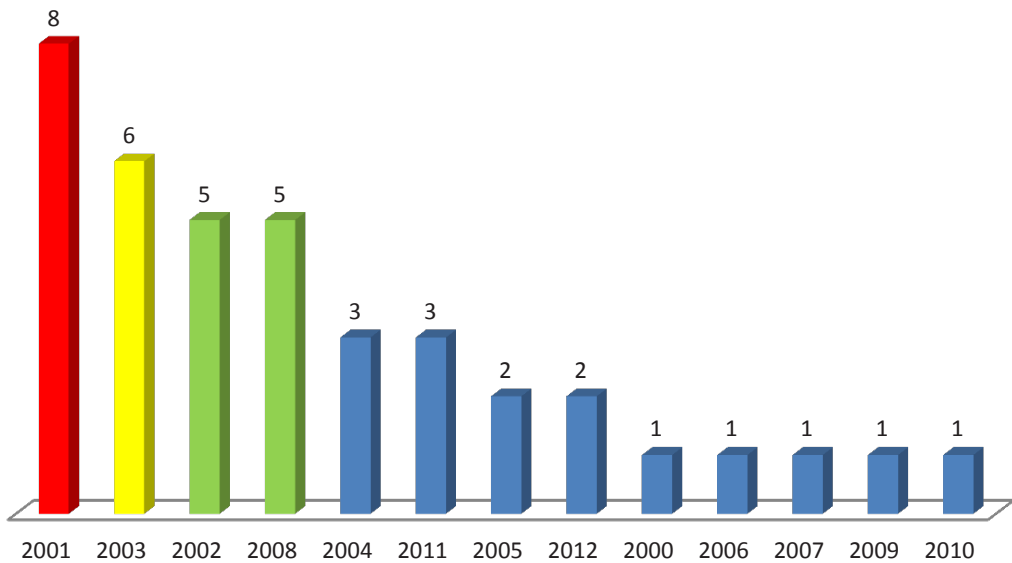
**Malaria**

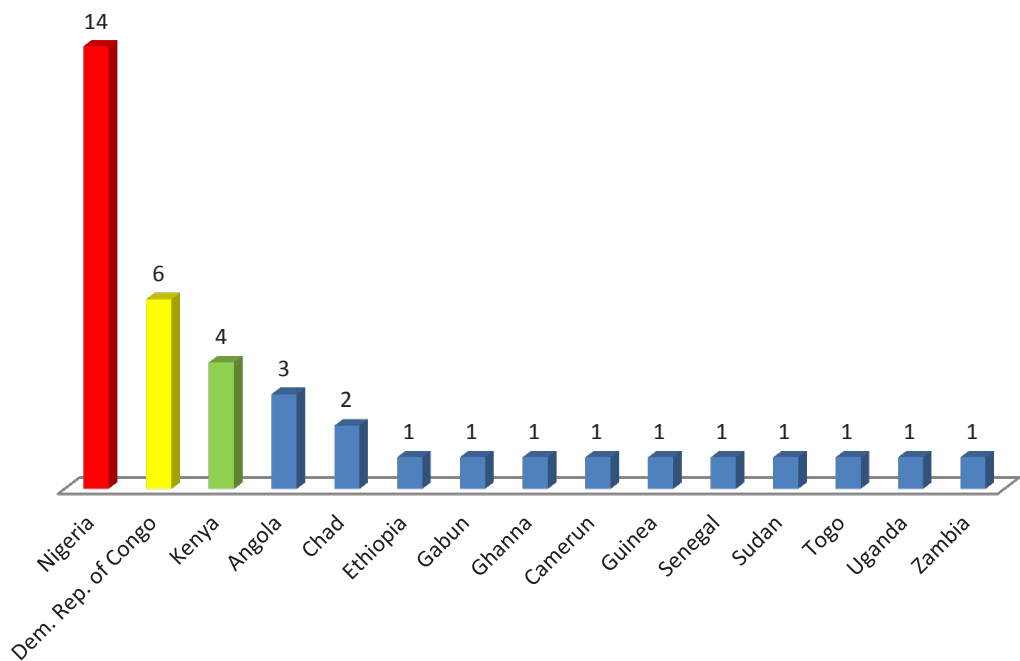
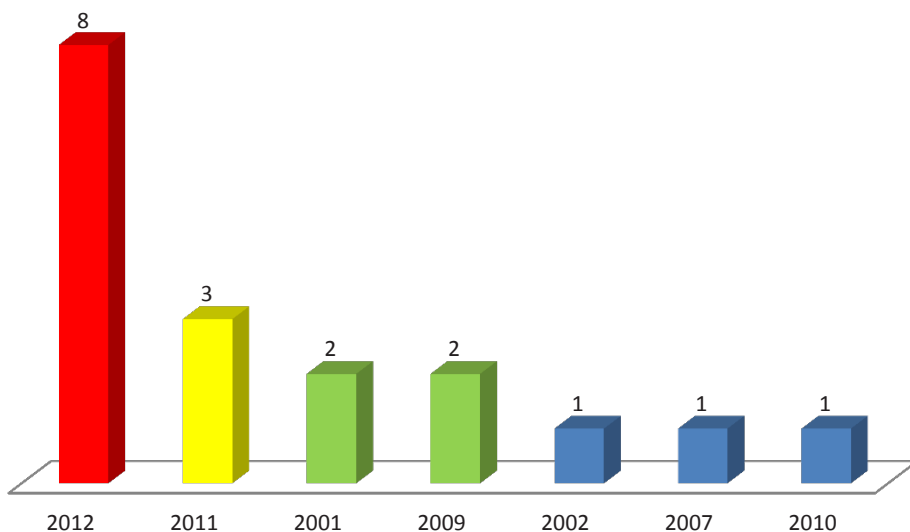
The most commonly imported disease from tropics was malaria reported in 39 cases, all cases of malaria in travelers who have returned from sub-Saharan Africa. Despite of prophylaxis recommended to travellers, the figure represents 21.79% cases of all imported infections in returning travelers what opens again the question of adherence to antimalarial prophylaxis (6,7).

**Figure 4: Geographic distribution of country of travel in 2000 - 2012**



**Figure 5: Number of imported malaria cases in returning travelers in 2000-2012**

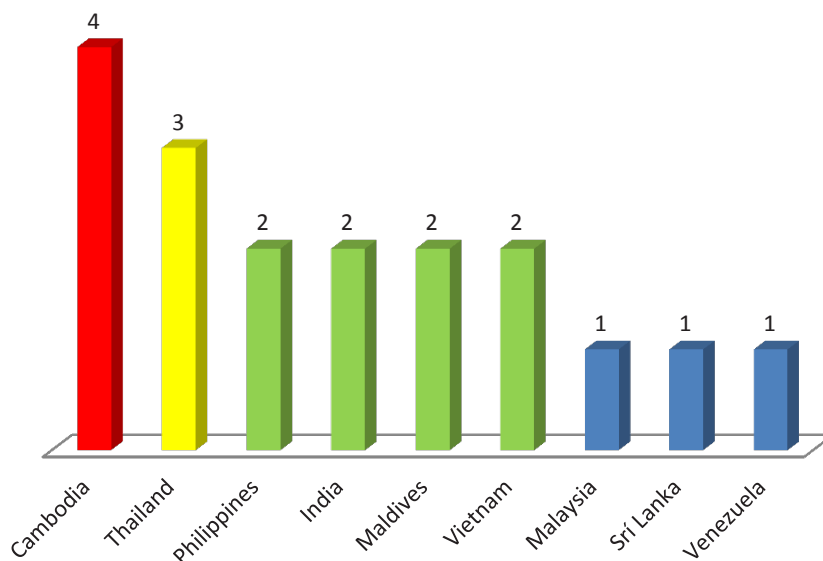


**Figure 6: Malaria cases imported from country of origin in 2000 - 2012****Figure 7: Diagnosis of DHF in 2000-2012 among returning travelers.**

Commonest country of imported malaria cases were Nigeria (14 cases, 35.89%) followed by Democratic Republic of Congo with 6 cases (15.38%), 4 cases from Kenya, 3 cases from Angola.

### Dengue Hemorrhagic Fever (DHF)

DHF was most frequently diagnosed in 2012, when we recorded 8 cases presented to our clinic (44.44%) among all cases recorded that year. In 2011 3 cases were

**Figure 8:** DHF cases imported from country of origin in 2000 - 2012

detected (16.66%), in 2001 and 2009 2 cases were confirmed (11.11%) and 1 case (5.56%) in 2002, 2007, 2010 (Fig. 7). No single CNS involvement was observed. Geographic distribution of DHF imported to Slovakia is shown in Figure 8.

In this communication we wanted to point out the variety of diseases we have diagnosed in returning travelers to Slovakia within last thirteen years at the Clinic of tropical diseases in Bratislava and remind the importance of preventive measures as well as the need for swift management of diagnosis and treatment of tropical diseases.

We found that the most common imported infection was malaria. (Askling et al 2005, Cook et al 2003, Dawis et al 2011). All returning travelers diagnosed with malaria visited countries in sub-Saharan Africa, no malaria case was diagnosed in travelers returning from Asia or Central and South America.

Increasing trend of Dengue Hemorrhagic Fever (Denguevirusnet 2013) was observed among travelers, reflecting a global trend. Given infection occurred only among travelers who have visited countries in Asia, no

DHF infection was reported in travelers returning from Africa or South America. (Coradia et al 2007, Eddlyton 2008, ECDC 2013, Fradin et al 2004)

## Conclusion

Vector-borne diseases are an important burden for Europe, partly through infected travelers returning from countries where some of these diseases are endemic, especially malaria, dengue and chikungunya. The incidence rate of malaria remains stable, while the rate of reported cases of dengue and chikungunya are growing. In some EU countries there is a risk that these diseases become endemic, previously considered only as imported.

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# Commonest parasitic infections in migrants from Middle East crossing Schengen border and comparison to general population in East Slovakia and to slum population of "economic" refugees to Nairobi

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Original Articles

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## Abstract:

The is ongoing debate on the danger or pseudodanger of migrants or asylum seekers due to foreign born population from Subsaharan Africa and Middle East Asia concernig the import of infectious namely parasitic diseases. The aim of this study was to asseses occurance of helmintic and protozoae pathogens in migrants through Schengen border to EU and compare them to the rural residents of East Slovakia versus slum population of economic migrants to Nairobi Urban Area.

## Introduction

Migrants, Asylum seekers, internally displaced and Refugees are considered specialy by media and undereducated population as year and danger for local population. Several papers on increasing incidence of infectious diseases with high transmission potential (as

tuberculosis, hepatitis, malaria, HIV, helminths, protozoa, and other parasitic diseases (3), we published last 2 year however none of them are long term comparative and or pilot studies with lorgitudinal surveillanc based on comparison with appropriate comparator group. Because of increasing debate on

migrants after dramatic and fatal events in mediterranean sea (Italy, Malta, Greece, and Spain) and conflicts in middle east (Syria, Iraq, Yemen, Somalia, Afghanistan), increasing xenophobia and fear of infectious diseases reached in public debate, political alert. Therefore to answer partially the question of suspected danger of migrant population from Middle East Asia to Schengen area of EU due to acute war conflict in Syria, Iraq and Yemen, we compared the occurrence of helminths and protozoa in stool samples urbanized population of slums of displaced economic migrants in Nairobi (A) versus migrant population to Slovakia via Schengen border from Southeast Asia (SEA) (B) and resident population in East, Slovakian Village (C) Rural population in Michalovce.

## Patients and Methods

The group of patients reporting themselves with any of symptoms originating from gastrointestinal tract (diarrhea, vomiting, abdominal pain, etc.) to outpatient department (OPD) in Nairobi Mary Immaculate Center – where in 7640 stool samples we examined with direct microscopy (Kato Katz Method) for ova of parasites and protozoan cells in period from January to December 2014. Stool samples of 101 patients (group B) reported as migrants and asylum seekers in Asylum center in Humenne (1 Jan – 31 Dec 2014) and 299 children from several villages reported by their parents to OPD Michalovce (group C). *Chi square* was used for univariate analysis.

**Table 1.** Isolation of Helminths in 3 other population (2014)

Helminths/Protozoa	A (7640)	B (101)	C (299)	P <sub>Avs.B</sub>	P <sub>Bvs.C</sub>
<i>Ascaris lumbricoides</i>	20,1	4	6	0,01	NS
<i>Trichuris trichiura</i>	17,0	1	2	0,01	NS
<i>Enterobius vermicularis</i>	22,9	5	13	0,01	NS
<i>Ankylostoma</i> / all	6,9	0	0	NS	NS
<i>Strongyloides stercoralis</i>	1,2	0	0	NS	NS
<i>Taenia saginata</i>	1,3	9	2	0,05	NS
<i>Taenia solium</i>	1,73	0	0	NS	NS
Other helminths	6,8	1	2	NS	NS
Parasite free	22,2	80	75	0,01	NS
<b>PROTOZA</b>					
<i>Entamoeba histolytica</i>	48,2%	2,0	0	0,01	NS
<i>Giardia lamblia</i>	22,8	18	21	NS	NS
<i>Cryptosporidium</i> spp.	6,3%	0	0	0,05	NS
Other protoza	13,6	2	1	NS	NS
None	20,1	76	78	0,01	NS

A. urban population in Nairobi Slums

B. migrant population to Slovakia through Schengen Border from South East Asia ( Middle East – Iraq, Syria, Yemen, Afghanistan, Lebanon)

C. resident population in East Slovak rural population (District Michalovce)

## Results and Discussion

From 7640 patients from the Nairobi slum area for Mary Immaculate clinic, about one fifth parasites were patients without parasitic isolate (parasite Free) of helminths (22,2%) and protozoa (20,1%), and were significantly low then among other groups – group of 101 asylum /migrants 299 children from East Slovakia with 75-78% of helminths three patients and 76-78% from protozoa, individuals both  $P < 0.01$ . Very high prevalence / occurrence of parasitic infections in this population is well known, due to low sanitary condition in Mukuru and St. Catharina as well as Lunga Lunga slums, where the majority of population has limited access to water and sanitation and water and/or food are major and logical drivers both in soil transmitted helminths (i) such as internal protozoa (ii) where *Cryptosporidium*, *Giardia lamblia*, are causing water borne outbreaks for decades (5). *Cryptosporidium* and *Isospora belli*, in addition are more frequently isolated among population with HIV / AIDS prevalence and in Kenya overall prevalence in 1.1.2015 was 7,8% however several slums with many „ecumenic“ refugees who are displaced internally migrating to large urban cities due to fatal droughts in Turkana, Garissa, North West, North Coast and North East Kenya are a reality, where up to 30% population migrated or internally displaced to highlands and cities and have HIV prevalence rose up to 20% . Therefore that those 3 factors continued to up to 77,8% occurrence of helminths and 79,1% protozoa in stool samples in patients for or tropical programme in Nairobi where population is approached by high AIDS / HIV and prevalence (i) poor sanitation (ii), limited water supply (iii) and economic migration and displacement (ii) due to 20 years lasting drought following to hunger, and malnutrition in North and East Kenya, South Sudan and Southeast Ethiopia.

Political, religious and human rights Refugees from Middle East, Through Schengen

Border to Slovakia have similar proportion of parasites to Slovak resident rural Population from Michalovce region (20km from Ukrainian border) East Slovakia

## Conclusions

The prevalence of helminths and intestinal protozoa between 3 groups of (i) internally displaced migrants from Nairobi (i), Refugees and migrants from Middle East (B) and (iii) residents of Eastern Slovakia (group C) showed no difference between group B and C in occurrence and etiology.

Somewhere would expect, that the occurrence of (helminths, protozoa) in group B, will not be so different (22,2% vs 80%  $P < 0.01$  and 20,1% vs 76%,  $P < 0.01$ , specially when migrants through Schengen border are also subject of risk factors from parasitic infectious such as travel in lowhygienic standard (ii) long exposure to each other in overcrowded transport facilities, (iii) immunosuppression and poor food and water hygiene supplies (iv).

However majority of those 101 migrants up to 90% (92 of 101) arrive from countries not from Sub-Saharan Africa from Middle East (Lebanon, Iraq, Syria) where water hygienic standards are better and most refugees are members of so called „middle“ class. They emigrated from political and religious reasons and not because of poor economic and social condition, what is the major reason from migration from Sub-Saharan Africa in contrast to refugees from Middle East (7). There was also difference in spectrum of organisms, e.g. first group (A) from Nairobi slums, to Middle East refugees (group B) and East Slovak residents (group C)

*Ascaris lumbricoides*, *Trichura trichuris* and *Enterobius vermicularis* were more sporadic.

Second interesting finding was that *Entamoeba histolytica* (48% group A) and *Cryptosporidium parvum* (6,3% group A) were

significantly more commonly observed among internally displaced in to town migrating population (Nairobi). Reason for this phenomenon may be again, population of HIV (7,8-20% group A vs 0% group B and C) and poor sanitation and lower hygienic standard of group A in comparison to group B and C, Third potentially surprising observation is that there is no statistic significant difference in spectrum and occurrence of parasities between group B (migrants from MEaM) and group C (Slovak Residence). Migrants from Middle East do not represent concerning parasitic, both helminth and protozoae infection to Slovak population of rural Region of East Slovakia any substantial risk. Epidemiologically imported protozoa (*E. histolytica*, *C. par-*

*vum*) as when as helminths (*Taenia solium*), among group B (refugees from Middle East) were sporadic (3%) or absent (0%).

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# Nutritional status and immunological profile in HIV infected patients with pulmonary tuberculosis involved in rural-urban migrants to Nairobi, Kenya

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Original Articles

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## Abstract

**Introduction:** Rural-urban migration in general, significantly contributes to the increased incidence of HIV and tuberculosis, as well as poor nutritional status. We analysed the nutritional status and immunological profile in HIV positive patients with pulmonary tuberculosis and the association between nutritional status and the CD4 count.

**Patients and methods:** A retrospective analysis of 69 ART-naïve subjects diagnosed with pulmonary tuberculosis was carried out. Subjects were diagnosed with active pulmonary tuberculosis through smear analysis and/or posteroanterior chest X-ray.

**Results:** Out of 28 (40.6%) and 41 (59.4%) subjects with smear positive and smear negative pulmonary tuberculosis, respectively, 18/9 (64.3% and 19.5%, resp.) had a CD4 count below 100 cells/ $\mu$ l, 9/21 (32.1% and 51.2%, resp.) had a CD4 between a 100-250, and 1/12 (3.6% and 29.3%, resp.) had a CD4 above 250 ( $p < 0.05$ ). Out of 28 (40.6%) and 41 (59.4%) subjects with smear positive and smear negative pulmonary tuberculosis, respectively, 15/15 (53.6% and 36.6%, resp.) had BMI  $< 18.5$ , and 13/26 (46.4% and 63.4%, resp.) BMI 18.5-24.9 ( $p = 0.36$ ).

**Discussion:** No significant association between low BMI and smear positive/smear negative pulmonary tuberculosis was seen. Statistically significant association was found between low baseline CD4 count and smear positive pulmonary tuberculosis. This suggests that positivity of the sputum sample microscopy tends to be detected in patients with low CD4 counts, therefore in subjects with significantly impaired function of the immune system. Low socioeconomic status of the study population makes health care provision onerous; therefore there is an urgent need for development of simple and cheap diagnostic methods.

## 1. Introduction

Since 1984, when the first case of HIV in Kenya was reported, the number of cases has significantly increased and according to the 2012 KAIS report current prevalence of HIV in adults and adolescents in Nairobi country was 4.9%. (KAIS Report, 2012) According to the report of the World Health Organisation from 2014, Kenya belongs among the 22 high burden countries for TB and HIV/AIDS infections with an estimated incidence rate of HIV and TB co-infection of 109 (105112)/100000 population. (Global Tuberculosis Report, 2014) Coincidentally, in the last few years, reported cases of tuberculosis and HIV co-infection in Kenya have increased, which constitutes a serious public health concern.

Tuberculosis is the main cause of morbidity and mortality in people living with HIV/AIDS worldwide. (Reid & Shah (2009) Prevalence of tuberculosis in HIV infected patients possesses a dual epidemic concern especially in Sub-Saharan Africa. Tuberculosis is the most common opportunistic infection in HIV infected individuals, accounting for significant morbidity and mortality in this respective group of patients. Moreover, the diagnosis of HIV-associated TB is often challenging due to atypical clinical and radiographic manifestations, more frequent extrapulmonary disease, and higher rates of smear-negative pulmonary TB. (Gray et al. (2013)

The association between tuberculosis and malnutrition includes two major interactions: the effect of tuberculous infection on the nutritional status of the individual and the effect of malnutrition on the clinical manifestations of the tuberculosis resulting from impairment of the immune system. (Oliveira et al. (2014)

It is widely known that low socioeconomic status significantly contributes to increased prevalence of tuberculosis in HIV infected individuals. In Nairobi, a large

percentage of the population involved in rural-urban migration ends up living in informal settlements of large cities with poor health outcomes. Poor health outcomes that informal settlements' residents exhibit at all stages of the life course are rooted in three key characteristics of slum settlements: poor environmental conditions, poor infrastructure, and limited access to services due to lack of income to pay for treatment and preventive services. (Zulu et al. (2011) Based on our experience, individuals migrating from rural to urban settings, due to above-mentioned factors, are often involved in illicit alcohol consumption, cigarette smoking, drug abuse and sexual promiscuity. All these factors together with generally poor living conditions play an important role in the development of pulmonary tuberculosis in an immunocompromised individual.

The objective of this study was to analyse the nutritional status and immunological profile in HIV positive patients with pulmonary tuberculosis involved in rural-urban migration to the capital city of Kenya, Nairobi; as well as to analyse the association between the nutritional status and the CD4 count at the diagnosis of pulmonary tuberculosis.

## 2. Patients and Methods

### Study design

A retrospective analysis was carried out in the ART clinic of St. Raphael Clinic, Mithang'o, Nairobi, Kenya, from January 2013 till July 2015. St. Raphael Clinic is located on the outskirts of Nairobi, the capital city of Kenya that serves a large population of people with a low socio-economic status, who migrated from villages to the capital city. We retrospectively analysed 69 subjects, who attended our centre on an outpatient basis and presented with HIV/TB co-infection. All the subjects included in



the study were ART-naïve. No subject had a history of tuberculosis.

### Study subjects

The analysis included 69 adult subjects who were diagnosed with active pulmonary tuberculosis. Out of 69 patients, 37 were females and 32 were males. The mean age of the cohort of TB/HIV coinfecting subjects was  $36.7 \pm 8.1$  years. All the HIV positive subjects presented with at least three symptoms of active pulmonary tuberculosis were diagnosed with active pulmonary tuberculosis through smear analysis and/or posteroanterior chest X-ray.

### Study methods and procedures

All subjects included in the study underwent an examination with conventional light microscopy of Ziehl-Neelsen-stained smears prepared directly from two samples of sputum (spot sample and morning sample). Two trained microscopists read all the prepared samples. Based on the presence or non-presence of acid-fast stained bacilli the samples were either positive or negative, respectively.

The smear negative subjects underwent additional screening procedure, i.e. posteroanterior chest X-ray. A trained physician according to the Guidelines for Management of Tuberculosis and Leprosy in Kenya, June 2014, interpreted each chest X-ray. All the patients included in the cohort underwent blood sampling for baseline CD4 count analysis (using a flow cytometry) and weight and height measurements for calculation of BMI. The subjects were stratified according to the baseline CD4 count in three groups: a CD4 count  $<100$  cells/ $\mu\text{l}$ , a CD4 count between 100-250 cells/ $\mu\text{l}$ , and a CD4 count  $>250$  cells/ $\mu\text{l}$ . According to the baseline BMI the subjects were stratified into three groups: underweight BMI  $<18.5$  kg/ $\text{m}^2$ , normal weight BMI 18.5-24.9 kg/ $\text{m}^2$ , and overweight BMI

$\geq 25.0$  kg/ $\text{m}^2$ . Median baseline CD4 count was  $133 \pm 164.58$  cells/ $\mu\text{l}$ . Median baseline BMI was  $19.0 \pm 2.7$  kg/ $\text{m}^2$ .

### 3. Results

Out of 69 analysed HIV positive ART-naïve subjects diagnosed with pulmonary tuberculosis, 28 (40.6%) had smear positive pulmonary tuberculosis and 41 (59.4%) smear negative pulmonary tuberculosis.

In the 28 smear positive subjects, 15 (53.6%) were underweight (BMI $<18.5$ ) and 13 (46.4%) had normal weight (BMI 18.5-24.9) ( $p=0.36$ ). No subject with smear positive pulmonary tuberculosis, however, was found to be overweight. In 41 subjects with smear negative pulmonary tuberculosis, 15 (36.6%) subjects were underweight and 26 (63.4%) subjects had normal weight ( $p=0.47$ ). No subject in both the sub-subsets was found to be overweight. (**Fig. 1**)

Baseline CD4 count analysis was performed in each subject. Out of 28 subjects with smear positive pulmonary tuberculosis 18 (64.3%) had their initial CD4 count lower than 100 cells/ $\mu\text{l}$ , 9 (32.1%) had a CD4 count in the range of 100-250, and 1 (3.6%) had a CD4 count above 250 ( $p<0.05$ ). Out of 41 subjects with smear negative pulmonary tuberculosis, 8 (19.5%) had their CD4 count lower than 100 cells/ $\mu\text{l}$ , 21 (51.2%) had a CD4 count in the range of 100-250 and 12 (29.3%) had CD4 count above 250 ( $p<0.05$ ). (**Fig. 1**)

Among the 28 subjects with smear positive pulmonary tuberculosis, 15 subjects had BMI below 18.5 kg/ $\text{m}^2$  and 13 subjects had BMI in between 18.5 and 24.9 kg/ $\text{m}^2$ . Among the 15 subjects, 7 subjects (46.7%) had baseline CD4 counts below 100 cells/ $\mu\text{l}$ , 6 (40.0%) had baseline CD4 counts between 100-250 cells/ $\mu\text{l}$ , and 2 (13.3%) had CD4 counts above 250 cells/ $\mu\text{l}$ . Among the 13 subjects with BMI in the range from 18.5 to 24.9 kg/ $\text{m}^2$ , 7 subjects (53.8%) had

baseline CD4 counts below 100 cells/ $\mu$ l, 3 (23.1%) had baseline CD4 counts between 100-250 cells/ $\mu$ l, and 3 (23.1%) had CD4 counts above 250 cells/ $\mu$ l. ( $p=0.68$ ) (**Fig. 2**)

Among the 41 subjects with smear negative pulmonary tuberculosis, 15 subjects had BMI below 18.5 kg/m<sup>2</sup> and 26 subjects had BMI in between 18.5 and 24.9 kg/m<sup>2</sup>. Among the 15 subjects, 6 subjects (40.0%) had baseline CD4 counts below 100 cells/ $\mu$ l, 5 (33.3%) had baseline CD4 counts between 100-250 cells/ $\mu$ l, and 4 (26.7%) had CD4 counts above 250 cells/ $\mu$ l. Among the 26 subjects with BMI in the range from 18.5 to 24.9 kg/m<sup>2</sup>, 7 subjects (26.9%) had baseline CD4 counts below 100 cells/ $\mu$ l, 11 (42.3%) had baseline CD4 counts between 100-250 cells/ $\mu$ l, and 8 (30.8%) had CD4 counts above 250 cells/ $\mu$ l. ( $p=0.71$ ) (**Fig. 3**)

#### 4. Discussion

In the analysed cohort of HIV positive subjects involved in rural-urban migration, no significant association between low BMI and smear positive/smear negative pulmonary tuberculosis was seen. No subject with pulmonary tuberculosis irrespective of smear positivity, was found to have BMI of 25.0 and above. No significant differences in baseline BMI values were found in the two sub-sets of subjects. (**Fig. 1**)

Statistically significant were the findings in the cohort of subjects with smear positive pulmonary tuberculosis, 18/28 subjects (64.3%) had a baseline CD4 count below 100 cells/ $\mu$ l, 9/28 (31.1%) subjects had a baseline CD4 count in the range of 100-250, and 1/28 (3.6%) had a CD4 count above 250 cells/ $\mu$ l ( $p<0.05$ ). On the other hand, in the cohort of subjects with smear negative pulmonary tuberculosis, 8/41 subjects (19.5%) had a baseline CD4 count below 100 cells/ $\mu$ l, 21/41 (51.2%) subjects had a baseline CD4 count in the range of 100-250, and

12/41 (29.3%) had a CD4 count above 250 cells/ $\mu$ l ( $p<0.05$ ). (**Fig. 1**) This suggest that positivity of the sputum sample microscopy tends to be detected in patients with low CD4 counts; in other words in subjects with a significantly impaired immune system.

No significant association, however, was detected between baseline BMI below 18.5 kg/m<sup>2</sup> and initial CD4 count below 100 cells/ $\mu$ l in smear positive and smear negative subjects, respectively. (**Fig. 2, 3**)

One of the limitations of the study was definitely a lack of diagnostic means. Only recently, the GeneXpert and mycobacterial culture became available for all the patients infected with HIV with suspected tuberculosis. However, mycobacterial culture is not suitable for immediate diagnosis, due to the fact that it is too slow and too complex to be used in resource-poor settings. Chest radiography itself, especially in HIV positive patients, also has its important shortcomings, one of them being low specificity. In a study performed in Kenya, the number of patients labelled as having TB using CXR with a negative culture that were placed in treatment was rather high: 22% among all suspects (smear positive and smear negative) and 45% among smear-negative suspects. (Cleeff et al. (2005)

Individuals involved in rural-urban migration to the capital city Nairobi, Kenya, due to low socioeconomic status associated with poor health outcomes, belong to a group of vulnerable individuals. They often seek health care professionals when their health condition has already significantly deteriorated, as our study demonstrated by the low baseline CD4 count. In addition, the scarcity of diagnostic methods available in resource-poor settings significantly restricts the provision of health care services. There is an urgent need for development of simpler, cheaper, and more sensitive diagnostics for tuberculosis for use in resource-poor settings.

**Figure 1** – Distribution of BMI and CD4 values in the cohort.

Variable	Smear positive PTB	Smear negative PTB	<i>p value</i>
	(n=28)	(n=41)	
BMI (kg/m <sup>2</sup> ) <sup>a</sup>			
Underweight	15 (53.6%)	15 (36.6%)	0.16
Normal weight	13 (46.4%)	26 (63.4%)	
Overweight	0 (0)	0 (0)	
CD4 (cells/μl)			
<100	18	8	<0.05
100-250	9	21	
>250	1	12	

<sup>a</sup> Underweight defined as BMI <18.5 kg/m<sup>2</sup>, normal weight BMI 18.5-24.9 kg/m<sup>2</sup>, overweight BMI ≥25.0 kg/m<sup>2</sup>.

**Figure 2** – Association between baseline BMI and CD4 count in smear positive subjects.

	Baseline CD4 count* (n=28)			<i>p value</i>
	<100	100-250	>250	
BMI				
Underweight	7	6	2	0.68
Normal weight	7	3	3	
Overweight	0	0	0	

\* CD4 count expressed in cells/μl.

**Figure 3** – Association between baseline BMI and CD4 count in smear negative subjects.

	Baseline CD4 count* (n=41)			<i>p value</i>
	<100	100-250	>250	
BMI				
Underweight	6	5	4	0.71
Normal weight	7	11	8	
Overweight	0	0	0	

\* CD4 count expressed in cells/μl.

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# Malaria in western Rwandan area of internal displacement after genocide: Comparison of prevalence of malaria according to the altitude and levels of C – Reactive Protein in patients with highland malaria

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Original Articles

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## Abstract

**Background:** Malaria is still a serious public concern in post-genocide Rwanda [1]. Despite of the intense effort of malaria eradication based on the program President Malaria Initiative introduced in the year 2005 and a positive development during the following years, Rwanda has not succeeded to keep malaria at bay, vice versa, the prevalence of malaria is increasing [2], endangering mostly the people in highlands, who have not developed partial immunity due to infrequent exposure to this infectious disease.

The aim of this article is to analyze values of C – Reactive Protein (CRP) in order to determine correlation between its value in highland malaria positive patients and more frequent exposure to malaria. In the second part of this article, we are trying to determine prevalence of malaria in three health care facilities according to their altitude.

**Methods:** A longitudinal quantitative study was conducted in the health centre of St Clementine Annuarite in Bigugu in rural part of western Rwanda in the altitude of 2250 meters above sea level. From December 2013 until August 2015, 371 malaria positive patients from Out Patients department confirmed by microscopy were also measured for the levels of CRP.

As the second part, a retrospective observational quantitative study was conducted in three health facilities in Karongi district of western Rwanda, Bigugu Health Centre, Kiziba Health Centre and Kibuye Health Centre, which are located in the altitude of 2250, 1960 and 1450 meters above the sea level respectively. Data including numbers of patients from Out Patients Department, numbers of malaria positive cases and mosquito nets distributed monthly were

collected from the beginning of January 2012 until the end of July 2015. Afterwards, data were analyzed in order to determine correlation between altitude and prevalence of malaria.

**Results:** In total, the average among 371 investigated malaria positive patients had CRP of value 70,33. Over the period of last 3,5 years in Rwanda, malaria has been increasing in all three monitored health facilities, however, according to the results, the higher altitude correlated with more significant increase. No direct short-term correlation between distribution of impregnated mosquito nets and prevalence of malaria was found Kiziba HC, while in Kibuye HC Pearson's correlation coefficient was positive.

**Conclusion:** The first part of our study shows that highland malaria is strongly positively correlated with elevated level of C-Reactive Protein, where a mean level of CRP was 70,33.

The second part of the study shows that the most significant growth of malaria prevalence was observed in Bigugu Health Centre, which is a health facility localized in the highest altitude measured in the research (2250 AMSL), where none of the patients admitted the use of mosquito net and no distribution campaign has ever occurred in this area.

## Background

A small and land-locked, Rwanda is the most densely populated country in continental Africa, located in the heart of Africa. Dependent on aid, the country is recovering from a genocide in 1994.

The entire population of Rwanda, consisting of 12,7 millions of inhabitants is at risk for malaria. Malaria is mesoendemic in the plains and prone to be epidemic in the high plateaus and hills. In endemic zones, transmission occurs year-round with two seasonal peaks in May-June and November-December. Besides climate and altitude, other factors that influence transmission include high human concentration, population movement, and irrigation schemes.

In 2005, the Government of Rwanda benefited from the US Presidential Malaria Initiative (PMI) to reduce malaria-related deaths in Africa. In Rwanda, PMI is expanding coverage of insecticide-treated mosquito nets (ITNs), indoor residual spraying (IRS) with insecticides, and prompt use of artemisin -based combination therapy (ACT) for malaria treatment. These interventions resulted in substantial decline in malaria transmission. For example, after the decline between 2006 and 2008, due to an increase in ITNs coverage, malaria increased again in 2009 because of limited coverage with ITNs. The number of malaria cases de-

clined again in 2010 following a new ITN distribution campaign. This achievement is, however, fragile as potential for local malaria transmission remains [3].

One of the aims of this study is to show by processing data from three health care facilities in western Rwanda that despite over-optimistic goals of PMI, malaria is increasing alarmingly, with the hypothesis that the most endangered people from highlands are left without partial immunity.

We were collecting and comparing data from three health facilities in western Rwanda in Karongi district: Kibuye Health Centre (1450 AMSL), which is a health facility run by government, Kiziba Health Centre (1960 AMSL), which is a health facility run by AHA (African Humanitarian Action) and paid by UNHRC, and Bigugu Health Centre (2250 AMSL), which is a health facility run by a private donor from Europe. While it is estimated by questionnaires that 70% – 80% percent of the population belonging to either Kiziba or Kibuye Health Centre does sleep under mosquito nets, use of mosquito net in the area belonging to Bigugu Health Centre is extremely rare and no distribution of impregnated mosquito nets is known to have happened in the past.

The another aim of this study is to find the correlation of highland malaria and

CRP. Highland malaria in Africa is defined by the occurrence above the altitude higher than 1500 m AMSL or with daily mean temperatures below 20° Celsius. In Bigugu Health Centre, where the study was conducted, both requirements were fulfilled. Highland malaria represents less than 5% of all malaria cases in Sub-Saharan Africa [4].

CRP is an acute phase reactant produced in a liver, especially in favour among general practitioners, as it helps easily to distinguish between bacterial and viral infection. But, in malaria, it is said to have a pathogenic role as well and it is believed that immune activation plays a very important role in pathogenesis of malaria [5]. CRP is also known as a marker of morbidity and mortality in malaria [6].

There are increasing number of studies confirming that CRP can be considered as a new, cost-effective, and reliable tool in the assessment of prognosis in malaria [7], however studies regarding CRP in highland malaria are still missing.

## Patients and methods

a) A longitudinal prospective quantitative study that began in February 2013 and ended in July 2015 was conducted in Bigugu Health Centre, which is located in Rwankuba sector, Karongi district, western province of Rwanda. Area of the study is localized in the altitude of 2250 meters above sea level and belongs to a area with very low or not at all malaria transmission areas. Bigugu Health Centre is a healthcare facility for the total population of 12,000 inhabitants.

371 patients of varying age (8 months – 77 years) with suspected malaria over this period were examined also for the level of CRP.

Patients with typical presentation of other infectious diseases than malaria itself that can alter CRP (cough, symptoms of urinary respiratory infections or symptoms

of gastroenteritis) were excluded from the study, as well as those who had in their medical history travelled into the area of lower altitude in previous 30 days, as well as patients on steroids or other immunosuppressants.

Only patients presenting with headache accompanied with elevated body temperature or history of fever in previous three days as well as abdominal pain without diarrhoea in children patients were included.

Those patients were examined for tropical malaria by microscopic examination and occasionally (in 47 out of total 371 patients) double checked by PhHRP2 based malaria rapid tests. 371 cases suffering from highland malaria were also examined for CRP, using machine Nycocard Reader II. All CRP tests were stored in the refrigerator accordingly to the instructions of a manufacturer and no test was used after the expiry date. All samples collected over the time were examined by the same person, an expert laboratory technician of Bigugu Health Post.

b) Retrospective quantitative study collecting and comparing data from January 2012 – July 2015 was performed in 3 health centres in Karongi District of Western Rwanda, which are localized in different altitude. We compared number of malaria positive cases against the total number of OPD patients, calculating the prevalence of malaria out of it. We were using data from HMIS, which is a surveillance document for monthly reporting unified by Rwandan Ministry of Health, which all health care facilities in the country are obliged to provide at the end of month. We also checked the accuracy of those reports by comparing data from books held by expert laboratory technicians, who are obliged to register every malaria positive case. In all health centres of our interest, laboratory technicians have been on regular basis attending training in order to improve their qualification.

Patients were examined for tropical malaria by microscopic examination using thick blood film stained by Giemsa in 95% – 98% of all malaria positive cases. In a case of absence of expert laboratory technician or during the weekends, PhHRP2 based malaria rapid tests were used by trained nurse.

Tests were stored according to manufacturer's recommendation at 25°C, protected from sunlight and humidity and no test was used after its expiratory date.

In two out of three health centre, where use of mosquito net is gold standard, we also collected data regarding mosquito net distribution. We used Pearson's correlative coefficient in order to determine correlation between prevalence of malaria in Kiziba Health Centre and Kibuye Health Centre.

## Data analysis and results

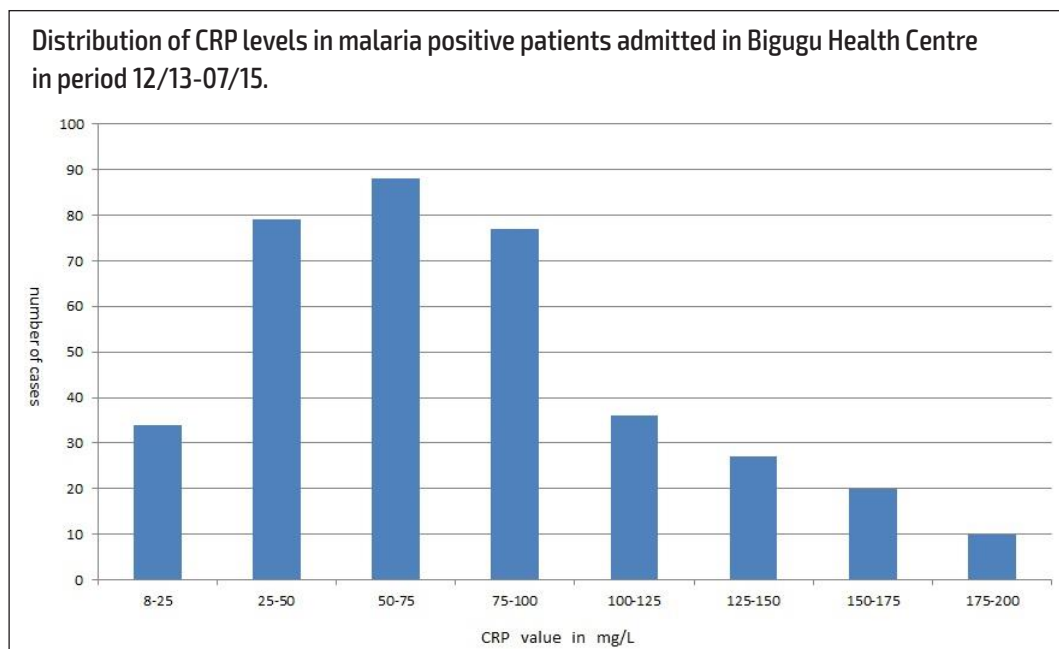
a) After collecting the data, we determined the mean level of CRP for each year separately, as well as the mean CRP in total. We determined mean level of CRP as proportion of sum of all CRP values to number of all measured patients.

In total, an average among 371 investigated malaria positive patients had CRP value of 70,6.

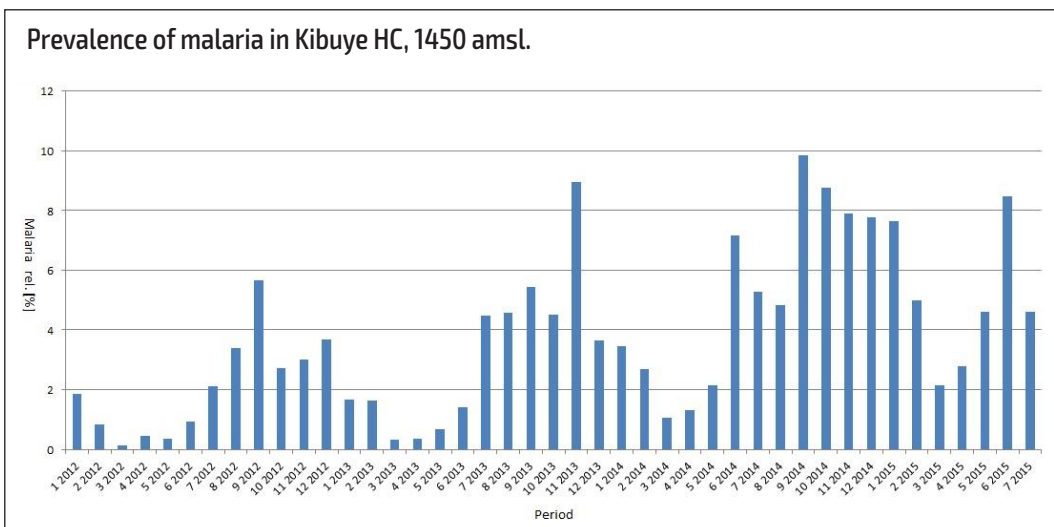
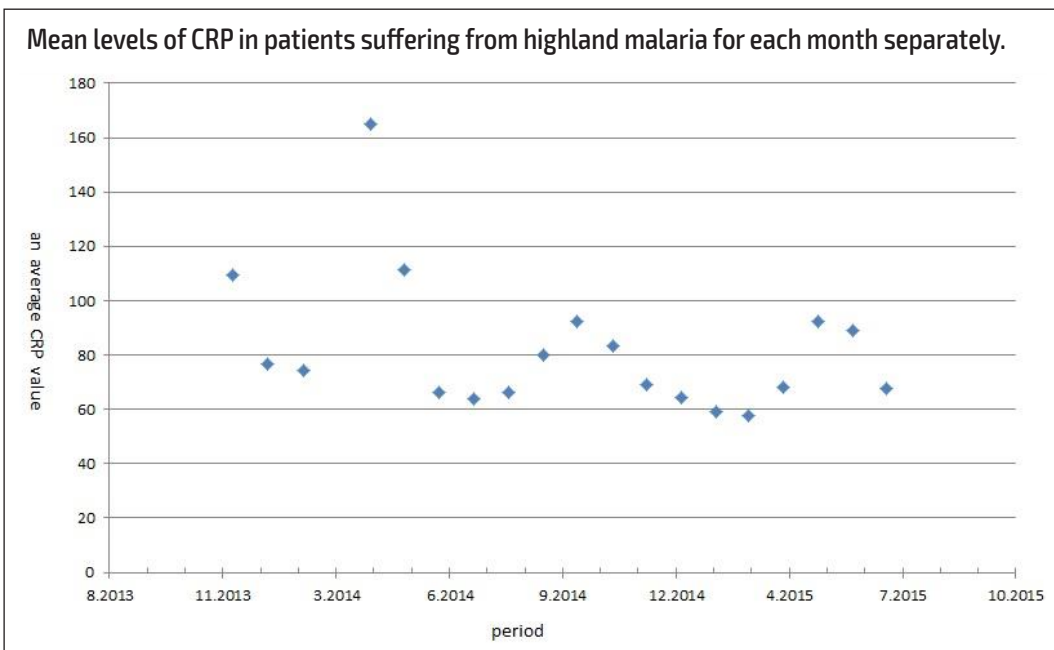
34 cases had level of CRP in values between 8-25 mg/l, 79 cases in values between 25-50 mg/l, 88 cases in values between 50-75 mg/l, 77 cases in values between 75-100 mg/l, 36 cases in values between 100-125 mg/l, 27 cases in values between 125-150 mg/l, 20 cases in values between 150-175 mg/l, 10 cases in values between 175 -200 mg/l. No one out of 371 malaria positive patients had level of CRP higher than 200 mg/l.

In patients where malaria was confirmed not only by microscopy but also by using RAPIDs, out of 47 were 44 positive and 4 results were invalid but we did not perform the examination repeatedly in order to avoid unnecessary unpleasant procedure.

a) We calculated prevalence over the time for each month separately. Prevalence was calculated for each health centre as number of malaria positive cases divided by total number of patients attending OPD. Results were put into graphs, from which the fol-





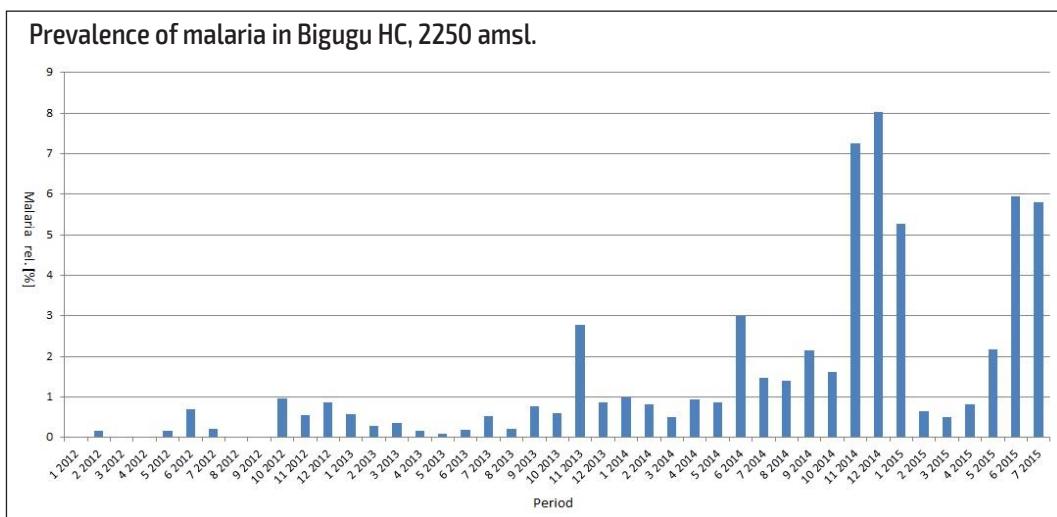
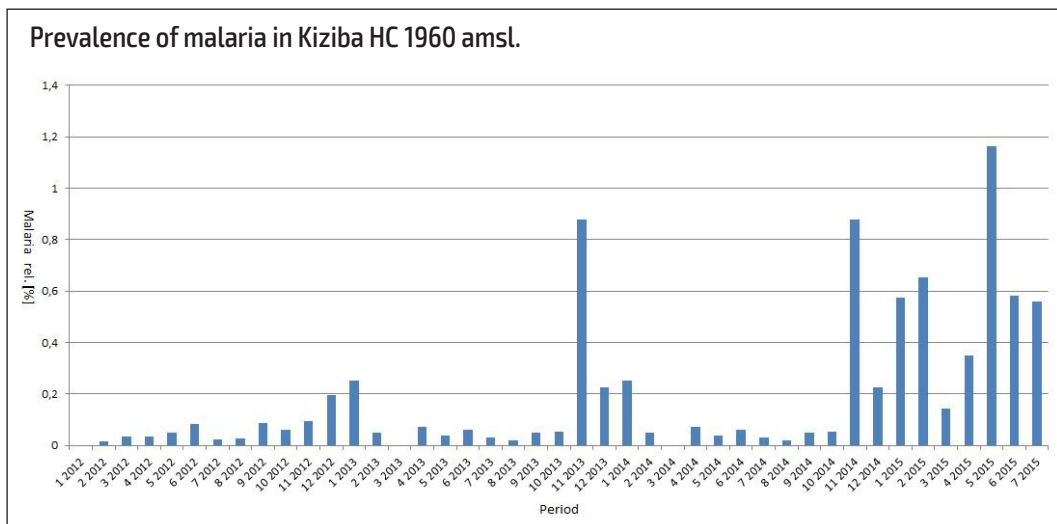


lowing is obvious: Prevalence in each investigated health centre increased multifoldly. The higher altitude of health centre, the more significant increase of malaria was observed. Regarding mosquito nets distribution, while for Kiziba HC was Pearson’s correlative coefficient negative -0, 00541, in Kibuye HC was Pearson’s correlative coefficient 0,11237, which means positive correlation between number of distributed mosquito nets and number of malaria positive cases.

### Discussion

The results of our study show that in the patients suffering from highland malaria the levels of CRP are significantly elevated, however, more voluminous studies of this topic are required.

As in the second part, our results are also highly suggestive that malaria is on the rise and in case of malaria outbreak in Rwanda, people living in the highlands are more endangered. The increase of prevalence is



more prominent the higher altitude is. The explanation behind it might be the missing partial immunity against malaria. The explanation behind increased prevalence offered by Rwandan government is low quality of donated mosquito nets or missing impregnation on it.

## Conclusions

Results of this study do prove that highland malaria has strong positive correlation with elevated value of C-Reactive Protein, as well as data from three health facilities in western Rwanda are all pointing out that

malaria in this country is on rise and necessary precautions should be undertaken to stop this trend.

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# Epidemiology and occurrence of dental and oral infectious diseases from daily practice in internally displaced population near Wau South Sudan

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## Running headline:

Dental infectious are one of major health care issues in Sub Saharan Africa

## Abstract:

In South Sudan whole areas have been left and population has been displaced into 3 – 5 large towns (urban components) to protect them against the Jamjarveeds (Governmental Militia) or SPLA / Sudanese Peoples Liberation Army. Within the last 25 years, civil war caused about two million death in South Sudan on violence/malnutrition/ infectious and other 2,5 million were displaced to Wau and Juba (Government – linked cities) or to Yambio or Rumbek. In this area between Wau and Juba (north) and Ugandan, Kenyan, CAR border, only 4 dental surgeons for about two mil (1,1 inhabitants displaced) are available. The aim of this communication is to return in the spectrum of commonest diseases of the oral cavity during routinely daily practise in Wau in 2015 (10 years after signature the peace treaty (in 6.6.2005 in Nairobi) and compare it to services in states with similar health infrastructure (Kenya, Muhoroni/Eldoret) and in Burundi (Buraniro CDS). Routine dental practice associated observations on dental and oral infections were assessed.

## Introduction:

Within the last 25 years, civil war caused about two million death in South Sudan on violence/malnutrition/ infectious and other 2,5 million were displaced to Wau and Juba (Government – linked cities) or to Yambio or Rumbek. In this area between Wau and Juba (north) and Ugandan, Kenyan, CAR border, only 4 dental surgeons for about two mil (1,1 inhabitants displaced) are available. The aim of this communication is to return in the spectrum of commonest diseases of the oral cavity during routinely daily practise in Wau in 2015 (10 years after signature the peace treaty (in 6.6.2005 in Nairobi) and compare it to services in states with similar health infrastructure (Kenya, Muhoroni/Eldoret) and in Burundi (Buraniro CDS).

## Patients and Methods:

Dental Tropical Project was involved into this observational cohort study and included 4 Dental Health clinics in Care countries, as follows: 2 in Kenya, 1 in Burundi, 1 in South Sudan as follows

1) st. Vincent Hospital, Muhoroni, Kenya, 11.2012 – 04.2013, (population of about 20 000)

2) st. Ladislaus Strattmann health Clinic, Eldoret, Kenya, 06.2013 – 09.2013 (population of about 120 000)

3) CDS Buraniro, Burundi, 03.2014 – 07.2014, 10.2014 – 01.2015 (population of 50 000 about)

4) st. Daniel Comboni Hospital, Wau, South Sudan, 02.2015 – 03.2015 (population of 100 000)

**Table:** Spectrum of infections and non-infections diseases among particular of cohorts of 3 Sub-Saharan countries (South Sudan, Wau, last column) 2012-2015

Diagnosis	The number of clinical cases of all admitted patients			
	Kenya, Muhoroni	Kenya, Eldoret	Burundi, Buraniro	South Sudan, Wau
Caries				
1.1 Initial Caries (caries limited to enamel), Superficial Caries	92 (1.2, 1.3)	52	39 (1.2, 1.3)	27 (1.2, 1.3)
1.2 Moderate Caries				
1.3 Deep Caries				
Developmental abnormality:				
2.1 jaws (agnathia, micrognathia, macrognathia, facial hemihypertrophy, facial hemiatrophy)				
2.2 lip and palate (cleft lip, cleft palate)				
2.3 gingiva (fibromatosis gingivae)				
2.4 tongue (microglossia, macroglossia, cleft), medial rhomboid glossitis (benign migratory glossitis)	3 (2.5)	1	2 (2.1, 2.5)	5 (2.1, 2.2, 2.5, 2.4)
2.5 disorders of tooth development and eruption (anodontia, supernumerary teeth, abnormalities of size and form of teeth, disturbances in tooth formation, structure and eruption)				
2.6 temporomandibular joint				

Infection of pulp and periapical tissues (dental marrow) – pulpitis and periodontitis: 3.1 Pulpitis (inflammation of dental pulp tissue) 3.2 Acute Apical Periodontitis of pulpal origin 3.3 Chronic Apical Periodontitis (granuloma) 3.4 Periapical abscess with sinus 3.5 Periapical abscess without sinus 3.6 Radicular cyst	183 (3.1, 3.2, 3.3, 3.4, 3.5, 3.6)	121	291 (3.1, 3.2, 3.3, 3.4, 3.5, 3.6)	153 (3.1, 3.2, 3.3, 3.4, 3.5, 3.6)
Odontogenous sinusitis: 4.1 Periostitis 4.2 Osteomyelitis 4.3 Alveolitis 4.4 Odontogenic sinusitis 4.5 Lymphadenitis 4.6 Abscess and phlegmon 4.7 Intracapsular and extracapsular purulent-inflammatory diseases of temporomandibular joint 4.8 Abscess, fistula of salivary gland	12 (4.1, 4.2, 4.5, 4.6)	3 (4.4, 4.5, 4.7)	33 (4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7)	5 (4.2, 4.4, 4.5)
Sialolithiasis and sialoadexitis 5.1 Atrophy, hypertrophy of salivary gland 5.2 Sialolithiasis (Calculus, stone of salivary gland or duct) 5.3 Mucocele of salivary glands (mucous extravasation cyst, retention cyst, ranula) 5.4 Disturbances of salivary secretion (hypoptyalism, ptyalism, xerostomia)	1 (5.3)	1	5 (5.2, 5.3, 5.4)	2 (5.3, 5.4)
Viral Oral Cavity inf.: 6.1 Herpetic gingivostomatitis 6.2 Herpangina 6.3 Chickenpox 6.4 Herpes Zoster 6.5 Infectious Mononucleosis 6.6 Measles (Paramyxovirus) 6.7 Measles (Rubeola) 6.8 Cytomegalovirus 6.9 Mumps 6.10 Human papilloma virus	5 (6.1, 6.3, 6.4, 6.10)	4 (6.1, 6.3, 6.9)	7 (6.1, 6.3, 6.7, 6.9)	2 (6.1)

Bacterial oral cavity inf.: 7.1 Necrotizing Ulcerative Gingivostomatitis 7.2 Aktinomykosis 7.3 Syphilis 7.4 Tuberculosis 7.5 Noma 7.6 Scarlet fever 7.7 Leprosy	2 (7.1)	1 (7.1)	4 (7.1, 7.4)	
Fungal oral cavity inf.: 8.1 Candidiasis 8.2 Histoplazmosis 8.3 Blastomykosis 8.4 Toxoplazmosis	112 (8.1)	26 (8.1)	18 (8.1)	7 (8.1)
Trauma / Fracture / dental Trauma: 15.1. Superficial injury of face, neck and scalp except eye without major open wound and without infection 15.2 Open wound of face, neck and scalp except eye, animal bite wound of face, neck and scalp 15.3 Fracture (open and closed) 15.4 Nerves injuries (nervi trigemini, nervi facialis, and other cranial nerves) 15.5 Injury to blood vessels of head and neck 15.6 Burns	2 (15.1,15.6)		16 (15.1,15.2, 15.3, 15.6)	4 (15.1,15.2, 15.6)
Temporomandibular articular disorders: 16.1 arthritis 16.2 ankylosis 16.3 trauma 16.4 subluxations and dislocations condyle and disc displacement 16.5 neoplastic 16.6 psychophysiological (myofascial pain-dysfunction syndrome)		1 (16.1)	5 (16.1, 16.3, 16.4)	
Systematic diseases ..... to oral cavity: 17.1 Recurrent aphthous stomatitis 17.2 Morbus Behcet (aphthosis Behcet) 17.3 Exsudative erythema multiforme, Stevens- Johnson syndrome 17.4 Autoimmune dermatostomatitis : - Systemic connective tissue disease - Pemphigus - Lichen planus - Psoriasis 17.5 Allergic contact stomatitis	8 (17.1)	1 (17.3)	10 (17.1,17.3, 17.4)	1 (17.1)
<b>Total</b>	377	220	412	173

## Results and discussion

Table 1 present variant types of dentogenic and extradentogenic infections of the oral cavity, including caries, pulpitis, gingivitis, dentogenic sinusitis, osteomyelitis and others dentogenic head and neck infections – 597 (377+220) from Kenya (Muhoroni and Eldoret), 412 Burundi (Buraniro), and finally 173 (Wau) South Sudan. Most common infections within 1182 patients were AIDS/HIV preventable oral cavity (TB, sinusitis, candidiasis) – TB in 103, candidiasis in 112 and pulpitis in 183 cases all in Kenya. High population of TB and candidiasis in aetiology of dentogenic diseases and sinusitis/gingivitis is due to higher proportion of AIDS/HIV among patient populations in Kenya. (Pezzoli, MC et al. 2009, WHO 2013). Fortunately, no dentogenic or sinusoid bacteria meningitis was observed in our group. (G. Benca et al. 2007)

## Conclusions

Most of dental procedures in our tropical dental programme we odontogenic infectious, starting with dental caries, following pulpitis, alveolitis, osteomyelitis. Most of these infectious we linked to dental pulpitis, periapical, and alveolar space, not infecting bone or sinuses. No case of dentogenic cerebral abscess and or meningitis, or mandibular osteomyelitis was diagnosed.

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# Respiratory infections after camping in free nature are the current diseases in Migrants to Austria and Germany via Hungary in September 2015: Experience from Röszke and Vámoszabadi

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## Key words:

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## Abstract

Spectrum of infections and non-infections diseases among refuges from Syria/Iraq to Hungary/Austria in September 2015 is analyzed. Respiratory isolates from patients with pneumonia were obtained from respiratory tract secretions and tested for antimicrobial susceptibility. Majority of ID were upper and lower respiratory tract infections, scabies and other skin and soft tissue infections. However, infections represented only about one half of cases seeking medical help – the rest 40-60% were hypertension, exhaustion, depression, diabetes, neuropsychiatric disorders.

## Introduction

Spectrum of infections and non-infections diseases among refuges from Syria/Iraq to Hungary/Austria in September 2015 is analyzed. Respiratory isolates from patients with pneumonia were obtained from respiratory tract secretions and tested for antimicrobial susceptibil-

ity. Majority of ID were upper and lower respiratory tract infections, scabies and other skin and soft tissue infections. However, infections represented only about one half of cases seeking medical help – the rest 40-60% were hypertension, exhaustion, depression, diabetes, neuropsychiatric disorders.

## Patients and Methods

From September -7.th when the Budapest Keleti Railway Station was occupied from Migrants/Refugees from Middle East via Greece to Austria, we have offered medical service tho all who made verbal request. 434 adults and children asked for medical therapy among 45 000 refugees/migrants transported from Serbia back to Hungarian Camp (Városszabadi) (sept. 7. – 14. 2015)

## Results and Discussion

Table 1 shows distribution of infectious and non-infectious diagnoses as reason for medical intervention. Infectious diseases were not the predominant diseases and they presented about 40-45% from

all cases, mainly upper RTI – pneumonia followed by skin and soft tissue/including wounds, bites, insect related infections. Some days, scabies was present in 20-40% of all children and 10-20% of all adults and after upper RTI was second commonest infection. From noninfectious diagnoses, hypertension, insomnia, depression and the neuropsychiatric diseases related to 10-60 days stressful journey were logically very common.(WHO 2013, WHO 2014) Analyzing the spectrum and susceptibility of bacterial isolates only one case of MRSA and 4PRP of 40 samples (12,5%) has been detected as potential pathogens. Causing severe infection. No one case of ID HIV or tropical neglected disease was observed within 8.9 to 15.9.2015

**Tab. 1:** Spectrum of communicable and noncommunicable children in Migrants though Schengen coming from Serbia to Hungary

Diagnosis %	day 1	day 3	day 10	day 10 – 28
Diabetes	2	3	0	12,5
Lower RTI	10	10	5	16
Upper RTI	52	55	60	44
Diarrhea	1	1	3	16
TB	0	0	0	0
Malaria	0	0	0	0
HIV	0	0	0	0
STD	1	0	0	1
Psychiatric	10	10	10	9
Scabies	30	30	20	25,5
Hypertension	20	20	15	23,5
Other	10	10	10	35
Geriatric	1	0	3	2
Snake bites	2	3	2	2
Insects Bites	10	5	1	2
Other wounds	6	20	15	18
More than one	50	10	45	50

**Tab. 2:** Etiology and antimicrobial resistance in isolates from patients with pneumonia

	<b>N°of pathogens</b>	<b>%</b>
MRSA	1/40	2,5
PRP Penicilin-R Pneumococci	8/40	5
<i>Haemophilus influenzae</i>	0	0
Candida	1	1
Other	0	2,5

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# Infectious diseases on Rwanda DR Congo border UNHCR camp

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## Original Articles

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### Key words:

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### Abstract:

Cross sectional study in area close to DRC border (SudKiwu) and Rwanda (Bisesero) in two clinics serving for 50 000 population (of them 25 000 internally displaced and refugees in UNHCR camps) was performed to assess occurrence of major ID in 2013. The aim of this study was to analyse spectrum of tropical neuroinfections and other infectious diseases in Refugees, lives near Bigugu on Rwanda – DRC border treated in 2013/2014 on outpatients basis. Of 10 051 patients, only 31 (0,3%) had malaria, and 26 of them (0,26%) had true highland malaria (without down country travelling history), confirmed both microscopically and with rapid diagnostic test (RDT). Commonest IDs were upper RTI representing (72,89%) of all visits, followed by diarrheal and gastroenteric diseases (13,19%). Also, 26,77% of all children were infected by geohelminths. Only one case of neuroinfection was recorded. Urinary tract infections and sexually transmitted diseases were rare as well (1,4%). Among 10 051 outpatient visits in two rural clinics, serving for UNHCR registered refugees from DRC in Rwanda and internally displaced population near SudKiwu Province.

### Introduction:

International migrants and Refugees Health have been included in to international Health priorities in EU in 2014. Migrants

and internally displaced in subSaharan Africa are subject of increasing threat of Infectious diseases (IDs) due to contaminated water supplies (cholera, typhoid fever),

food (salmonellosis, shigellosis), malnutrition (tuberculosis/TB, HIV) and absence of housing (pneumonia, upper respiratory tract infections RTI).

## Patients and Methods:

Cross sectional study in area close to DRC border (SudKiwu) and Rwanda (Bisesero) in two clinics serving for 50 000 population (of them 25 000 internally displaced and refugees in UNHCR camps) was performed to assess occurrence of major ID in 2013. Bigugu Clinic is located in altitude of 2350 m and Bisesero United Nations High Commissioner for Refugees (UNHCR) camp is in 1150 m above sea level. The aim of this study was to analyse spectrum of tropical neuroinfections and other infectious diseases in Refugees, lives near Bigugu on Rwanda – DRC border treated in 2013/2014 on outpatient basis.

## Results:

Of 10 051 patients, only 31 (0,3%) had malaria, and 26 of them (0,26%) had true highland malaria (without down country travelling history), confirmed both microscopically and with rapid diagnostic test (RDT). Commonest IDs were upper RTI representing (7289%) of all visits, followed by diarrheal and gastroenteric diseases (1319%). Also, 2677% of all children were infected by geohelminths. Only one case of neuroinfection was recorded. Urinary tract infections and sexually transmitted diseases were rare as well (1 4%). Among 10 051 outpatient visits in two rural clinics, serving for UNHCR registered refugees from DRC in Rwanda and internally displaced population near SudKiwu Province. Malaria was extremely rare due to high altitude, and diarrheal and gastrointestinal infections were relatively rare, too. Of all ID, upper RTI were the commonest, while neuroinfections (such as bacterial

or viral meningitis and sleeping sickness) were only exceptional. Very high proportion of RTI was associated with malnutrition and very low socioeconomic status in areas of high altitudes above sea level with low temperature.

## Conclusion:

Refugees and migrants are extremely vulnerable patients population bringing the attention of EU Health agenda after catastrophes on the Italian coasts of Sicily, Lampedusa, as well as Southern Crete and Malta and South Eastern Spain. Importing Infectious diseases to EU from Sub-Saharan Africa and Central/South Asia may cause to a new immune population several clinical encephalitis of typical ID. Early warning system based on Point of Care Diagnosis of commonest ID as Tuberculosis, HIV, Malaria, SARS, Avian Flu, Ebola are of highest priority in this type of patients population not only for EU, but also for all countries.

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# Infectious Diseases among African irregular migrants in Italy. Just an individual problem?

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## Abstract

Migration is one of the possible points of contact between the rich world and the poor world. This paper describes and analyzes the presence of infectious diseases in a large cohort of immigrants from Africa who have landed in Lampedusa and in Sicily from 2011 to 2015. In the experience of “Lampedusa 2011”, in over 75% of the cases observed, the population was healthy. At least 20% of cases, diseases were observed in relation to the migration route, especially the precarious conditions of the crossing of the Channel of Sicily. Infectious diseases or female genital pathologies and or reproductive problems were observed in less than 2% of the population. These experiences confirm the Healthy Migrant theory, a population predominantly represented by young people who are at risk of becoming ill during the difficult migration or in the host country due to poor living conditions. In the last years, our experience confirm the higher prevalence of HBV, HIV and TB infection in irregular migrant people compared to general population living in Italy. Taking care of such people is an act of civilization and ensures the health of those individuals and of community.

## Introduction

In the last two decades, in view of international migration flows, there have been outstanding changes directly related to social, political and economic factors that have forced a huge amount of people to leave their land, their habits, their culture, often brutally.

The phenomenon of world globalization and some alterations of the political-economic order in the nearby counties of the near East and in eastern Europe, such as the fall of the Berlin Wall or the “fall of the wall of the Magheb” have determined an inevitable revival of the possibility to consider and plan their life beyond the natural and political boundaries of those people who are nowadays facing conditions of extreme poverty and are forced to suffer violence, torture, war and human misery in their own countries.

The Mediterranean area can be considered a good example to understand the complexity of migration. Africa and Europe are strictly interconnected by migration, both for geographical nearness and because of the huge socio-economic gap between the two continents: 15 out of 20 of the most developed Countries in the world are in Europe, while the 20 least developed Countries of that same world are in Africa (1).

This means that Europe appears as the new “promised land”, and migrants of African origin are willing to face long and difficult journeys to reach it, often travelling across the whole African Continent.

But who are these people? Where are they from? What are they looking for?

The word “migration” covers a wide range of movement, the reasons for it and the conditions under which it takes place (2-4). It is nevertheless important to keep in mind that not all migrants come from the same type of background, nor do all migrants move for the same reasons and under the same circumstances. The vulnerability

of migrants from different backgrounds to communicable and non-communicable diseases is likely to be different and so is their capacity to respond to their health needs and participate in national public health programs (5,6).

Poverty and the desire for a better life continue to be among the most important factors motivating people to move. The fact that both real and relative poverty is becoming more evident, and that the gap between rich and poor countries is growing, this type of migration is likely to continue. The range of people moving for economic reasons is broad, and includes highly skilled migrants from social and economic backgrounds. However, the largest portion of migrants is, and will continue to be, made up of people fleeing disadvantaged socioeconomic and environmental backgrounds. These people are highly vulnerable and exposed to infection (particularly to HIV infection, to other sexually transmitted infections and to tuberculosis) due to frequent episodes of violence, torture, abuse and deplorable conditions of vulnerability they are submitted to along the migratory route (7-12). Immigrants with greater social marginalization (illegal immigrants, drug-addicted people, homosexuals, sex workers, victims of human beings trafficking, ethnic minorities, prisoners) are at additional risk of morbidity, exploitation and social exclusion due to high mobility, social status, linguistic and economic difficulties, cultural diversity, misinformation, low level of education, lack of work, difficult access to health care and prevention, social exclusion and gender issues (13-21).

Social and political attitudes to migration have become stricter in recent years, and countries have introduced measures designed to make in-migration (even for short periods) more difficult. In opposition to many expectations, the result has been a marked increase in the number of people



moving, rather than a marked decrease. Although it is difficult to exactly define how many people are involved in this irregular migration, the number is thought to be growing and possibly exceeding the number of people moving officially and in a recorded way (2-4,22,23). From the perspective of public health and infectious diseases prevention and control, irregular migrants present difficult challenges (10). Not only they remain unseen and benignly neglected by local authorities, but they also remain largely unreached by health initiatives. Their conditions of life, which are often characterized by overcrowded and promiscuous housing, poor hygiene, frequent mobility within and between cities, marginalization from health care systems and a reluctance/fear of being identified by judicial authorities, make the task of reaching them with screening, early diagnosis and treatment difficult. Conflicts remain a major cause of forced migration and the last twenty years have seen the number of refugees and Internally Displaced People (IDPs) come to constitute a significant proportion of all people around the world. Most refugees move from developing countries. The rights of IDPs,

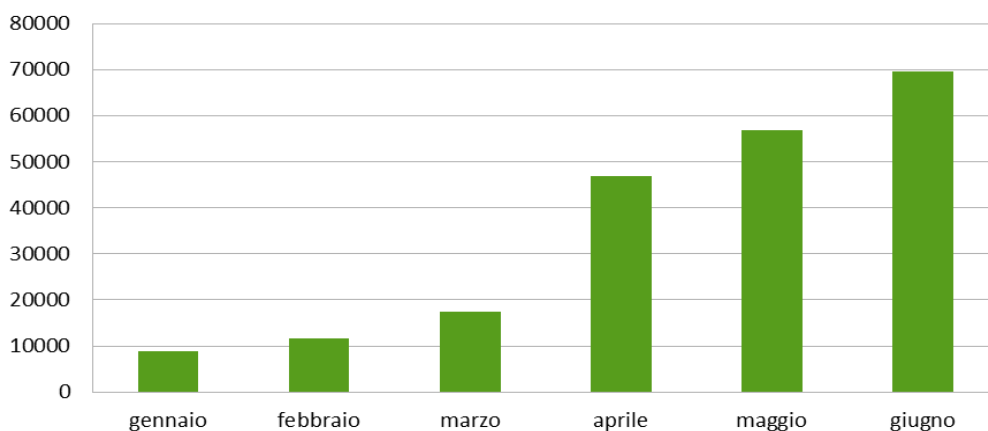
however, including their health, essentially remains the responsibility of their own governments and is often neglected, if not further abused once they flee. Many IDPs, as well as refugees, go on leaving their countries of origin and make their way to other countries, including EU countries. In the case of both refugees and IDPs, the social and environmental conditions in which most of them are forced to live, even temporarily, tend to be poor and lead to the spread of infectious diseases (2-4).

In this complex and difficult contest Sicily, and more recently Greece, have become a forced crossroads, a piece of land of arrival or transit where those people must have the right to be welcome, cared for and treated in the name of the basic human rights to ensure and guarantee collective health.

In the report for the first half of 2015, made known in Geneva by UN High Commission for Refugees (UNHCR), the total amount of migrants and refugees has reached 137.000 people (figure n°1), the vast majority of whom is fleeing war, conflicts and persecutions, seeking protection. The report shows that the route of the eastern Mediterranean Sea, from Turkey to

**Figure n°1:** Migration from Africa to Italy and Greece in the first half of 2015

**Flussi Migratori Africa > Italia/Grecia (2015)**

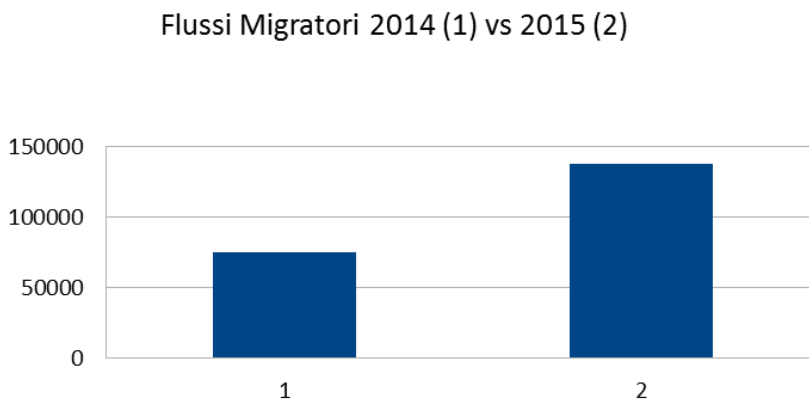


Greece, has nowadays substituted the one situated in the central Mediterranean Sea (from North Africa to Italy) and it can be considered the most important one for those arriving by sea.

Data show an increase of 83% of refugees and migrants who have come through the Mediterranean Sea from January to June; as a matter of fact, in the same period 2014 the total number of migrants coming through the Mediterranean was 75.000 (figure n°2).

The resulting framework shows a fragmentation of the available data that requires a strong effort on the part of Public Health System to improve the quality of information and to implement specific programs of prevention and care. The data on the spread of some infectious diseases (such as HIV, TB, HBV) among the immigrant population and the indigenous are rather limited, although the clear disproportion of cases in the migrant population suggests that the immigrant status in the EU even nowadays rep-

**Figure n°2:** Number of migrants in the years 2014 and 2015



### **Migrants and infectious diseases: the European scenario**

The Report of the European Center for Disease Control and Prevention (ECDC) “Assessing the burden of key infectious diseases Affecting migrant populations in the EU/EEA” presented in Stockholm in 2014 (25) shows a cross-section of particular interest on the health of the migrant population in the European Union.

The report takes into account a group of infectious diseases considered relevant and is based on an analysis of data and information from a variety of sources: the European system of surveillance of infectious diseases (Tessy), a revision of literature and a survey conducted through a network of experts selected in all EU countries.

resents an important determiner of health, making immigrants more fragile with less access to prevention programs and care.

**HIV infection:** between 2007 and 2011, 39% of new cases of HIV infection come from the immigrant population. This shows that there is a clear disproportion between the incidence of new cases of HIV among the indigenous population and the immigrant one. The increase in incidence has been observed especially among people from Latin America and Eastern Europe. Down instead the proportion of new infections in Sub-Saharan Africa. The route of transmission is found to be more frequently through unprotected heterosexual intercourse. It would seem obvious that many migrants are at high risk of acquiring the in-

fection once they are in the EU: there is thus no “imported” cases, but problems related to increased susceptibility of these patients to infection once they get in EU, as well documented in the Italian study PRISMA (26) and in the European study aMASE (27) under publication.

**Tuberculosis:** also for tuberculosis, it was observed an increase of cases related to the migrant population: from 10% in 2000 to 25% in 2010 (25). In Western Europe, the majority of cases of TB is reported in the migrant population while, on the contrary the incidence of infection seems to be reduced in the European population. However, the increase of TB cases registered in the immigrant population has not caused an increase in the spread of TB in Europe. Therefore, this evidence suggests the need to implement specific strategies for prevention and care in those population groups of people who are at increased risk of infection.

**Hepatitis B virus (HBV):** it affects in a discriminatory way the immigrant populations who are not usually vaccinated as opposed to the people of Europe who, thanks to the spread of vaccine strategies against hepatitis B, have very limited prevalence rates of infection thanks to poor local circulation of the virus.

In many European countries immigrants from highly endemic regions are 5-90 times more frequently affected by HBV than the general population (28-32). Pregnant women involved in Médecins du monde (MdM) programs face multiple vulnerabilities. Only half of the pregnant women knew their HIV, hepatitis B or hepatitis C status when they arrived under the MdM program and, of these, 14.3% were HIV positive, 11.1% tested positive for hepatitis B and 2.8% for hepatitis C. In addition, 67.1% of the women wished to be screened for one or the other of these viruses, but 34.3% did not know where they could go for the test. (33)

## **Experiences and activities aimed at the migrant population landed in Sicily**

The model of community health path adopted envisages an initial intervention of hospitality and triage at the pier and a subsequent activity of transcultural and social health care.

The phases of the intervention project have envisaged the following activities:

- Preparation of the host location and clinical diagnostic path: it has been necessary to draw routes linking the sites of hospitality and triage at the pier and the structures to host the assisted people: a clinic for a first diagnostic and/or therapeutic approach to offer to the people who presented symptoms and / or signs of disease; a first help centre, in the case of those landed people who have not showed any disease; transfer to Sicilian hospitals specifically identified in case of need for hospitalization.

The presence and intervention of cultural mediators is fundamental to encourage and enable all the communication skills of interpretation through interventions of direct or indirect linguistic and cultural mediators. Mediators have used a triage form specially created and validated for the collection of personal data, medical history and symptoms and for the attribution of a code of evaluation of clinical conditions, necessary for the subsequent care pathway.

- Creation of a centralized DB for collecting and analyzing data on the physical and psychological condition of people just landed.

- psychological and legal assistance through the activation of specific special windows to give psychological support, information on the right to health and access to care and to respond directly to the needs expressed by the migrants.

The program was launched in 2011 and made it possible to accommodate and assist

24,861 people who came through 106 landings (34).

The presence of infectious disease has been reported in 66 subjects (see Table n° 1)

In 184 cases out of the total of the population observed (0.3%), it has been necessary to use a transfer by helicopter rescue to the Sicilian hospital network previously identified. The clinical pictures that have requested the transfer to hospital are shown in Table 2 below in which it is possible to highlight that female genital pathologies and or reproductive problems have represented the largest part among women; in men, the diseases that have requested more urgent transportation have been infectious diseases and mental disorders.

After 2011 the activities of reception and service have undergone some changes related to the number of landings and migrants arrived in Sicily and at the specific request of screening for sexually transmitted infections manifested by the migrants themselves. Specific interventions for early diagnosis of tuberculosis have been started in some centers for identification and expulsion on the Italian territory.

**Table n°1:** Diagnosis of identified infectious diseases

Diagnosis	n° of cases
TB infection	21
HBV infection	13
Scabies	8
Pneumonia/bacteria bronchopneumonia	5
Malaria	5
HCV infection	4
Acute gastroenteritis	4
HIV infection	2
Herpetic stomatitis	1
Purulent meningitis	1
Bacterial endocarditis	1
Visceral leishmaniasis	1
<b>Total</b>	<b>66</b>

A specific study evaluated the prevalence of HBV infection in a population of African migrants in Palermo (35).

Hepatitis B Virus (HBV) affects the liver and can result in chronic infection, which may lead to liver cirrhosis and hepatocellular carcinoma (HCC).

Worldwide, an estimated two billion people have been infected with hepatitis B virus (HBV) at some point in their lives and 360 million of them are estimated to have chronic infection (36). In the WHO European Region, 14 million people are estimated to have chronic hepatitis B and HBV is responsible for 36.000 deaths annually (37). WHO classifies countries according to HBV endemicity, based on the prevalence of hepatitis B surface antigen (HBsAg) in the population. Endemicity is classified high in countries with a general population HBsAg prevalence above 8.0%, intermediate where this prevalence is between 2.0% and 8.0%, and low where HBsAg prevalence is below 2.0% (36). High-prevalence areas include sub-Saharan Africa, central and south-east Asia, the Pacific and South America. Southern parts of eastern and central Europe, the Middle East and India are classified as intermediate prevalence and western Europe and North America are classified as low prevalence areas (27) (see figure 3).

Between May 2014 and April 2015 a total of 265 males African migrants were tested for HbsAg, since it was requested. In HBsAg positive patients the biochemical and virological activity of infection and the possible presence of co-infections (HCV, HDV, HIV) were evaluated.

Among the 265 subjects tested, 19 (7,1%) resulted HBsAg positive. All had an average age of 28 years (range 18-42). The HBsAg positive patients came from Mali: 4 (21%); Ghana: 4 (21%); Gambia: 3 (15,7%); Nigeria and Guinea Bissau: 2 (10,5%); Senegal, Somalia and Costa d'Avorio: 1 (5,2%)

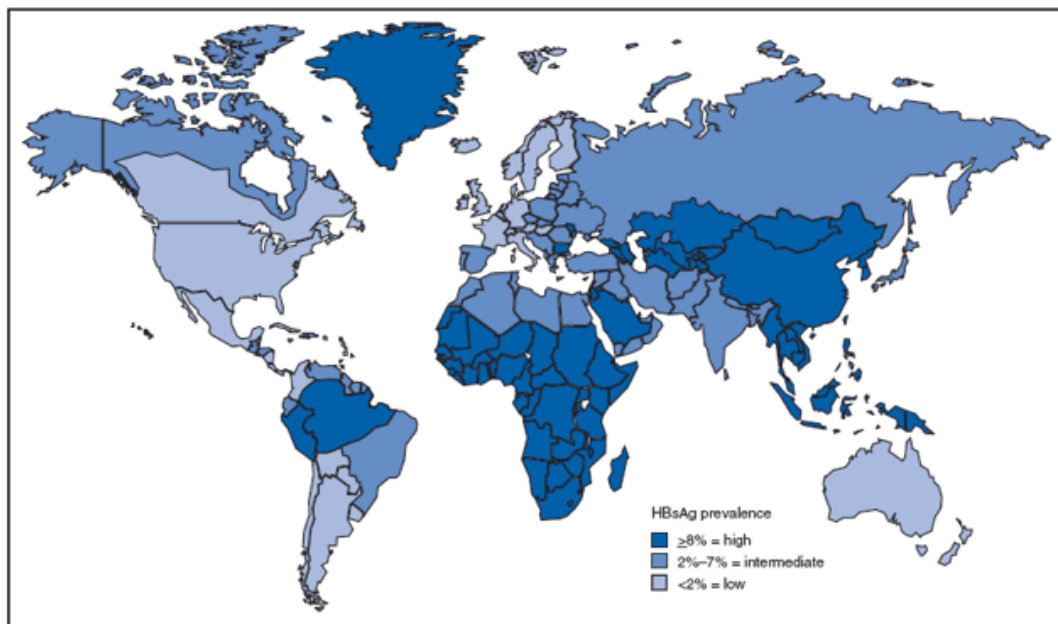
**Table n°2:** clinical cases requiring urgent transportation by helicopter rescue

<b>Females (n° 88)</b>		<b>Males (n° 96)</b>	
<b>Gynecological and Reproductive disorders</b>	<b>80</b>	<b>Infectious diseases</b>	<b>23</b>
Term pregnancies or premature births	63	Tuberculosis	10
Abortion	11	Pneumonia or bacterial bronchopneumonia	5
Pelvic pain unknow origin	5	Acute gastroenteritis	3
Bartholinitis	1	Scabies	2
		Bacterial endocarditis	1
		Bacterial Meningitis	1
		Herpetic stomatitis	1
<b>Other pathologies</b>	<b>8</b>	<b>Neuropsychiatric disorders</b>	<b>29</b>
Acute appendicitis	4	Suicide attempt	23
HIV infections	1	epileptic seizures	5
Pulmonary TBC	1	abstinence syndrome	1
Visceral leishmaniasis	1		
Acute gastroenteritis	1	<b>Traumatic Diseases</b>	<b>14</b>
		Traumatic fractures of the limbs	11
		Brain trauma with fracture	3
		<b>Other Pathologies</b>	<b>30</b>
		Acute abdominal pain	7
		Severe dehydration (shock)	7
		Acute urinary retention	5
		Acute appendicitis	4
		Skin ulceration/burns	4
		Cerebrovascular accidents	3

Only 3 patients infected by HBV had elevated alanine-aminotransferase (ALT) serum levels (average level was 202 IU/L, range 61-323). The others 16 patients had normal ALT serum levels. In the normal ALT group, the serum HBV-DNA were detectable by PCR-Real Time in 11 patients (68,7%); (average level 1.688.284 copies/mL; range: 96-170.000.000). In the last 5 patients (31,3%) of this group, HBV-DNA were undetectable (<20 copies/mL). In the 3 patients with elevated alanine-aminotransferase serum levels, we observed serum HBV DNA detectable by PCR-Real Time (average level 16.277 copies/mL; range 128-47.740).

Our study points out an intermediate prevalence of HBV-infection in migrant African people. Two remarkable aspects emerged by the study: the elevated number (13 cases, 68,4%) of young healthy carrier of HBsAg (average age: 26,4 years, range: 18-37) and the relative frequency (21%, 4 cases) of coinfection with Human Immunodeficiency Virus (HIV).

Another important experience has been conducted to assess the prevalence of tuberculosis in young migrants confined in the Centres for Identification and Expulsion (CIE) (38). In Italy, notification of TB cases has decreased annually by an average of 2.5% going from a rate of 9.2 notified TB

**Figure3:** Geographic distribution of chronic hepatitis B virus (HBV) infection – worldwide, 2006\*

\* For multiple countries, estimates of prevalence of hepatitis B surface antigen (HBsAg), a marker of chronic HBV infection, are based on limited data and might not reflect current prevalence in countries that have implemented childhood hepatitis B vaccination. In addition, HBsAg prevalence might vary within countries by subpopulation and locality.

Source: CDC. Travelers' health; yellow book. Atlanta, GA: US Department of Health and Human Services, CDC; 2008. Available at <http://wwwn.cdc.gov/travel/yellowbookch4-HepB.aspx>.

cases per 100 000 population in 1995 to a rate of 5.8 in 2011 (this is just below the European trend which consisted of an annual decrease of 2.9% starting from a rate of 22.7 in 1995 to a rate of 14.2 in 2011). (25)

The breakdown of TB cases by place of birth shows 39.8% native, 58.3% foreign, while 1.8% is of unknown origin. Average age at diagnosis for native TB cases is 56.1 years versus 35.5 years for foreign people. According to the European Union case definition, Italy has this classification of TB cases (2012) as it follows: confirmed 21.5%, probable 12.2%, possible 66.2%. This is far below the standard of the 30 European countries which is respectively 61.9%, 7.4% and 30.7%. (25)

In June 2012, Medecins sans Frontières (MSF), in collaboration with local health authorities, designed a “Pilot project for early diagnosis, treatment and monitoring of tuberculosis in migrants hosted in closed Centres of Identification and Expulsion and

consequently prevent the spread of the disease” to improve and strengthen the prevention, diagnosis and care of tuberculosis in 4 out of 13 immigration centres in Italy.

The objectives of the project were: 1) to evaluate the TB screening tool and to identify factors leading to loss to follow-up 2) to determine the number of TB cases and suspected TB cases in the screened population 3) to identify significant risk factors for active TB in this specific population.

The investigators provided TB training for local staff, administered TB screening questionnaires to all inmates at admission in collaboration with local health staff and facilitated referrals to TB centers. TB questionnaires consisted of verbal screening on symptoms proving active TB, previous history of TB or previous contact with a TB case.

From August 2012 to December 2013, 1931 migrants were enrolled; the majority were young adult men with an average

age of 30 years. The screened migrants came from 93 different countries origin. The most represented countries were Tunisia, Morocco and Nigeria. Among the migrants screened, 54 (2.8%) had positive questionnaires: the majority were men, but HIV co-infected transsexuals had the highest risk of having a positive questionnaire due to previous TB. Most frequent answers were: previous history of TB (35%) and chronic cough (33%). Twenty-three (42.6%) were referred to TB centers. Reasons for not being referred were (in order): CIEs operational limitations, physician decision and host's refusal. Active TB was diagnosed in four individuals (0.2% among screened) (see Tables 3 and 4).

The results confirm the higher incidence of active TB among irregular migrants in closed centres compared to general population living in Italy. The overall yield of this intervention is in the range reported for other migrant TB screening programs in open contexts. Referral outside the CIEs was not optimal, mainly because of CIEs operational limitations: since a high number of positive questionnaires were not referred, in order to ensure universal access to secondary health care, more effort must be done by CIEs staff towards the completion of the diagnostic workup.

In the last five years there have not been performed screening programs for HIV infection in immigrants who have landed in

**Table 3:** Preliminary results of the MSF TB screening protocol (1st August 2012 – 30th April 2013)

Center	Total new inmates	Total TB questionnaires (% among new inmates)	Positive TB questionnaires (% among new inmates)	Second evaluation (% among positive questionnaires)	TB (% among new inmates)
Milano	547	541 (98.9)	24 (4.4)	8 (33.3)	1 (0.2)
Roma	889	880 (99.0)	19 (2.1)	11 (57.9)	1 (0.1)
Trapani	416	385 (92.5)	11 (2.6)	4 (36.4)	2 (0.5)
Caltanissetta	7978	(98.7)	0 (0)	0 (0)	0 (0)
Total	1931	1884 (97.6)	54 (2.8)	23 (42.6)	4 (0.2)

**Table 4:** Clinical characteristics of active TB cases (1st August 2012 – 30th April 2013)

	Sex	Age (years)	Nationality	Localization	Sputum Microscopy	Treatment compliance
Milano	M	38	Morocco	Pulmonary	Negative <sup>1</sup>	Good
Roma	M	42	Algeria	Pulmonary	Negative	Bad <sup>2</sup>
Trapani	M	18 <sup>4</sup>	Morocco	Pulmonary	Negative	Bad <sup>2</sup>
Caltanissetta	M	33	Ghana	Pulmonary	Not done	Not evaluable <sup>3</sup>

<sup>1</sup> Diagnosed in prison (2012): in continuation phase treatment (5th month), released from the CIE for medical reasons.

<sup>2</sup> Escaped from Infectious Diseases Unit after 2 days of hospitalization.

<sup>3</sup> Diagnosed in Palermo Infectious Diseases Unit (2012) with voluntary treatment interruption: re-started initial phase treatment inside the CIE.

<sup>4</sup> Just landed in Lampedusa island: reported 1 year of antibiotic treatment in Morocco for an unspecified lung disease.

Sicily. Therefore, no reliable data is available. However, the observation and the perception of an increased risk of sexually transmitted infections in the I-migrants from Libya has led us to make, in Lampedusa, in the month of July 2011, a special screening for the diagnosis of HBV infection and HIV in two specific cohorts who reported different migration patterns (see Figure No. 4). The methodological limitations and sampling of the study do not allow an accurate and meaningful analysis of the data, however, it has been highlighted a relevant difference of prevalence among the population from Tunisia and Morocco than from Libya, with a history of prolonged forced permanence in the concentration camps (39). In fact, the Tunisian population screened (171 people) filed a single case of HBV infection; no case of HIV infection was detected. The 194 people from the Horn of Africa region and sub-Saharan Africa, who reported about an extended period of stay in the concentration camps in Libya, have been found to be infected with HIV in one case; a co-infection of HIV/HBV in one case; HBV infection in 4 cases.

As could be expected, migration is changing the epidemiology of HIV infection; indeed in 2013, 24% of new diagnoses of HIV infection has been reported in not Italian patients (40). In the same year, the incidence was 4.9 new cases per 100,000 among Italian residents and 19.7 new cases per 100,000 among foreign residents. The highest incidences of foreigners were observed in Lazio, Campania, Sicily and Sardinia. Among the foreigners, the highest proportion of cases has shown that women are infected through heterosexual (38.3%), while among Italians by homosexual males (45.9%).

The data reported by the AIDS Operational Centre (AOC) Institute of Health reflects the cases observed in our unit that receives the largest number of migrants with infectious diseases in Sicily; in the period between 2009 and 2014 we observed 138 new diagnoses of HIV infection: 77 (55.9%) in not Italian patients and 61 in Italian patients living in Sicily. In our experience, men represent 59% of cases; the average age is 27 years in the foreign patients and 32 years in the Italian ones.

**Figure n°4:** Main migratory routes in Africa



Adapted From: H. De Haas, *Trans-Saharan Migration to North Africa and the EU: Historical Roots and Current Trends*, Migration Information Source, november 2006



## Conclusions

In the light of the experiences described and the data reported, it cannot be denied the theory of the “Healthy Migrant” who, in most cases, leaves his/her land in good health.

To understand the main objective of all activities for the protection of the health of migrant populations, it is very important to always remember the Universal Declaration of Human Rights which, in Article 25, points out: “Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care and necessary social services”.

All activities for reception and assistance in the various landing points (Lampedusa, Pozzallo, Licata, Rosolini and, more recently, Palermo and Catania), have always considered the right to health as a milestone and a starting point for all activities aimed at these populations. But this is not enough; In fact, the observation of what it is happening in the foreign population without a valid residence permit or for those asking for international protection, highlights a worrying limitation of the so-called “determinants of health” well indicated by the World Health Organization (41).

Among these people there is a further critical element represented by the difficulty of access to health facilities and the limited and difficult fruition of them. The natural consequence of this phenomenon is the observation of serious delays in the diagnosis and treatment of infectious diseases, with very serious consequences for the patient and with possible risk for the community health: **Just an individual problem?**

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# Commonest Diseases Amongst Iraqi Internally Displaced After Islamic State Expansion

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## Abstract

Commonest communicable and non communicable diseases among 1119 Refugee patients Internally displaced in 2015 to Erbil, Iraq autonomous Republic of Kurdistan escaping from Islamic State Expansion visanalyzed. Respiratory infections (18%) hypertension (16,5%) were the commonest diseases among ID Iraqi adults in UNHCR Refugee camp.

## Introduction

The number of forcibly displaced people has grown in the last years, according to the UN Refugee Agency (UNHCR), and has reached 51.2 million in 2013.(UNHCR, 2013) Amongst these people two major groups are distinguished – refugees and internally displaced persons (IDPs). The former are people who, out of fear of persecution, have left their home country and are unable or unwilling to return to that country. (UNHCR, 1951) IDPs flee their homes for the same reasons as refugees, but remain on

the territory of their country of origin.(Siriwardhana et al., 2014)

The number of refugees grew from 15,4 million in 2012 to 16,7 million at the end of 2013.(UNHCR, 2013, UNHCR, 19 June 2013) War remains the most important cause of refugee displacement – most (55%) refugees come from five countries: Afghanistan, Somalia, Iraq, Syria and Sudan, each of the countries affected by war. The vast majority (81%) of refugees live in developing countries, with the countries hosting most people being Pakistan, Iran and Germany. 2,5 mil-

lion people became new refugees in 2013 – it's the highest number since 1994.(UNHCR, 19 June 2013, UNHCR, 2013)

Unlike refugees, the more numerous IDPs lack in the protection from the international law and institutions because formally they are under the jurisdiction of their own governments (even if these governments don't have the ability to provide them with help and security or are themselves the reason of forceful displacement). The number of IDPs is rapidly growing in the recent years, from 26,4 million in 2011 (UNHCR), to a record 33,3 million in 2013.(UNHCR, 2013) The countries with the most IDPs are Syria, which, because of the violent civil war, reached the top place in 2013 with 6,5 million persons, Colombia (5,4 million IDPs) and Congo (3 million).((iDMC), 2014)

IDPs are often subject to prolonged exposure to politically-induced collective violence as they often experience much greater insecurity than refugees.(Roberts et al., 2009)

Displacement is connected to worsening of living conditions, loss of family, friends, social and cultural support, and poverty. It is also mostly long- term, with the majority of victims living like this for more than 5 years, and in many cases decades.(Luitel et al., 2013)

Modern Iraq has a long history of people displacement, with many waves of migration overlapping, from Hussein's times, through the latest war, up until now. This overlapping of the waves of migration, with many people moving more than one time, the lack of reliable data from the pre-war period and the difficulty to assess the extent to which some of the displaced found durable solutions, makes it hard for monitoring organizations to calculate the exact number of IDPs in Iraq.(Center, 2014)

It is certain though, that the ongoing Syrian civil war and last year's developments in Iraq, including the rise of the

so called Islamic State of Iraq and Syria (ISIS), significantly increased the number of refugees and almost tripled the already big number of IDPs in the country.(Center, 2014) With the weak central government and corrupt national army unable to maintain stability, the escalation of armed conflict have led to new and secondary migration of IDPs.(UNHCR, 2015) The International Organization for Migration (IOM) registered movement of 2.12 million IDPs in Iraq as of December 25, 2014, of which close to 800,000 settled in over 300 locations across the politically and militarily semi-independent Kurdistan Region of Iraq.(UNHCR, 2014)

Neither the central nor the regional governments have the sufficient resources to provide help, and the sudden increase in the number of the displaced presents a significant challenge to the international organizations as well. Our personal experiences coming from working in a medical charity project for IDPs in Kurdistan Region of Iraq, allowed us to make observations about the conditions of living and problems faced by the new wave of Iraqi displaced. Despite significant efforts of international and local structures, many IDPs still lack sustainable shelter and sufficient health care. While some of them are lucky enough to live in houses, sometimes rented by themselves but mostly paid for by charity organizations, most stay in IDP camps or unfinished buildings, schools and other temporary shelters. Cold winter nights, sanitation problems, overcrowding and restricted access to medicine lead to general ill health in the population. Traumatic events, loss of livelihood, unemployment and lack of income, disturbance of social structure, and uncertainty about the future are also visibly starting to have their toll on the mental and physical well-being of Iraqi IDPs.

As a response to recent Iraq's crisis, St. Elizabeth University of Health Care and So-

cial Work opened the Clinic of St. Zdenka Scheling – charitable primary healthcare clinic in Erbil for Iraqi IDPs. Majority of IDPs visiting this clinic live in houses rented by humanitarian actors, with up to 5 families squeezed in one house. Even if their living conditions are better than of the people living in camps or in so called open-air locations, they are facing similar problems: overcrowding, challenges in keeping good hygiene or restricted access to healthcare.

This study reviews the prevalence of the commonest disease among Iraqi IDPs who attended our clinic as of March 2015.

## Methods

We conducted a retrospective review of the electronic medical records of 1119 refugee patients at a primary care clinic for Iraqi IDPs in Ozal city, Erbil. Any patient rostered at the clinic between March 23rd, 2015, and July 28th, 2015, with at least 1 clinic visit was included in our study. The clinic database collects the following data for each patient: unique patient number, date of birth, sex, and disease number based on Simplified Disease Classification system created specifically for the clinic database. In our study we focused on number of cases instead number of visits, since a great number of patients of the clinic visits the place for checkups or follow-ups of previously diagnosed illnesses.

Diagnoses of chronically ill patients issued before their displacement were not verified by the clinic's doctors and were accepted and followed based on patients' documents. Suspected new cases and cases requiring additional tests were referred to outside specialists and then followed by the clinic's doctors.

## Findings

In the researched period the clinic has been visited a total of 2326 times by 1119 patients (av. 2,08 visit per patient). A total

of 1498 diagnoses were made (av. 1,34 diagnoses per patient). The mean age was 35 years (SD 23,9) with slightly more women than men present in the patient population (53,6%).

The most frequent diagnoses were respiratory infections (18,42%) dominating in age group below 35y.o., and hypertension (16,56%), most common amongst patients 45y.o. and older (see Tables 2 and 5)

Most diagnoses (58,34%) were of non-communicable diseases (see Table 1) with hypertension, digestive diseases, bone diseases and diabetes being most popular amongst them (see Table 3). In the communicable diseases category respiratory diseases dominated followed by gastroenteritis (see Table 4)

The most prevalent diagnoses in respective age groups are described by Table 5.

## Discussion

We found that among 1119 patients of our clinic 58,34% suffered from non-communicable diseases, out of which hypertension was the most common one (28,4%). Chronic medical symptom complexes such as musculoskeletal pain, gastrointestinal pain, headaches also belong among leading causes of the patients' visits. On the other hand, burden of infectious diseases (27,04%) is not as high as it could be expected amongst displaced population. This can have various reasons. First, Iraq is not a tropical developing country where prevalence of infectious diseases is generally high and often uncontrolled even in non-displaced population. Second, as mentioned above, majority of our patients live in regular houses, even if up to 4 families share one house. These better living conditions without overcrowded camps stand as a protective factor against quick transmission of infections. Third, in comparison with other parts of the country, health care in Erbil is still relatively easily accessible even for displaced population.

**Table 1:** Number of cases by disease communicability

	%	n
Non – communicable disease	58,34%	874
Communicable disease	27,04%	405
Other	14,62%	219

**Table 2:** Most common diseases – whole population

	%	n
Respiratory infections	18,42%	276
Hypertension	16,56%	248
Digestive diseases	9,01%	135
Bone diseases	7,61%	114
Diabetes melitus type II	6,68%	100

**Table 3:** Non-communicable diseases in the whole population

	Men		Women		Total	
	n	%	n	%	n	%
<b>1. Hypertension</b>	<b>111</b>	<b>30,2%</b>	<b>137</b>	<b>27,1%</b>	<b>248</b>	<b>28,4%</b>
<b>2. Digestive tract dis. <sup>1)</sup></b>	<b>63</b>	<b>17,1%</b>	<b>72</b>	<b>14,2%</b>	<b>135</b>	<b>15,4%</b>
<b>3. Bone diseases <sup>2)</sup></b>	<b>39</b>	<b>10,6%</b>	<b>75</b>	<b>14,8%</b>	<b>114</b>	<b>13,0%</b>
<b>4. DM 2</b>	<b>46</b>	<b>12,5%</b>	<b>54</b>	<b>10,7%</b>	<b>100</b>	<b>11,4%</b>
<b>5. Renal diseases <sup>3)</sup></b>	<b>30</b>	<b>8,2%</b>	<b>37</b>	<b>7,3%</b>	<b>67</b>	<b>7,7%</b>
<b>6. Lung diseases <sup>4)</sup></b>	<b>22</b>	<b>6,0%</b>	<b>24</b>	<b>4,7%</b>	<b>46</b>	<b>5,3%</b>
<b>7. Neurologic diseases <sup>5)</sup></b>	<b>12</b>	<b>3,3%</b>	<b>22</b>	<b>4,3%</b>	<b>34</b>	<b>3,9%</b>
<b>8. Headaches</b>	<b>9</b>	<b>2,4%</b>	<b>20</b>	<b>4,0%</b>	<b>29</b>	<b>3,3%</b>
<b>9. Heart diseases <sup>6)</sup></b>	<b>11</b>	<b>3,0%</b>	<b>15</b>	<b>3,0%</b>	<b>26</b>	<b>3,0%</b>
<b>10. Anemia</b>	<b>7</b>	<b>1,9%</b>	<b>19</b>	<b>3,8%</b>	<b>26</b>	<b>3,0%</b>
<b>11. Ophthalmologic dis.</b>	<b>8</b>	<b>2,2%</b>	<b>15</b>	<b>3,0%</b>	<b>23</b>	<b>2,6%</b>
<b>12. Traumas</b>	<b>7</b>	<b>1,9%</b>	<b>5</b>	<b>1,0%</b>	<b>12</b>	<b>1,4%</b>
<b>13. Hyperholesterolemia</b>	<b>2</b>	<b>0,5%</b>	<b>8</b>	<b>1,6%</b>	<b>10</b>	<b>1,1%</b>
<b>14. Psychiatric diseases</b>	<b>1</b>	<b>0,3%</b>	<b>3</b>	<b>0,6%</b>	<b>4</b>	<b>0,5%</b>
<b>Total:</b>	<b>368</b>		<b>506</b>		<b>874</b>	

- 1) Digestive tract diseases include: diseases of the esophagus, stomach, bowel, rectum, liver, gall-bladder and pancreas
- 2) Bone diseases include: osteoporosis, osteoarthritis, osteochondritis and rheumatologic disease
- 3) Renal diseases include: renal insufficiency, nephrolythiasis, urolythiasis and other diseases of the urinary tract
- 4) Lung diseases include: asthma, chronic cough and interstitial lung disease
- 5) Neurologic diseases include: vertigo, migraines, epilepsy, stroke and Manier syndrome
- 6) Heart diseases include: coronary artery disease, valvular heart disease, heart failure and arhythmia

**Table 4:** Communicable diseases in the whole population

	Men		Women		Total	
<b>1. Respiratory Infect.</b>	<b>136</b>	66,7%	<b>140</b>	69,7%	<b>276</b>	68,1%
<b>2. Gastroenteritis</b>	<b>44</b>	21,6%	<b>32</b>	15,9%	<b>76</b>	18,8%
<b>3. Intestinal parasitosis</b>	<b>13</b>	6,4%	<b>14</b>	7,0%	<b>27</b>	6,7%
<b>4. Scabies</b>	<b>5</b>	2,5%	<b>7</b>	3,5%	<b>12</b>	3,0%
<b>5. Others</b>	<b>6</b>	2,9%	<b>8</b>	4,0%	<b>14</b>	3,5%
<b>Total:</b>	<b>204</b>		<b>201</b>		<b>405</b>	

**Table 5:** Most common diseases by age groups

Age	n patients	Disease name	n cases	%
<b>0 – 4 years</b>	n = 125	<b>Respiratory infections</b>	71	<b>56,80%</b>
		<b>Gastroenteritis</b>	22	<b>17,60%</b>
		<b>Digestive diseases</b>	7	<b>5,60%</b>
<b>5 – 15 years</b>	n = 201	<b>Respiratory infections</b>	92	<b>45,77%</b>
		<b>Digestive diseases</b>	20	<b>9,95%</b>
		<b>Gastroenteritis</b>	20	<b>9,95%</b>
<b>15 – 24 years</b>	n = 78	<b>Respiratory infections</b>	24	<b>30,77%</b>
		<b>Digestive diseases</b>	8	<b>10,26%</b>
		<b>Lung diseases</b>	6	<b>7,69%</b>
		<b>Trauma</b>	6	<b>7,69%</b>
		<b>Headache</b>	6	<b>7,69%</b>
		<b>Gastroenteritis</b>	6	<b>7,69%</b>
<b>25 – 34 years</b>	n = 94	<b>Respiratory infections</b>	28	<b>29,79%</b>
		<b>Digestive diseases</b>	10	<b>10,64%</b>
		<b>Renal diseases</b>	9	<b>9,57%</b>
		<b>Bone diseases</b>	9	<b>9,57%</b>
<b>35 – 44 years</b>	n = 122	<b>Digestive diseases</b>	22	<b>18,03%</b>
		<b>Respiratory infections</b>	17	<b>13,93%</b>
		<b>Renal diseases</b>	14	<b>11,48%</b>
		<b>Bone diseases</b>	14	<b>11,48%</b>
		<b>Hypertension</b>	10	<b>8,20%</b>
<b>45 – 54 years</b>	n = 204	<b>Hypertension</b>	46	<b>22,55%</b>
		<b>Bone diseases</b>	35	<b>17,16%</b>
		<b>Digestive diseases</b>	24	<b>11,76%</b>
		<b>Respiratory infections</b>	21	<b>10,29%</b>
<b>55 – 64 years</b>	n = 231	<b>Hypertension</b>	79	<b>34,20%</b>
		<b>Diabetes melitus type II</b>	36	<b>15,58%</b>
		<b>Digestive diseases</b>	30	<b>12,99%</b>
		<b>Bone diseases</b>	27	<b>11,69%</b>
<b>over 65 years</b>	n = 226	<b>Hypertension</b>	109	<b>48,23%</b>
		<b>Diabetes melitus type II</b>	38	<b>16,81%</b>
		<b>Bone diseases</b>	21	<b>9,29%</b>



Within communicable diseases, infections of respiratory tract had the highest prevalence (68,1%) followed by gastrointestinal tract infections (18,8%) and intestinal parasitosis (6,7%). Similar findings were published by Farrah J Mateen et al. where upper respiratory tract infections were the most prevalent among acute communicable diseases.(Farrah J Mateen, 2012)

The global trend towards high burden of chronic diseases is also seen in Iraqi population. A study made in 23 low- and middle-income countries (LMICs) showed that chronic NCDs account for 61% of all deaths and 46% of the burden of disease.(Abegunde et al., 2007, Mehdi Sanati Pour, 2014) Despite their huge burden of morbidity and mortality chronic NCDs are often neglected in the countries with a largely unstructured approach to their management of primary care and a lack of systematic follow-up and monitoring care.(Maher, 2012) In combination with other difficulties faced by displaced population chronic disease could be seen as one of the biggest challenges for health care providers.

There are more reasons why chronic NCDs are so common in this population. Lifestyle of Iraqis is one of the dominant factors for development of chronic diseases such as hypertension or diabetes. Even if our database does not contain data on tobacco and alcohol use, obesity, sedentary lifestyle or non-adherence to medication, we consider it to be high from our observation. Some of those factors might be even more prevalent in conditions of displacement. Forced displacement commonly leads to worsening of the living conditions, impoverishment and loss of family, friends, assets, livelihoods, self-esteem and cultural and social support. Substance use may act here as a coping strategy in response to such exposure to traumatic events and social stressors.(Nagendra P. Lutitel, Kane et al., 2014, Roberts et al., 2009) Moreover, most of the IDPs in Iraq are not

displaced for the first time in their life. These traumatic events carry a considerable burden of stress, which could be another important contributory factor for the development of chronic diseases such as hypertension and symptoms including gastrointestinal pain or chronic headaches. Those syndromes have often both organic and psychological origin.

Our findings are consistent with the study made among Iraqi refugees in Jordan. Here, the most commonly identified health problem in adult population was essential hypertension (22%) followed by diabetes mellitus type 2 (11%).(Farrah J Mateen, 2012) Higher prevalence of chronic medical conditions in comparison with infectious diseases was also found in a study amongst asylum seekers in EU.(Pfortmueller et al., 2013) Yun et al. found that 51,1% of the adult refugees screened on arrival in the United States had at least one chronic non-communicable disease.(Yun K, 2012)

We detected almost no psychiatric disorders except for a few cases of clinical depression. This might be surprising in a population in which higher than average rates of mental disturbances are expected. The most probable explanation is that IDPs are looking for mental health care somewhere else, especially in the centers known for providing mental health services. Another considerable factor may be the fact that mental health problems remain taboo in the patient population.

## Conclusion

Even if respiratory tract infections were the most prevalent diagnoses among our patients, chronic NCDs are the major health issue among Iraqi IDPs. Four out of five the most common diagnoses among our patients belonged to chronic NCDs. This not only poses a huge medical and economical burden on patients but also presents big challenge for health services providing care to the displaced population.

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# Severe malaria including cerebral malaria among 3707 admissions in South Sudanese hospital for internally displaced population after tribal conflicts in 2012-2013 (note)

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## Original Articles

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### Key words:

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### Abstract:

The aim of this study was to assess proportion of severe malaria among all admissions in hospital located in area with internally displaced population in South Sudan, within years 2013-2014. Diagnosis of severe malaria was done clinically, plus microscopically, plus rapid diagnostic testing (RDT) has been used since 2013. Altogether, 1438 patients (38,8%) had severe malaria clinically confirmed as fever plus severe anemia, or respiratory distress syndrome, or cerebral malaria, liver or kidney failure, or severe hypoglycemia with acidosis. Of 1438 severe malaria cases, 76 died (5,3%).

### Introduction:

Severe malaria is responsible for 1,2 million deaths worldwide with main proportion of them in Sub-Saharan Africa, es-

pecially in children below 5 years of age, which is caused by several factors including poor infrastructure, low household income and many more.

The aim of this study was to assess proportion of severe malaria among all admissions in hospital located in area with internally displaced population in South Sudan, within years 2013-2014.

## Patients and methods

Data on infectious diseases were analyzed at admission in St. Francis of D'Assisi mission Hospital in Marial Lou, South Sudan, built for internally displaced refugees coming from north to South Sudan, due to civil war (1982-2005) and Darfour Conflict (2002-2012) and for about 50 000 of Dinka population. Diagnosis of severe malaria was done clinically, plus microscopically, plus rapid diagnostic testing (RDT) has been used since 2013.

## Results and discussion:

Seasonality of severe malaria was observed among majority of cases in period from April to November, with 113 to 221 cases per month with up to 9 deaths due to severe malaria (among 3707 admissions monthly, in 2013). Altogether, 1438 patients (38,8%) had severe malaria clinically confirmed as fever plus severe anemia, or respiratory distress syndrome, or cerebral malaria, liver or kidney failure, or severe hypo-

glycemia with acidosis. Of 1438 severe malaria cases, 76 died (5,3%). Relatively low mortality may be explained with: (i) good access to the hospital, (ii) pre-referral administration of antimalarial drugs taught by education campaign in 2010-2013, and (iii) use of artemisinin-based combination therapy (ACT) since 2010 in Marial Lou. Severe malaria in travelers returning to Europe is associated with up to 20% mortality (WHO 2013, G. Benca et al 2007). It can be more successfully treated on site in tropics due to semi-immune population, early pre-referral administration of antimalarial drugs and early empiric intramuscular or intravenous administration of artemisine drugs.

## Conclusion:

Severe malaria still remains threatening life condition, however by combination of new drugs, early recognition and treatment and preventive educative programs we can achieve decrease in mortality.

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- 2) Benca, G. Duong, SL Shakum, A.: Meningitis in tropics. *Neuroendocrinology Letters* 28 (S3) 2007, 10-11





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