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## ORIGINAL PAPER

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# Characteristics of Travellers from Bosnia and Herzegovina to Africa

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## ABSTRACT

**Introduction:** Travellers from Bosnia and Herzegovina (B&H) travel to different world countries. The awareness of people is changing every day and nowadays travellers seek advices related to their travel and destination more often than before. In the previous years, travellers came to Travel Clinics almost only to get the vaccines which were obligatory for entry into a country. In B&H travel clinics are a part of public health institutes. The largest Travel Clinic which provides service for the highest number of travellers is in the Public Health Institute of Sarajevo Canton, in the city of Sarajevo, which is the capital of B&H. In the last years we have seen an increasing interest for travel to Africa because the highest number of travellers travel to African countries. **Objective:** To show the characteristics of persons travelling to Africa, the reasons of their travel, the destination countries and the types of vaccines applied. **Materials and methods:** We used protocol books of the Travel Clinic in Public Health Institute of Sarajevo Canton and the data from individual forms of travellers. **Results:** Persons travelling to Africa make 55% of all travellers that are advised and vaccinated in the Travel Clinic in Public Health Institute of Sarajevo Canton. There are significantly more men than women among people travelling to Africa. The highest number of travellers is in the category of working population which means age group of 20-50 years. The most visited countries are Kenya, Ethiopia, Somalia and Ghana. Travellers received the following vaccines: yellow fever, VHA, VHB, meningitis, tetanus. All travellers were given the advice on how to dress, feed and protect against malaria.

**Key words:** travellers, B&H, Africa.

## 1. INTRODUCTION

Bosnia and Herzegovina (B&H) is a small county in the heart of Europe. On the area of 51.129 km<sup>2</sup> according to the estimation from 2009 (last census was in 1991), there are 4.613.414 inhabitants. B&H was a part of former Republic of Yugoslavia until 1992 when it became an independent country. Between 1992-1995 there was a war in Yugoslavia and also in B&H, and this period was very difficult in all aspects of life.

Republic of Yugoslavia had a very good relation with different counties in Africa. A lot of big companies worked in Africa, they build roads, damms, electricity and they introduce new agriculture programs. During this period a lot of people from Yugoslavia (and from B&H as well) travelled to Africa, but in the war period it was stopped. In the last few years, companies from B&H rebuilt old and established new relations with African countries, and the number of travellers grew. Nowadays, again a lot of travellers from B&H travel to different world countries and also to different African countries. In the previous years, travellers came to Travel Clinics almost only to get the vaccines which were obligatory for entry into a country, but now the awareness of people is changing every day and travellers seek advices related to their travel and destination more often than before.

B&H is a decentralized country, has two entities (Federation of Bosnia and Herzegovina and Republic of Srpska) and one district (Brcko) According to the political organization, the health system is also decentralized. Public Health Institutes are located in ten cantons in Federation of Bosnia and Herzegovina, in five regions of Republic of Srpska and one in District Brcko. Travel Clinics are located in a few of Public Health Institutes and they are a part of the Epidemiology department.

The largest Travel Clinic which provides service for the highest number of travellers is in the Public Health Institute of Sarajevo Canton, in the City of Sarajevo, which is the capital of B&H.

Contents of work of Travel Clinics are the same as in other Travel Clinics: pre-travel counseling, immunization and post-travel counseling, without treatment (1)The highest number of travellers visit Travel Clinics because of immunization (obligatory or recommended vaccines).

## 2. AIM

To analyze and show characteristics of travellers to Africa according to:

- number of travellers per years,
- destination countries,
- age and sex of travellers,

- purpose of travel,
- type of applied vaccines.

### 3. MATERIALS AND METHODS

For this research we used the protocol books of the Travel Clinic in Public Health Institute of Canton Sarajevo and Individual forms of vaccinated travellers. It is one retrospective epidemiological study for the three years period (2009-2011).

### 4. RESULTS

The exact number of travellers from Bosnia and Herzegovina to Africa is unknown, because we have only data about travellers which are vaccinated in the observed years.

Some of the travellers to Africa travel to the northern part (Tunisia, Morocco, Egypt) for holiday. It is the Mediterranean area and for this region immunization is not obligatory.

Countries	2009	2010	2011	Total
Algeria	0	0	1	1
Angola	1	1	5	7
Benin	0	0	42	42
Burkina Faso	1	0	0	1
Burundi	0	15	0	15
Chad	5	1	0	6
Cote d'Ivoire	6	0	0	6
Djibouti	0	1	12	13
Egypt	0	1	5	6
Eritrea	0	1	0	1
Ethiopia	25	3	16	44
Gabon	2	0	0	2
Ghana	0	3	10	13
Guinea	2	0	0	2
Guinea Bisao	0	1	0	1
Kenya	36	38	31	105
Kongo	7	8	17	32
Liberia	6	3	4	13
Lybia	0	4	1	5
Mauritania	1	3	0	4
more countries	4	12	20	36
Niger	1	0	2	3
Nigeria	1	6	0	7
Rwanda	0	6	6	12
Senegal	1	5	3	9
Sierra Leone	0	0	2	2
Somalia	0	2	0	2
South Af	0	3	5	8
Sudan	19	14	14	47
Tanzania	2	4	2	8
Togo	0	1	3	4
Trinidad	0	1	0	1
Tunis	0	0	1	1
Uganda	4	5	7	16
Zambia	2	0	0	2
Total	126	142	209	477

Table 1. Number of travellers per country 2009-2011

Some other travellers travel to African countries which request immunization against yellow fever, but this vaccine is valid for ten years and those travellers visit the Travel Clinic only once in that period.

According to this data, travellers to Africa make 55% of all travellers that came for counseling and vaccination to the Travel Clinic in Public Health Institute of Sarajevo Canton.

The number of travellers to Africa is rising every year: 2009 – 127, 2010 – 143, 2011 – 209 travellers.

Travellers from Bosnia and Herzegovina travelled to 34 African countries. Kenya, Sudan, Ethiopia and Benin were the main destination countries. Some of them travelled to more countries, especially young travellers.

Our travellers belong to different age groups (Table 2). The mean age was 38,1 year. The oldest traveller was 72 and the youngest only 2 years old.

YEARS	AVERAGE	THE YOUNGEST	THE OLDEST
2009	39.2	8	68
2010	37.9	7	72
2011	37.3	2	67
Average	38.1	5.7	69

Table 2. Age structure of travellers

According to sex structure, males travelled more often. There were 72% of male travellers in total for the three years period. However, sex structure was different per year and rose from 56%, in 2009 to 80% in 2011 (Table 3). This structure was depending on the purpose of travelling.

Sex	2009		2010		2011		Total	
	Number	%	Number	%	Number	%	Number	%
F	44	34.9	48	33.8	41	19.6	133	27.8
M	82	65.1	94	66.2	168	80.4	344	72.1
Total	126	100.0	142	100.0	209	100.0	477	100.0

Table 3. Sex structure of travellers per year

The main purpose of travelling was business with 286 tourists for this three years period. The second reason was involvement in peace keeping missions (total 83). The number of travellers which travelled to African countries for touristic reason rose in this three years period. (Table 4).

	BUSINESS	PEACE KEEPING MISSION	FRIENDS AND RELATIVES	SPORT	TOURISTIC
2009	80	12	11	2	21
2010	103	7	16	0	16
2011	103	64	14	1	27
Total	286	83	41	3	64

Table 4. Purpose of travelling per year

The term „Visit friends and relatives“ means that people from B&H visit their friends and relatives which are living and working in African countries. People from B&H are living in African countries in very good conditions and in the very low risk. According to countries, business was the main purpose for travelling to Kenya, Ethiopia, Sudan, Congo and to more countries at the same time (Table 5).

	BUSINESS	PM	VFR	SPORT	TOURIST	Total
Algeria	1	0	0	0	0	1
Angola	7	0	0	0	0	7
Benin	0	42	0	0	0	42
Burkina Faso	1	0	0	0	0	1
Burundi	13	0	2	0	0	15
Chad	5	0	0	0	1	6
Cote d'Ivoire	4	0	0	0	2	6
Djibouti	7	6	0	0	0	13
Egypt	6	0	0	0	0	6
Eritrea	1	0	0	0	0	1
Ethiopia	39	0	5	0	0	44
Gabon	0	0	0	0	2	2
Ghana	11	0	1	0	1	13
Guinea	2	0	0	0	0	2
Guinea Bisao	1	0	0	0	0	1
Kenya	56	0	25	1	23	105
Kongo	19	12	0	0	1	32
Liberia	10	3	0	0	0	13
Lybia	5	0	0	0	0	5
Mauritania	4	0	0	0	0	4
more countries	19	0	2	0	15	36
Niger	2	0	0	0	1	3
Nigeria	7	0	0	0	0	7
Rwanda	8	0	2	0	2	12
Senegal	0	0	0	2	7	9
Sierra Leone	2	0	0	0	0	2
Somalia	2	0	0	0	0	2
South Af	3	0	0	0	5	8
Sudan	27	20	0	0	0	47
Tanzania	7	0	0	0	1	8
Togo	4	0	0	0	0	4
Trinidad	1	0	0	0	0	1
Tunis	1	0	0	0	0	1
Uganda	11	0	4	0	1	16
Zambia	0	0	0	0	2	2
Total	286	83	41	3	64	477

Table 5. Travellers per country and purpose of travel

Our travellers are vaccinated with different vaccines depending on the risks of the destination country. Vaccine against yellow fever was the most frequently applied, total 367 for three years. The number of vaccinated people was similar every year.

The second most applied vaccine was VHB (total 124) and the number of vaccinated rose from 12 in 2009 to 93 in 2011. (Table 6)

Mencevax vaccine (tetraivalent conjugate vaccine against serogroups A;C; W135, Y) was applied for the travellers which travelled to „african meningitis belt countries“ : Sudan, Nigeria, Burundi, Rwanda and Republic of Tanzania during the dry season. The total number of vaccinated was 102. Other vaccines (Ana-Te, Typhi, Polio, Rabies) are applied rarely.

**5. DISCUSSION**

Travellers from Bosnia and Herzegovina travel quite frequent to different african countries. They visit Travel Clinics to get some advice how to prevent travel related

diseases. This face to face discussion is very important (1) in the travel clinic. Pre travel health consultation in our country is the same as in other countries. Travellers get advised about clothes and footwear, food hygiene, hand washing and potential exposure to infection (2, 3).

The increase in the transport of freight and passengers by air has allowed parasite vectors to spread quickly and easily over large distances (3, 4). As a consequence, last few years different kind of mosquitos are spread to previously mosquito-free countries, and it may result in the reappearance of malaria in countries where it was previously eradicated (5). The proportion of imported malaria cases due to immigrants in Europe who travel to visit friends and relatives in their country of origin, mostly African countries is getting more important (6).

Our travellers belong to different age groups, mean age was 38,1 years, very similar with a study in Singapore (36 years) (7). Older travellers (>60 years) accounted 4,61% and in the study in France it was about 10% (8). Age is no barrier to travel, but sometimes some diseases are. For example during influenza pandemic, travel restrictions for children were introduced in some countries (9).

Immunization is a very important part of pre-travel counseling. Usually, during the contact with travellers regular vaccination records are checked. Ensuring high levels of vaccination for travellers is important to prevent future outbreaks of vaccine-preventable diseases, particularly measles (10). They also get some vaccines against different diseases (depending on the risks). Yellow fever is the most frequent applied vaccine because a lot of people travelled to countries where this disease is endemic.

Vaccine against hepatitis B (VHB) is recommended for almost all frequent travellers regardless of the destination country, because this disease is very spread around the world. Hepatitis B is endemic in many african regions and our travellers are more and more vaccinated against VHB, similar as in other Travel Clinics (11, 12).

For some african countries (meningitis belt countries) vaccine against meningococcal disease is very important (13, 14).

Our travellers did not pay enough attention to rabies

	YELLOW FEVER	VHA	VHB	MENCEVAX	ANA-TE	TYPHI	POLIO	RABIES	Total
2009	117	10	12	19	13	21	1	1	194
2010	123	4	19	19	16	13	0	0	194
2011	127	65	93	64	33	25	0	0	388
Total	367	79	124	102	62	59	1	1	776

Table 6. Applied vaccines per years

pre-travel vaccination which is important for North-African countries. The same situation is in other countries and more than 70% travellers are not immunized prior to departing (15).


**6. CONCLUSION**

A significant number of travellers from B&H travels to different african countries every year. Pre-travel counselling is given in travel clinics which are a part of public health institutes. Beside this, they provide the service of

recommended and obligatory vaccination depending on the destination country. We expect an increase of travels from Bosnia and Herzegovina to Africa in the future. We would like to improve our pre-travel health consultation and help our travellers to stay healthy during travel and to avoid different risks as much as possible.

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