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# Health Status of Population in Federation of Bosnia and Herzegovina in 15 Years of Transitional Period

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## ABSTRACT

*War in Bosnia and Herzegovina lasted from 1991 to 1995 and resulted in profound consequences marked by the large number of victims, increase in the diseases and disorders prevalence, that were not common before it occurred. The effects it had on health status of the entire population was reflected through many negative demographic trends, increasing prevalence of chronic diseases and the spread of a number of unhealthy behavioral patterns and a lot of migrations. All this presents a problem for institutions of health system which are attempting to control these negative influences especially during the transition period, marked by the direct adverse consequences of the 1991–1995 war. The present paper presents a summation of various sources which are attempting to provide a synthetic overview and provide basic information in relation to the health status of the population, and also to provide a baseline evaluation for deployment of public health interventions.*

**Key words:** opiate drugs, risk factors, alcohol, tobacco, living conditions, population, Federation of Bosnia and Herzegovina

## Introduction

The breakup of Yugoslavia in April 1992 resulted in a formation of an independent Bosnia and Herzegovina, which was officially acknowledged by the United Nations<sup>1</sup>. In the September the same year, the country became a member of the World Health Organization (WHO)<sup>2</sup>. According to Dayton peace agreement<sup>3</sup>, Bosnia and Herzegovina consists of two entities – Federation of Bosnia and Herzegovina and Republic of Srpska – and a third administrative unit – city of Brčko.

One of the major health-care organization problems in Bosnia and Herzegovina is different organization of health systems in different entities. In the Federation of Bosnia and Herzegovina, the health system administration is decentralized. In the Republic of Srpska, the authority over the health system is centralized. Since health care systems are organized on the entity level with sepa-

rate information systems, there has been no institutional analysis and assessment of health condition indicators on the level of the total population.

On the other hand, some of the health indicators for the total population of Bosnia and Herzegovina are given in regular publications by WHO/EURO, World Bank, OECD, UNSD and other international reports. Hence, it might be of substantial importance to provide an overview and analyze the indicators of health status in the population of Federation of Bosnia and Herzegovina, one of two entities in Bosnia and Herzegovina, with its particular way of organization of the healthcare system (cantonal decentralization with federal coordination). Therefore, the aim of this study was to analyze and discuss the impact of those factors that are the result of transitional changes and that directly or indirectly influence the

health condition of population of Federation of Bosnia and Herzegovina, including demographic factors and migrations, socio-economical indicators, health insurance and financing of health care system in FB&H, leading health risks and health status of the population in FB&H (health behavior, abuse of alcohol, drugs and psychoactive substances, incidence of chronic non-infectious diseases, malignant tumors, mental disorders, infectious diseases and immunization, epidemics of infectious diseases, HIV infection, tuberculosis, oral health and environmental factors that influence general population health condition and lack of control of domestic and imported provisions.

### Sources of Information

The indicators, especially those that are result of transitional changes and that directly or indirectly influence the health care conditions of population in FB&H. We used reports and documents of health institutions in FB&H, and other European and World institutions engaged in analysis of data about migrations in specific countries and regions. Results of this study are based on the sources of health institutions of government in FB&H and other institutions in Europe especially those published by WHO/EURO, World bank, OECD and UNSD.

### Demographical Indicators and Migrations in F Bosnia and Herzegovina

Health condition of population in FB&H is highly under influence of demographical changes with higher incidence of chronic diseases and spreading of bad living habits<sup>4</sup> (Table 1). For the analysis of health status of population, first it is important to examine so called negative indicators such as morbidity and mortality as well as natality. Mortality rate in 2007 was 8.3‰ and has been slowly but constantly growing in the last couple of years, which reflects aging of the population<sup>4</sup>. In the Federation of Bosnia and Herzegovina, birth rate in 2007 was 9.3‰,

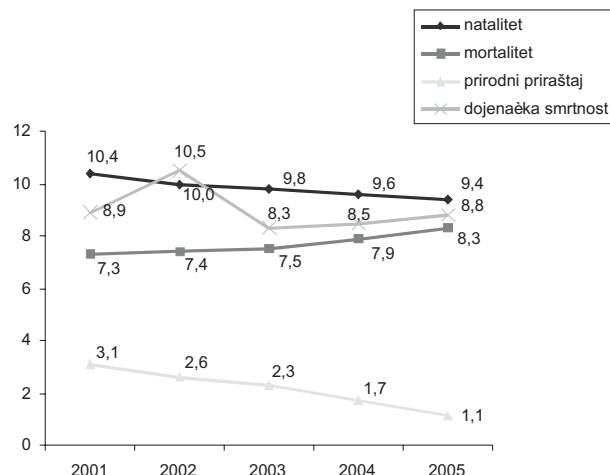


Fig. 1. Natural increase of population in FB&H from 2001–2005<sup>4</sup>.

which was the same as in 2006<sup>4</sup>. Infant mortality in 2007 was relatively low, amounting to 8.9‰, with significant differences between the cantons, from 3.6‰ in Posavski canton to 17.3‰ in Bosansko-podrinjski canton<sup>4</sup> (Figure 1). The rate of natural increase has a decreasing trend (Figure 1) and amounted to 1.0‰ in 2007, which indicates natural depopulation, e.g. greater number of deaths than births<sup>4</sup>. Vital index in 2007 (the number of livebirths per 100 deaths) is still higher than 100, ie, amounts to 111.8%, which means that reproduction of population is still under way, WITH life expectancy at birth for men 72.1 and for women 77.3 years, in general<sup>4</sup>. The main problem of the population of FB&H during the 1991–1995 were migrations<sup>5</sup>. Before the war, 4.395,643 of citizens lived in Bosnia and Herzegovina on a territory of 51 129 square kilometers<sup>4</sup> and in 2000 there were 3.7 million citizens or 17% fewer than in 1991. According to data of Federal Ministry for displaced persons refugees, on the territory of Federation during 2007 status of displaced persons had only 54 331 person, or 6% less than in 2006<sup>6</sup>.

TABLE 1  
COMPARISON OF DEMOGRAPHIC CHARACTERISTICS BETWEEN BOSNIA AND HERZEGOVINA (B&H) AND FEDERATION OF BOSNIA AND HERZEGOVINA (FB&H) IN PERIOD FROM 2000–2006<sup>4</sup>

Indicator	B&H (2001)*	B&H	FB&H (2000)*	FB&H (2006)
Population (in millions)	4.1	3.8	2.5	
0–14 years (%)		24.3		18.3%
15–64 years (%)		69.5		70.3
65+ years (%)	11.0	6.3	9.0	11.4 %
Birth rate	10.4	9.1	12.9	9.2
Death rate	8.1	8.6	12.9	8.0
Life expectancy of women	74.9	76.0	74.4	75.8*
Life expectancy of men	69.3	69.0	68.8	71.2*
Maternal mortality			10.0	
Infant mortality	23.5 (estimated)		11.7	

## Socio-economical Indicators

The Federal Ministry of Work and Social Welfare registers 9,853 civil war victims and 48,308 disabled persons in the Federation of Bosnia and Herzegovina, which represents 2.5% of the total population. Data on the number of disabled war veterans are not available<sup>7</sup>. According to Federal Bureau for the Insurance of Retired and Disabled Persons, at the end of 2007, the share of retired persons in the total population was 14.3%. Life Standard Measurement Survey (LSMS) showed that about 15% of the population of the Federation of Bosnia and Herzegovina lived under the general poverty line<sup>7</sup>.

## Health Insurance and Financing of Health Care System

Law on Health Insurance from 1997 grants all citizens of Federation of Bosnia and Herzegovina the right to compulsory, extended, and voluntary insurance. However, there are still 17% citizens of FB&H, mostly unemployed ones, without health insurance, very many of whom are young people<sup>8</sup>. Extended and voluntary insurance are regulated by cantonal laws, but according to data from Federal institute, no canton has yet introduced either extended or voluntary insurance. Because a lack of financial resources in the Fund of Health Insurance, Federal Fund of Solidarity has been established. All cantons have to contribute to this Fund 8% of their budget and the Fund is used for financing programs of interest for the whole Federation of Bosnia and Herzegovina<sup>8</sup>.

According to Law on Health Insurance, the system of health care is financed with resources from compulsory health insurance, entity budget, donations, and personal contributions of insured persons, financial resources of social contributions, resources of humanitarian help, and other. There have been attempts to improve the availability of healthcare by strengthening the role of primary care services, which was the basic goal of the reform that began in 1997<sup>9</sup>.

## Leading Health Risks and Health Status of the Population of FB&H

Some of the causes of bad health status of Bosnia and Herzegovina population are bad economical conditions, unemployment, migrations, unsolved domicile status of many displaced persons, bad nutrition, drugs, alcohol and tobacco use, unhealthy way of life, stress, and other factors.

Risk factors connected to life style and health behavior are one of the leading problems in Bosnia and Herzegovina and Federation of Bosnia and Herzegovina (Table 2).

According to a research on risk factors for chronic non-infective diseases in the Federation of Bosnia and Herzegovina, in 2002 there were 37% of adult smokers (25–64 years), 49% of whom were men and 30% women<sup>12</sup>. A study about health behavior of school-age children performed in the Federation of Bosnia and Herzegovina in 2002/03 showed that 2% of pupils aged 11–13 smoked cigarettes<sup>12</sup>. Among pupils aged 13–15, there were 14% of smokers, 17% of whom were boys and 10% were girls<sup>12</sup>. Tobacco abuse is a leading risk factor for cardiovascular diseases, as well as for obstructive and malignant pulmonary diseases.

The prevalence of mental disorders caused by alcohol abuse amounted to 4.85% of the total number of all registered mental disorders in the population in 2005<sup>4</sup>. Škobić et al. found high alcohol abuse in the sample of 704 examinees from Mostar region – 180 eight-grade primary school pupils, 180 high school pupils, 180 students, and 164 metal industry workers<sup>13</sup>. Prevalence of periodical alcohol abuse with low risk for development of alcohol addiction in the total sample was 87.93%. Prevalence of alcohol abuse with high risk for development of alcohol addiction was 9.94%. Alcohol addiction was found in 2.13% of examinees. Among student population, there were 3.89% of alcohol addicts, while 11.11% of them had high risk for development of alcohol addiction. In high school pupils, there were 1.67% of alcohol addicts, while high risk for development of alcohol addiction was found in 14.44%. Alcoholism is the main cause of injuries on

TABLE 2  
TEN LEADING RISK FACTORS AND DALY IN FB&H (2005)<sup>4,11</sup>

Rank	Men		Women	
	Risk factor	Total DALYs (%)	Risk factor	Total DALYs (%)
1	Tobacco	20.9	High blood pressure	13.8
2	High blood pressure	12.9	High BMI	8.2
3	Alcohol	9.4	Tobacco	6.9
4	High cholesterol	6.8	High cholesterol	5.1
5	High BMI	6.7	Physical inactivity	2.8
6	Low fruit and vegetable	3.7	Low fruit and vegetable	2.7
7	Physical inactivity	3.2	Unsafe seks	1.5
8	Illicit drug	1.5	Alcohol	1.3
9	Lead	1.4	Childhold sexual abuse	1.1
10	Occupational risk factors and injuries	0.9	Lead	0.9

working place and in traffic and violence and it is still in growing rate.

The socio-economical environment in the postwar period could lead to an increase in drug addiction and other addiction diseases in Federation of Bosnia and Herzegovina. Data from health care sector, police, and social work sector point to this problem<sup>14</sup>. Use of drugs and psychoactive substances is a risk factor for sexual transmitted diseases like HIV/AIDS, hepatitis B and C, tuberculosis, syphilis, scabies, etc. In public health research conducted by UNICEF and Federal institute in 2001<sup>14</sup>. A total of 50% of adolescents who had experience with drugs reported the use of two or more drugs, while 37.7% of them reported already having had a sexual intercourse<sup>15</sup>.

### Chronic Non-infectious Diseases

Increase in the number of chronic non-infectious diseases is a key public health problem in the Federation of Bosnia and Herzegovina. The recent data point to an increase in the prevalence of arterial hypertension, cardiac and vascular diseases, diabetes mellitus, etc. All this leads to a high level of disability and requires greater use of healthcare services and greater health care budget. Cardiovascular diseases are the leading cause of death in the Federation of Bosnia and Herzegovina, amounting to 53.5% of the total mortality<sup>16</sup>.

In 2002, for the first time in the postwar period in the Federation of Bosnia and Herzegovina, one big population study was performed on a sample of 3000 adults (25–64 years). The results showed that 41% of adults had hypertension (blood pressure over 140/90 mmHg). This percentage significantly increased with age, so that almost 70% of examinees aged 55–64 had high blood pressure<sup>17</sup>.

The prevalence of diabetes mellitus in Federation of Bosnia and Herzegovina in 2006, according to primary care offices and policlinics reports, was 1.9%. A popula-

tion study in 2002 included a sample of 3000 adults aged 25–64 and showed that 5.4% of examinees had diabetes mellitus. Prevalence of persons who died as a consequence of diabetes mellitus in the total number of deaths during 2006 was 4.0%, with greater prevalence among women (63%)<sup>16</sup>.

The incidence rate of malignant tumors in Bosnia and Herzegovina is 300/100,000, similarly to the countries in the region (Albania, Turkey, Romania). Mortality rate is around 150/100,000 and is still growing. According to the data from the Cancer Register of the Federation of Bosnia and Herzegovina, malignant tumors with the highest incidence are lung and gastric cancer in men and breast and cervical cancer in women<sup>6</sup>.

### Mental Health

Bad economic situation in the Federation of Bosnia and Herzegovina caused by the continuous increase in the rate of unemployment, feeling of a lack of perspective, and increase in the number of psychoactive substances users has certainly contributed to the sudden increase in mental disorders in the population<sup>17</sup>. Zalihić A, Škobić H, and Pejanović-Škobić N (2008) studied a sample of 120 examinees, 60 war veterans with PTSD and 60 war veterans without PTSD. There were significantly more employed war veterans without PTSD than veterans with PTSD. More war veterans with PTSD than war veterans without PTSD used psychoactive substances, anxiolytic drugs, and alcohol during war period. Leading mental disorders were neurotic, somatic, and stress disorders and mood disorders (affective disorders), amounting to 46.5% and 18.8%, respectively, of the total number of disorders in the population<sup>17</sup>.

### Infectious Diseases and Immunization

In the Federation of Bosnia and Herzegovina in 2007, there were 42,020 people with infectious and parasitic

TABLE 3  
LEADING INFECTIOUS DISEASES THAT NEED TO BE REPORTED IN FB&H, 2006 AND 2007<sup>15</sup>

Ranking 2007	Disease	Number of registered cases in 2007	Mb/100000	Ranking 2006	Disease	Number of registered cases 2006	Mb/100000
1	Influenza	20892	897.28	2	Influenza	5556	238.97
2	Varicellae	9336	400.96	1	Varicellae	7196	309.50
3	Enterocolitis ac.	4219	181.20	3	Enterocolitis ac.	4339	186.62
4	TBC activa resp.	1369	58.79	5	TBC activa resp.	1361	58.54
5	Toxiinfectio aliment.	1209	51.92	6	Toxiinfectio aliment.	862	37.07
6	Angina streptoc.	1054	45.26	4	Angina streptoc.	1646	70.80
7	Scarlatina	563	24.18	8	Scarlatina	551	23.70
8	Salmonellosis	531	22.80	10	Salmonellosis	294	12.65
9	Brucellosis	484	20.78				
10	Scabies	442	18.98	7	Scabies	588	25.29
				9	Carriers of HBsAg	362	15.57



**TABLE 4**  
REGISTERED MORBIDITY OF INFECTIOUS DISEASES IN CANTONS OF FB&H, 2007 AND 2006<sup>15</sup>

Canton	Morbidity / 100.000 citizens			
	Ranking	2007	Ranking	2006.
Sarajevski	1	2705.53	2	1885.11
Zapadno-Hercegovački	2	2537.30	9	506.96
Zeničko-Dobojski	3	2507.49	4	1071.78
Bosansko-podrinjski	4	1892.34	1	2488.62
Hercegovačko-Neretvanski	5	1843.30	3	1192.63
Srednje-Bosanski	6	1428.56	8	746.63
Unsko-sanski	7	1388.78	6	864.75
Tuzlanski	8	1060.93	7	751.13
Herceg-Bosanski	9	868.78	5	921.20
Posavski	10	123.83	10	283.03
FB&H		1804.70		1080.68

diseases, which according to the Law on Infectious Diseases Protection need to be reported. The morbidity rate was 1804.70 diseased *per* 100,000 people, which is more than in 2006 (Mb 1.080.68/100,000) (Table 3). There are different rates of morbidity of infectious diseases in cantons of FB&H (Table 4). In this period, human brucellosis had an obvious trend of increase. In the last 5 years, the number of diseased persons *per* year was 182<sup>15</sup> (Figure 2).

During 2007, on the territory of FB&H there was 28 registered epidemics of infectious diseases in total 5195 of patients (without influenza 1671), which is 73 patients in average *per* one epidemic. In the period 1989–2007, in the Federation of Bosnia and Herzegovina there were 86 registered HIV-positive persons, 57 of whom had fully-developed AIDS. So far, 38 AIDS-related deaths have been registered and there is no data for 10 diseased. The dominant route of transmission is heterosexual intercourse, followed by homosexual intercourse, and injection drug abuse<sup>15</sup>. New registered cases of HIV infection

in the period from 2003–2007 are shown in Table 5. The total number of tuberculosis cases in the Federation of Bosnia and Herzegovina in 2007 was 1369, which represents the morbidity rate of 58.8/100,000 population. The greatest number of registered cases was in Unsko-sanski Canton (Mb 95.5/100,000 population), while the lowest number was in Hercegovačko-neretvanski Canton (6.2/100,000 population) (Table 6).

**TABLE 5**  
REGISTERED NEW CASES OF HIV INFECTION/AIDS IN FB&H (2003–2007)<sup>15</sup>

Year of registration	Registered new cases of HIV/AIDS	Death from HIV/AIDS
2003	8	2
2004	10	2
2005	11	1
2006	12	3
2007	4	1

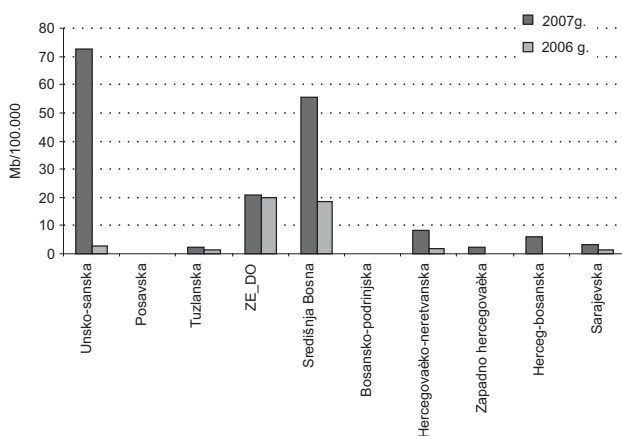


Fig. 2. Registered brucellosis cases in FB&H, comparison Mb/100,000, 2006 and 2007<sup>15</sup>.

**TABLE 6**  
INCIDENCE OF TUBERCULOSIS OF RESPIRATORY SYSTEM IN FB&H IN 2007.

	Canton	Morbidity /100 000
1.	Unsko-sanski	95.5
2.	Tuzlanski	86.4
3.	Ze-Do	69.7
4.	Bosansko-podrinjski	68.3
5.	Sredisnja Bosna	55.4
6.	Sarajevski	41.4
7.	Posavski	19.4
8.	Livanjski	14.6
9.	Zapadno-hercegovački	13.4
10.	Hercegovačko-neretvanski	6.2

The program of obligatory immunization against some infectious diseases was successful in gaining pretty good protection from diseases that are preventable by immunization<sup>15</sup>. Epidemic of morbili in 2007 was a consequence of spreading of disease between especially vulnerable population that was not vaccinated (Roma population).

## Oral Health

The most frequent oral diseases are: dental caries, diseases of dental pulp (pulpopathy), diseases of supportive tooth tissue (parodontopathy), and occlusive deformations. Numerous authors in the region and the world show that these are the most widely spread diseases of modern civilization, which was also confirmed by recent studies in 5 cantons in the Federation of Bosnia and Herzegovina. Dental caries was found in 95–100% of examinees in some cantons, while a few forms of parodontopathies were found in 69% of adults and in 42% of children older than 12 years. Before the war, occlusive deformations were found in 36% of children, 30% of whom needed treatment. This number was significantly increased after the war, to up to 55% of children, 49% of whom needed treatment<sup>18,19</sup>.

## Environmental Risk Factors

All population groups are continuously exposed to environmental risk factors. The list of open environmental issues in Bosnia and Herzegovina is quite long and represent direct danger for health of population of FB&H:

- water supply – only 50% to 60% of Bosnia and Herzegovina citizens use water from central water supply system under regular quality control,
- huge number of leftover unexploded bombs and land-mines from the war
- biological and chemical contaminations of water and soil,
- inadequate and deficient health control of domestic and imported provisions.

## Discussion

The increase in the share of older population in the developed countries represents an indicator of higher living standard. However, in the Federation of Bosnia and Herzegovina, a change in age structure of population is a result of younger people leaving the country in search for jobs and older people returning to the country. Federation of Bosnia and Herzegovina with birth rate of 9.3‰ belongs to regions with low birth rate, with a decreasing trend since 1996. Decrease in the infant mortality rate, besides other socio-economical factors, is a result of better accessibility of health care for mothers and children, which became an obligatory part of healthcare.

After the World War II, more than 2/3 of Bosnia and Herzegovina population was employed in agriculture. That number decreased to only 1/5 after 1981. In 1990/91, 52.6% of gross domestic product (GDP) in Bosnia and Herzegovina was produced in industry. After war 1991–1995, Federal Ministry of Work and Social Welfare registers 9,853 civil war victims and 48,308 disabled persons in the Federation of Bosnia and Herzegovina, which represents 2.5% of the total population. Life Standard Measurement Survey showed that about 15% of the population of the Federation of Bosnia and Herzegovina lived under the general poverty line<sup>7</sup>.

There are still 17% citizens, mostly unemployed ones, without health insurance, very many of whom are young people, because of general unemployment rate that is pretty high and low salaries. Those persons can not afford themselves to pay health care service so this represents additional problem for spreading diseases to other persons around them. During the last 13 years, in developed countries GDP *per capita* has significantly increased, while in Bosnia and Herzegovina it has significantly decreased<sup>19,20</sup>.

After the 1991–1995 war, health status of the population of Bosnia and Herzegovina has been constantly deteriorating. During the war, emigration of medical personnel had a negative influence on the quantity and quality of health care, as well as worsening of social, economical and epidemiological changes<sup>20</sup>.

Population of Bosnia and Herzegovina was among the leading users of cigarettes in Europe in 2000. Annual consumption was six billion of cigarettes, ie, 5 cigarettes

TABLE 7  
FIRST IMMUNIZATION OF CHILDREN IN FB&H (2003–2007)<sup>15</sup>

Sort of vaccine	Rate of immunization (%)				
	2003	2004	2005	2006	2007
BCG	91	93	95	97	96
DTP 3	83	79	88	91	90.5
OPV 3	85	82	89	92	91.8
MRP primary	84	85	85	84	96.2
Hib revaccination			88	85	85.9
Hepatitis B 3			86	89	89.7

per citizen per day<sup>12</sup>. While in 2002 there were 37% of adult smokers 49% of whom were men and 30% women. A study about health behavior of school-age children showed that 2% of pupils aged 11–13 smoked cigarettes, and among pupils aged 13–15, there were 14% of smokers, 17% of whom were boys and 10% were girls. Tobacco abuse is a leading risk factor for cardiovascular diseases, as well as for obstructive and malignant pulmonary diseases.

Alcohol abuse is a leading cause of injuries at workplace and in traffic, as well as of criminal acts and violence. According to the most recent studies, in Bosnia and Herzegovina there is an increase in alcohol production, which was 20.3 liters per citizen in 1998, while in 2002 it was 27.7 litres. The percentage of those who get ill as a consequence of alcohol use is getting higher and in 2002 it was 29.7%. The prevalence of mental disorders caused by alcohol abuse amounted to 4.8% of the total number of all registered mental disorders in the population in 2005<sup>17</sup>. Škobić et al. found high alcohol abuse in the sample of 704 examinees from Mostar region (FB&H), 180 eight-grade primary school pupils, 180 high school pupils, 180 students, and 164 metal industry workers, and the results of the study are very alarming and indicate a need for introduction of preventive measures in student and pupil population in this postwar period<sup>13</sup>.

The socio-economical environment in the postwar period could lead to an increase in drug addiction and other addiction diseases in Federation of Bosnia and Herzegovina. Data from health care sector, police, and social work sector point to this problem<sup>21</sup>. Use of drugs and psychoactive substances is a risk factor for sexual transmitted diseases like HIV/AIDS, hepatitis B and C, tuberculosis, syphilis, scabies, etc. In public health research conducted by UNICEF and Federal institute in 2001, 50% of adolescents who had experience with drugs reported the use of two or more drugs, while 37.7% of them reported already having had a sexual intercourse.

### *Chronic non-infectious diseases*

The most important chronic non-infectious diseases in FB&H population are: cardiovascular diseases, hypertension and diabetes mellitus. During the transition period, population of Bosnia and Herzegovina has been exposed to different psychosocial factors, psychological and physical stress, nutritional diseases, and lifestyle disorders that could influence the development of different diseases, especially chronic noninfectious diseases like cardiovascular diseases, psychiatric disorders, gastrointestinal disturbances, and malignant diseases. Although some reports on these diseases are not very confident and are confusing, without any doubt they point to the increase in their prevalence<sup>16</sup>.

Cardiovascular diseases are the leading cause of death in the Federation of Bosnia and Herzegovina, amounting to 53.5% of the total mortality. Cerebrovascular incident and acute myocardial infarction are the leading causes of mortality in Federation of Bosnia and Herzegovina, which are the consequences of aging of population and adoption

of unhealthy life style. Hypertension as one of the most frequent non-infectious disease, was analysed in one big population study<sup>17</sup> on a sample of 3000 adults (25–64 years). The results showed that 41% of adults had hypertension (blood pressure over 140/90 mmHg). This percentage significantly increased with age, so that almost 70% of examinees aged 55–64 had high blood pressure. Risk factors for this disease are tobacco use, unhealthy way of life, physical inactivity, inadequate nutrition, and others. Seventy nine percent of persons with high blood pressure received medication treatment and only 13% of them were adequately treated. Diabetes mellitus is one of the risk factors for cardiovascular system diseases and it significantly lowers the quality of life. This indicates a need for development and implementation of unit-integrated programs for reduction of those most frequent non-infectious diseases, or at least a screening program on the level of primary health care which would require involvement of numerous interested parties, from strategic to operative level of management.

### *Problem of malignant tumors incidence in population of FB&H*

The incidence rate of malignant tumors in Bosnia and Herzegovina is 300/100,000, similarly to the countries in the region (Albania, Turkey, Romania). Mortality rate is around 150/100,000 and is still growing. An increase in the incidence of malignant tumors has been reported all over the world. It was 10 million in 2000 and is expected to increase to 15 million in 2020, 60% of which will be in developing countries. Malignant tumors with the highest incidence in FB&H are lung, prostate and gastric cancer in men and breast and cervical cancer in women. The most effective measurement for decrease of mortality rate from malignant tumors is screening and early detection, and they play very important role among other measures in preventive medicine during past few years.

A recent study investigated a sample of 120 examinees, 60 war veterans with PTSD and 60 war veterans without PTSD. Leading mental disorders were neurotic, somatic, and stress disorders and mood disorders (affective disorders), amounting to 46.5%. Bad economic situation in the Federation of Bosnia and Herzegovina caused by the continuous increase in the rate of unemployment, feeling of a lack of perspective, and increase in the number of psychoactive substances users has certainly contributed to the sudden increase in mental disorders in the population.

### *Morbidity of infectious diseases and risk factors for health of population of FB&H*

The morbidity rate of infectious diseases is a little bit higher in 2007 than it was in 2006. The structure of 10 leading infectious diseases in 2007 was similar to that in 2006, with somewhat higher percentage of varicella and zoonosis cases (brucellosis, salmonellosis). In most of the cantons, registered morbidity rate was higher than in 2006. The greatest increase in morbidity was registered in u Zapadno-hercegovački Canton. The lowest morbid-



ity rate in both 2006 and 2007 was registered in Posavski Canton. The structure of 10 leading Infectious diseases according to canton is similar to that in the Federation of Bosnia and Herzegovina, only with the exception that brucellosis was ranked higher in some of the cantons (Srednje-bosanski, Unsko-sanski, and Herceg-bosanski).

Bosnia and Herzegovina is considered to be a country with a low prevalence of HIV/AIDS<sup>45</sup>, but bad socio-economic situation, high unemployment, large number of people with low educational level, increase in drug abuse, prostitution, trafficking, migrations, stigmatization, discrimination, and a lack of knowledge about risk factors could facilitate the spread of HIV and other sexually transmitted diseases especially for categories with high risk for this infections (Table 5).

The total number of tuberculosis cases in the Federation of Bosnia and Herzegovina in 2007 was 1369, which represents the morbidity rate of 58.8/100,000 population (Table 6). The greatest number of registered cases was in Unsko-sanski Canton (Mb 95.5/100,000), while the lowest number was in Hercegovačko-neretvanski Canton (6.2/100,000). Number of patients with tuberculosis was decreasing as socio-economical, hygiene and material conditions were getting higher.

#### *Reasons for high rate of morbidity of oral diseases*

Status of oral health in FB&H before war was in trend with developed countries of Europe<sup>18</sup>. But war 1991–1995 brought to the significant worsening in this part of health care. The most important reasons for this were personnel deficit during war, devastation of health institutions and equipment, migrations of population, lack of money for material expenses of dentists' practice<sup>19</sup>.

#### *Environmental risks factors that threaten to health of population*

All population groups are continuously exposed to environmental risk factors, but children, pregnant women, chronic patients, and older persons are especially vulnerable. There are a lot of such factors, but only the most

frequent are mentioned in these results. Harmful influences of these factors are being solved slowly from federal budget and some of them need to be solved with help of international institutions.

## Conclusions

On the basis of the exposed results, we can make the following conclusions:

1. Health of population of Federation of Bosnia and Herzegovina is a reflection of transitional processes: demographic, social, economic, and epidemiological factors.
2. Significant demographic changes in the population are influenced partially by reduction in reproductive power (decrease in birth rate and high mortality rate) and partially by emigration of younger persons, which contributes to aging of the population.
3. General socio-economical indicators point to a really difficult situation because of continuous increase in the number of unemployed persons, low GDP, migrations, as well as great participation of vulnerable groups in the general population (women, children, older persons, war victims, and disabled persons)
4. Epidemiologic transition can be seen as an increase in the prevalence of non-infectious diseases, like cardiovascular and cerebrovascular diseases, malignant tumors, diabetes mellitus, mental disorders, and behavioral disorders.
5. Increase in the number of behavioral disorders point to an increase in tobacco, alcohol, and psychoactive substances use.
6. There are new infectious diseases, that still represent significant public health problem, such as HIV/AIDS, hepatitis B and C, and zoonoses, as well as »old« diseases as tuberculosis.
7. Environmental risk factors (polluted water, air, soil, ionizing radiation) are prominent public health problems, especially for some risk groups: children, pregnant women, chronic patients, and older persons.

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## **ZDRAVSTVENO STANJE POPULACIJE FEDERACIJE BOSNE I HERCEGVINE TIJEKOM 15 GODINA TRANZICIJSKOG RAZDOBLJA**

### **SAŽETAK**

Rat u Bosni i Hercegovini trajao je od 1991. do 1995. godine, a rezultirao je dubokim posljedicama obilježenim velikim brojem žrtava, povećanjem prevalencije bolesti koje nisu bile česte prije. Ovi učinci su se odrazili na cijelu populaciju, kroz mnoge negativne demografske trendove, povećanu prevalenciju kroničnih bolesti i pojavu mnogih nezdravih oblika ponašanja i mnogo migracija. Sve ovo predstavlja problem za ustanove koje pokušavaju održavati kontrolu nad bolestima, posebice tijekom tranzicijskog razdoblja nakon rata. Ovaj rad prikazuje sumarni pregled raznih izvora i pruža uvid u zdravstveno stanje populacije i početnu točku za vrednovanje javnozdravstvenih intervencija.