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INSTITUTE FOR PUBLIC HEALTH FB&H



**HEALTH STATUS OF THE POPULATION
AND HEALTH CARE IN THE FEDERATION
OF BOSNIA AND HERZEGOVINA 2020.**

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FOREWORD



Siniša Skočibušić, MSc,MD

Director of the Institute for Public Health of the Federation of BiH

Health Status of the Population and Health Care in the Federation of Bosnia and Herzegovina 2020 is a traditional publication issued by the Institute for Public Health of the Federation of Bosnia and Herzegovina. This publication is the result of comprehensive and continuous work of a large number of experts from several fields of public health, as well as a large number of associates. A good result cannot be achieved without teamwork. Thus, as part of its legally defined position and through developed cooperation, the Institute strives to collect information from all 10 cantonal public health institutes, from 3 clinical centres, from 15 general and cantonal hospitals and 80 health care centres, as well as other health care institutions in the FBiH. The combined and appropriately presented information compared to the methodologically equally prepared information from previous years gives a clear direction in which health care system and population health in the FBiH are developing.

The Covid-19 pandemic has shaken the whole world and posed new challenges to institutions and individuals in health care, as well as society as a whole. We are witnessing the devastating effects of the Covid-19 pandemic on the economy and health of developed and underdeveloped countries alike. The health care system in Bosnia and Herzegovina, as well as in the Federation of Bosnia and Herzegovina, has not been spared from negative effects either. In addition to the relatively high mortality that accompanies Covid-19, health personnel (physicians, nurses, and numerous associates) were particularly affected and made efforts to maintain health care continuity. Unfortunately, with the redistribution of work tasks, one of the segments that suffered was the reporting on the health status. The reporting system has been improved in recent years, digitized, harmonized with international needs and our future accession to the European Union, which is stressful in itself because it changes the routine of our associates. This fragile and fragmented structure was partially disrupted, but thanks to the overarching structure of the Institute, it did not give up or succumb to challenges, but on the contrary, individuals and institutions as a whole managed to overcome all challenges and prepare this publication for professionals and the general public.

This year's Health Status of the Population and Health Care in the Federation of Bosnia and Herzegovina also presents the situation of Covid-19, a respiratory infectious disease that marked the whole year, and apparently, in terms of health, will mark 2021 too. Restrictions encountered by patients and healthcare facilities will undoubtedly have their effect on non-communicable chronic diseases and vaccine-preventable infectious diseases. The impossibility of adequate physical contact and social activities has diminished the efforts made in preventive work against numerous diseases, i.e. in improving the health of the population.

The comprehensiveness of this document is not only in the number of pages or the number of figures, but in the diversity of all areas that have been analytically processed. We recommend the reader to thoroughly read the prepared accounts, which will certainly be indispensable for a better understanding of the current health and social moment in the Federation of Bosnia and Herzegovina. Ideas and thoughts that emerge from the well-founded arguments in this Health Status of the Population and Health Care in the Federation of Bosnia and Herzegovina 2020 will certainly be unavoidable for decision makers in health and society at all levels.

The Institute continues its long tradition of working in the service of public health and good quality health system in partnership with all who wish well to each individual and society as a whole, and we want the reader to read this publication as a stimulus for the future.

ABSTRACT

The goal of the report on the health status of the population of the Federation of BiH and the organization of health care in the Federation of Bosnia and Herzegovina in 2020 is to present and analyze the current situation in the health sector and indicate priorities for action, with the aim of improving and preserving health and improving the health care system.

In preparing this report, a descriptive-statistical method was used based on data from regular health-statistical surveys, population surveys and data from other sectors, comparatively for 2019 and 2020.

All presented indicators concerning the health status of the population and the organization of health care in the Federation of BiH in this report refer to the public health care sector and are presented with a delay due to certain difficulties related to the introduction of a single IT solution for public health institutions in the Federation of BiH and adaptation of health care institutions to this new and more advanced form of health statistical reporting.

The Covid-19 pandemic is the reason for the delay of reports received from cantonal institutes, but also significant changes in the presentation and interpretation of data, especially mortality statistics.

Thus, Covid-19 infection is the leading cause of death in the population of the Federation of BiH in 2020, with a share of 10.2% in total mortality. It is the leading cause of death of men with a share of 12.5% of all deaths of men in the Federation of BiH and 7.8% of all deaths of women in the Federation of BiH (it is also the leading cause of death among women).

In 2020, the epidemic in FBiH was marked by two waves. The first wave during the spring and early summer of 2020 was marked by strict epidemiological measures, with the closure of numerous public places and gathering places, the introduction of mandatory wearing of masks indoors and outdoors, and restriction of movement and very effective containment of the epidemic. The second wave, which began in October and lasted until the end of the year, marked a larger increase in the number of laboratory-confirmed cases of Covid-19 disease, peaking in November, when the average number of cases was 989/100,000 inhabitants.

The trend of negative natural increase in all cantons in the Federation of BiH continues. The dominant risk factors for the health of the population are improper diet, lack of physical activity, overweight and obesity, tobacco and alcohol consumption, stress and environmental risk factors.

Unfavourable trends leading to the human resources deficit as a key segment of the maintenance and development of the health care system in the Federation of BiH are recorded, requiring the need for strategic planning of human resources development in the health sector in the Federation of BiH.

Population

According to estimates, the total population number in 2020 was 2,184,680. The negative difference in the total estimated population is 5,418, which is a relative decrease of 0.24%. This decrease in population is accompanied by deterioration in its age structure, an increase in mortality, a decline in birth rates, and therefore a significant decline in natural increase.

The population of the Federation of BiH according to the ratio of young to old persons already belongs to the mature type of age structure because the share of the elderly reached 16.3% with a further decrease in the share of children under 14, which fell to 14.4%.

The average mortality age in the past few years has risen significantly to 73.4 years. According to the stated average longevity, it can be said that the population of BiH is reaching much older age, which will affect all aspects of human life.

Compared to the previous year, birth rates are declining, i.e. the number of live births in 2020 is lower by 4.7%.

In the Federation of BiH, the natural increase is still extremely negative (-4.0) and drastically lower than in 2019, because there were many more deaths compared to live births and compared to the previous year.

Due to a significant 18% increase in the number of deaths, in 2020 the mortality rate rose to 11.9 ‰.

In the Federation of BiH, 119 infants died in 2020 (167 in 2019), and the infant mortality rate is 6.9/1,000 live births, which is also a decrease compared to 2018 (9.3/1,000 live births).

Mortality and morbidity

Unlike previous years, in 2020 the health of the population of the Federation of BiH was most endangered by the Covid-19 pandemic, which affected both the morbidity indicators and the mortality indicators.

Although the Covid-19 pandemic was the dominant health problem, non-communicable diseases were significantly represented in morbidity and mortality, and the incidence rate of hypertensive diseases, diabetes, and mental disorders recorded an increase compared to 2019.

In 2020, as in previous years, the leading causes of death in the Federation of BiH were diseases of the circulatory system, with a share of 44.2%, which decreased compared to 47.9% in 2019. The second group of diseases that caused death in the Federation of BiH in 2020 are malignant neoplasms, with a structure index of 18.5%, which is much less compared to the share of 21.8% in 2019. The third leading group of diseases that were the cause of death of the population in 2020 are diseases with codes for special purposes (U00-U99) with a share of 10.2%. The fourth group of diseases that caused the most deaths in the Federation of BiH are diseases of the respiratory system (J00-J99), with a share of 5.9%, which is slightly higher compared to the share of 5.6% in 2019.

Among the diseases that caused death of the population of the Federation of BiH, the leading one is the Covid-19 virus confirmed (U07.1), with a share of 10.2% in the total mortality in the Federation of BiH.

The state of oral health of the population is poor.

Health risk factors

Environmental risk factors (contaminated water and food, polluted air, noise, hazardous chemicals, waste materials, etc.) are among the leading public health problems, requiring constant monitoring. Children, pregnant women, the chronically ill and the elderly are particularly at risk.

According to a 2012 survey, the prevalence of risk factors for public health is high: tobacco is consumed by 44.1% of adults, alcohol by 28.8%, more than a fifth (21.2%) of adults are obese, and only 24.6% of population was physically active.

Extremely high, health-threatening concentrations of suspended particulate matter are evident at almost all measuring points in the Federation of BiH (Sarajevo, Zenica, Kakanj, Ilijaš, Tuzla, Lukavac, Visoko). Very high, dangerous concentrations of sulphur dioxide are evident in places where and in the vicinity of which extensive coal burning is carried out. High values of concentrations of these substances occur not only during the cold part of the year, but during any period of the year. Significant trends in decreasing concentrations of suspended particulate matter in the past few years have not been observed.

On the territory of the Federation of BiH, there are about 2,000 locations of uncontrolled (wild) landfills on an area of 974,221 m², except in Sarajevo Canton and Canton 10, where such landfills are not observed in all municipalities. 55% of potentially infectious, 23% of chemical and 20% of pharmaceutical waste from health care institutions is disposed of in landfills together with municipal waste.

According to the latest available data from the Mine Action Centre in BiH, in the period from 2016 to 2019, a total of 22 people were injured from mines and explosives in the Federation of BiH, of which 9 cases were fatal (adults).

According to the data of the FBiH Ministry of Internal Affairs, there is a significant downward trend in the total number of traffic accidents in the Federation of BiH from a total of 27,926 in 2018 to 20,376 in 2020.

Health care organization

According to the data of regular health statistics for 2020, there were 27,517 employees in the health sector of the Federation of BiH, which is slightly more than in 2019 (26,811).

The number of 1,891 medical doctors (34.8% of the total number) worked in the PHC services in the Federation of BiH (family medicine, health care of preschool and school age children, emergency medical care, protection of women's reproductive health, community mental health centres, polyvalent community nurses, occupational medicine), and 3,289 nurses/technicians (25.3%), that is, 87 medical doctors and 151 nurses/technicians per 100,000 inhabitants. In 2019, there were 1,771 medical doctors and 3,416 nurses/technicians employed at the PHC level.

In 2020, there were an average of 1,155 inhabitants per one medical doctor in PHC, with the largest number of inhabitants per one medical doctor in Una-Sana Canton (2,082), and the smallest in Herzegovina-Neretva Canton (894).

The share of patients referred to the laboratory in relation to the first visits was 76.1%, and the share of patients referred to specialists in relation to the first visits was 112%, which means that the patient was referred to several doctors of different specialties at the first visit.

In 2020, dental care in the public sector of PHC was provided by 521 dentists (24/ 100,000 inhabitants) and 627 dental nurses/technicians (28.7/100,000).

In 2020, there were an average of 4,193 inhabitants per dentist in the public sector of PHC.

In the Federation of BiH in 2020, hospital health care was provided in 24 hospitals (3 university-clinical centres, 6 cantonal hospitals, 9 general hospitals, 3 special hospitals and 3 rehabilitation centres/spas).

In 2020, all hospitals in the Federation of BiH organized their work so that priority is given to patients with Covid-19, which was reflected in other hospital services.

In 2020, slightly more than two-fifths of all medical doctors, 2,270 of them (44.7%) worked in hospitals, which is less than in 2019 (2,283), and 5,447 nurses/technicians (40.1% of the total number), which is also less than in 2019 (5,476).

The lack of data from the private health care sector still prevents full insight into the health status of the population and the organization of health care in the Federation of BiH.

Conclusions

As in 2019, the trend of unfavourable indicators of the health status of the population in the Federation of BiH continued in 2020, which is related to the still poor socio-economic situation in the country, the outbreak of the Covid-19 pandemic, lifestyle habits, housing conditions, working conditions, environmental factors and many other factors.

In 2020, as in the previous year, the delivery of data from the field was delayed, which was conditioned by the outbreak of the Covid-19 pandemic, as well as the introduction of a single information reporting system.

Data from population surveys, although done long ago, registered a significant presence of risk factors for public health: consumption of tobacco (44.1% of adults) and alcohol (28.8% of adults), unhealthy diet (21.2% of obese adults), physical inactivity (75.4%), stress, etc.

The population of the Federation of BiH suffered from both non-communicable diseases and Covid-19. In this regard, the leading cause of death of the population of the Federation of BiH in 2020 was the Covid -19 virus confirmed (U07.1).

Although the reform of the health care system in the Federation of BiH is based on the strengthening of primary health care, there are still differences in its accessibility to the population among the cantons of the Federation of BiH.

The implementation of family medicine, as a basis for health care reform, is still unsatisfactory. The reasons for this are the lack of medical doctors, staff turnover, slow process

of reorganization of services within health care centres, non-stimulating payment mechanisms, lack of managerial skills etc., and in recent years the migration of health workers to other countries.

The Federation of BiH has a smaller number of hospital beds compared to the countries in the region and the average of the European region, but the insufficient use of hospital capacities is evident, which indicates the need to rationalize them.

The lack of data from the private health care sector prevents full insight into the health status of the population and the organization of health care in the Federation of BiH.

ABBREVIATIONS

AFP	Acute Flaccid Paralysis
AIDS	Acquired immunodeficiency syndrome
AKAZ	Agency for Quality and Accreditation in Health Care in FBiH
BCG	Bacillus Calmette Guerin – vaccine against tuberculosis
BDP/GDP	Gross Domestic Product
DARNS	State Regulatory Agency for Radiation and Nuclear Safety
DT (pedriatic)	Diphtheria Tetanus vaccine for children under 7 years of age
DT (pro adultis)	Diphtheria Tetanus vaccine for children older than 7 years
DtaP	Diphtheria Tetanus Acellular Pertussis Vaccine
DTwP	Diphtheria Tetanus whole cell Pertusis Vaccine– cellular
DTaP-IPV	Diphtheria Tetanus Acellular Pertussis Vaccine, inactive Polio Vaccine
DTaP-IPV-Hib	Diphtheria Tetanus Acellular Pertussis Vaccine, inactive Polio Vaccine and Hemophilus Influenzae type b Vaccine
FBiH	Federation of Bosnia and Herzegovina
FBiH MoH	FBiH Ministry of Health
FBiH IfS	FBiH Institute for Statistics
HBV	Hepatitis B virus
HBC	Hepatitis C virus
HepB	Hepatitis B Vaccine
Hib	Hemophilus Influenzae type b Vaccine
HIV	AIDS-causing virus
IAEA	International Atomic Energy Agency
IPV	Inactivated Polio Vaccine
ITM/BMI	Body mass index
CPE	Continuing professional education
CVD	Cardiovascular diseases
MoCA	Ministry of Civil Affairs
MCD	International Classification of Diseases, Injuries and Causes of Death
MMR	Measles, rubella and mumps vaccine
FM	Family medicine
OPV	Oral Polio Vaccine
PAT	Programme of additional training
POLIO	Polio Vaccine (OPV or IPV)
PHC	Primary Health Care
ECD	Early Childhood Development and Growth
SDR	Standardized death rate
STI	Sexually Transmitted Infections
WHO	World Health Organisation
TT	Tetanus Toxoid Vaccine
IPH FBiH	Institute for Public Health of the Federation of Bosnia and Herzegovina

Selected indicators for 2020

DEMOGRAPHIC	EUROPEAN REGION*	FEDERATION OF BOSNIA AND HERZEGOVINA 2020
Population estimate(%)	0-14: 17.8 65+: 15.5	0-14:14.4 65+:16.3
GDP per capita	25,118	5,931**
Unemployment rate (%)	8.5	18.4***
Live births /1000 population	10.4	7.9
Fertility rate	1.7	1.3
MORTALITY: Standardized death rate (SDR)/100,000 population		
SDR all causes and all ages	718	818.0
SDR, circulatory system diseases, all ages	315	348.0
SDR, malignant neoplasms, all ages	150	159.2
SDR, suicides, all ages	10.5	5.8
SDR, infectious and parasitic diseases	11.8	7.7
INFECTIOUS DISEASES		
AIDS incidence/100,000 pop.	1.8	0.18
HIV incidence/100,000 pop.	16	0.54
Tuberculosis: incidence/100,000	28	12.9
CHILD AND YOUTH HEALTH		
Infant mortality (per 1000 live births)	6.9	6.9
Percentage of live births in women over 35 years of age	20.7	16.86
RISK FACTORS		
Tobacco consumption - adults (%)	23.9	Total: Men: Women:
Obesity (BMI - body mass index >30)	Total: 23.3 Men: 21.9 Women: 24.5	Total: Men: Women:
Physical activity - active	...	Total: Men: Women:

RESOURCES/100,000 POPULATION AND USE OF HEALTH CARE		
Medical doctors, total	...	233
General practitioners	62	43
Dentists	53	24
Masters of Pharmacy	57	16
Nurses/technicians	741	634
Hospitals (per 100,000 population)	3.1	1.1
Hospital beds	553	430
Average length of stay (days)	8.6	6.7
Total costs in health care (% GDP)	7.4	...

* WHO, European Health for All data base**Central Bank of BiH (preliminary data)

*** Labour Force Survey 2019

1. DEMOGRAPHIC AND SOCIO-ECONOMIC INDICATORS

1.1 Demographic indicators

For the analysis of the population of the Federation of Bosnia and Herzegovina, it is necessary to consider the changes in the latest population estimates. According to estimates, the total population number in 2020 was 2,184,680. The negative difference in the total estimated population is 5,418, which is a relative decrease of 0.24%. This decrease in population is accompanied by a deterioration in its age structure, an increase in mortality, a decline in birth rates, and therefore a significant decline in natural increase.(1)

The age structure is one of the most important pieces of structure of the population, because it is a key determinant in the assessment of fertility and working capacity. Changes in the age structure of the population of the Federation of Bosnia and Herzegovina are accompanied by two parallel trends: an increase in the share of the elderly aged 65 and over and a decrease in the share of children (0-14). This can be seen from the comparison of the data shown in the table below.

Table 1: Share of age groups in the total population in the Federation of BiH, 2016 – 2020

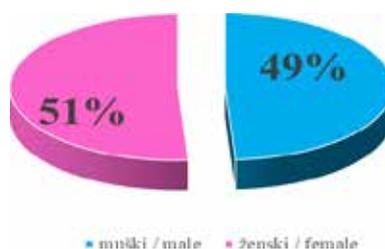
Year	Share in total population (%)		Average mortality age
	Young	Elderly	
	0 - 14	65+	
2016	15.2	14.1	72.3
2017	15	14.6	72.5
2018	14.8	15.1	73.0
2019	14.6	15.7	73.0
2020	14.4	16.3	73.4

The population of the Federation of BiH according to the ratio of young to old persons already belongs to the mature type of age structure because the share of the elderly reached 16.3% with a further decrease in the share of children under 14, which fell to 14.4%.(2)

The average mortality age in the past few years has risen significantly to 73.4 years. According to the stated average longevity, it can be said that the population of BiH is reaching much older age, which will affect all aspects of human life.

The share of women in the total population is 51% and men 49%.

Figure 1: Gender structure of the population in FBiH in 2020



The age pyramid allows a visual representation of the age-sex structure of the population of an area at a given time.

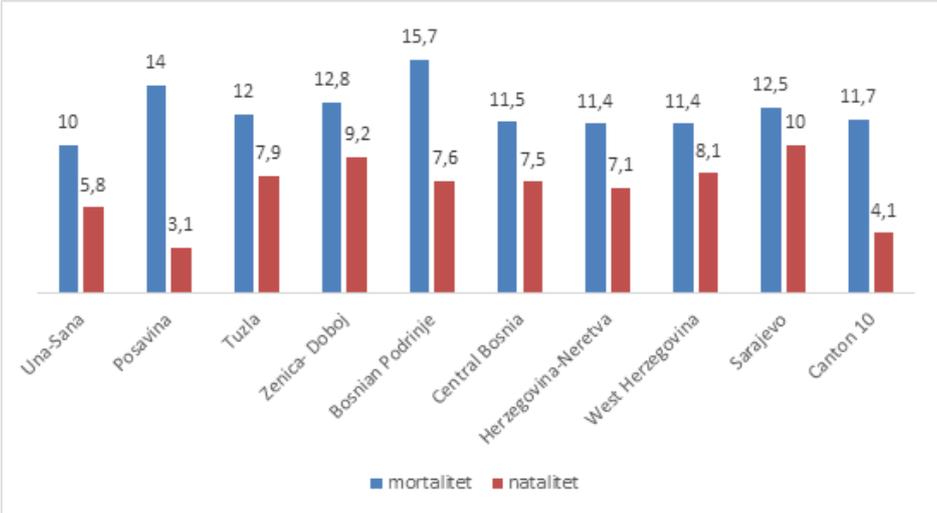
Figure 2: Age structure of the population in FBiH in 2020



The depiction of the age pyramid of the population of Bosnia and Herzegovina shows that the bottom of the pyramid is indented (the so-called children’s base), and that the columns, which represent children aged 0-14, are narrower compared to older age groups due to declining birth rate. The two successive age groups, 30-34 and 35-39, have approximately equal shares in the total population, while in the five-year-ranges 40-44 and 45-49 there is a noticeable narrowing on the pyramid. The shortage of people in these age groups can be attributed to emigration (departure of labour force). Thus, the mature (middle aged) population is predominantly represented on the pyramid, with the column of the age interval 55-59 being the most prominent.

If we look at the spatial distribution of the population, Sarajevo Canton leads with the largest number of inhabitants, the largest number of live births or the highest birth rate of 10‰. The opposite of Sarajevo Canton is Posavina Canton with a birth rate of 3.1 ‰.

Figure 3: Natural population change in FBiH in 2020



Compared to the previous year, birth rates are declining, i.e. the number of live births in 2020 is lower by 4.7%.

In the Federation of BiH, the natural increase is still extremely negative (-4.0) and drastically lower than in 2019, because there were many more deaths compared to live births and compared to the previous year.

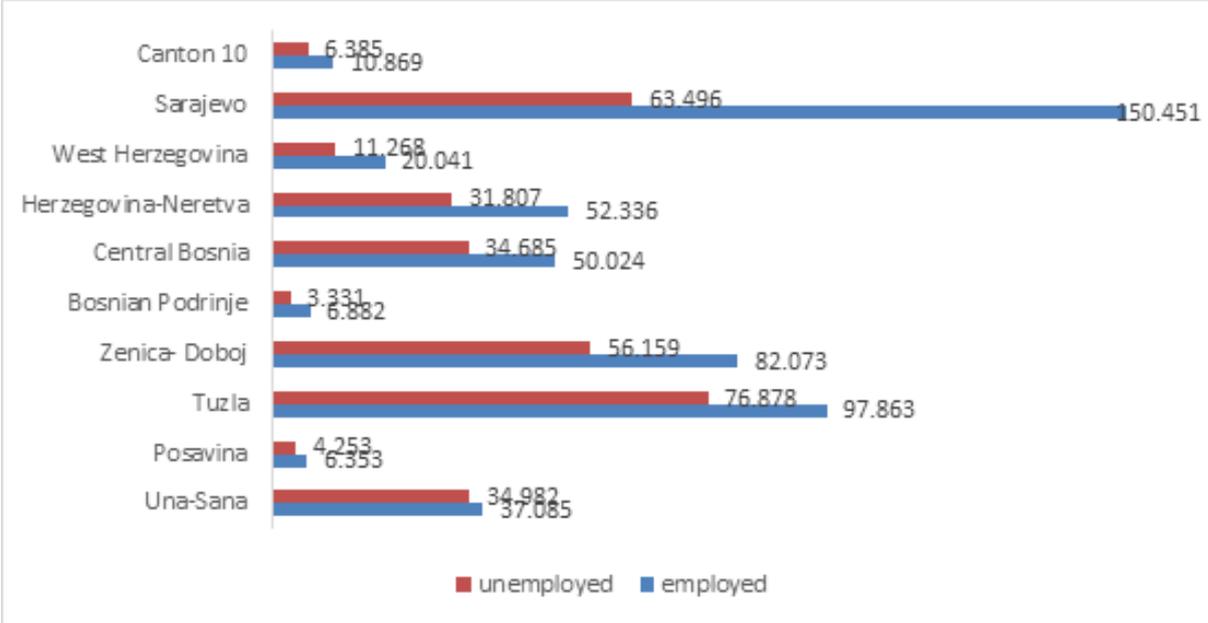
Due to a significant 18% increase in the number of deaths, in 2020 the mortality rate rose to 11.9‰.

In the Federation of BiH, 119 infants died in 2020 (167 in 2019), and the infant mortality rate is 6.9/1,000 live births, which is a decrease compared to 2018 (9.3/1,000 live births).

1.2 Socio-economic indicators

According to the data of the FBiH Employment Institute, at the end of July 2020, there were 323,244 unemployed persons registered in the Federation of BiH. Compared to the number of unemployed in 2019 (307,864), the number of unemployed in July 2020 was higher by 15,380 people or 5%.(3)

Figure 4: Number of employed and unemployed persons by cantons of the FBiH, 2020



At the end of 2020, there were 513,977 employed persons in the Federation of BiH, which is 17,506 persons or 3.4% less than in 2019 (531,483).

Net monthly salary was slightly higher compared to the previous year, and it amounted to BAM 956.

1.3 Poverty and social exclusion

Poverty could most simply be defined as the lack or insufficiency of money, having little or insufficient property, and as insufficient income to procure a minimum basket of goods and services. Today, poverty is considered to be a condition when a person lacks basic opportunities for a dignified life. People are said to be living in poverty if their income and resources are so inadequate as to preclude them from having a standard of living considered acceptable in the society in which they live. Because of their poverty, they can experience multiple

disadvantages through employment, low income, poor housing, inadequate health care, and barriers to lifelong learning, culture, sports, and recreation.

According to the EU definition and the decision of the Council of Europe, persons, families and groups of persons are poor when their resources (material, cultural and social) are limited to such an extent as to exclude them from the minimum required for living in the country in which they live.

The two basic types of income poverty are absolute and relative poverty, i.e. there are absolute and relative poverty lines.

Absolute poverty refers to the percentage of the population living below a certain amount of disposable income. This amount is called the poverty line. The absolute poverty line indicates the absolute minimum standard of living and is usually based on a well-defined consumer basket of food products increased by some other costs (such as housing and clothing).

The relative poverty line treats poverty according to the national standard of living. The relative poverty line is usually determined as a certain percentage of the median or average household income. So, it is a different approach to the problem because the notion of poverty is acquired through comparison with others.

Social exclusion is a process whereby certain individuals are pushed to the edge of society and prevented from participating fully by virtue of their poverty, or lack of basic competencies and lifelong learning opportunities, or as a result of discrimination. This distances them from job, income and education opportunities as well as social and community networks and activities. They have little access to power and decision-making bodies and thus are often feeling powerless and unable to take control over the decisions that affect their day to day lives.

Social exclusion (according to EU2020) is monitored through three indicators: at-risk-of-poverty rate, material deprivation and low work intensity households.

Poverty in BiH is monitored using the Household Budget Survey (HBS), which is prepared by the BiH Agency for Statistics on a three-year basis. The Household Budget Survey was conducted for the first time in Bosnia and Herzegovina in 2004, then in 2007, and in 2011 and 2015. The main goal and purpose of the Household Budget Survey is to obtain data on the size and structure of household consumption in BiH, basic demographic and socioeconomic characteristics of their members, housing conditions, sources and size of income, investment, social inclusion, health etc.(4)

Poverty, according to the European standard methodology, is defined by equivalent household consumption expenditures that are below the standard threshold, which is set annually at 60% of the median monthly household expenditure.

According to the 2015 Household Budget Survey, the relative poverty rate of the population in the Federation of Bosnia and Herzegovina was 17.1%. This means that in 2015, about 330,000 persons lived below the relative poverty line. The monthly relative poverty threshold for a one-member household in the Federation of Bosnia and Herzegovina in 2015 was BAM 389.26. Compared to 2011, the relative poverty rate in the Federation of

Bosnia and Herzegovina in 2015 remained the same. The relative poverty line has also been reduced by BAM 27.14 KM per month.

In 2020, according to incomplete data from the FBiH Ministry of Labour and Social Policy, there were 129,963 social protection beneficiaries registered in the Federation of BiH, which is 5.9% of the total population. Of the registered number, 44,700 were persons with disabilities (non-war), 4,494 civilian victims of war and 80,769 were beneficiaries of social protection (71,758 adults, 9,011 children beneficiaries of social protection).(5)

Observed by cantons, the largest number of social protection beneficiaries was in Tuzla Canton (18,902), Zenica-Doboj Canton (16,583), and Sarajevo Canton (16,086). The largest number of children beneficiaries of social protection in FBiH was in Zenica-Doboj Canton (2,361) and Tuzla Canton (2,190).

At the end of 2020, according to the data of the FBiH Institute for Pension and Disability Insurance, the total number of pensioners was 428,117, which is 4,108 more than in 2019 and has been constantly increasing in recent years. The average pension at the end of 2020 was BAM 427.92.

The number of disability pension beneficiaries by cause of disability and by gender in December 2020 was 65,693, of which there were more men (43,604) than women (22,089). According to the cause of disability, it is mostly due to illness (61,431), followed by several causes (2,057), injuries at work (1,423), injuries outside work (763), and occupational diseases (19).

According to the data of the FBiH Ministry for the Issues of Veterans and Disabled Veterans of the Defence and Liberation War, the total number of beneficiaries of veterans' benefits in 2020 was 80,769 and is significantly lower than in 2019 (84,029).

1.4. Adult literacy

According to the 2013 Census of population, households and dwellings in BiH, 2.63% of the total population over the age of 10 in the Federation of Bosnia and Herzegovina are illiterate, which is more than in the surrounding countries. According to the latest censuses, there are 1.96% of illiterate persons in Serbia, 0.8% in Croatia and 1.5% in Montenegro. Such a large number of illiterate people in BiH is additionally devastating due to the fact that primary education is mandatory throughout BiH. Those who do not complete primary education by the age of 17 can complete it in one of the adult education institutions.

BiH Youth Study 2018/2019 showed that only 13% of young people in BiH have a university degree, 50% have a three-year secondary education, and as many as 4% of young people have no formal education.

According to the definition of literacy used in the census, a literate person is one who can read and write a short, simple statement about his or her daily life with understanding. Otherwise, the person is illiterate.

For the first time in BiH, data on computer literacy of the population were collected during the census. Computer literacy is defined as the ability to process text, create tables, use e-mail and the Internet, while a person who is not able to perform any of these activities is considered computer illiterate and there were 1,229,972 or 38.7% of them in BiH.

2. SELECTED POPULATION HEALTH INDICATORS

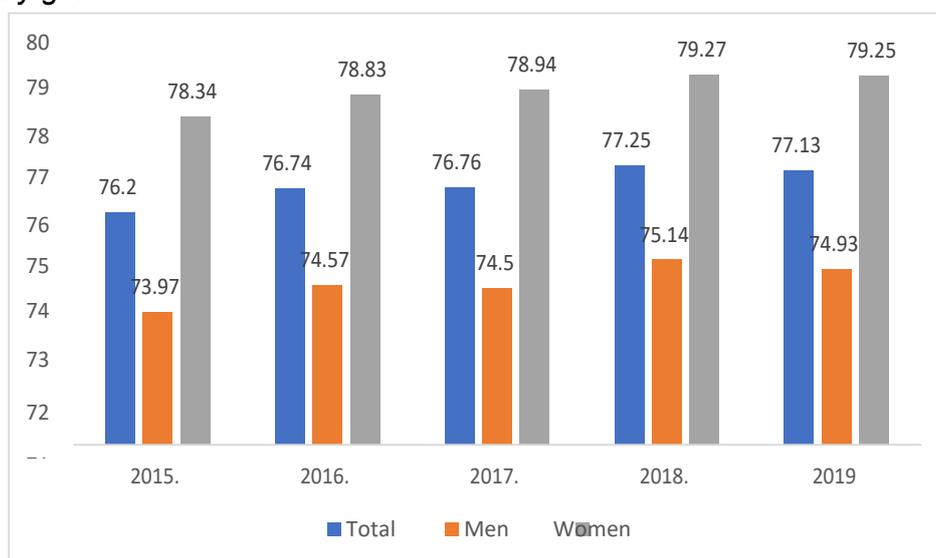
As in previous years, the selected indicators of health status and organization of health care in the Federation of BiH refer to the public health care sector.

This report used data from regular health statistics, population surveys and data from other sectors, which responded to the query.

2.1. Life expectancy

According to the latest available data from the FBiH Institute for Statistics, life expectancy at birth for population of the Federation of BiH in 2019 was 77.13 years, slightly more for women (79.25) than for men (74.93). The average of the countries of the WHO European Region is 77.1 years. (6)

Figure 5: Life expectancy at birth of the population of the Federation of BiH 2015-2019, total and by gender



2.2. Mortality (Death rate)

The most reliable data for the assessment of the health of the population, both in the world and in our country, are mortality indicators. In addition, data and information from population surveys are used, as well as data from other sectors, in order to get a more realistic picture of the health status of the population.

The health indicators of the population in this report are analyzed for 2019 and 2020 by monitoring trends or comparing them for these three years in order to determine the changes that have occurred.

2.2.1 General mortality

The general mortality rate per 100,000 population in the Federation of BiH in 2020 is 1202.07 and records a significant increase compared to 2019, when its value was 1005.6 per 100,000 population.

General mortality is a reflection of the aging process of the population and old-age specific pathology.

The leading disease that caused death of the population in the Federation of Bosnia and Herzegovina in 2020 was Covid-19 confirmed virus with SDR 85.8 and an overall rate of 123.1. SDR for males is 126.1 and for females 53.7.

Five leading groups of diseases causing death in the Federation of BiH, comparatively for 2019 and 2020

Five leading groups of diseases that caused the death of the population of the Federation of BiH: in 2020, the leading ones were circulatory system diseases (I00-I99), with a share of 44.2%, which is slightly less than in 2019 when the share of circulatory system diseases in the mortality of the population of the Federation of BiH was 47.9%.

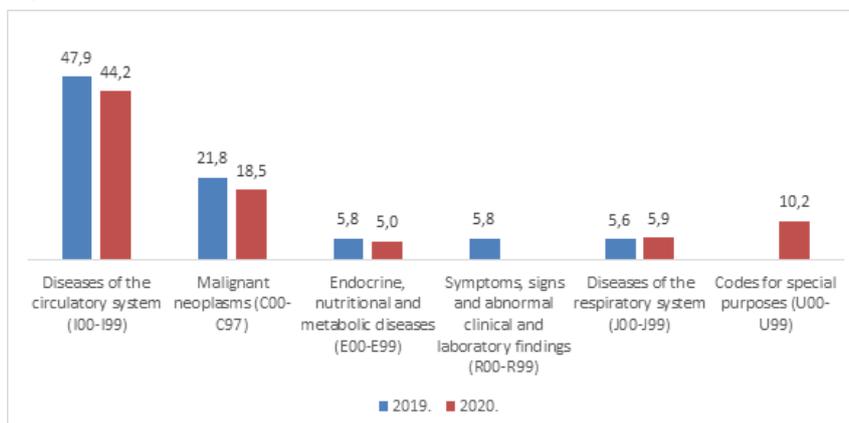
The second group of diseases that most often caused death of the population in the Federation of BiH in 2020 are malignant neoplasms (C00-C97) with a structure index of 18.5%, which is slightly less compared to the share of 21.8% in 2019.

The third leading group of diseases that were the cause of death in 2020 are diseases coded as a Codes for special purposes (U00-U99), with a share of 10.2%, while in 2019 the third most common cause of death in the Federation of BiH were symptoms, signs and abnormal clinical and laboratory findings (R00-R99), with a share of 5.84%.

The fourth most common cause of death in 2020 is diseases of the respiratory system (J00-J99), with a structure index of 5.9% and which recorded an increase compared to 2019 when their value was 5.6%. The fifth most common group of diseases that caused the death of the population of the Federation of BiH are endocrine and metabolic diseases with eating disorders (E00-E99), with a share of 5.0%, which is a slight decrease compared to the previous year when the share of these diseases in total mortality was 5.8%.

From the compared data for 2019 and 2020, it can be concluded that the population of the Federation of Bosnia and Herzegovina is aging and that the number of leading diseases that were the cause of death is increasing accordingly. Lack of healthy lifestyles, insufficient physical activity, obesity, etc. are the factors that contribute to the fact that the listed groups of diseases are the most common causes of death in the population of the Federation of BiH.

Figure 6: Five leading groups of diseases as causes of death in the Federation of BiH, 2019 and 2020, structure index

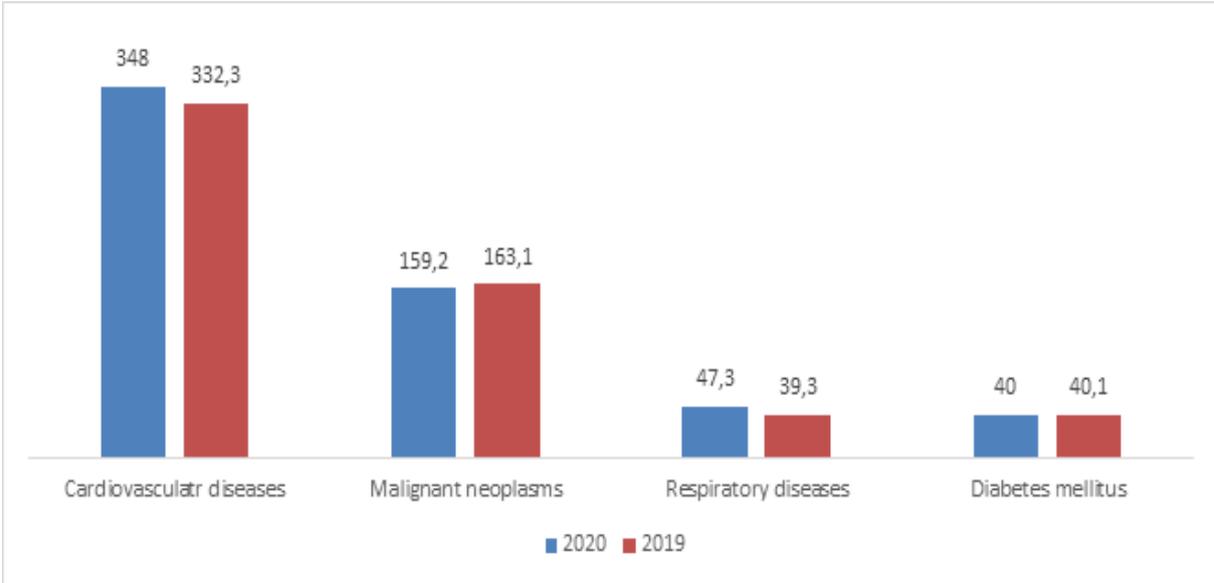


Standardized death rate (SDR) for the four leading non-communicable diseases as causes of death in the Federation of BiH

The standardized mortality rate (SDR) for cardiovascular diseases decreased slightly from 332.3 in 2019 and amounted to 348 in 2020. It is followed by malignant neoplasms with SDR of 159.2 for 2020, which are in a slight decline compared to 163.1 at 2019.

The third are chronic respiratory diseases with SDR of 47.3 for 2020, which is a significant increase compared to SDR of 39.3 in 2019. Diabetes mellitus is fourth with an SDR of 40.0 for 2020, which is a decrease compared to 2019, when this value was 40.1.

Figure 7: SDR per 100,000 population for cardiovascular diseases, malignant neoplasms, diabetes mellitus and chronic respiratory diseases in the Federation of BiH, comparatively 2019 – 2020



The leading disease causing death of the population of the Federation of Bosnia and Herzegovina in 2020 was the Covid-19 virus confirmed (U07.1) with a rate of 123.0 per 100,000 population, and it appears in mortality for the first time in 2020.

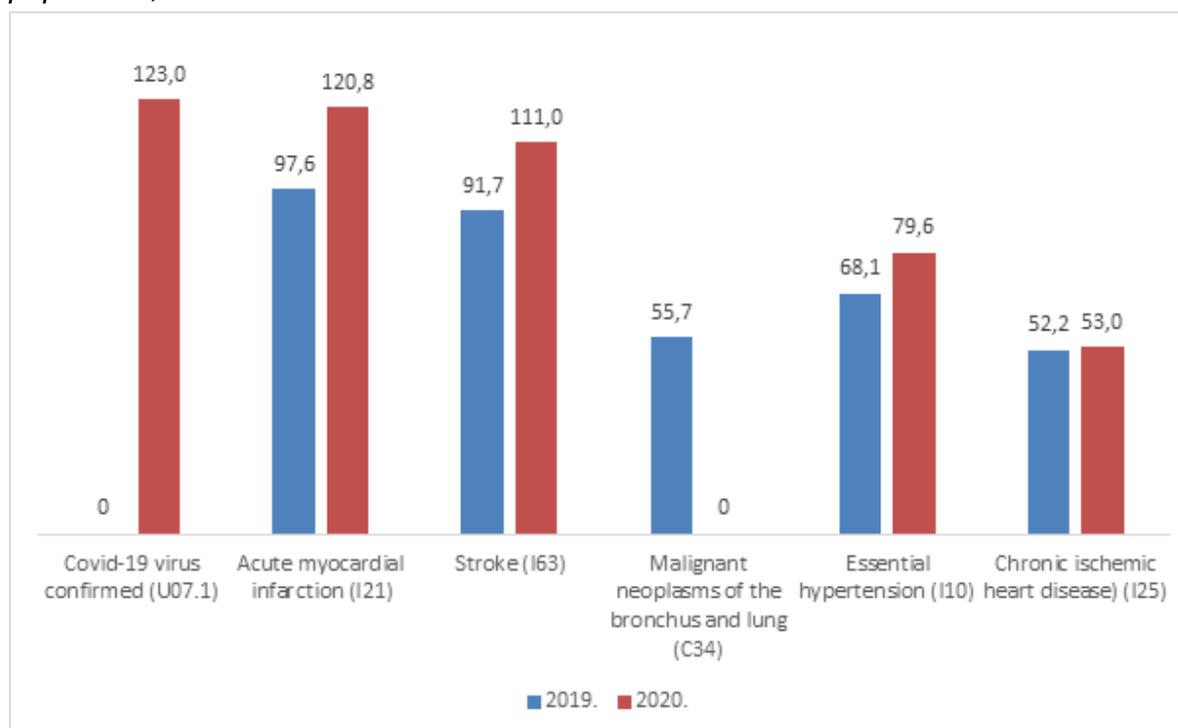
The second leading cause of death of the population of the Federation of BiH in 2020 was acute myocardial infarction (I20) with a rate of 120.8 per 100,000 population, which increased compared to 97.6 per 100,000 population in 2019.

The third leading cause of death in 2020 is stroke (I63) with a rate of 111.0 per 100,000 population, which increased compared to the rate of 91.7 per 100,000 population in 2019.

The fourth cause of death of the population of the Federation of BiH in 2020 was essential hypertension (I10) with a rate of 79.6/100,000 population, which is an increase compared to the rate of 68.1 per 100,000 population in 2019.

The fifth most common cause of death in the population of the Federation of BiH in 2020 was chronic ischemic heart disease (I25) with a rate of 53.0 per 100,000 population, while this rate in 2019 was 52.2 per 100,000 population.

Figure 8: Five leading diseases causing death in the Federation of BiH, rate per 100,000 population, in 2019 and 2020



2.2.2 Specific mortality

The leading cause of death for women in 2020 was stroke (I63), with a rate of 121.9/100,000 population, which is a significant increase compared to 2019, when the rate was 103.3/100,000 population.

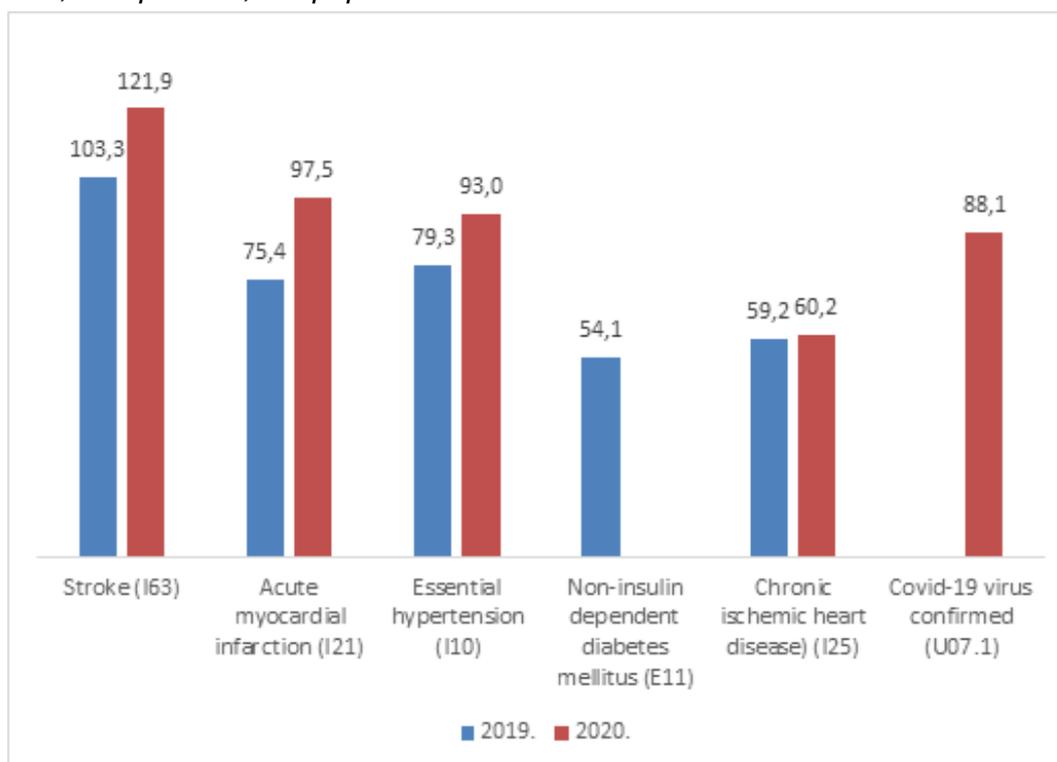
The second most common cause of death for women was acute myocardial infarction (I21), with a rate of 97.5/100,000 population in 2020 and recorded a growth trend compared to the rate of 75.4 per 100.000 population in 2019.

The third most common cause of death for women in 2020 was essential hypertension (I10) with a rate of 93.0/100,000 population, which is an increase compared to the rate of 79.3/100,000 population in the previous year (2019).

The fourth leading cause of death of women in the Federation of Bosnia and Herzegovina in 2020 was the Covid-19 virus confirmed (U07.1) with a rate of 88.1 per 100,000 population, and it appears for the first time as the cause of death of women in the Federation of Bosnia and Herzegovina in 2020.

The fifth most common cause of death for women in 2020 is chronic ischemic heart disease (I25) with a rate of 60.2 per 100,000 population.

Figure 9: Five leading diseases causing death of women in the Federation of BiH in 2019 and 2020, rate per 100,000 population



In 2020, mortality of men was most caused by the Covid-19 virus confirmed (U07.1) with a rate of 159.2 per 100,000 population, which appears for the first time as the cause of death of men in the Federation of BiH in 2020. In 2019, the most common cause of death of men in the FBIH was acute myocardial infarction (I21) with a rate of 120.6 per 100,000 population.

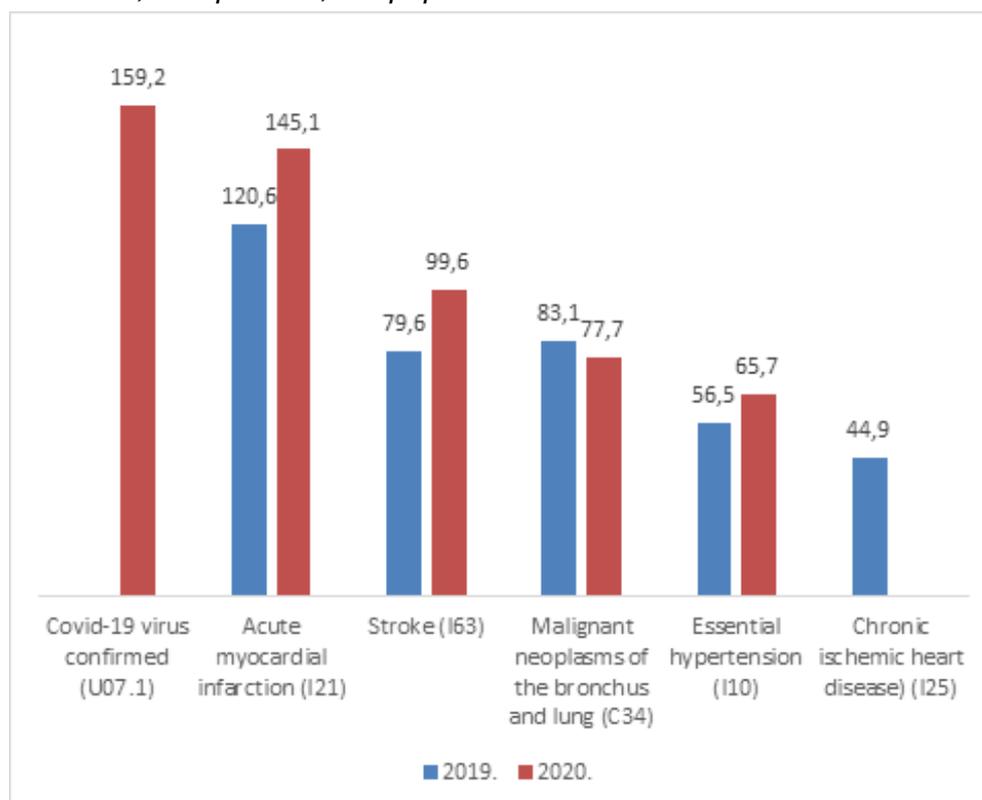
In 2020, acute myocardial infarction (I21) was the second most common cause of death in men with a rate of 145.1 per 100,000 population, which is a significant increase compared to the rate of 120.6 per 100,000 population in 2019.

The third most common cause of death of men in the Federation of BiH in 2020 was stroke (I63), with a rate of 99.6/100,000 population, which is significantly higher compared to the rate of 79.6 per 100,000 population in 2019.

The fourth most common cause of death of men in 2020 was malignant neoplasms of the lung and bronchus (C34) with a rate of 77.7 per 100,000, which is less compared to the rate of 83.1 per 100,000 population the year before (2019).

The fifth most common cause of death of men in the Federation of BiH in 2020 was chronic ischemic heart disease (I25), with a rate of 65.7 per 100,000 population, which is higher than in 2019, when the rate was 56.5/100,000 population.

Figure 10: Five leading diseases causing death of men in the Federation of BiH in 2019 and 2020, rate per 100,000 population



2.2.3 Mortality from cardiovascular diseases (CVD)

This group of diseases is the most prevalent in total mortality.

Regarding cardiovascular diseases (CVD) in the Federation of Bosnia and Herzegovina in 2020, the most common cause of death was acute myocardial infarction (I21), with a rate of 119.7 per 100,000 population, which is a significant increase compared to 2019, when this rate was 97.6/100,000 population.

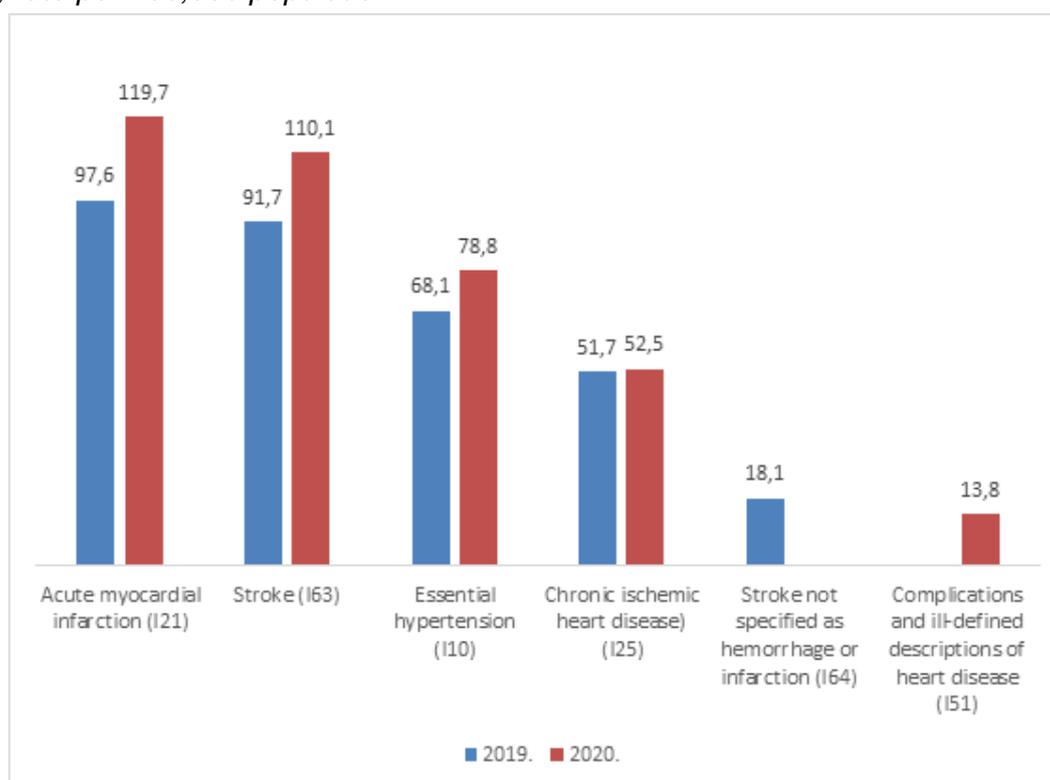
The second ranked in 2020 is stroke (I63), with a rate of 110.1/100,000 and shows an upward trend compared to 2019, when the rate was 91.7/100,000.

The third leading cause of death from CVD is essential hypertension (I10) with a rate of 110.1/100,000 population in 2020, which is significantly higher compared to 2019, when the rate was 91.7/100,000 population.

Chronic ischemic heart disease (I25) is the fourth leading cause of death from the CVD group in 2020, with the rate 52.5.8 per 100,000 population, which is slightly higher than in 2019, when the rate was 51.7 per 100,000 population.

Complications and ill-defined descriptions of heart disease (I51) emerged as the fifth most common cause of death from CVD in 2020, with a rate of 13.8 per 100,000 population, while in 2019 the fifth most common cause of death from CVD was stroke not specified as haemorrhage or infarction (I64), with a rate of 18.1 per 100,000 population.

Figure 11: Mortality from cardiovascular diseases in the Federation of BiH in 2019 and 2020, rate per 100,000 population



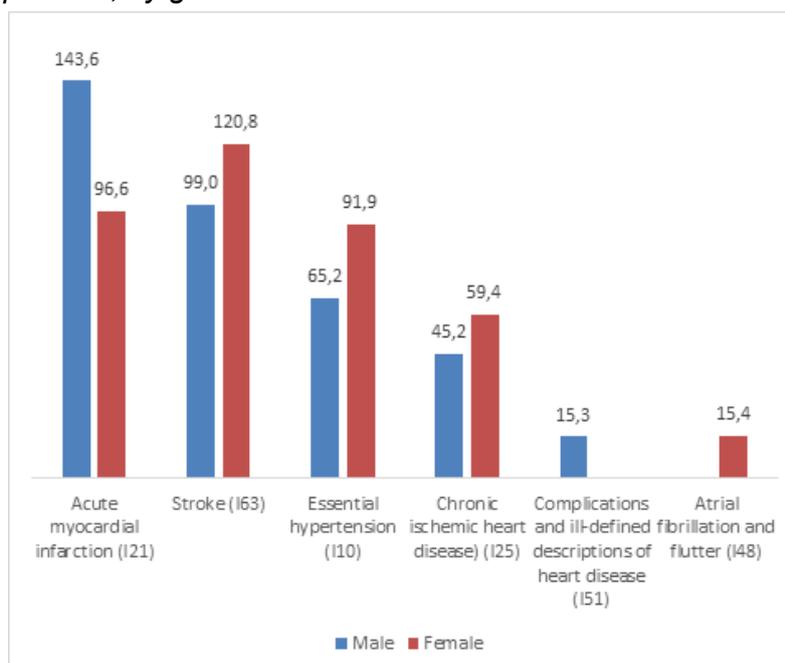
According to gender, from the group of cardiovascular diseases in 2020, men most often died from acute myocardial infarction (rate 143.6/100,000), then from stroke (rate 99.0/100,000), followed by essential hypertension (rate 66.2/100,000). The fourth leading cause of death of men in the Federation of BiH from the group of cardiovascular diseases is chronic ischemic heart disease (45.2/100,000), while complications and ill-defined descriptions of heart disease (I51) occur in fifth place, with a rate of 15.3 per 100,000 population. All the listed causes of male mortality in the Federation of BiH record an increase in the rate per 100,000 population compared to 2019.

From the group of cardiovascular diseases in 2020, women in the Federation of BiH most often died of stroke (120.8/100,000), followed by acute myocardial infarction (rate 96.6/100,000). The third most common cause of death of women in the Federation of BiH from the group of cardiovascular diseases is essential hypertension (I10) (91.9/100,000).

In the fourth place in terms of the frequency of death of women from CVD in the Federation of BiH are chronic ischemic heart diseases (59.4/100,000), while in fifth place is atrial fibrillation and flutter (I48), with a rate of 15.4/100,000 population.

As in previous years, in 2020, in this group of diseases, the leading cause of death in men was acute myocardial infarction, and in women, stroke.

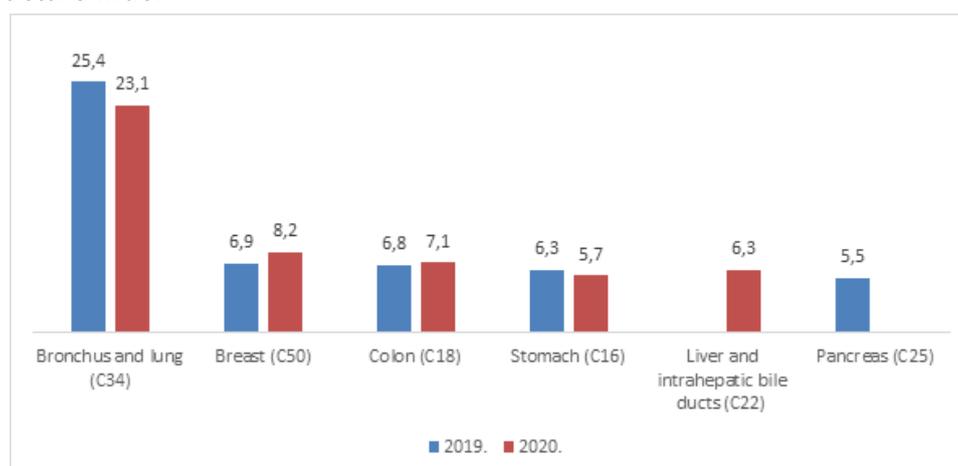
Figure 12: Mortality from cardiovascular diseases in the Federation of BiH in 2020, rate per 100,000 population, by gender



2.2.4 Mortality from malignant neoplasms

Bronchus and lung cancer (C34) is the leading malignant neoplasm causing death of the population of the Federation of BiH. It has long been the leading cause of death in men from this group of diseases, but increasingly more women in the Federation of BiH are dying from lung and bronchus cancer (C34).

Figure 13: Mortality from malignant neoplasms (top five) in the Federation of BiH 2019 – 2020, structure index



Among the causes of death from malignant neoplasms in men in 2020, the leading one was malignant neoplasm of bronchus and lung (C34), with a share of 31.0%, and recorded a slight downward trend compared to 2019 (33.2%), followed by malignant neoplasm of prostate (C61), with a share of 8.7%, which is slightly higher than in 2019, when the share of total deaths from malignant neoplasms among men was 8.3%.

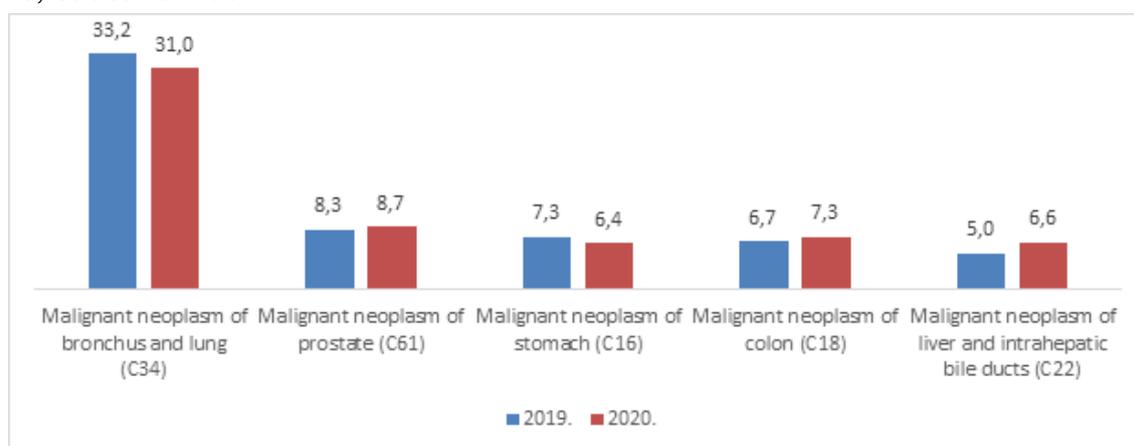
The third most common malignant neoplasm that caused the death of men in the Federation of BiH in 2020 is malignant neoplasm of colon (C18), with a share of 7.3%, which went

up compared to 2019, when the share was 6.7%. In 2019, the third most common cause of death of men in the Federation of BiH from the group of malignant neoplasms was malignant neoplasm of stomach (C16), with a share of 7.3%.

The fourth in 2020 is malignant neoplasm of liver and intrahepatic bile ducts (C22), with a share of 6.6%, which is slightly higher compared to 2019 when the share of this malignant neoplasm in the death of men was 6.4%.

The fifth malignant neoplasm that most often caused the death of men in the Federation of BiH in 2020 is malignant neoplasm of stomach (C16), with a share of 6.4%, which is slightly less than in 2019 when the share of this neoplasm in the death of men was 7,3%.

Figure 14: Mortality from malignant neoplasms in men in the Federation of BiH, 2019 - 2020, structure index



The most common malignant neoplasm that caused the death of women in the Federation of Bosnia and Herzegovina in 2020 was malignant neoplasm of breast (C50), with a share of 18.4% in the total mortality from malignant neoplasms among women in the Federation of BiH, which is a significant increase compared with 2019, when the share of this malignant neoplasm in the total death of women from malignant neoplasms was 15.3%.

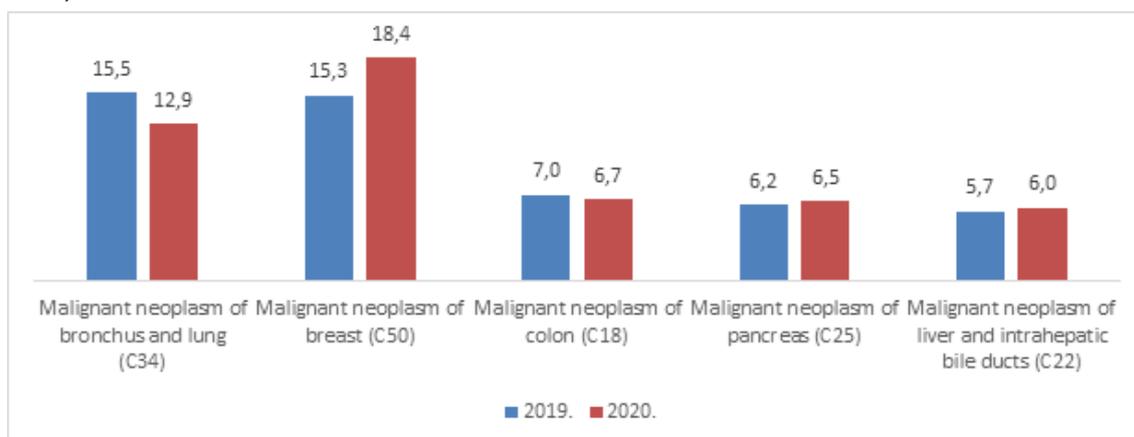
The second most common neoplasm from which women in the Federation of BiH died in 2020 is malignant neoplasm of bronchus and lung (C34), with a share of 12.9%, which is a slight decrease compared to 2019, when the share of this neoplasm in deaths of women was 15.5%.

The third malignant neoplasm from which women most often died in 2020 is malignant neoplasm of colon (C18), with a share of 6.7%, which is slightly less than in 2019, when the share of this neoplasm was 7.0%.

The fourth most common malignant neoplasm that was the cause of death in women in the Federation of BiH in 2020 is malignant neoplasm of pancreas (C25), with a share of 6.5%, which is a slight increase compared to 2019, when the share was 6,2%.

Fifth in frequency in 2020 was malignant neoplasm of liver and intrahepatic bile ducts (C22) with a share of 6.0%, while in 2019 the share of this neoplasm in the death of women was 5.7%.

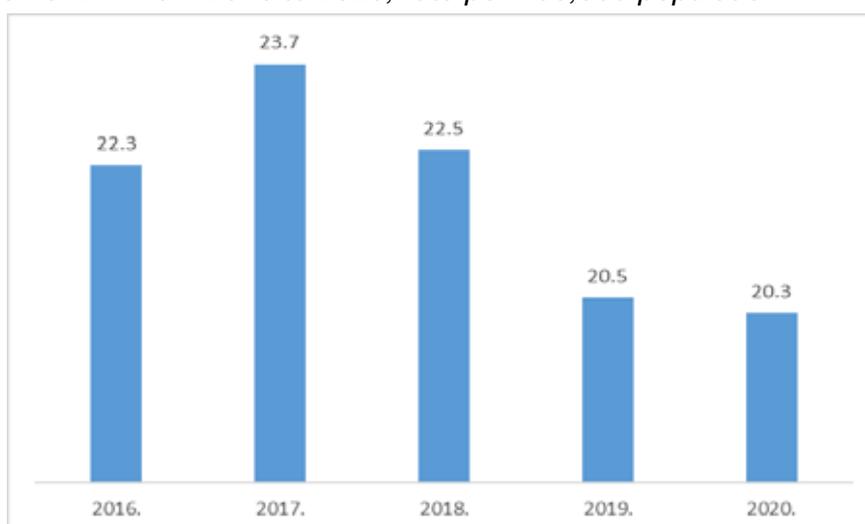
Figure 15: Mortality from malignant neoplasms in women in the Federation of BiH, 2019 - 2020, structure index



2.2.5 Injuries as a cause of death

The death rate from injuries, poisonings and other consequences of external causes of death per 100,000 population of the Federation of BiH in 2020 was 20.3/100,000 and recorded the lowest value in the past five years.

Figure 16: Injuries, poisonings and other consequences of external causes of death in the Federation of BiH from 2016 to 2020, rate per 100,000 population



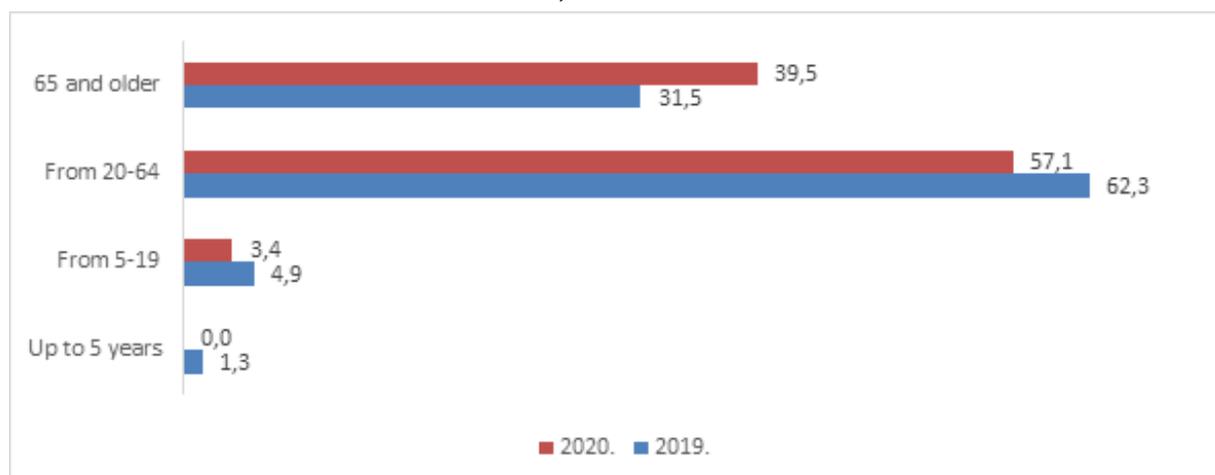
The share of injuries in mortality in 2020 was 1.7% turning slightly downwards compared to 2019 when it was 2.0%.

In the age group of 5-19 years, the share of injuries as a cause of mortality for 2020 is 3.4%, which is slightly less compared to the share of 4.9% in 2019.

There is a reduced share of injuries, poisonings and other consequences of external causes of death in 2020 in the age group 20-64 years, namely 57.1%, compared to 2019, when the percentage was 62.3%.

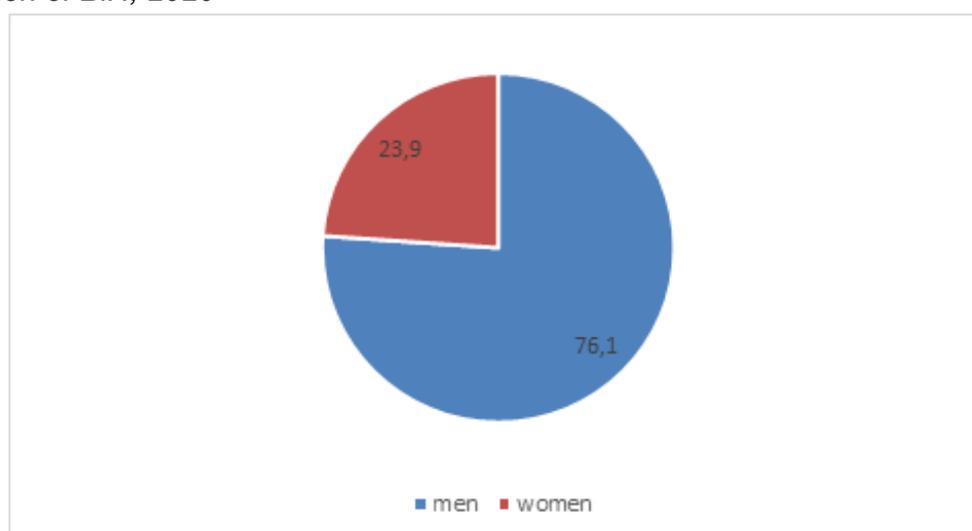
In the age group 65+, the share of injuries increased in 2020, recording a value of 39.5%, which is more compared to the share of 31.5% in 2019.

Figure 17: Injuries, poisonings and other consequences of external causes of death in the Federation of BiH for 2019 and 2020, structure index



In 2020, by gender, men died from injuries almost three times more often than women - men 76.1% and women 23.9%.

Figure 18: Percentage share of mortality from injuries for women and men in the Federation of BiH, 2020



2.2.6 Infant mortality

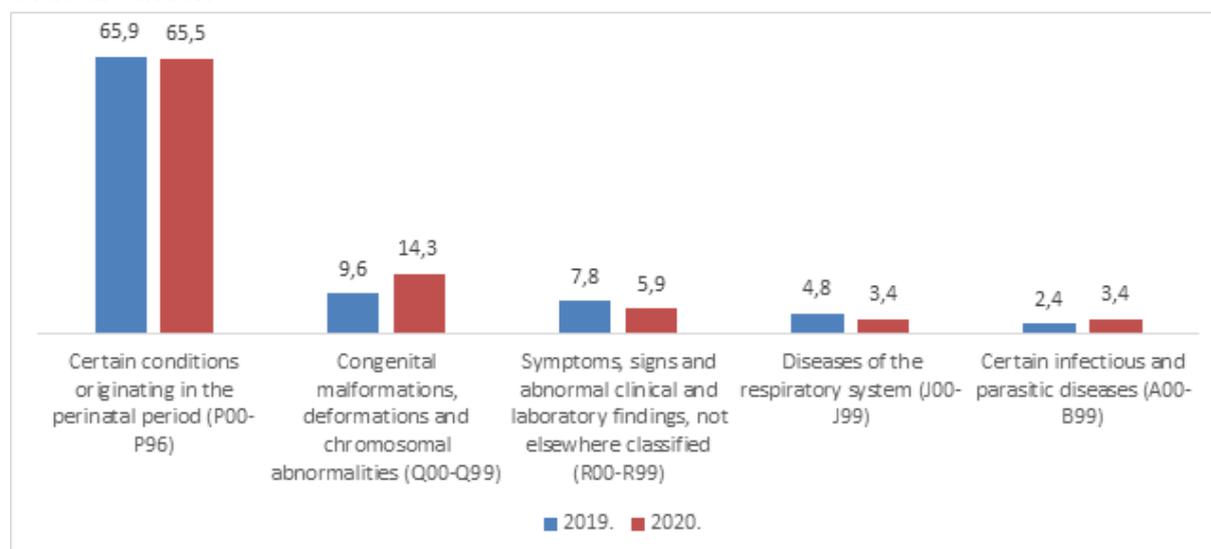
Leading causes of infant mortality in FBiH in 2019 and 2020

In 2020, the leading cause of infant mortality in the Federation of Bosnia and Herzegovina were certain conditions originating in the perinatal period (P00-P96), with a share of 65.5%, which is slightly less compared to 2019, when the share was 65.9%. They are followed by congenital malformations, deformities and chromosomal abnormalities (Q00-Q99), with a share of 14.3% in 2020, which is significantly higher than the share of 9.6% in 2019.

The third leading cause of infant mortality in 2020 is symptoms, signs and abnormal clinical and laboratory findings not elsewhere classified (R00-R99), with a structure index of 5.9%, which is slightly less than in 2019, when the share of this cause of infant deaths in the Federation of BiH was 7.8%.

The fourth and fifth respective most common cause of infant mortality in 2020 are diseases of the respiratory system (J00-J99), with a share of 3.4%, which is less compared to a share of 4.8% in 2019 and certain infectious and parasitic diseases (A00), with a share of 3.4%, which is an increase compared to 2019, when the share of these causes of infant deaths was 2.4%.

Figure 19: Leading causes of infant mortality in the Federation of BiH in 2019 and 2020, structure index



Leading causes of mortality in children under 5 years of age in FBiH in 2019 and 2020

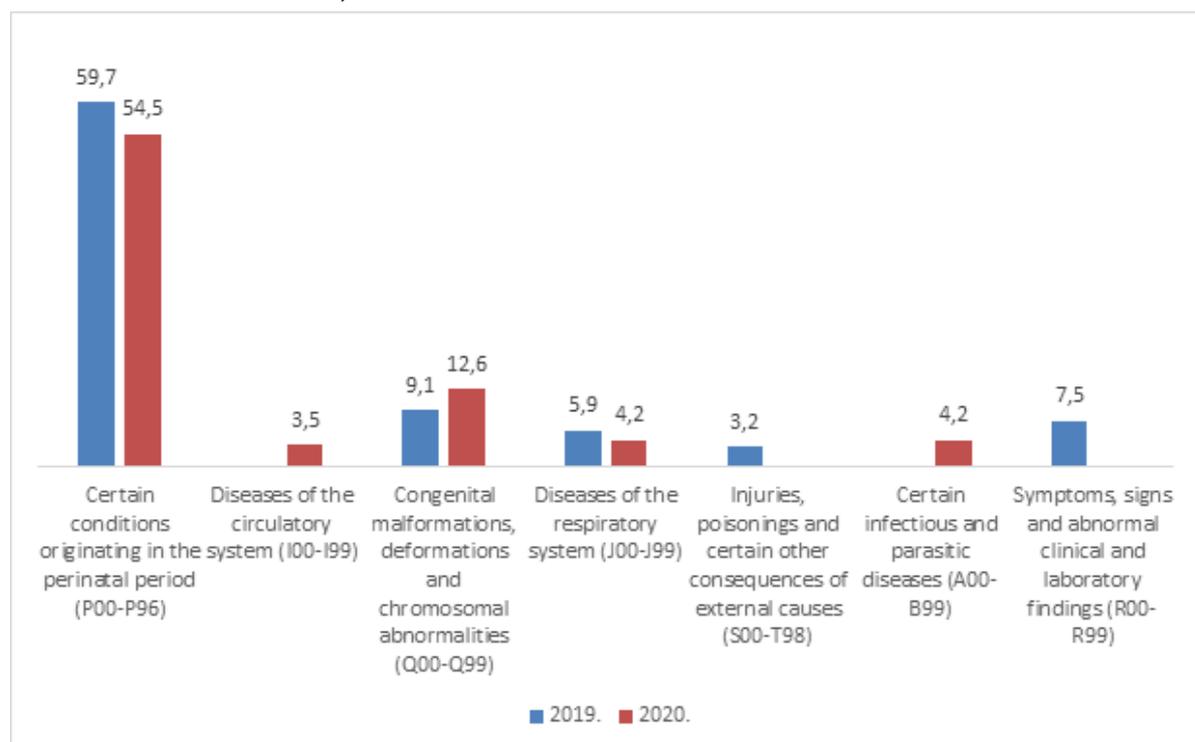
In 2020, the leading cause of mortality of children under 5 years of age in the Federation of BiH were certain conditions originating in the perinatal period (P00-P96), with a share of 54.5%, which is a decrease compared to 2019, when the structure index was 59.7%.

They were followed in 2020 by congenital malformations, deformities and chromosomal abnormalities (Q00-Q99), with a share of 12.6%, which is a significant increase compared to the share of 9.1% in 2019.

The third most common cause of mortality of children under 5 years of age in 2020 in the Federation of BiH were diseases of the respiratory system (J00-J99), with a share of 4.2%, compared to the share of 5.9% in 2019. Certain infectious and parasitic diseases (A00-B99) also had a share of 4.2% in the deaths of children under 5 years of age in the Federation of BiH in 2020.

The fifth most common cause of death of children under 5 years of age in the Federation of BiH in 2020 were diseases of the circulatory system (I00-I99), with a share of 3.5% while in 2019 the fifth were injuries, poisoning and other consequences of external causes (S00-T98), with a share of 3.2%.

Figure 20: Leading causes of mortality in children under 5 years of age in the Federation of BiH in 2019 and 2020, structure index

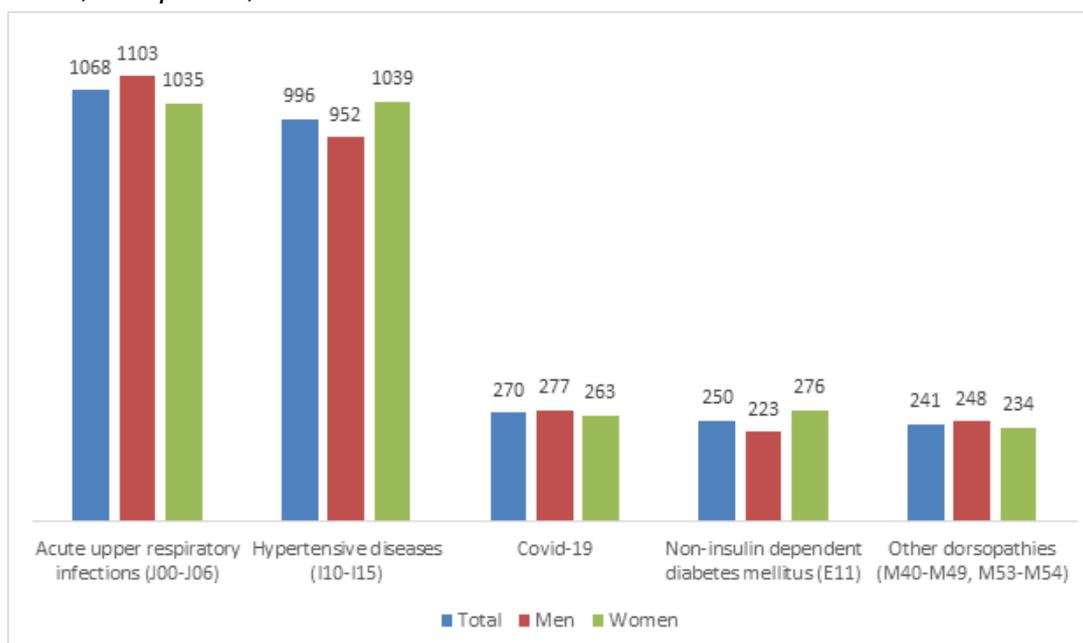


2.3. Morbidity

In addition to biological and genetic characteristics of individuals, socio-economic factors have an equally strong impact on the health of the population, primarily peace, education, income, housing conditions, nutrition, environmental factors, etc. In 2020, the health of the population of the Federation of BiH was highly endangered by the Covid-19 pandemic, which was registered both in the indicators of morbidity and in the causes of mortality of the population.

In the overall morbidity at the PHC level, the leading diseases of the population of the Federation of BiH in 2020 were acute upper respiratory tract infections, hypertensive diseases and Covid-19, followed by non-insulin-dependent diabetes mellitus and other dorsopathies.

Figure 21: Leading diseases of the population of the Federation of BiH, 2020, total and by gender, rate per 10,000

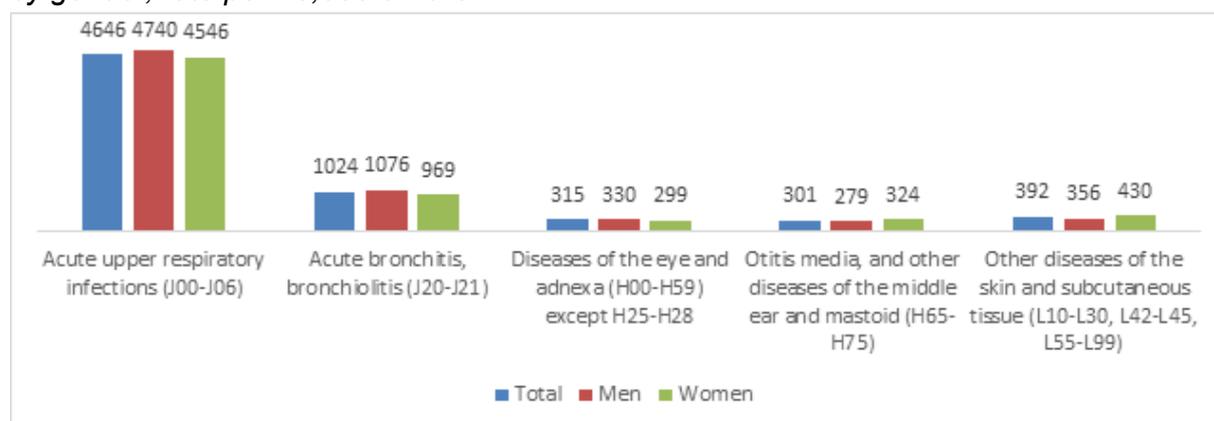


2.3.1. Morbidity of individual population groups

Morbidity in preschool children

In 2020, 91,829 diseases and conditions (without injuries) of children under the age of 4 were registered, which is less than in 2019 (140,174 diseases). The leading diseases were: acute infections of the upper respiratory tract, acute bronchitis, bronchiolitis, diseases of the eye and adnexa, inflammation and other disorders of the middle ear and other diseases of the skin and subcutaneous tissue. Boys and girls were equally affected: the incidence rates were similar.

Figure 22: Morbidity in the preschool children in the Federation of BiH in 2020, total and by gender, rate per 10,000 children



During 2020, according to the report on well-child check ups of preschool children, 60,568 children were examined, which is slightly less than half of the total number of children of this age (46.4%). Physical development, nutrition, presence of rickets and anaemia, psychomotor development, visual, hearing and speech disorders, dental and oral disorders and diseases, musculoskeletal malformations, congenital anomalies and genital

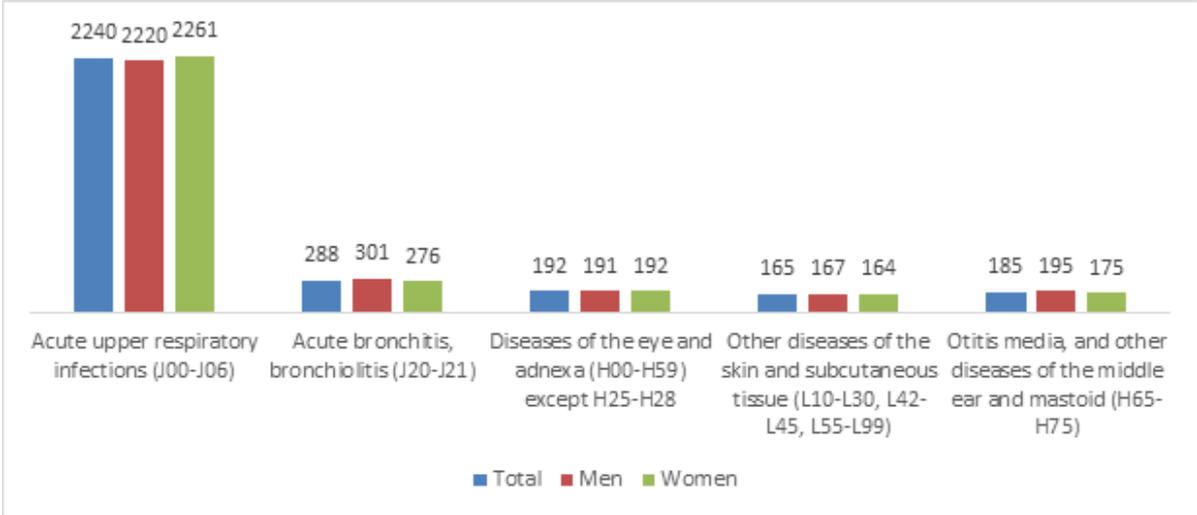
anomalies were monitored. Speech disorders (1.6%) were observed, especially among children aged 4-6 years, signs of anaemia (1.3%) in all subgroups, and delayed psychomotor development (0.6%).

In 2020, despite the Covid-19 pandemic, a significant activity was the monitoring of early growth and development (ECD) among children of age 0-6 years with a focus on children under 3 years of age. In 2020, an assessment of 7,122 children was made, slightly less than in 2019 (8,041). In 13.3% of children (944) a deviation was registered in the ECD, predominantly in the area of communications (73.4% or 693). 73.7% of children (696) with developmental deviations were referred for further diagnostics, and 1,714 interventions were registered at the ECD/intervention centre.

Morbidity of children and adolescents of age 5–19 years

In 2020, 203,727 diseases and conditions (without injuries) were registered among children and adolescents aged 5-19, which is less than in 2019 (254,758). The leading diseases were: acute infections of the upper respiratory tract, acute bronchitis, bronchiolitis, diseases of the eye and adnexa, other diseases of the skin and subcutaneous tissue and inflammation and other disorders of the middle ear. Boys and girls were equally affected: the incidence rates were very similar.

Figure 23: Leading diseases in children and adolescents aged 5-19 years in the Federation of BiH in 2020, total and by gender, rate per 10,000 children and adolescents

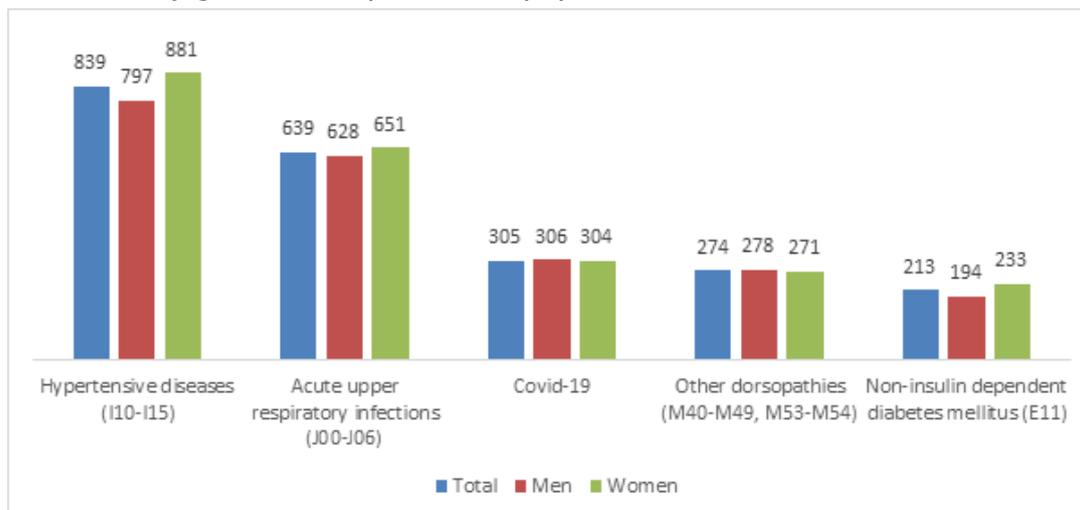


Morbidity of the population aged 20 - 64 years

In this age group, 844,949 diseases and conditions (without injuries) were registered in 2020, which is much more than in the previous year (368,901), and probably a consequence of the Covid-19 pandemic.

The leading diseases in this age group are similar to previous years, with the exception of Covid-19, and they are: hypertensive diseases (more common in women than men), then acute upper respiratory tract infections, Covid-19, dorsopathies, and non-insulin-dependent diabetes which was more common among women.

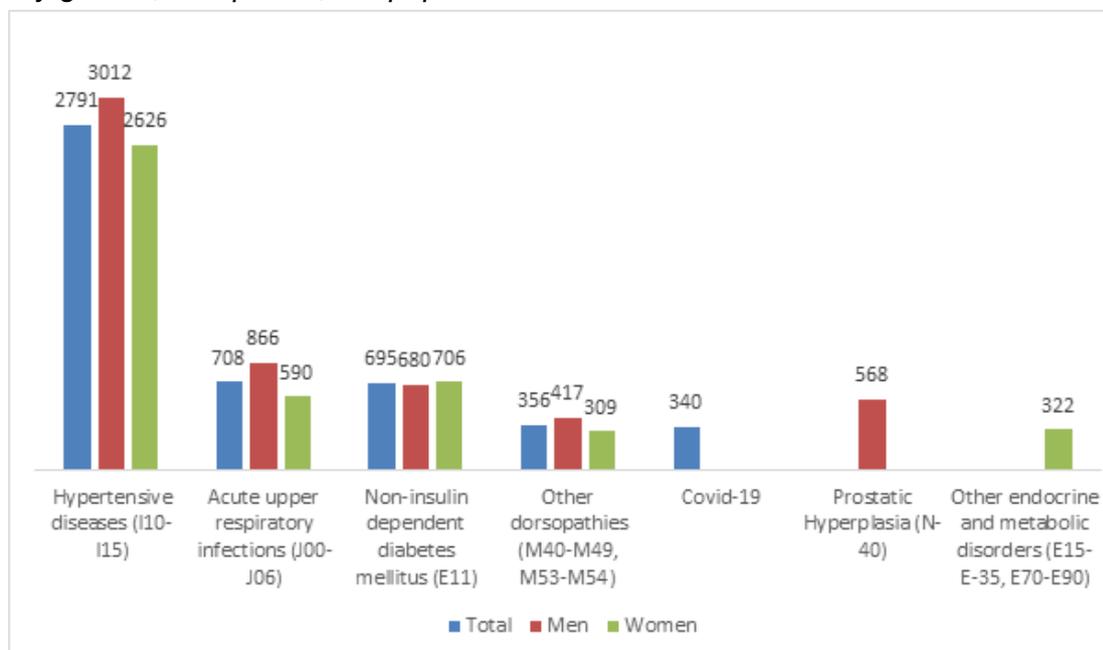
Figure 24: Leading diseases of the population aged 20-64 in the Federation of BiH in 2019, total and by gender, rate per 10,000 population



Morbidity of the population 65+

In this age group, a slightly higher number of diseases was registered (425,725) in 2020 than in the previous year (415,958). The five leading diseases were: hypertensive diseases, then acute upper respiratory tract infections, non-insulin-dependent diabetes, other dorsopathies, Covid-19 and other endocrine and metabolic disorders. The incidence rate of hypertension was higher in men and diabetes in women.

Figure 25: Leading diseases of the population 65 + in the Federation of BiH in 2020, total and by gender, rate per 10,000 population



2.3.2. Women's reproductive health

Reproductive health means that people are able to have a satisfactory and safe sexual life and the ability to have children, as well as the freedom to decide whether to have them, when and how often, which means that men and women have the right to be informed, and to have access to safe and accessible methods of birth control of their choice, as well

as the right to access appropriate health care services, which will enable women to have a safe pregnancy and childbirth, and couples the best chances for healthy children.

Reproductive health, according to the definition of the World Health Organisation (WHO), is a state of complete physical, mental and social well-being regarding all issues referring to the reproductive system and its functions, at all stages of life.

Reproductive health also refers to diseases, disorders and conditions that affect the functioning of the male and female reproductive systems at all stages of life. Reproductive disorders include birth defects, developmental disorders, low birth weight, premature birth, reduced fertility, impotence, menstrual disorders etc.

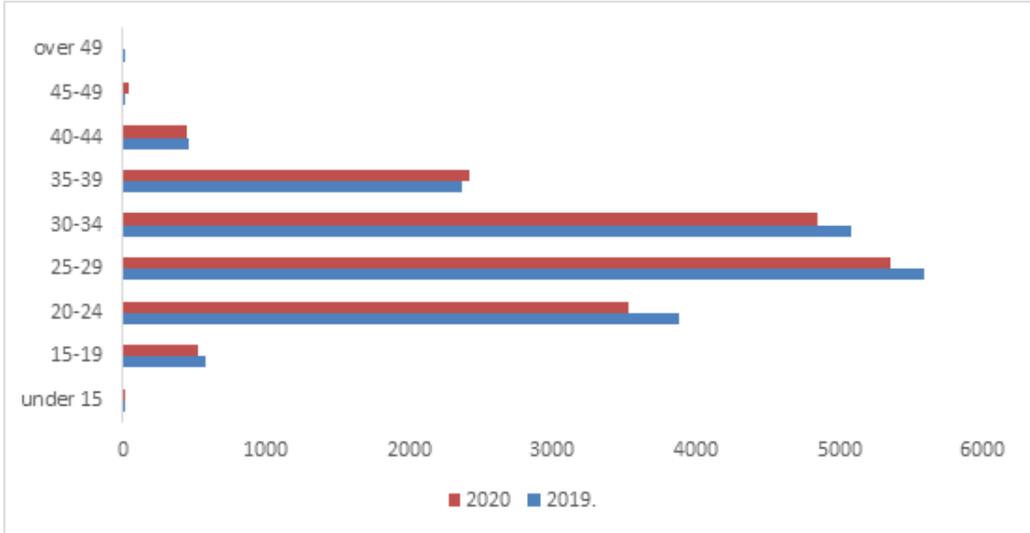
Reproductive health problems remain the leading cause of illness and death in women of childbearing age worldwide. Poor women, especially those living in developing countries, are at disproportionately high risk of unwanted pregnancies, maternal mortality, sexually transmitted diseases including AIDS, violence, as well as other problems related to the reproductive system and sexual behaviour.

In 2020, according to the FBiH Institute for Statistics, there were 1,112,131 women (50.9%) in the Federation of BiH.

The fertility rate (number of live births per 1,000 women aged 15-49) was 1.3.

In 2020, the downward trend in the number of births continued. The number of 7,211 children were registered in health care institutions in the public sector, of which the largest number was registered in the age subgroup of women 25-29 (31%). 99.95% of women had professional assistance in childbirth.

Figure 26: Number of births by age of mother in the Federation of BiH, 2019 and 2020



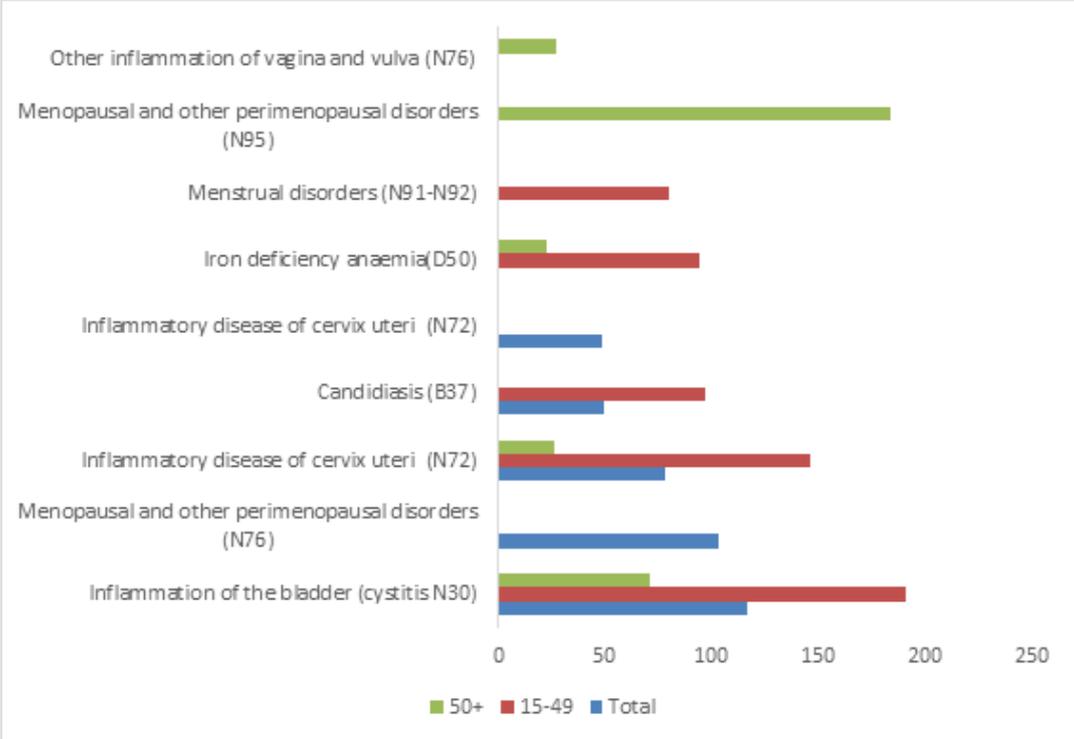
There were 4 births under the age of 15, while none was registered at the age over 49.

In 2020, there were 133,139 diseases, conditions and injuries registered in the services for the protection of women’s reproductive health, which is less than in 2019 (171,244), and conditioned by the Covid-19 pandemic, and the increasing use of private sector services.

In 2020, the leading diseases registered in the health care of women aged 15 and over were: other inflammation of the vagina and vulva, menopausal and other perimenopausal

disorders, iron deficiency anaemia, and inflammation of the cervix, with differences according to age (15 – 49 and 50+).

Figure 27 : Leading diseases and conditions in women’s health care in 2020, total, age 15 - 49 and 50+ , rate per 10,000 women



Women of reproductive age (15-49 years) most often suffered from inflammation of the reproductive organs and anaemia, and the leading diseases and conditions in women older than 50 years were menopausal and other perimenopausal disorders, and inflammation of the reproductive organs and bladder.

During 2020, women’s reproductive health care services in the public sector were provided by 110 work teams at 74 geographical locations/ clinics, and 241,387 visits to doctors were registered, significantly less than in 2019 (300,836), caused by the Covid-19 pandemic and the strengthening of the private sector. Pregnant women made only 109,621 visits to the prenatal advisory services, unlike in 2019, when 527,748 visits were registered. During 2020, the number of 3,557 contraceptives was prescribed in the Federation of BiH, most of which were oral.

2.3.3. Mental health

Mental health is the foundation of the well-being and good functioning of the individual as well as the community. If we want a mentally healthy community, in addition to meeting basic needs (such as food and shelter), a safe environment from violence, positive educational experiences, employment and good working conditions and respect for human rights, we must create conditions for learning and practicing coping skills and building good relationships.

Mental health concerns all of us, and it is extremely important for the state and society to recognize the importance of preserving the mental health of population and to be

involved in research, planning and implementation of activities that promote and support the development of mental health. To promote the importance of mental health care, it is important to live in a social climate in which basic human, political, economic, social and cultural rights are respected and protected. Particular attention should be paid to the most vulnerable groups in society and minorities, and equal access to mental health services and their programmes should be ensured for all persons in the Federation of Bosnia and Herzegovina, regardless of their age.

Mental disorders are gaining momentum especially in Western civilization due to a number of changes and influences that characterize the modern way of life and work, changes in the structure and role of the family, negative impacts of technological development, numerous substances and risks for youth growth and development, wars, natural disasters etc. Research has also shown that rates of mental illness double in parts of the world after war or other disasters.(7)

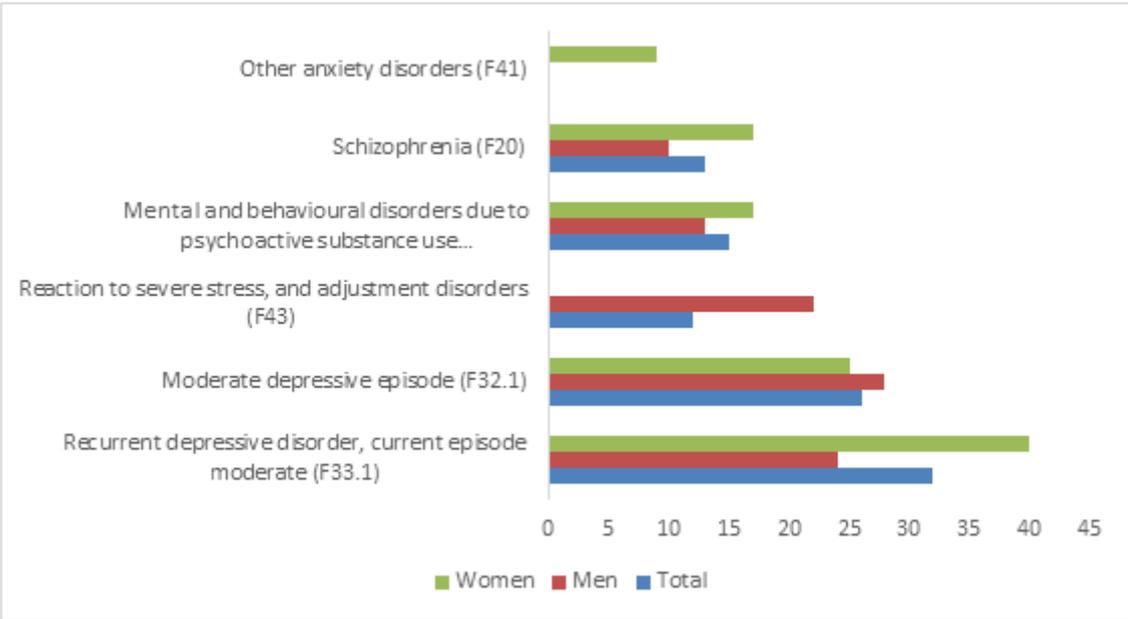
Mental difficulties and disorders can no longer be ignored but must be prevented and treated with recognized therapeutic methods and techniques.

To protect mental health, it is important to provide mechanisms that protect people's mental health, which increase the mental stability and emotional balance of the majority of the population in the community. It is also necessary to raise awareness of personal responsibility for health.

Preservation of mental health in the community is based on the prevention and protection of mental health of all age groups (empowerment of children, youth and adults through various prevention programmes that support personal growth and development and strengthen personal protective mechanisms for coping with difficulties); better understanding of human behaviour in the global and local environment, monitoring trends, lifestyles, socioeconomic conditions and other factors that affect people's mental disorders in the broadest sense and developing available professional support services (health services and psychological counselling/psychotherapy services in the immediate living and working environment).

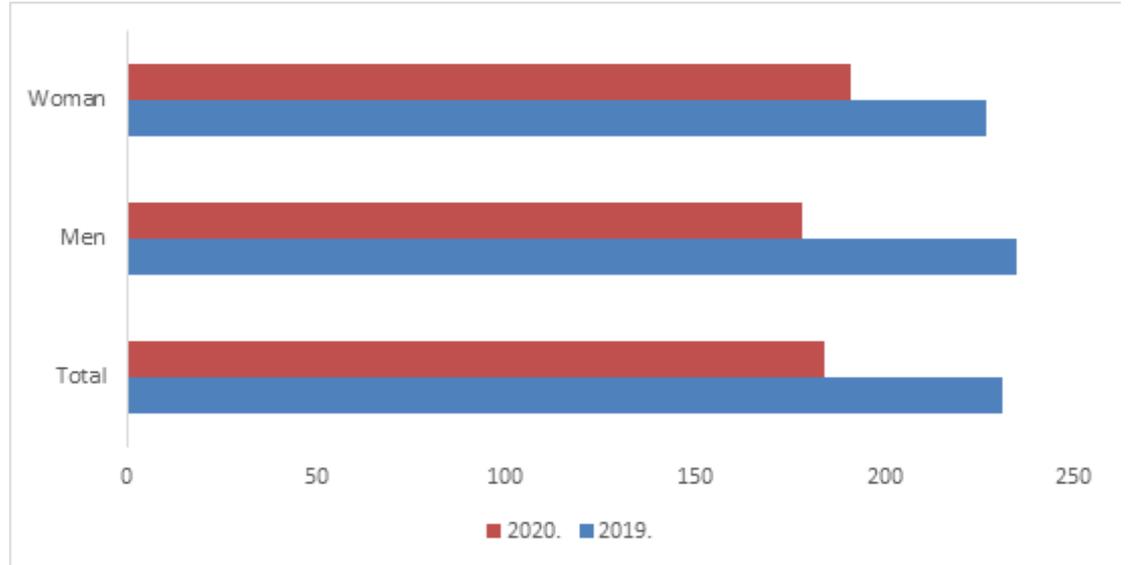
The most common mental health disorders in the Federation of Bosnia and Herzegovina in 2020 are other anxiety disorders (F41), which affected women more often, the same as in 2019. Schizophrenia (F20) is in second place in terms of frequency, and there are more male patients in this category. This is followed by a reaction to severe stress and adjustment disorders (F43), which are the third most common recorded mental health problems in women, while in men these are behavioural disorders caused by the use of other psychoactive substances (F11-F19). The fourth most common incidence in men is a reaction to severe stress and adjustment disorders (F43), and in women a moderate depressive episode (F32.1). The last ones are moderate depressive episodes in men (F 32.1) and recurrent depressive disorders with moderate episodes (F33.1) in women.

Figure 28: Leading mental and behavioural disorders in FBiH 2020, total population by gender



According to the comparison of mental and behavioural disorders in 2019 and 2020, it is noticeable that there was a larger number of recorded mental illnesses in 2019. Given the Covid-19 pandemic in 2020, it was to be expected that this number would be higher in 2020, however according to official FBiH health statistics this is not the case. There were slightly more men with mental health problems registered in 2019, and in 2020 slightly more women.

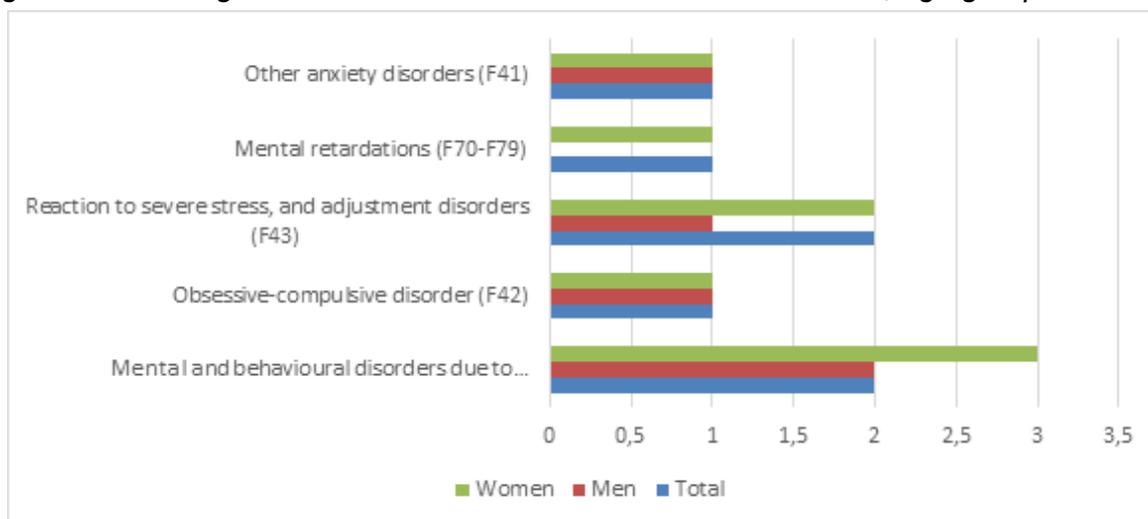
Figure 29: Mental and behavioural disorders in FBiH 2019 - 2020, total and by gender, rate per 10000



In the age group 0 - 19, the leading mental disorders for 2020 are other anxiety disorders (F41), in which more women were registered. The reaction to severe stress and adjustment disorders (F43) is in second place in 2020, which is a change compared to 2019 when more people were recorded in the group of mental retardation (F70-F79). In 2020, no pervasive developmental disorders (F84) were recorded among the top five diseases, as was the case in 2019. This is followed by mental and behavioural disorders due to the use

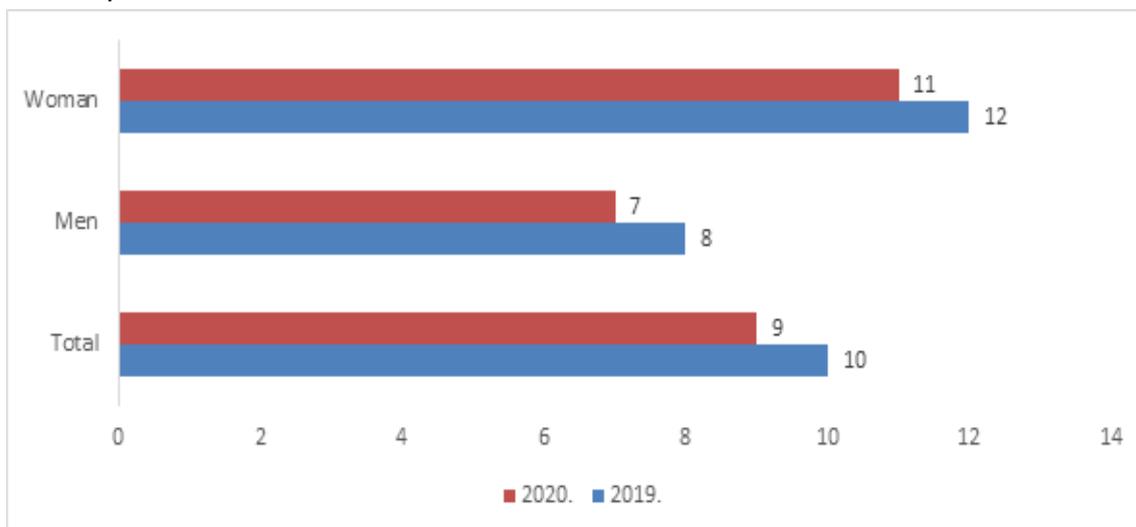
of other psychoactive substances (F11-F19). And the last, fifth, is obsessive-compulsive disorder (F42), which is more often recorded in women, the same as in 2019.

Figure 30: Leading mental and behavioural disorders in FBiH 2020, age group 0 - 19



In the age group 0 - 19, there were more men with mental health problems in 2019, and in 2020 slightly more women.

Figure 31: Mental and behavioural disorders in FBiH 2019 - 2020, total and by gender, 0 - 19, rate per 10000



For the age group 20-60 years, the leading mental disorders are, as in the previous group, other anxiety disorders (F41), followed by schizophrenia (F20), which is registered somewhat more often in men, then the reaction to severe stress and adjustment disorders (F43), which is, according to the number of registered persons, predominately registered in women. Behavioural disorders caused by the use of other psychoactive substances (F11-F19) are among the five leading diseases registered in men, while moderate depressive episodes (F32.1) are among the top five diseases in women. Post-traumatic stress disorder (F43.1) was reported separately in this age group.

Figure 32: Leading mental and behavioural disorders in FBiH 2020, age group 20 – 60

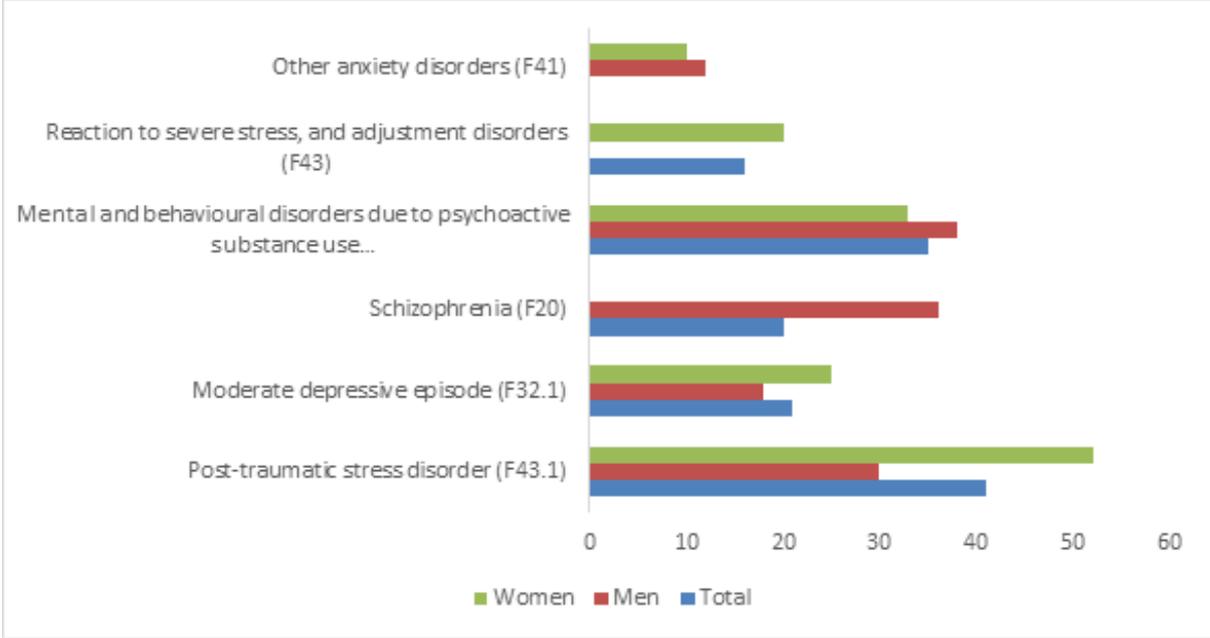
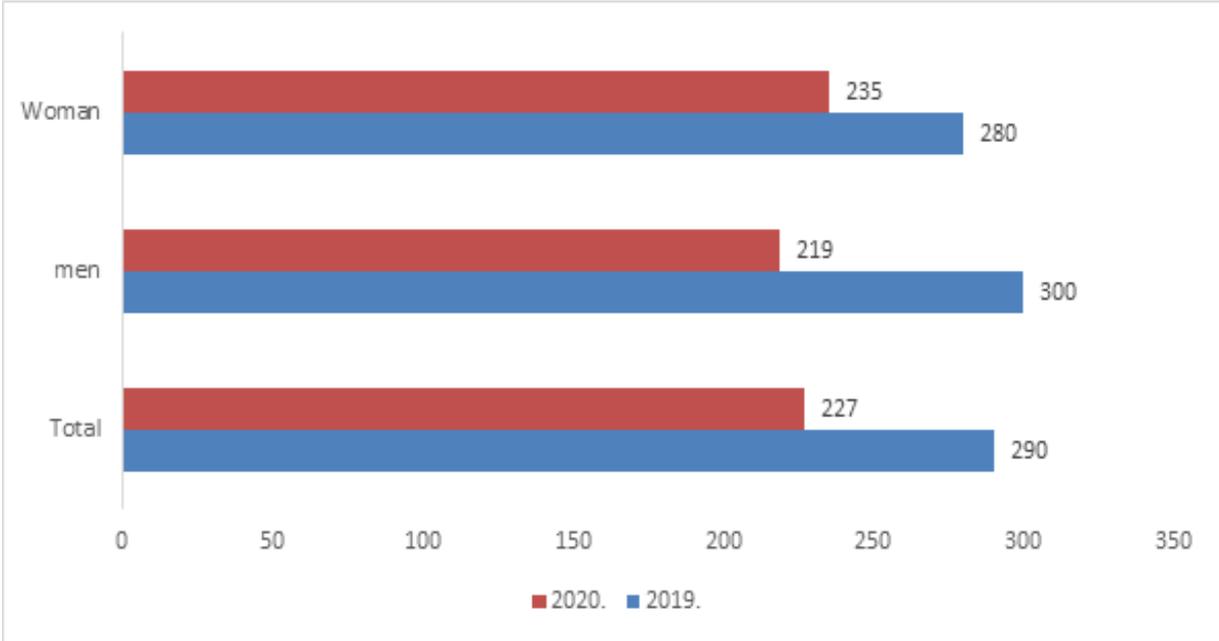


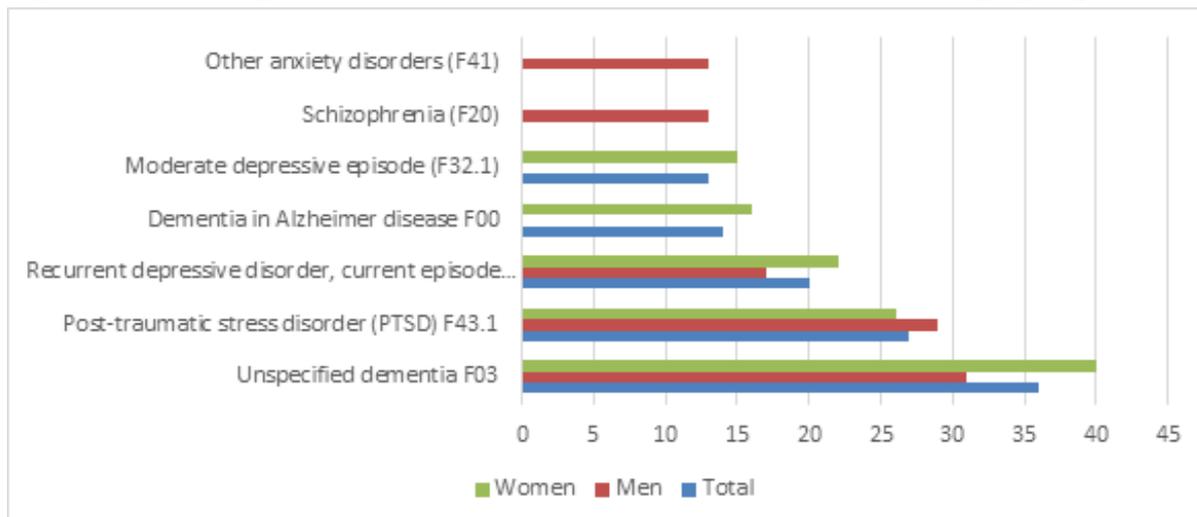
Figure 33: Mental and behavioural disorders in FBiH 2019 - 2020, total and by gender, 20 – 60, rate per 10000



As in previous age groups, a comparison between 2019 and 2020 shows that a higher number of mental illnesses was recorded in 2019 than in 2020, both in men and women.

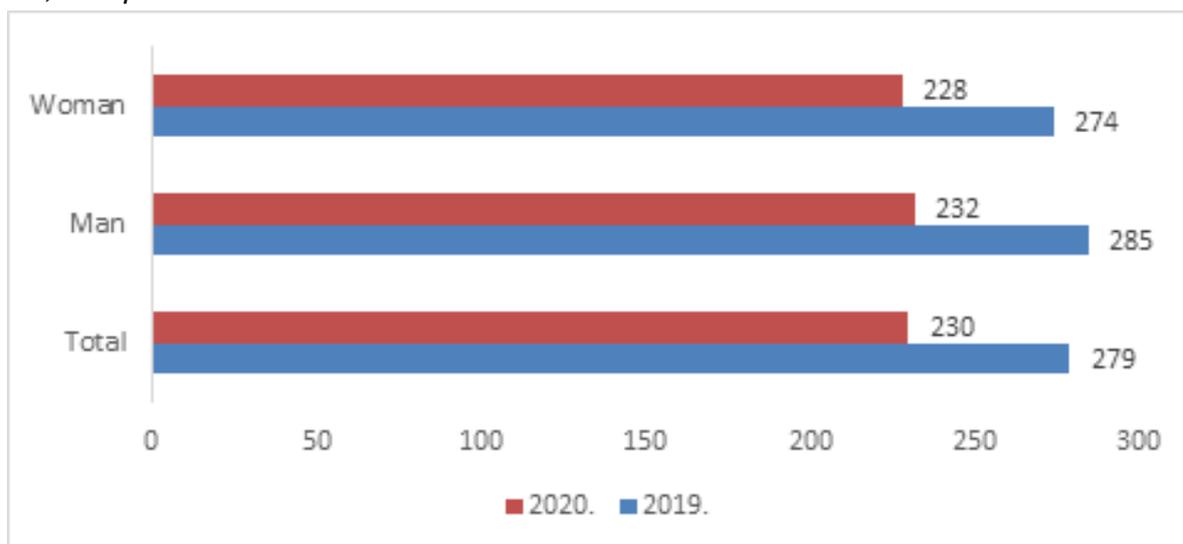
In the last age group of persons over 60+, the recorded mental health disorders follow the frequency of the disease as in the previous age group, so other anxiety disorders are the most common here as well (F41). The second most common is schizophrenia (F20) (slightly more men) and a moderate depressive episode (F32.1) in third place, where more women are recorded. In the fourth place, post-traumatic stress disorder was most often recorded in men (F43.1), and dementia in Alzheimer’s disease in women. In the last, fifth place, non-specific dementia was registered in men (F03), and recurrent depressive disorders with moderate episodes in women (F33.1).

Figure 34: Leading mental and behavioural disorders in FBiH 2019, age group 60+



Looking at the previous and this year and by gender, mental and behavioural disorders in this age group were also recorded more often in men in 2019.

Figure 35: Mental and behavioural disorders in FBiH 2019 - 2020, total and by gender, 60+, rate per 10000



According to the data of the Mental Health Project in BiH, in the period March 2018 - February 2019, the total number of persons with severe mental disorders in the FBiH who were provided with mental health services in the community is 14,793. The percentage of beneficiaries whose social, health and psychological functioning has improved, i.e. who are successfully recovering through coordinated care is 69.9%, N = 496 and through occupational therapy 78.6%, N = 208. (8)

A study measuring the recovery of 208 beneficiaries through the application of occupational therapy in mental health: therapy was based on art therapy, decoupage techniques, making boxes, greeting cards, housekeeping, eco therapy, music therapy, cooking lessons, music and drama section, dance, work on the computer... while the goals of therapy are strengthening psychosocial skills, training for daily activities, strengthening existing resources and acquiring new knowledge, regular attendance at therapy, raising self-confidence, improving mental health, improving motor functions, adapting to new lifestyles,

improving mood and developing creativity. The re-evaluation showed significant progress of 28%, with respect to evaluation, especially in the area of strengthening psychosocial skills and raising self-confidence. Regarding the satisfaction of patients with occupational therapy, 69% of them said that they would recommend occupational therapy to others, 68% said that the service provided helped them a lot and that the quality of service is excellent. (66%).

Prevention programme

In the period January 2021 - September 2022, the Institute for Public Health in cooperation with mental health care centres in the Federation of BiH implements a prevention programme in the field of mental health called "Cooperation of mental health centres and family medicine services with timely detection of depression and anxiety in the adult population".

Based on the positive effects and importance of programmes aimed at the prevention of depressive disorders, the implementation of programmes aimed at timely detection and treatment of depression will provide support and assistance to people suffering from depressive disorders in order to improve their mental, physical and social health. At the same time, the implementation of the prevention programme will enhance inter-institutional cooperation, strengthening the capacities of all stakeholders involved in terms of planning and implementation of prevention programmes in the field of mental health.

A brief description of project activities

Direct implementation of the programme by the PHI expert team in the first step involves preparing teams of selected mental health care centres to train family medicine teams on the risks and vulnerable groups for the development of depressive disorder and the application of standardized instruments to determine the presence of depression and fear of Covid-19. After the training, the MHC teams, selected for the programme, will train family medicine teams for the application of standardized screening instruments and initial psycho-education of patients at risk of developing depressive disorder, as well as increased fear of Sars-Cov virus, and in agreement with them, define a detailed timeline for conducting timely screening for depression and fear of Covid-19. Persons who, based on the threshold values of the screening instrument, are diagnosed with depressive symptoms will be referred to a mental health care centre in order to receive appropriate treatment and have their health monitored. Also, persons who are found to have an increased fear of the Covid virus will be referred to the MHC to have their anxiety levels assessed and to receive appropriate treatment.

In June 2021, the Institute for Public Health of the FBiH conducted professional training of teams of 10 selected mental health care centres, which further performed professional training of 30 family medicine teams and started screening for depression and anxiety in the adult population in the FBiH.

2.3.4. Infectious diseases and immunization

Public health surveillance and monitoring are one of the basic duties of the Institute for Public Health of the Federation of Bosnia and Herzegovina (PHI of the Federation of BiH). Providing relevant public health data, analysis and reporting on infectious disease trends

and implementation of immunization programs in the Federation of BiH are the basis for policy development and activities for decision makers, professionals and health care workers, and for various institutions in the country.

The collection and use of data from public health surveillance of infectious diseases is the result of close cooperation between the PHI of the Federation of BiH, cantonal institutes for public health and health care institutions, which jointly ensure the functioning of the system of surveillance of infectious diseases in the Federation of BiH.

As part of strengthening the infectious disease surveillance system and activities on priority programmes (e.g. sentinel surveillance for influenza, measles and rubella), the Epidemiology Service was reorganized to strengthen public health practices and further build a network of cooperation and dialogue with health care institutions. An evaluation of the surveillance system was done too.

Continuous improvement of data quality and harmonization of activities with the Ministry of Civil Affairs of BiH (MoCA) and the Public Health Institute of Republika Srpska creates conditions for reporting key infectious diseases in a single European database - The European Surveillance System (TESSy). Professional development of staff has been one of the priorities this year as well.

In 2019, a new Rulebook on immunization was published, for the first time a tender on multi-year procurement of vaccines was announced, thanks to which a more stable procurement of vaccines in the next three years and at a more favourable price was ensured. The Department of Immunization within the Epidemiology Service has implemented several interventions aimed at increasing the coverage of immunization (more details in the second part of the report).

This report is being written at a time of unprecedented crisis, during the response to the Covid-19 pandemic, which once again highlighted the importance of continuously improving the public health system for surveillance and control of infectious diseases.

Overview of registered infectious diseases in the Federation of BiH in 2020, according to indicators

In 2020, a total of 99,857 cases of infectious diseases were reported to the Institute for Public Health of the Federation of Bosnia and Herzegovina (I 4516.3 / 100,000), as opposed to 2019 when 45,428 cases were reported (I 2074.2 / 100,000), less than in 2018 (46,178 cases reported; I 2097.9/100,000) and in 2017, when a significantly higher number of cases was registered (49,180 cases reported; I 2234.24 / 100,000) (Table 2).

Table 2: Registered cases of infectious diseases by cantons in the period 2016 – 2020

Year	2016		2017		2018		2019		2020	
Canton	Number of cases	I/ 100,000								
Una-Sana	4295	1583.6	3970	1468.7	3577	1323.3	3039	1134.4	5202	1912.1
Posavina	207	487.6	108	256.8	132	313.9	140	338.6	871	2035.8
Tuzla	9386	2118.4	11218	2538.5	9142	2068.7	10140	2310.7	16800	3782.1
Zenica-Doboj	8046	2228.6	8375	2325.7	8092	2247.2	6964	1943.6	10494	2898.5
Bosnian Podrinje	556	2364.1	500	2140.4	445	1904.9	780	3385.2	1576	6676.2
Central Bosnia	2886	1145.3	2337	929.4	2405	956.5	1853	741.5	4252	1682.7
Herzegovina-Neretva	2050	934.3	2802	1282.5	3290	1505.9	3301	1521.4	18006	8177.3
West Heze-govina	2606	2772.6	3731	3982.0	4160	4439.8	3229	3457.7	7439	7896.5
Sarajevo	18480	4426.3	15752	3763.3	14720	3516.9	15576	3704.2	31899	7660.0
Canton 10	414	504.1	387	475.7	215	264.2	406	507.4	3318	4007.6
Total FBiH	48926	2217.6	49180	2234.2	46178	2097.8	45428	2074.2	99857	4516.3

The lowest incidence rate of infectious diseases was registered in the Central Bosnia Canton, with 4252 patients and 1682.7/100,000, and the highest in the Herzegovina-Neretva Canton, where 18,006 cases were registered (I 8177.3/100,000) (Table 2).

In contrast to previous years, this year the total morbidity from infectious diseases was mostly affected by influenza-like illness (ILI), and in 2020 it was mostly affected by Covid-19 disease, where it accounts for 72.3% of all registered cases of infectious diseases (by monitoring the progression of infectious diseases during the calendar year).

In the structure of leading infectious diseases, in 2020, there are significant changes compared to the previous year (Table 3). Chickenpox, acute enterocolitis and streptococcal angina (angina streptococcica) have a significant place in the structure of infectious diseases in FBiH. Although a decline in the incidence rate of pulmonary TB has been registered in recent years, it is still on the list of the top ten infectious diseases in the Federation of Bosnia and Herzegovina.

Table 3: Top ten infectious diseases in FBiH in the period 2019-2020

2020				2019			
Rank	Disease	Registered number	I/100,000	Rank	Disease	Registered number in	I/100,000
1	COVID-19	72188	3264.	1	ILI/ influenza	26,505	1,210.2
2	ILI/ influenza	21346	965.4	2	Varicellae	8,635	394.2
3	Varicellae	2937	132.8	3	Enterocolitis acuta	3,507	160.1
4	Enterocolitis acuta	1105	49.9	4	Morbilli	1,332	60.8
5	Herpes zoster	466	21.0	5	Herpes zoster	984	44.9
6	Angina streptococ- cica	412	18.6	6	Angina	944	43.1
7	Scabies	356	16.1	7	Scabies	861	39.3
8	*TBC resp. system	288	13.0	8	Toxiinfectio	554	25.3
9	Toxiinfectio aliment.	140	6.3	9	Scarlatina	517	23.6
10	Scarlatina	139	6.2	10	*TBC resp. system	379	17.3

*Passive surveillance

In 2020, a higher number of deaths from infectious diseases was registered (2377) compared to the previous year (41). In the last five years, the highest number of deaths from infectious diseases was registered in 2020 (2377 deaths, mortality rate 107.5/100,000), and the lowest number of deaths from infectious diseases was registered in 2016 (32 deaths; mortality rate 1.4/100,000) (Table 4).

Table 4: Incidence and mortality rates of infectious diseases in FBiH, in the period 2016-2020

Year	Number of cases	I/100,000	Number of deaths	Mt/100,000
2020	99857	4516.3	2377	107.5
2019	45428	2074.2	41	1.8
2018	46178	2097.8	47	2.1
2017	49180	2234.2	37	1.6
2016	48926	2217.6	32	1.4

VACCINE-PREVENTABLE DISEASES

Of the 18 available vaccines, 10 vaccines are used in the Federation of BiH, which protect against ten very serious infectious diseases. In 2020, 2 measles patients (0.09%), 13 mumps patients, and 8 pertussis patients were registered in the group of vaccine-preventable diseases (Table 5). All age groups, predominantly unvaccinated and/or with unknown immunization status, were affected.

Table 5: Vaccine-preventable diseases (I /100,000) in FBiH, 2019 – 2020

Disease	2020		2019	
	No. of cases	I/100,000	No. of cases	I/100,000
HIB	0	0	0	0
Pneumococcosis infection	0	0	0	0
Morbili	2		1332	60.8
Parotitis epidemica	13	0.6	50	2.3
Pertussis	8	0.3	17	0.7
Rubella	0	0	3	0.1
Tetanus	0	0	1	0.0

The highest share in 2020 is occupied by parotitis epidemica (0.6%). In the same period, morbili (measles) have the largest share in the overall structure of this group of diseases, in 2019 (94.9%), followed by pertussis (whooping cough).

Table 6: Vaccine-preventable diseases (I /100,000) in FBiH, 2019 – 2020, by cantons

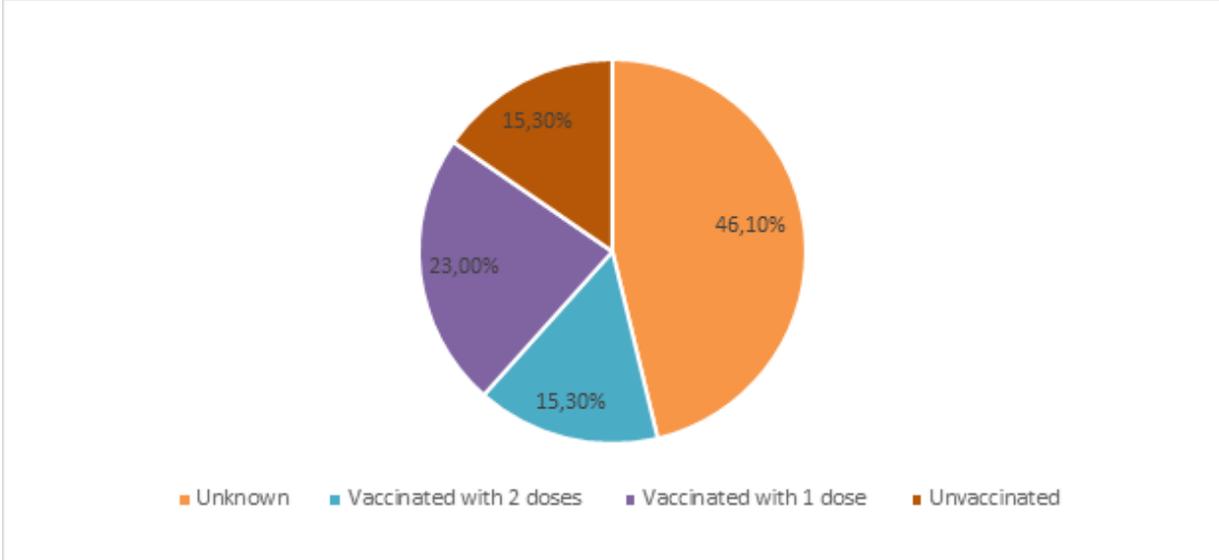
Canton	I/ 100,000 2020	I/ 100,000 2019
Una-Sana	1.1	32.4
Posavina	0	4.8
Tuzla	0	6.1
Zenica- Dobož	1.3	12.0
Bosnian Podrinje	0	13.0
Central Bosnia	0.7	123.6
Herzegovina-Neretva	1.3	13.3
West Hezegovina	0	6.4
Sarajevo	2.4	211.8
Canton 10	0	7.5
Federation of BiH	1.0	64.0

The highest incidence from this group of diseases was registered in the Sarajevo and Central Bosnia cantons.

Mumps (parotitis epidemica)

Parotitis occurs in the Federation of BiH as the second most common vaccine-preventable disease, with an incidence of 0.6/100,000, or 13 cases in total and a share of 56% in the overall structure of this group of diseases. The largest number of cases is registered in the age group 30+, and the smallest in the age group 15-19. Men are more often affected (53.8%).

Figure 36: Cases of mumps by vaccination status, Federation of BiH 2019



Surveillance of acute flaccid paralysis (AFP)

Poliomyelitis (polio) caused by wild poliovirus has not been registered in the Federation of BiH for almost half a century. In 2020, a total of 140 cases were registered in Afghanistan and Pakistan, slightly less than in the previous year (176 cases) (Table 6). Also, reinfections have been reported in several countries that have declared eradication. In 2019, the World Health Organization (WHO) adopted the “Polio Endgame Strategy 2019 - 2023”, a plan that aims to interrupt the transmission of all types of wild poliovirus and stop the circulation of vaccine-derived poliovirus within 120 days of onset and achieve complete eradication of poliovirus. According to the GPEI (Global Polio Eradication Initiative), all WHO members are obliged to conduct surveillance of acute flaccid paralysis (AFP), which, with high coverage with the polio vaccine, is the gold standard of this programme.

Table 7: Registered cases of polio worldwide, wild poliovirus (WPV1), 2019 and 2020

Country	2020	2019
Pakistan	84	147
Afghanistan	56	29
Total	140	176

In 2020, 1 case of AFP was registered in the Federation of BiH. The surveillance rate is below 1, which does not meet the surveillance criteria. Other indicators are satisfactory, the case was investigated according to WHO criteria (Table 8).

Table 8: AFP surveillance quality indicators in 2020

Number of AFP reporting units	Completeness of reporting to State level (%)	Timeliness of reporting to State level	Total number of non-polio AFP reported	Non-polio AFP rate	% of total AFP with adequate specimens ^c	Non-polio AFP index
10	100%	100%	10	0.6/100000	100%	1

Stool samples, analyzed in an accredited polio laboratory - WHO (Rome), were negative for polioviruses, and the AFP case was rejected as poliomyelitis by the Expert Commission for Ultimate Case Classification (which works at the BiH Ministry of Civil Affairs).

Suboptimal coverage of polio vaccines, including vulnerable groups and suboptimal AFP surveillance, makes it difficult to achieve the goals of the Strategic Plan of the Global Polio Eradication Initiative. Improving AFP surveillance quality indicators, as well as maintaining high immunization coverage (> 90%) by conducting continuous and supplementary immunization in areas where the desired immunization coverage has not been achieved, will prevent virus transmission after possible “import” of wild poliovirus.

Immunization

Immunization coverage is an important indicator of the level of protection of the population against vaccine-preventable diseases, as well as a measure for the implementation of immunization programmes. It is important to note that coverage rates do not take into account timeliness in the administration of vaccines (a factor important for the prevention of vaccine-preventable diseases).

In the Federation of BiH in 2019, a slightly lower coverage of children with vaccines from the mandatory immunization programme was registered, except for the vaccine against tuberculosis, where a slightly higher coverage was recorded (95%) compared to the previous year. The lower coverage is caused in part by the coronavirus pandemic. Coverage with three doses of hepatitis B vaccine was 67.2% and with three doses of vaccine containing DTaP components and polio coverage was 62.6%. The coverage of the third dose of the pentavalent vaccine is significantly lower compared to the previous year.

At the level of the Federation of BiH, in 2020 there was a significant decrease in the coverage of DTP vaccine compared to the previous year. Vaccination coverage in the primary vaccination with three doses of vaccine against diphtheria, tetanus, pertussis and poliomyelitis was 80.2%, i.e. out of the planned 18,540 infants, 14,872 of them were vaccinated.

Coverage of the first dose of measles, rubella and mumps vaccine in the Federation of BiH in 2020, was a worrying 52.3%, i.e. out of the planned 18,273, only 9,560 infants were vaccinated. Coverage of over 95% was recorded in Posavina Canton (98.6%). In the past year, 1,709 children were vaccinated with the first dose of MMR vaccine at the age over 24 months.

Table 9: Vaccination coverage according to the immunization programme in FBiH, 2017 – 2020

Vaccine	2020	2019	2018	2017
BCG	95	92.7	95.2	97.7
Hep B 3	67.2	81.6	79.5	72.0
DTP 3	62.6	80.2	72.8	68.7
POLIO 3	62.6	80.2	72.8	68.7
MMR 1	52.3	79.0	68.4	62.6

Interventions to increase immunization coverage, conducted by the Epidemiology Service, include informational and educational materials for parents, development of a mobile application with basic information about vaccines and vaccinations, as well as opportunities for regular maintenance of child immunization calendars and vaccination reminder systems.

Also, the website of the FBiH Institute for Public Health is part of the Vaccine Safety Net, by which the World Health Organization tries to establish standards for the quality of information on health issues, i.e. information on vaccines. In 2020, the campaign on the importance of immunization, conducted during the European Immunization Week 2020, can also be highlighted.

Pursuant to the Law on the Protection of the Population from Infectious Diseases, i.e. the Order on the Mandatory Immunization Programme of the Population against Infectious Diseases in 2020, in order to improve immunization coverage, it is still necessary to check the immunization status of children and perform catch-up vaccinations for those who missed them. Refusal and delay of vaccination leaves children susceptible to diseases that can be prevented by vaccination, which poses a risk of contracting these diseases at the earliest age, when it can cause serious consequences.

Educating and raising awareness of the importance of immunization and adhering to the recommended schedule is a shared social responsibility of several key actors: the education system, health care workers, all levels of government, the media and NGOs.

Covid-19

Covid-19 is an infectious disease caused by the SARS-CoV-2 virus. The first known case was identified in Wuhan, China, in December 2019. Since then, the disease has spread around the world, leading to an ongoing pandemic. Surveillance of Covid-19 in the Federation of Bosnia and Herzegovina began on 25 February 2020, and the first case of Covid-19 disease was recorded in Zenica on 9 March 2020. In 2020, there were 72,188 laboratory-confirmed cases of Covid-19 disease and 2,339 deaths related to Covid-19 recorded in the Federation of BiH. The highest cumulative incidence was recorded in the Herzegovina-Neretva Canton (6984.7/100,000) and Sarajevo Canton (5,639.3/100,000). The highest mortality was recorded in Bosnian Podrinje (169.4/100,000) and PC (137.9/100,000), while the highest lethality rate was in Una-Sana (10.3) and Central Bosnia Canton (7.5). The lethality rate in the Federation of BiH in 2020 was 3.2.

Table 10: Incidence, mortality and lethality of Covid-19 cases, by cantons in FBiH, 2020

Canton	Population	Number of cases	Incidence /100,000	Number of deaths	Mt / 100,000	Lethality rate
USC	272053	2444	898.3	252	92.6	10.3
POS	42784	824	1925.9	59	137.9	7.2
TUZ	444196	11046	2486.7	510	114.8	4.6
ZDC	362048	6485	1791.2	428	118.2	6.6
BPC	23606	1051	4452.2	40	169.4	3.8
CBC	252682	3699	1463.9	276	109.2	7.5
HNC	220194	15380	6984.7	231	104.9	1.5
WHC	94206	4690	4978.4	98	104.0	2.1
SAR	416433	23484	5639.3	382	91.7	1.6
C 10	82792	3085	3726.2	63	76.1	2.0
F/BIH	2210994	72188	4516.3	2339	105.8	3.2

The epidemic in FBiH in 2020 was marked by two waves. The first wave during the spring and early summer of 2020 was marked by strict epidemiological measures with the closure of numerous public places and gathering places, the introduction of mandatory wearing of masks indoors and outdoors, and restriction of movement and very effective containment of the epidemic. The second wave, which began in October and lasted until the end of the year, marked a larger increase in the number of laboratory-confirmed cases of Covid-19, peaking in November, when the average number of cases was 989/100,000 population.

Influenza (flu), season 2019/2020

In the Federation of BiH, in addition to universal influenza surveillance in which 79 health centres participate, sentinel surveillance over ILI/SARI has been established since the 2013/2014 flu season. This surveillance consists of one sentinel ILI site in HCC Novi Grad Sarajevo and one sentinel SARI site in UCC Sarajevo. In the last two years, piloting of SARI sites has been carried out in UCC Tuzla, UCH Mostar and CH Zenica.

Epidemiological surveillance

In the 2019/2020 flu season, a total of 27,811 patients were reported who had influenza-like symptoms or the influenza was laboratory confirmed. Similar to this season, there were 27,834 cases reported in the 2018/2019 flu season. The weekly ILI incidence rate rose above the epidemic threshold in week 3 of 2019, with a peak of 120/100,000 in week 8. Incidence rates were above the epidemic threshold by week 12, 2019, with widespread prevalence. Unlike the 2018/2019 season, in the 2019/2020 season, influenza activity at its peak was higher and occurred later.

According to the age structure, the activity reached a high level in preschool age and age group 30-64. The highest influenza activity was reported in the West Herzegovina and Sarajevo cantons.

In the 2019/2020 flu season, the circulation of both influenza viruses was recorded. Influenza A virus was represented by 83%, predominantly subtype A (H1N1) 09.

Through the sentinel surveillance system, from the 40th to the 20th week of the 2019/2020 season, a total of 289 SARI cases positive for influenza virus were reported, which were hospitalized in 4 clinics/hospitals in the Federation of BiH. Most hospitalized cases were registered in the age group 25-64 years. Influenza A virus was represented by 83%, predominantly subtype A (H1N1) 09, while influenza B virus was represented by 17%. Twenty-one deaths were registered in which influenza virus was confirmed, in twenty cases influenza A virus, in one case influenza B virus.

Table 11: Influenza viruses detected in samples taken at the sentinel SARI site of UCC Sarajevo, Federation of BiH season 2019/2020

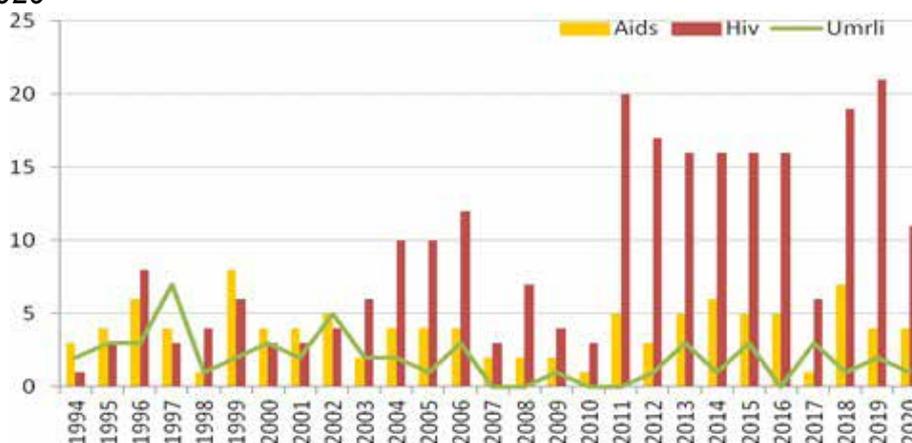
Virus type and subtype	Current week		Season 2019/20	
	Number	%	Number	%
Influenza A	5		111	100
A(H1N1)09	2		98	88.3
A(H3N2)	2		11	9.9
A without subtyping	1		2	1.8
Influenza B	0		8	100
B/Victoria lineage	0		0	0
B/Yamagata lineage	0		0	0
Unknown lineage	0		8	100
Total detected (tested)	0 (0)		119 (309)	38.5

Epidemiology of HIV infection and AIDS in the Federation of Bosnia and Herzegovina

In the period from 1992 to the end of 2020, the number of 249 people were diagnosed with HIV infection in the Federation of Bosnia and Herzegovina (Federation of BiH). Among them are 105 cases of AIDS. In the same period, 52 patients died. Among infected people, 86.7% are male. The largest number of HIV cases is registered in the age group of 20-29. In the last five years, an average of 14 new cases of HIV infection have been registered in the Federation of BiH, which is a rate of 6 cases per million population, i.e. a low prevalence of HIV epidemic. The recorded increase in newly diagnosed cases of HIV infection in recent years is associated with more testing, as a result of the operation of centres for voluntary, free and confidential counselling and testing.

In 2020, 12 new cases of HIV infection were reported in the Federation of BiH, among which 4 cases of AIDS.

Figure 37: Number of registered cases of HIV infection and AIDS, Federation of BiH, 1992 – 2020

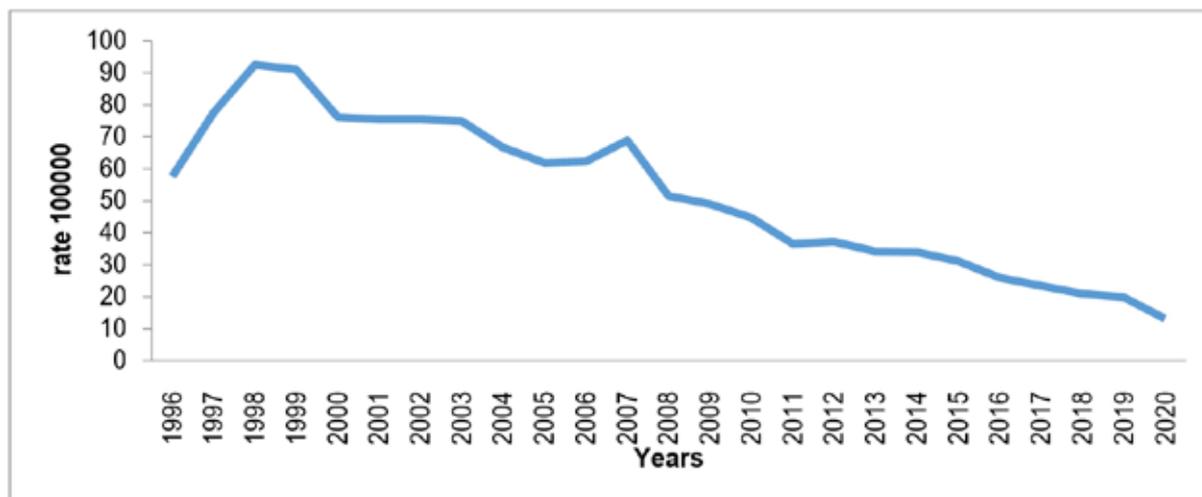


According to the mode of transmission, in the total number of cases, the dominant mode of HIV infection was unprotected sexual intercourse, namely homosexual/bisexual (men who have sex with men - MSM) with 52.4% and heterosexual with 40.8%. In 6.3% of cases, the mode of HIV infection was injecting drug use (non-sterile equipment). One case of mother-to-child vertical transmission was also reported. In the last few years, there has been an increase in HIV infection among the MSM population, with the highest number of cases recorded in 2019 (19 cases).

Tuberculosis (TB)

According to the Rulebook on the manner of reporting infectious diseases, tuberculosis is reported according to the FBiH Tuberculosis Control Programme. According to the data of the FBiH Register for Tuberculosis, in 2020, 287 cases of tuberculosis were reported, i.e. the incidence rate is 12.93/100,000 population. Of the 287 registered cases, 256 were newly discovered and 31 were recurrent. In the Federation of BiH, the downward trend in the incidence of tuberculosis continues. In 2019, the rate of tuberculosis in the Federation of BiH was 19.6/100,000 population, which is 8.4% less than in the previous year. In 2020, at the time of the pandemic, the recorded decline is more significant and amounts to 34.2%, which can be attributed to problems in the organization of surveillance during the public health crisis, which will require further analysis and engagement of staff involved in surveillance in the coming period (WHO monitors the global trend of declining tuberculosis in the world by 2.5 annually).

Figure 38: Trends in the incidence of TB, Federation of BiH, period 1996-2020



The highest number of cases of tuberculosis was in the age group 65+, and the lowest number in the group under 14 years of age. Men were somewhat more often represented (176 cases, i.e. 61.3%) compared to women (111 cases, i.e. 38.7%).

In 2020, the highest TB incidence rate was in the USC (22.3), followed by ZDC (16.7), TC (14.6), and the incidence rate in the Federation of BiH in 2020 was 12.9/100,000 population, and for the first time found itself in low incidence countries. The lowest incidence rates are in WHC (4.21) and C10 (5.94).

Among the reports in 2020, 250 (87.1%) were cases of pulmonary tuberculosis, 37 (12.9%) of extrapulmonary tuberculosis. During 2020, the most common form was pleural (67.6%), followed by bone and joint (16.2%), genito-urinary tuberculosis (8.1%), and lymphatic extrathoracic (5.4%) tuberculosis, while other forms of EPT were significantly less common.

According to the submitted deregistrations, the success of treatment was 163 (81.9%) for newly diagnosed, 12 (80%) for recurrences of the disease, and 175 (81.81%) in total, while there were 221 (50.8%) non evaluated patients, slightly less than in the previous year.

Resistant TB in the Federation of BiH in 2020 recorded a total of 1 patient, from monoresistant (MR-TB), and no cases of polyresistant (PR-TB) and multidrug-resistant tuberculosis (MDR-TB) were recorded.

The past 2020 is characterized by a regular supply of antituberculosis drugs (fixed combinations and individual drugs), and the efforts of the FBiH Ministry of Health and the FBiH Insurance and Reinsurance Institute ensured the continuous supply of drugs and tuberculosis treatment lines in the FBiH for the next three years. The migrant crisis in BiH has marked the incidence of disease among migrants, and the number has increased compared to 2019 (5 in 2020), which is a major challenge due to the possibility of drug-resistant, especially multi-drug-resistant tuberculosis, for which there are no available medicines in BiH. The treatment of migrants takes place in a hospital in the initial phase, but the phase of continuing treatment is without adequate control by the pulmonologists of the health care centres, because the IOM has taken over the treatment of migrants in the camps.

Zoonoses

In the group of zoonoses in 2020, there were 108 registered cases (I 4.8), significantly less than in 2019, when 253 cases were recorded (I 11.6/100,000). As in previous years, the most common in this group of diseases is brucellosis - 90 patients (I 4.0/ 100,000). In second place in 2020 is Q fever with 10 patients (I 0.4/100,000).

Table 12: Zoonoses (I/100,000) in the Federation of BiH 2019 – 2020

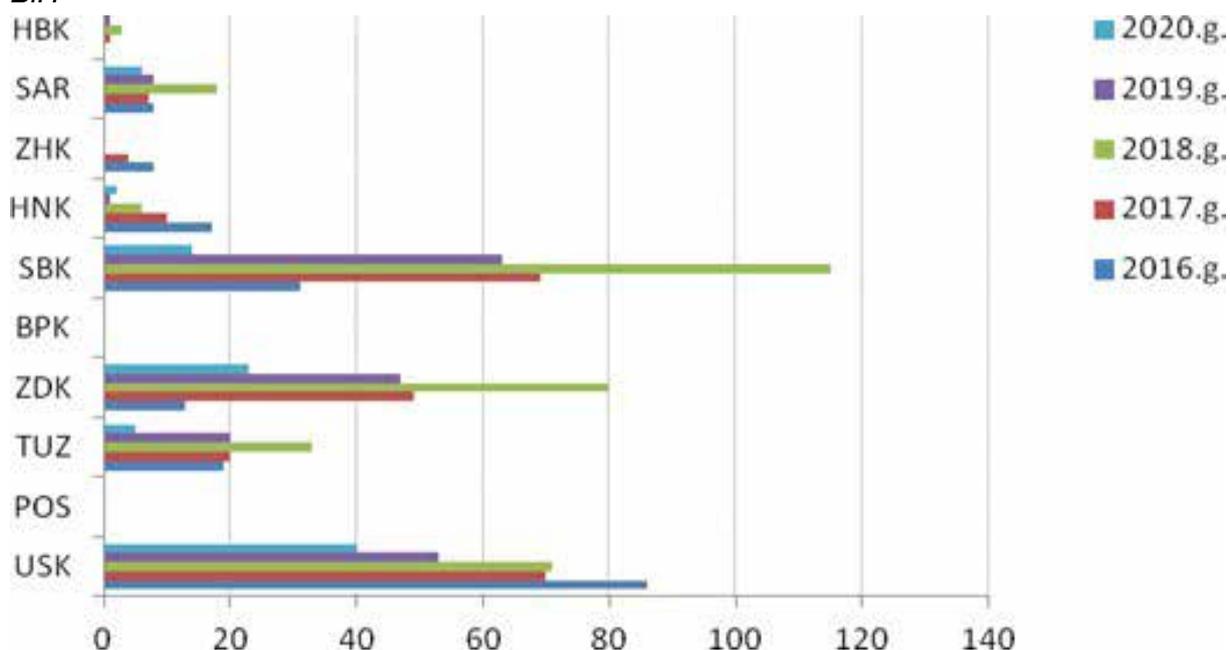
Disease	2020		2019	
	No. of cases	I/100,000	No. of cases	I/100,000
Brucellosis	90	4.0	193	8.8
Febris haemorrhagica	1	0.05	11	0.5
Q febris	10	0.4	43	1.9
Echinococcosis	7	0.3	5	0.2
Leishmaniasis	0			
West Nile febris	0			
Antrax	0		1	0.0

In 2020, except in Posavina, Bosnian Podrinje and West Herzegovina cantons, these diseases were registered in all other cantons of the Federation of BiH. The highest incidence was registered in Una-Sana Canton - I 15.4/100,000, followed by Zenica-Doboj Canton - I 7.7/100,000 and Central Bosnia Canton - I 6.3/100,000.

Brucellosis

Brucellosis is the most commonly registered zoonosis in the Federation of BiH. It has been present in BiH for many years, in greater or lesser numbers. During 2020, significantly fewer patients were reported (90 patients) than the year before (193 cases). During 2020, the disease was not registered in Posavina, Bosnian Podrinje and West Herzegovina cantons.

Figure 39: Registered cases of brucellosis by cantons, period 2016–2020, Federation of BiH



The disease is registered in all age groups, both sexes. Most patients, 38.8%, were registered in the groups of working age population 25-49 and 50-64, and more often in men. In the five-year period (2016-2020), the disease was registered in 8 cantons of the Federation of BiH (the disease was not registered in Posavina and Bosnian Podrinje cantons).

The disease has serious consequences for public health, both for human health and for the country's economy, which is why it is necessary to emphasize the importance of more active control over this disease, as well as the implementation of measures to prevent risk factors. Surveillance is a key element for the management of prevention programmes, as well as the close connection between the human and veterinary sectors.

Epidemics of infectious diseases

In 2020, one epidemic was registered in the Federation of BiH, namely Covid-19, with 72,188 confirmed cases of the disease.

In the last five-year period (2016-2020), the highest number of epidemics was reported in 2019 - 6 epidemics.

Table 13: Epidemics of infectious diseases in FBiH 2017 – 2019, according to the transmission path

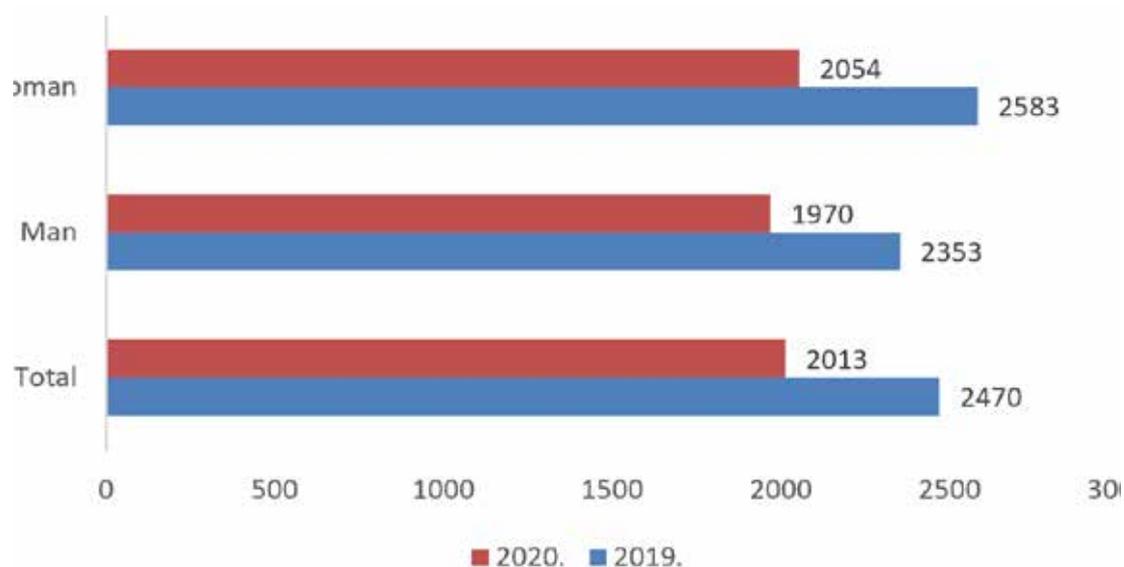
Year	Number of epidemics/ cases	Epidemics	
		Droplet	Alimentary
2016	No. of epidemics	0	3
	No. of cases	0	306
2017	No. of epidemics	0	3
	No. of cases	0	156
2018	No. of epidemics	0	1
	No. of cases	0	17
2019	No. of epidemics	0	6
	No. of cases	0	376
2020	No. of epidemics	1	0
	No. of cases	72188	0

The reason for under-reporting epidemics in the Federation of BiH lies in the implementation of legal regulations and the manner of reporting epidemics of infectious diseases. In order to strengthen surveillance of infectious diseases, it is necessary to strengthen basic capacities for surveillance and response to epidemics.

2.3.5. Oral and dental health

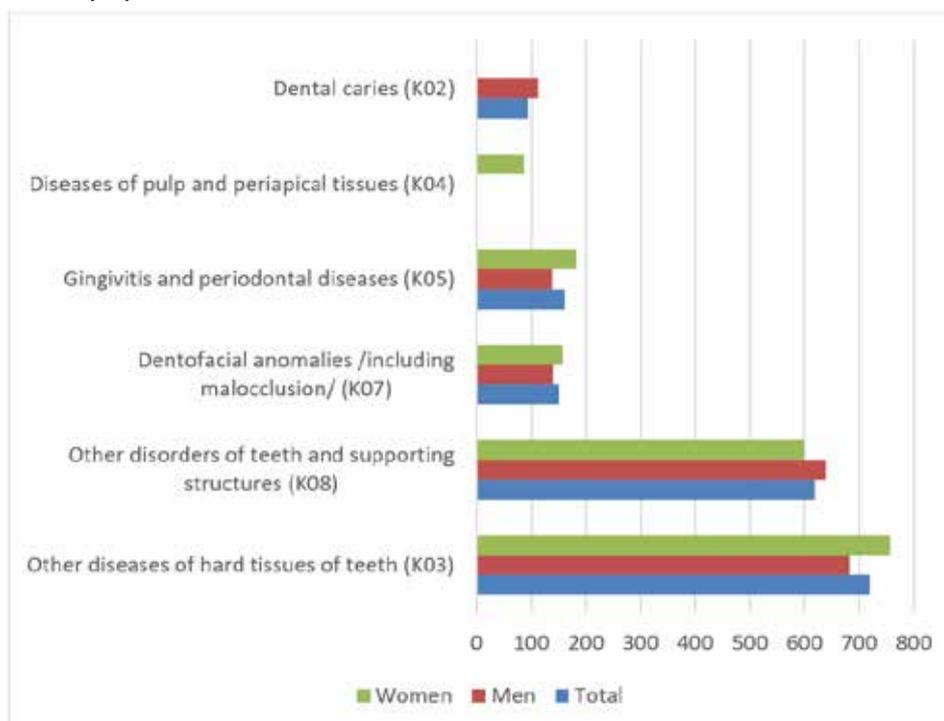
In 2020, 439,718 diseases, conditions and injuries were registered in the public sector of dental health care at the PHC level, which is 18.7% less than in 2019 (541,027), so disease rates have lower values.

Figure 40: Diseases in dental care in the Federation of BiH, 2019 and 2020, total and by gender, rate per 10,000 population



Among registered diseases, conditions and injuries in dental care, in 2020, in the public sector, as in all previous years, dental caries is the leader, both in the total population of the Federation of BiH (share of 35.7% of all diseases and conditions; rate of 720/10,000 inhabitants), and by gender (men: 34.6% and rate 681/10,000, women: 36.8% and rate 756/10,000). As in previous years, the second among the registered diseases were pulp and periapical tissue diseases (structure index: 30.8%; rate of 619/10,000 inhabitants), which is similar by gender too.

Figure 41: Leading diseases and conditions in dental care in 2020, total and by gender, rate per 10,000 population



In all observed age subgroups, dental caries and pulp and periapical tissue diseases were the leading diseases.

Figure 42: Leading diseases in dental care in 2020, age subgroup 0 - 4, rate per 10,000

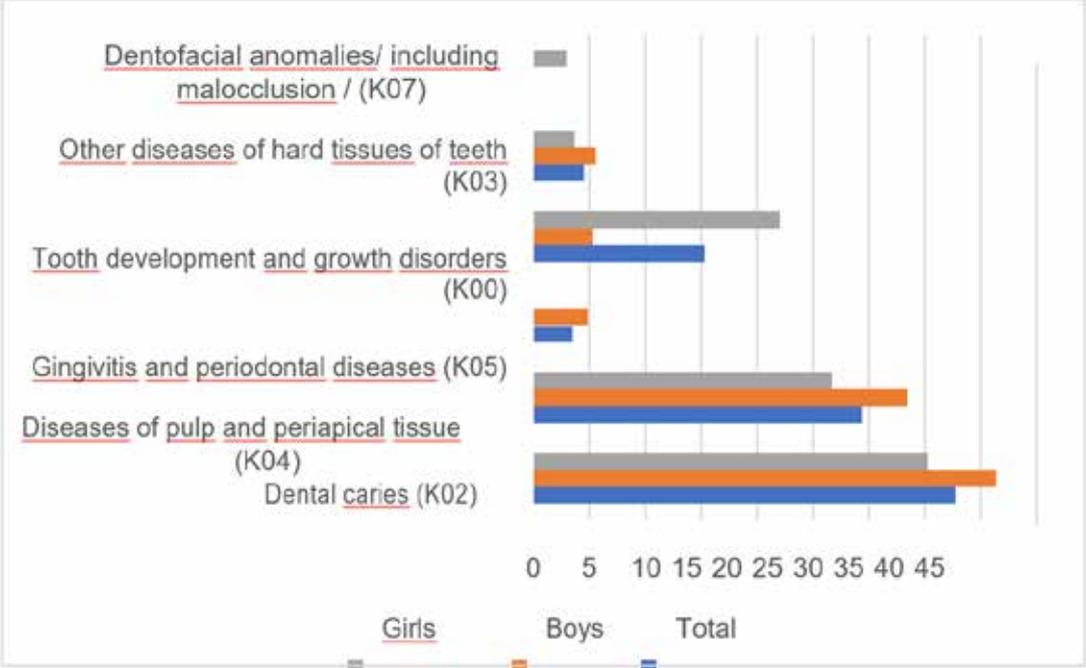


Figure 43: Leading diseases in dental care in 2020, age subgroup 5 - 19, rate per 10,000

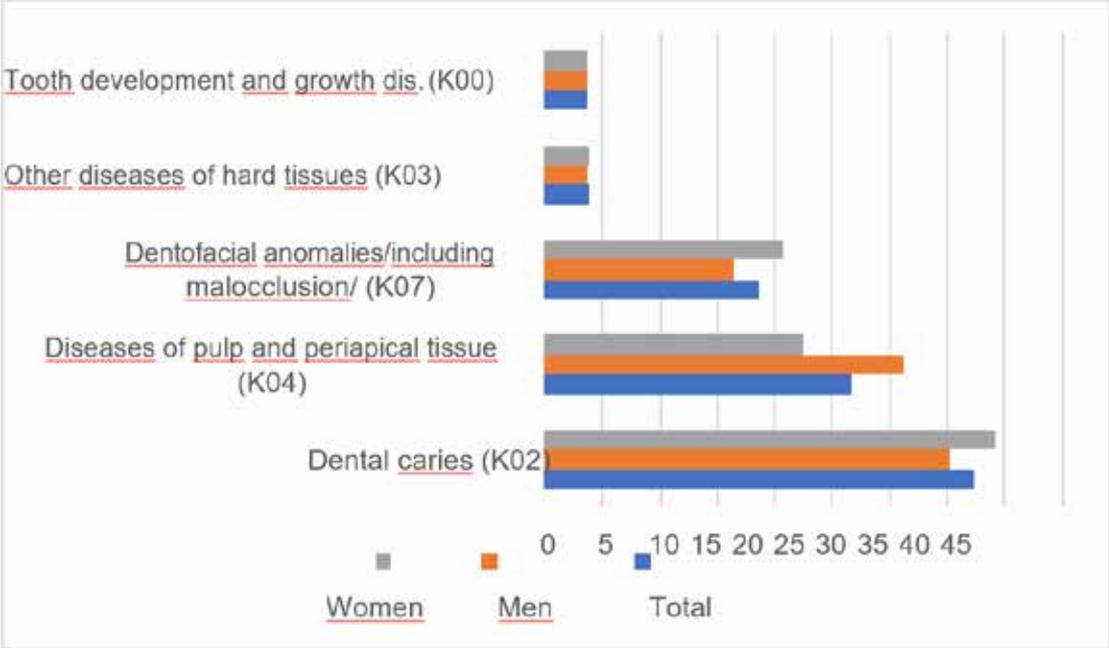


Figure 44: Leading diseases in dental care in 2020, age subgroup 20 – 59, rate per 10,000

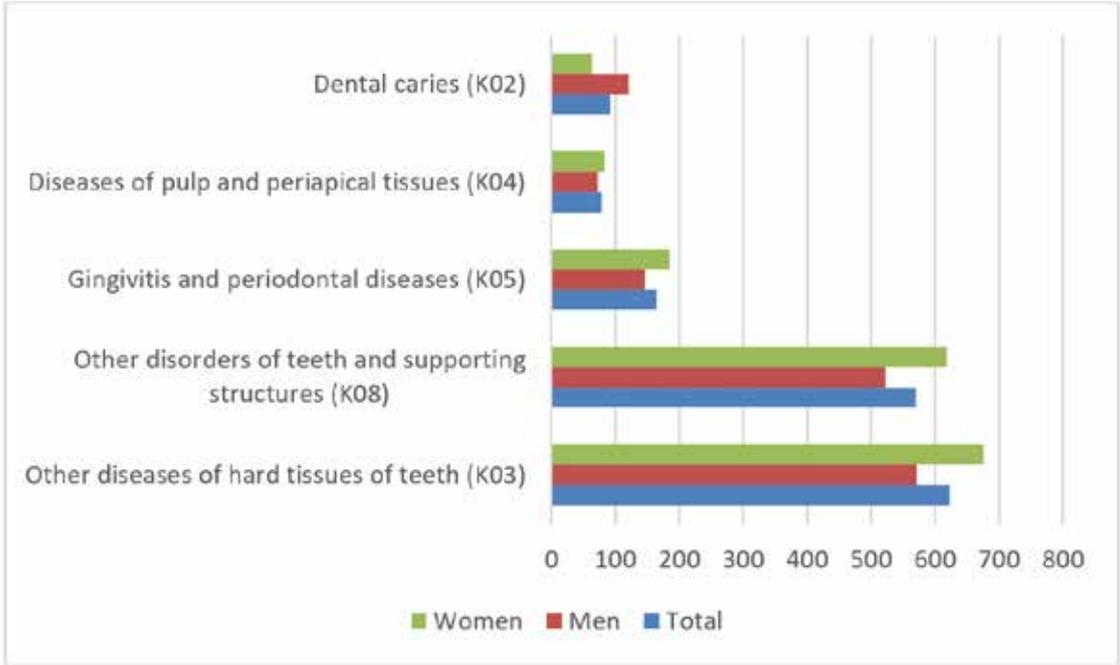
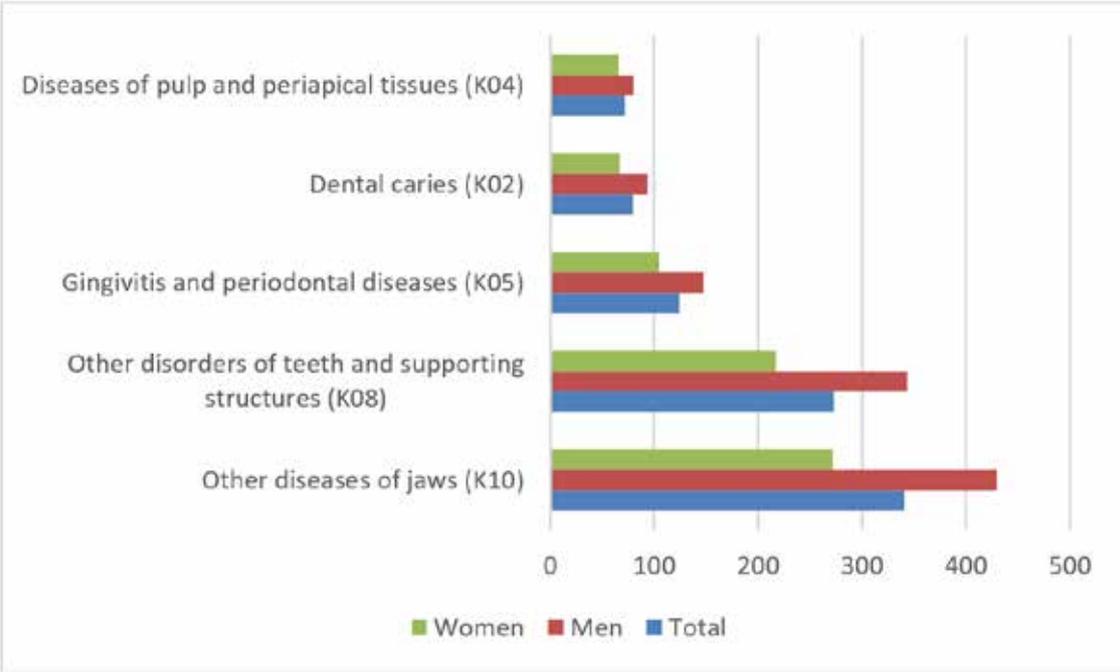


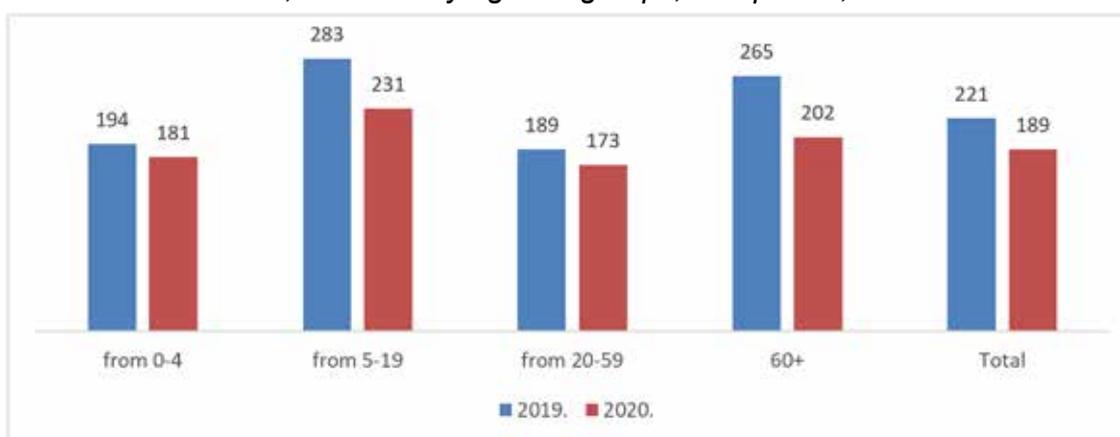
Figure 45: Leading diseases in dental care in 2020, age subgroup 60+ , rate per 10,000



2.3.6. Injuries

In 2020, there were 41,275 injuries recorded in primary health care, which is less than in 2019 (48,442), so the injury rate was 189/10,000 population. This is probably a consequence of the Covid-19 pandemic, during which movement was often limited, especially in the evening.

Figure 46: Injuries, poisonings and other consequences of external causes of morbidity in the Federation of BiH, total and by age subgroups, rate per 10,000



The highest number of injuries per 10,000 population was registered in the age subgroup 5 - 19.

2.3.7. Hospital morbidity

In 2020, there were 153,756 hospital discharges registered in hospitals in the Federation of BiH, which is more than one third less than in 2019 (244,276).

Residents of the Federation of BiH used hospital treatment mostly for heart and blood vessel diseases (16.3%) and malignant neoplasms (11.1%).

According to age, hospital treatment was mostly used by the population from the age group 70+.

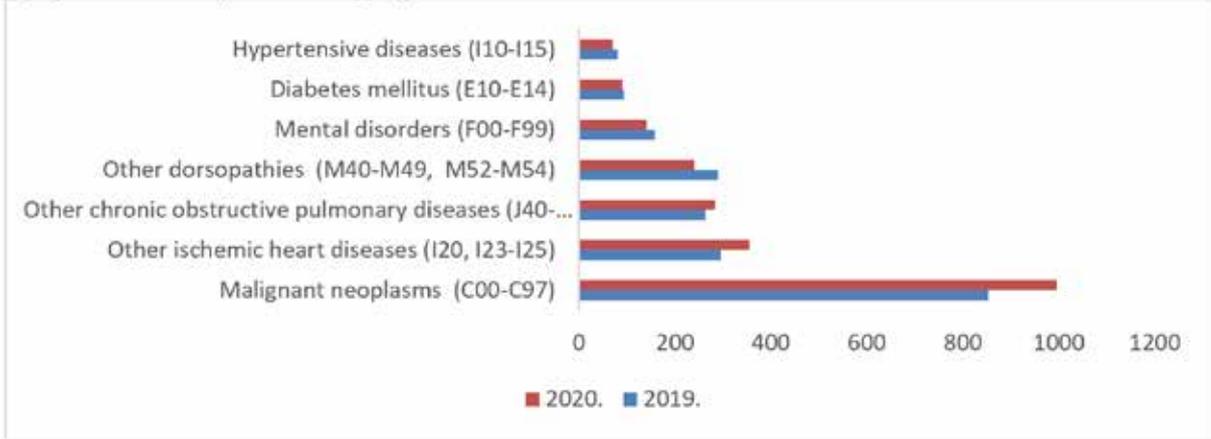
In 2020, a large number of the population of the Federation of BiH was hospitalized for Covid-19, so in the total number of days of hospital treatment, the treatment of patients with Covid-19 accounted for 7.9% of days, and 9,332 patients who recovered from Covid-19 were discharged from hospital treatment, significantly more men (5,645) than women (3,687). Among the cantons, the largest number of hospital discharges related to Covid-19 was registered in Sarajevo Canton (2,283).

2.4. Non-communicable diseases

Although Covid-19 was a priority health problem in 2020, both in the world and in the Federation of BiH, chronic non-communicable diseases are still present and endanger human life and health and economic development of the country. They affect people of all ages, and most of them end in premature death, making them one of the global health problems of the 21st century. They have common risk factors as well as common prevention options. This is especially true for cardiovascular and malignant diseases, diabetes, and chronic respiratory diseases associated with four common risk factors: tobacco consumption, improper diet, physical inactivity, and alcohol consumption. There is also a link between non-communicable diseases and common risk factors with mental disorders and injuries. All this together significantly burdens the health care system, causes high costs and ultimately affects the social and economic development of the country.

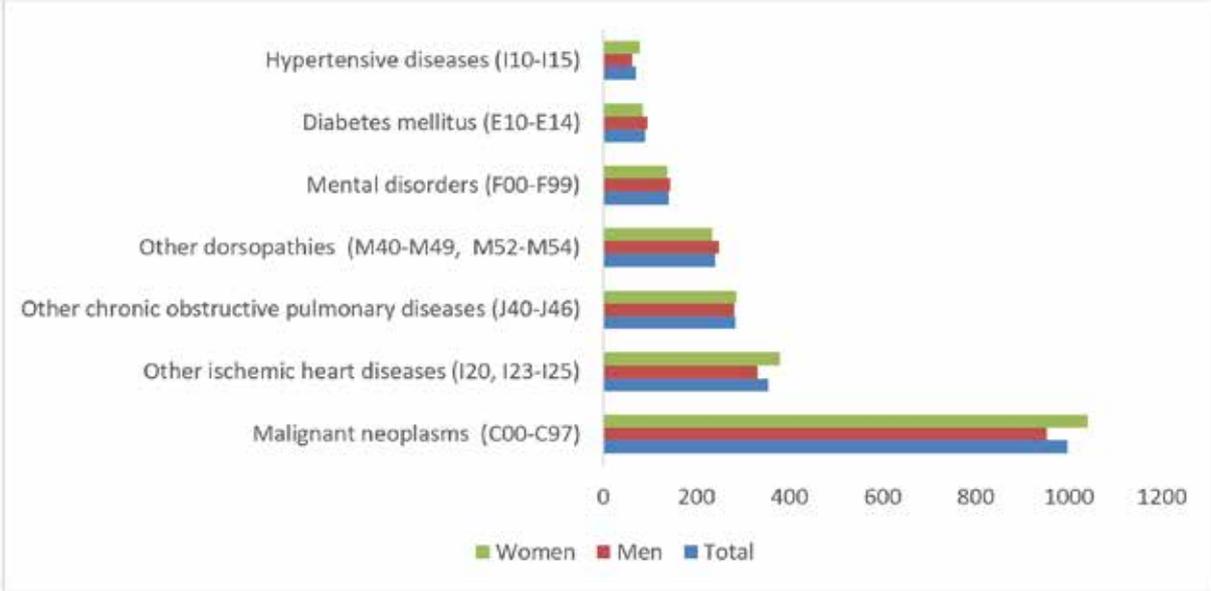
In 2020, the most commonly registered non-communicable diseases in primary health care in the Federation of BiH are hypertensive diseases, diabetes and mental disorders, and all three groups of diseases record an increase in the incidence rate compared to 2019.

Figure 47: Leading non-communicable diseases in the Federation of BiH in 2019 and 2020, total and by gender, rate per 10,000 population



Observed by gender, in 2020, women suffer more from non-communicable diseases than men.

Figure 48: Leading non-communicable diseases in the Federation of BiH in 2020, total and by gender, rate per 10,000 population



2.4.1 Cardiovascular diseases

Cardiovascular diseases are of great public health importance in the Federation of BiH because they have been the leading cause of death for decades.

In 2020, heart and blood vessel diseases accounted for 19.7% of the total morbidity in PHC, which is slightly higher than in 2019 (17.9%), and women were more likely to fall ill than men.

In addition to individual risks, there are high population risks among the inhabitants of the Federation of BiH that affect the development of cardiovascular diseases, such as tobacco and alcohol consumption, improper diet, insufficient physical activity etc. Values of these risk factors among the population are highly unfavourable. The latest indicators from 2012, when the research was done, showed that tobacco is consumed by 44.1% of adults, alcohol by 28.8%, more than a fifth (21.2%) of adults are obese, and only 24.6% were physically active.

2.4.2 Diabetes

Diabetes is one of the fastest growing health challenges in the 21st century. According to the International Diabetes Federation (IDF), the number of adults living with diabetes has more than tripled in the last twenty years. The IDF estimates that 9.3% of adults aged 20-79 and 1.1 million children and adolescents under the age of 20 live with diabetes, and that by 2030, there will be 578 million adults worldwide living with diabetes.

Although the process of collecting data on diabetics in the Federation of BiH through reports has begun, the register has not yet come to life. In 2020, there were 72,797 cases registered in PHC, which is more than in 2019 (64,594).

2.4.3 Chronic obstructive pulmonary disease

In 2020, there were 30,839 cases from the group of chronic obstructive pulmonary diseases (J40-J46) registered at the level of the Federation of BiH, which is less than in 2019 (34,634). This is probably a consequence of the Covid-19 pandemic and the smaller number of visits to doctors in PHC because of chronic diseases.

2.4.4 Preventive activities

In 2020, according to the report on systematic, preventive and periodic examinations, there were 113,484 adults over the age of 18 who underwent some of the preventive examinations (6.5% of the total number of 18+ adults in the Federation of BiH), which is more than in 2019 (43,189 persons or 2.5%).

Elevated blood pressure was found in 9,267 examined persons (8.2%), slightly more in women (4,822) than men (4,445). Obesity was found in 8,714 persons (7.7% of those examined), significantly more in women (5,103) than in men (3,611), and consumption of tobacco and tobacco products in 8,224 persons (7.2%), more among men (4,526) than among women (3,698). Physical activity was practiced by 9,005 adults (7.9% of those examined), both women and men. A Pap smear was performed for 3,953 women, and the pathological findings of the Pap smear were determined in 274 examined samples (6.9% of women who performed this test).

Digital rectal examination was performed on 758 adults of both sexes, of which 14 (1.8%) had pathological findings.

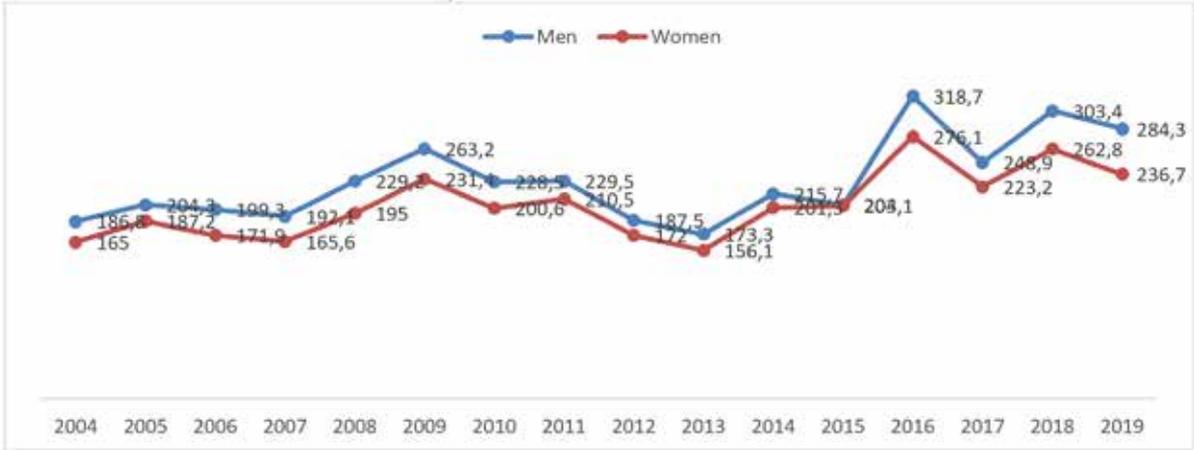
2.4.5 Trend of malignant neoplasms

The Cancer Registry in the Federation of BiH was established in 2004 as a special activity for collecting, researching and interpreting data on each new cancer case in the FBiH, over a given period of time. The goal of the report is to present data on morbidity and deaths

due to cancer in the FBiH in the period from 2004 to 2019, then the incidence of malignant neoplasms, geographical distribution, gender and age structure of patients. The report used data from the Cancer Registry regarding people diagnosed with cancer (without skin cancer) in the period from 2004 to 2019. Due to numerous sources regarding the collection of data on malignant neoplasms, their publication is quite a long process (not only in our country but also in the world and usually takes two to three years).

The average incidence rate of cancer in the period 2004 - 2019 in men is 239.60/ 100,000 and in women 203.62/100,000.

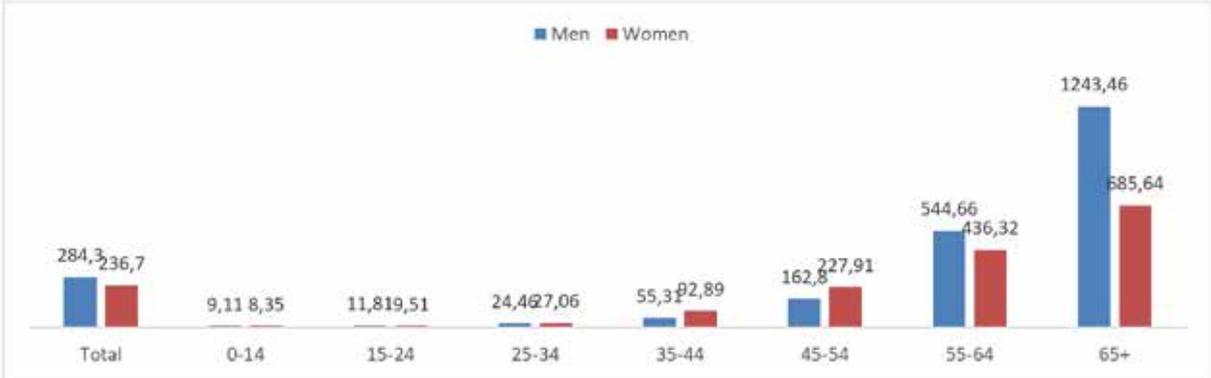
Figure 49: Trends in cancer incidence (excluding skin cancer) by gender in FBiH, 2004 –2019



The number of registered malignant neoplasms in 2019 is 5,695, of which 3,056 are in men and 2,639 in women. The cancer incidence rate in 2019 is 284.3/100,000 for men and 236.7/100,000 for women.

The average age of registered patients was 63 years (64 in men and 62 in women).

Figure 50: Incidence of cancer by gender and age groups in FBiH, 2019



The lowest rate of cancer incidence was registered in the age group 0 - 34. Other incidences increase with age and reach the highest rate in the age group 65+. In the age group 25 - 54, there is a noticeably higher incidence rate among women compared to men.

Figure 51: Incidence of cancer in men by cantons in FBiH, 2019, rate/100,000

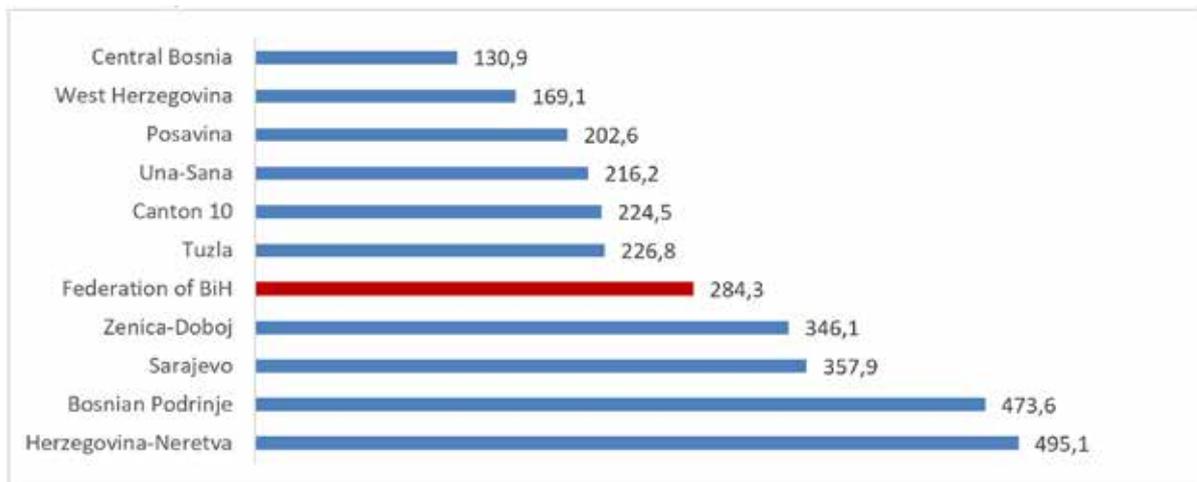
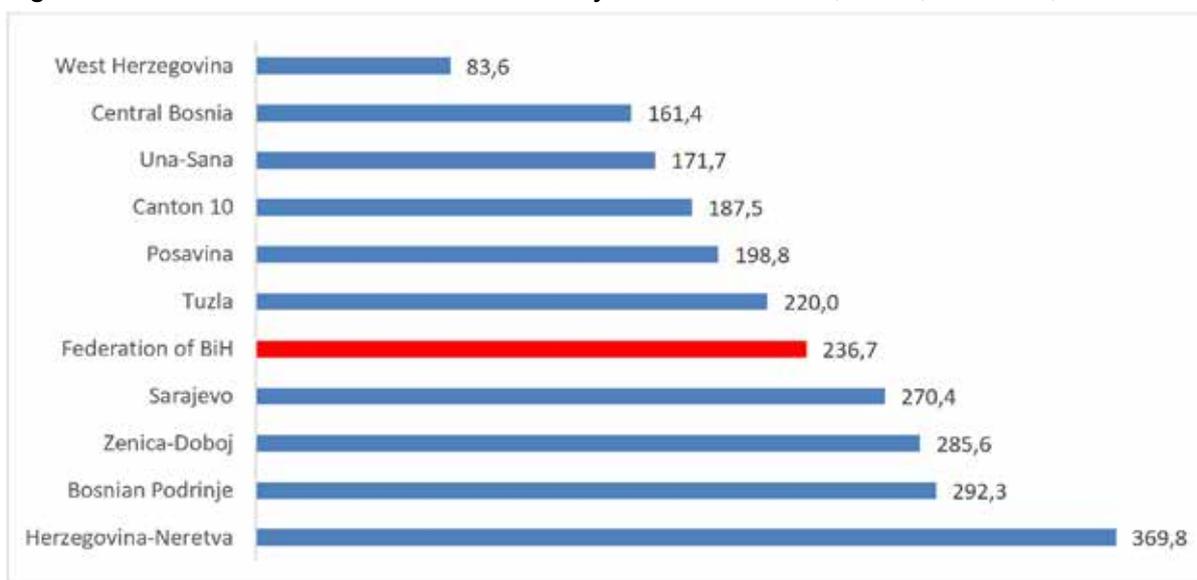


Figure 52: Incidence of cancer in women by cantons in FBiH, 2019, rate/100,000



Regarding the geographical distribution of registered malignant neoplasms, the highest rate in both men and women is in the Herzegovina-Neretva Canton. The rate for men is 495.1/100,000, and for women 369.8/100,000.

The lowest rate for men is in the Central Bosnia Canton and amounts to 130.9/100,000 and for women in the West Herzegovina Canton, 83.6/100,000.

Table 14: The most common cancer sites in men in FBiH, 2019

Rank	MKB-10	Localization	Number of registered cases	Structure Index	Mb/100,000
1	C33-34	Lung, bronch., trachea	585	19.2	54.4
2	C61	Prostate	395	12.9	36.7
3	C19-20	Rectum	223	7.3	20.7
4	C67	Bladder	222	7.3	20.7
5	C18	Colon	214	7.0	19.9
6	C16	Stomach	151	4.9	14.0
7	C25	Pancreas	95	3.1	8.8
8	C64	Kidney	93	3.0	8.7
9	C22	Liver	93	3.0	8.7
10	C32	Larynx	80	2.6	7.4
Other (without skin cancer)			905	29,6	84,3
Total (without skin cancer)			3056	100.0	284.3

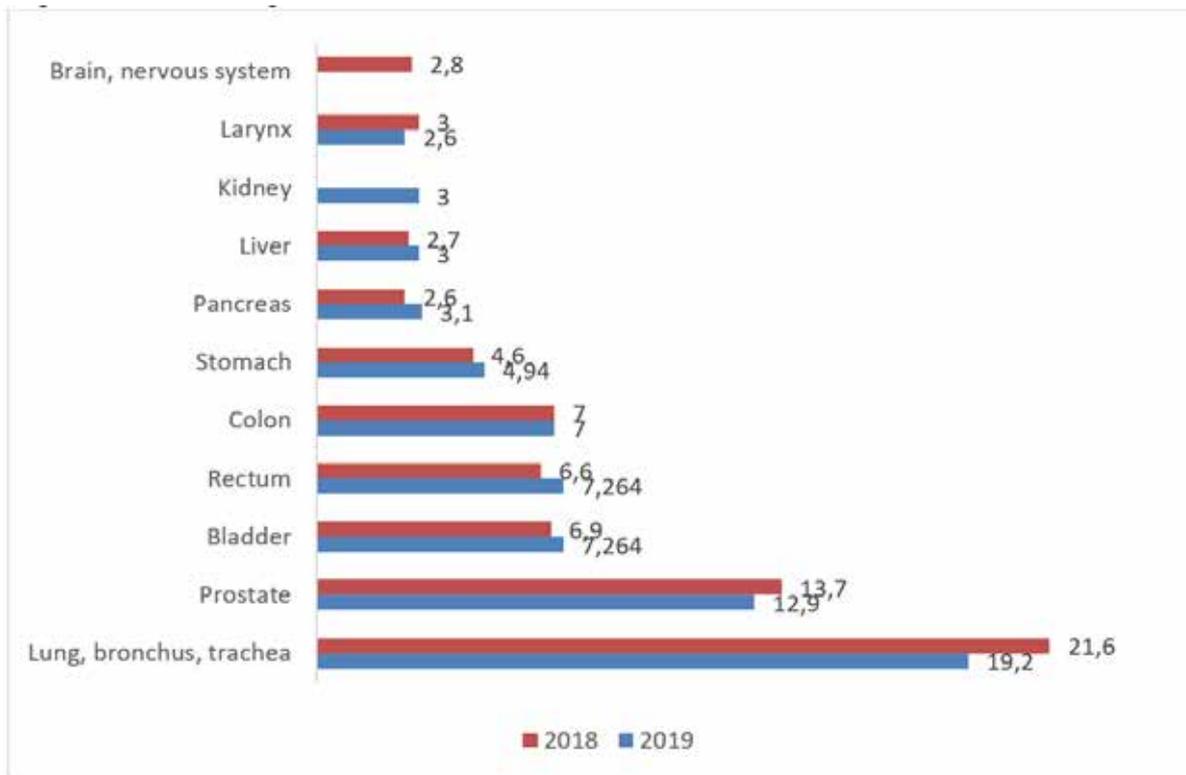
The ten most common cancer sites in men in the FBiH in 2019 account for 70.4% of all registered cases of cancer in men. Of all newly diagnosed neoplasms in men, according to localization, the leading ones are cancers of the respiratory system (lung, bronchus, trachea), which account for 19.2%, followed by prostate cancer (12.9%) and rectal cancer (7.3%).

Table 15: The most common cancer sites in women in FBiH, 2019

Rank	MKB-10	Localization	Number of registered cases	Structure Indexe	Mb/100,000
1	C50	Breast	563	21.3	50.5
2	C33-34	Lung bronch, trachea	258	9.8	23.2
3	C54	Corpus uteri	189	7.2	16.9
4	C19-20	Rectum	154	5.8	13.8
5	C18	Colon	149	5.6	13.4
6	C56	Ovary	118	4.5	10.6
7	C53	Cervix uteri	113	4.4	10.1
8	C16	Stomach	102	3.9	9.2
9	C25	Pancreas	77	2.9	6.9
10	C64	Liver	70	2.7	6.3
Other (without skin cancer)			846	32,0	75,9
Total (without skin cancer)			2639	100.0	236.7

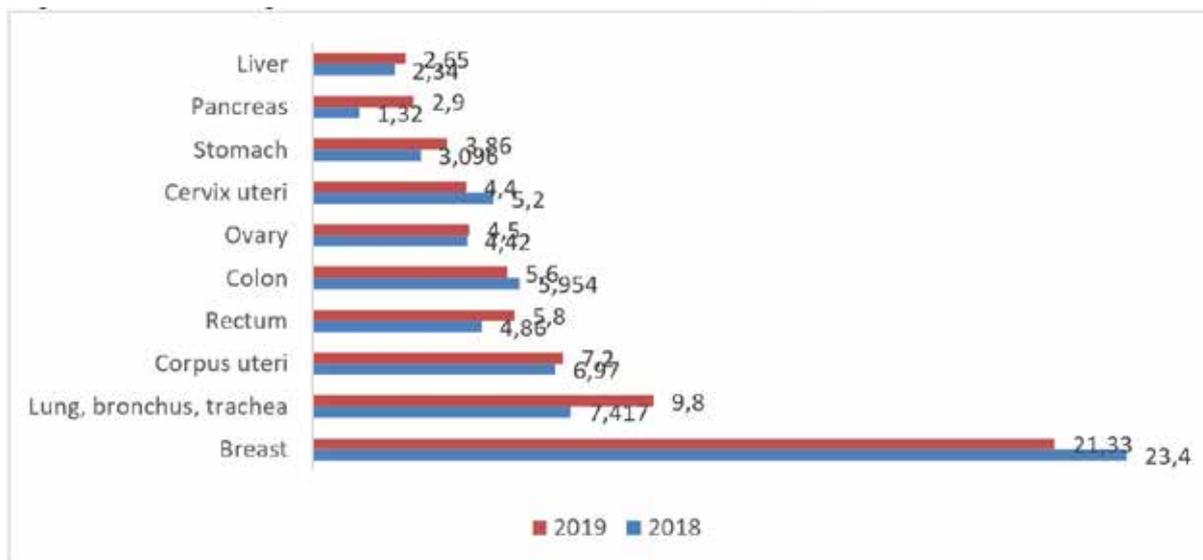
The ten most common cancer sites in women in the FBiH in 2019 account for 68% of all registered cases of cancer in women. Of all newly diagnosed neoplasms in women, according to localization, the leading ones are breast cancer (21.3%), followed by respiratory cancer (lung, bronchus, trachea), which account for 9.8%, and uterine body cancer (7.2%).

Figure 53: Leading cancer sites in men in FBiH, comparison 2019 and 2018



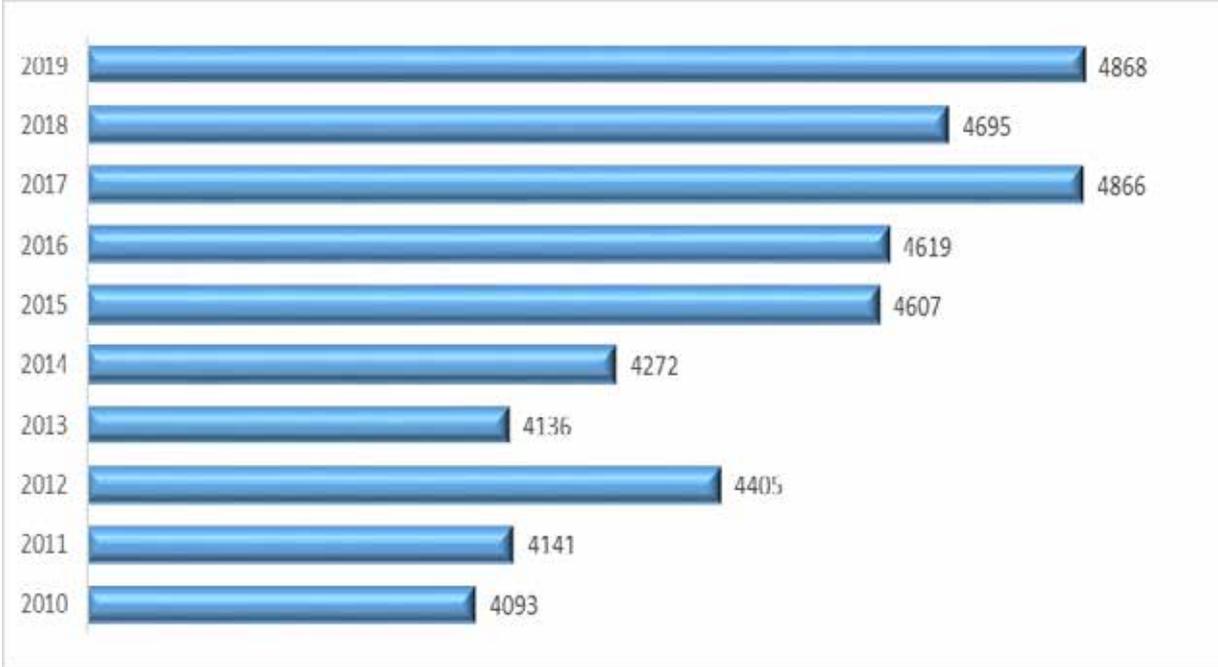
The structure of the leading cancer sites in men in the FBiH in 2019 has slightly changed compared to 2018. Colon cancer is in fifth place (in 2018 it was in third place) and in 2019 among the leading sites of cancer are bladder and rectal cancers that share third and fourth place (in 2018 they were in fourth and fifth place). In the ten leading cancer sites this year, kidney cancer is ranked ninth, while cancer of the brain and nervous system is not among the leading localizations. Leading ones are: cancer of the respiratory organs (trachea, bronchus, lung), then prostate, colon and rectum.

Figure 54: Leading cancer sites in women in FBiH, comparison 2019 and 2018



The structure of the leading cancer sites in women in the FBiH in 2019 has slightly changed compared to 2018. Rectal cancer is fourth (it was in sixth place in 2018), and cervical cancer has dropped and is now seventh (in 2018 it was in fifth place). Breast cancer is still by far the most common cancer site in women.

Figure 55: Number of cancer deaths in FBiH, 2010 - 2019



The specific mortality from cancer was increasing continuously until 2013, and in 2013 the total number of deaths dropped to 4136. After 2013, there was a continuous increase in the number of deaths in the FBiH. In 2014, the number of deaths increased to 4272, and in 2017 it was significantly higher than the previous year and amounted to 4866. Compared to 2017, the mortality from cancer in 2018 was significantly reduced and amounted to 4695 deaths. In 2019, the total number of cancer deaths reached its highest value and amounted to 4868 deaths.

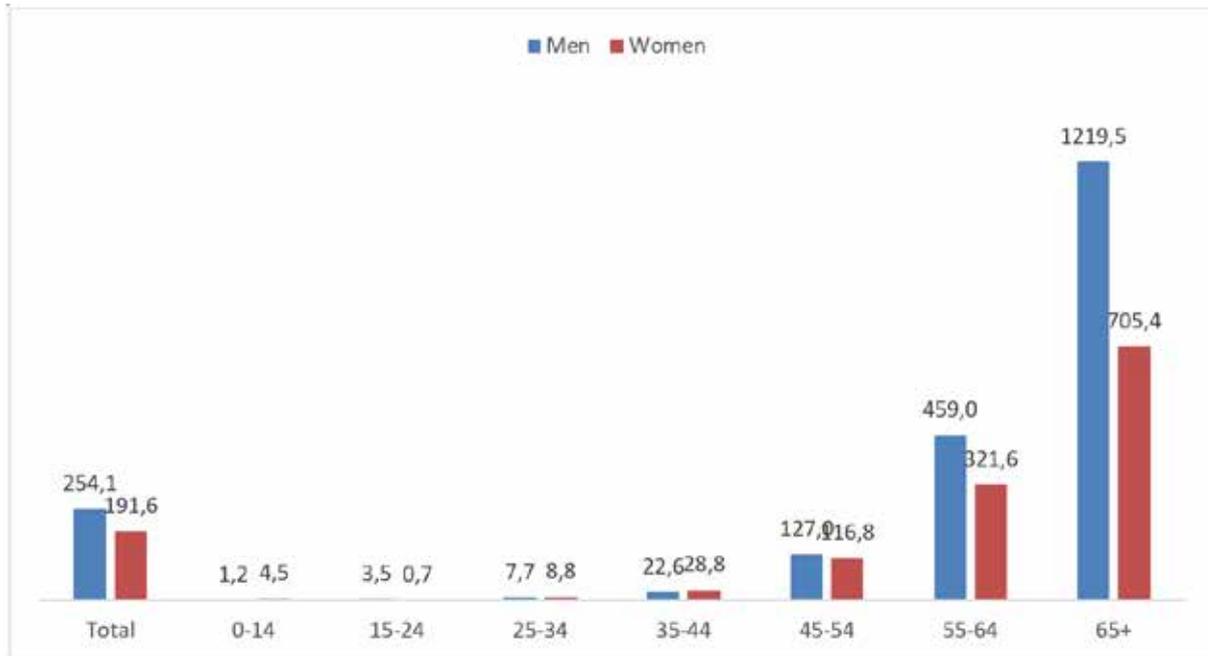
Table 16: Share of cancer mortality in total mortality in FBiH, 2010-2019

Year	MEN			WOMEN			TOTAL		
	Total number of deaths	Number of cancer deaths	Share in total mortality	Total number of deaths	Number of cancer deaths	Share in total mortality	Total number of deaths	Number of cancer deaths	Share in total mortality
2010	10220	2361	23.1	10036	1732	17.3	20256	4093	20.2
2011	10234	2468	24.1	9745	1673	17.2	19979	4141	20.7
2012	10591	2546	24.0	10010	1859	18.6	20601	4405	21.4
2013	10237	2354	23.0	10019	1782	17.8	20246	4136	20.4
2014	10176	2502	24.6	9840	1770	18.0	20016	4272	21.6
2015	10855	2619	24.1	10848	1988	18.3	21703	4607	21.2
2016	10538	2617	24.6	10567	2002	18.9	21105	4619	21.8
2017	11123	2745	24.7	10819	2121	19.6	21942	4866	22.2
2018	10903	2725	25.0	10788	1970	18.3	21691	4695	21.6
2019	11140	2732	24.5	10884	2136	19.6	22024	4868	22.1
2010-2019	106017	25669	24.1	103556	19033	18.2	209563	44702	21.2

Source: FBiH Institute for Statistics

According to the Institute for Statistics, the share of cancer mortality in total mortality in 2019 was 22.1%, and ranks second, just behind diseases of the circulatory system. In the past ten years, the share of cancer mortality in total mortality has been continuously increasing from 20.2% (2010) to 22.2% (2017). In 2019, the share in total mortality was 22.1%.

Figure 56: Cancer mortality in FBiH in 2019, by age groups and gender, rate/100,000



The number of registered mortality cases in 2019 is regularly higher in men than in women. The average age of registered mortality cases was 63 years (64 years in men and 62 years in women).

The lowest cancer mortality rate was registered in the age group 0-34, and the highest cancer mortality rate was in the age group 65+.

In 2019, more men (56%) than women (44%) died from cancer.

Table 17: Ten leading causes of death from cancer in men in FBiH, 2018 and 2017

Localization	2019			2018		
	Rank	No. of deaths	%	Rank	No. of deaths	%
Lung, bronch. and trachea (C33- C34)	1	887	32.5	1	873	32.0
Prostate (C61)	2	221	8.1	2	223	8.2
Stomach (C16)	3	192	7.0	4	171	6.3
Colon (C18)	4	178	6.5	3	183	6.7
Liver (C22)	5	134	4.9	5	166	6.1
Pancreas (C25)	6	134	4.9	6	145	5.3
Rectum (C19-20)	7	121	4.4	7	121	4.4
Bladder (C67)	8	107	3.9	9	95	3.5
Brain, nervous system (C70-72)	9	88	3.2	8	100	3.7
Larynx (C 32)	10	76	2.8	10	72	2.6
Other		594	21.8		576	21.2
TOTAL (without skin)		2732	100.0		2725	100.0

The order of the leading causes of cancer death in men has changed slightly compared to 2018. The cause of death from stomach cancer (in third place) in 2018 had a lower rank (fourth place). Cause of death from respiratory cancer (trachea, bronchus, lung) is still the leading cause of death in men in 2019.

Figure 57: Ten leading causes of death from cancer in men in FBiH, 2019 and 2018, structure index

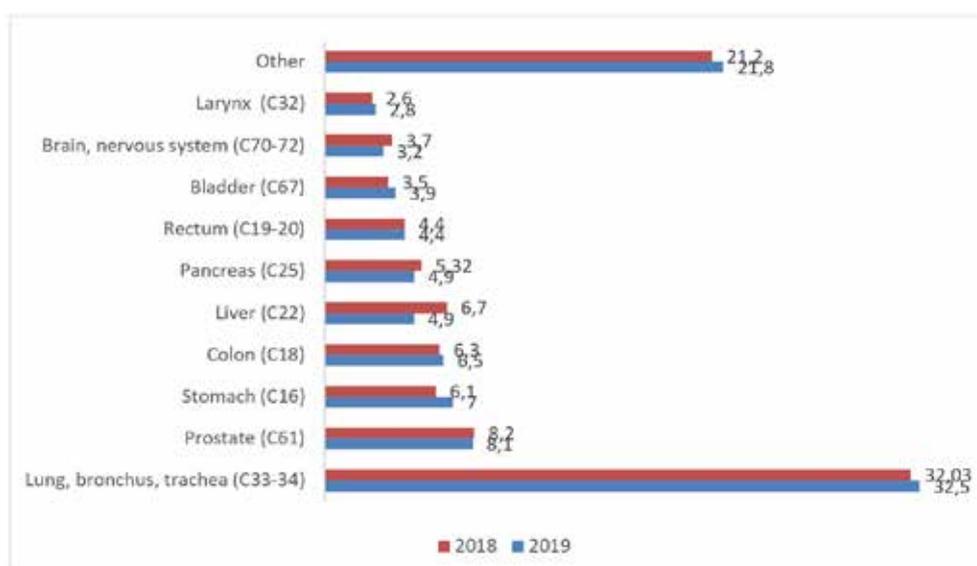
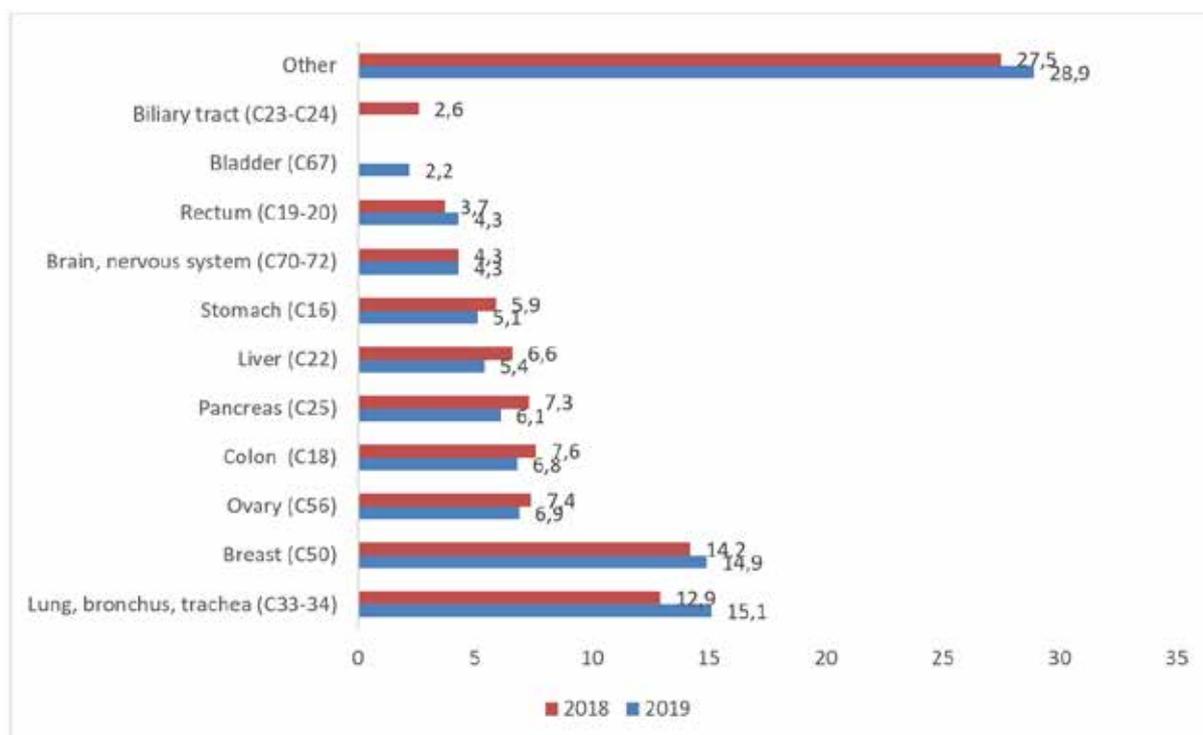


Table 18: Ten leading causes of death from cancer in women in FBiH, 2019 and 2018

Localization	2019			2018		
	Rank	No. of deaths	%	Rank	No. of deaths	%
Lung, bronch. and trachea (C33-C34)	1	323	15.1	2	254	12.9
Breast (C50)	2	318	14.9	1	279	14.2
Ovary (C56)	3	147	6.9	4	146	7.4
Colon (C18)	4	146	6.8	3	149	7.6
Pancreas (C25)	5	131	6.1	5	145	7.3
Liver (C22)	6	116	5.4	6	131	6.6
Stomach (C16)	7	108	5.1	7	116	5.9
Rectum (C19-20)	8	92	4.3	9	73	3.7
Brain, nervous system (C70-72)	9	91	4.3	8	84	4.3
Bladder (C67)	10	48	2.2			
Biliary tract (C23-C24)				10	52	2.6
Other		616	28.9		541	27.5
TOTAL (without skin)		2136	100.0		1970	100.0

The order of the leading causes of cancer death in women has changed significantly compared to 2018. The cause of death from ovarian cancer (in third place) was ranked lower in 2018 (fourth place). Breast and respiratory cancers (trachea, bronchus, lung) are still the leading causes of death in women in 2018.

Figure 58: Ten leading causes of death from cancer in women in FBiH, 2019 and 2018, structure index



Data of the Population Cancer Registry maintained by the FBiH Institute for Public Health are the result of an analysis of data submitted/collected from the field by health care institutions (mainly cantonal institutes for public health). It is important to emphasize that in 2019,

thanks to good cooperation, coordination and engagement of all health care institutions in the Federation of Bosnia and Herzegovina, the number of registered malignant neoplasms is 5695.

2.5. Health of persons occupationally exposed to ionizing radiation

Exposure of the population to ionizing radiation in Bosnia and Herzegovina originates from environmental sources (radiation from space, air and soil, as well as from food and water consumption) containing natural and artificial radionuclides, and from the use of ionizing radiation sources in health, industry, research (medical, patient exposure and occupationally exposed persons). Sources of ionizing radiation (radioactive substances and x-ray generators) are used intensively, primarily in health care institutions, but also in industry and research, and the number and type of sources used are constantly growing. Ionizing radiation, and radiation in general, has been identified as one of the environmental factors contributing to the disease burden of occupationally exposed individuals, and the population as a whole. Effects on human health, depending on the type and amount of radiation can be immediate (deterministic) or delayed (stochastic). There are no nuclear facilities on the territory of BiH, but there are nuclear power plants nearby (<1000 km), the closest ones being NPP Krško (Slovenia), NPP Kozloduy (Bulgaria) and NPP Paks (Hungary).

2.5.1 Control of occupational exposure to ionizing radiation

Occupational exposure to ionizing radiation is a category that includes employees who perform their work tasks in radiation zones. For the purpose of protection of occupationally exposed persons, workplace control is prescribed, including control of ionizing radiation sources and individual monitoring of occupationally exposed persons, both dosimetry and health.

Ionizing radiation source monitoring

Sources of ionizing radiation are devices that produce ionizing radiation or devices that contain radioactive substances. Source control is performed by assessing the radiation safety of the workplace in accordance with the Rulebook on radiation protection in occupational exposure and exposure of the population (Official Gazette of BiH, 102/11).

Table 19: B Number of controlled sources of ionizing radiation in 2020

Activity	No. of controlled devices containing a radioactive substance		No. of controlled devices producing ionizing radiation	
	Inspected	Not satisfactory	Inspected	Not satisfactory
Diagnostic and interventional radiology	0	0	118	0
Radiotherapy	0	0	0	0
Nuclear medicine	0	0	0	0
Dental medicine	0	0	83	0
Veterinary medicine	0	0	0	0
Industry	24	0	11	0
Transport	0	0	0	0
Research	0	0	0	0
Other	9	0	18	0
TOTAL	33	0	230	0

Data: Institute for Public Health of FBiH (IPHFBiH), data of the State Regulatory Agency for Radiation and Nuclear Safety (DARNS) are missing

Table 20: Overview of controlled sources of ionizing radiation 2017 - 2020

	Diagnostic and interventional radiology	Radiotherapy	Nuclear medicine	Dental medicine	Veterinary medicine	Industry	Transport	Research	Other
2017	63	12	6	0	0	7	0	0	48
2018	179	0	0	0	3	65	0	0	0
2019	200	0	0	0	3	49	0	0	0
2020	118	0	0	83	0	35	0	0	27

In 2020, 266 sources of ionizing radiation were controlled in the Federation of BiH. The largest number of devices, 201 (75.6%), is used in the healthcare activities. Devices that produce ionizing radiation (X-ray devices) account for the largest number of inspected sources of ionizing radiation, 230 (86.5%).

The inspected radioactive sources, 33 of them, containing radioactive material are radioactive sources used in industry and radioactive lightning rods. The inspected sources of ionizing radiation meet the criteria of radiation safety and are safe for use from the point of view of protection against ionizing radiation for occupationally exposed persons and the general public. The total number of controlled sources of ionizing radiation is approximately the same for the previous 3 years (247, 252, 263).

2.5.2 Health monitoring of persons occupationally exposed to ionizing radiation

Occupationally exposed persons are subject to medical examination in accordance with the applicable regulations of BiH, Rulebook on health surveillance of persons professionally exposed to ionizing radiation (Official Gazette of BiH, 68/15). The Rulebook prescribes a preliminary medical examination for all persons who start working with sources of ionizing radiation, and that only persons of category "A" are subject to regular (periodic) medical examinations.

Table 21: Overview of health control of occupationally exposed persons for the period 2015 - 2020

	Total	Capable	Limited capability	Temporarily incapacitated	Not assessed
2015	760	728	13	6	13
2016	680	558	52	6	64
2017	1035	926	59	16	34
2018	1006	905	51	20	30
2019	281	239	32	3	7
2020	193	164	24	3	2

In 2020, 84.97% of the total number of employees who underwent a health examination in the FBiH PHI (193) were in the category of capable for work, 12.43% were in the category of limited capability, 1.55% were temporarily incapacitated, while for 1.00% of examined persons working capacity was not assessed as they did not access all mandatory examinations defined by regulations. For persons in the category of limited capability, during the assessment of working capacity due to health condition, a recommendation was given for further health check ups and work with sources of ionizing radiation under certain conditions as defined by regulations. Persons who were declared temporarily incapacitated for working in the ionizing radiation zone had medical contraindications that were not acceptable for work, but were not necessarily a consequence of working in the ionizing radiation zone. In general, the results of health assessments of occupationally exposed persons show that their health condition is satisfactory, which indicates a good application of protective measures when working with ionizing radiation sources. We note that the decrease in the total number of examinations, compared to the previous annual period, is causally related to the occurrence of the Covid-19 pandemic in BiH as well.

2.5.3 Dosimetric monitoring of persons occupationally exposed to ionizing radiation

Occupationally exposed persons, in accordance with the categorization, are under personal dosimetric control in accordance with the Rulebook on radiation protection in occupational exposure and exposure of the population (Official Gazette of BiH, 102/11). The results of dosimetric monitoring of occupationally exposed persons for 2020 are shown in the following tables.

Table 22: Overview of dosimetric data for occupationally exposed persons by activities

	Number of workers	Collective dose (men-mSv)	Average dose for 2020 (mSv/year)	Average dose for 2015-2019 (mSv/year)
Diagnostic and interventional radiology	1069	229.93	0.22	0.17
Radiotherapy	37	9.93	0.27	0.10
Nuclear medicine	57	21.75	0.38	0.00
Dental medicine	117	16.06	0.14	0.00
Veterinary medicine	31	4.99	0.16	0.17
Industry	13	1.70	0.13	0.22
Transport	4	0.36	0.09	0.00
Research	0	0.00	0.00	0.38
Other	118	11.05	0.09	0.17
TOTAL:	1446	296	0.20	0.19

Data: Institute for Public Health of FBiH (IPHFBiH), data of the State Regulatory Agency for Radiation and Nuclear Safety (DARNS) are missing

The largest number of professionally employed persons is in health care, in the field of diagnostic and interventional radiology (73.9%). The average personal dose is from 0.09 mSv/year to 0.38 mSv/year for individual activities, where the average dose for all activities is 0.20 mSv/year and is significantly below the prescribed limit value.

Table 23: Distribution of dosimetric data for professionally employed persons by activities for 2020

Activity	<1,00 mSv	1,00-5,99 mSv	6,00-9,99 mSv	10,00-14,99 mSv	15,00-20,00 mSv	>20 mSv
Diagnostic and interventional radiology	1056	12	0	0	1	0
Radiotherapy	37	0	0	0	0	0
Nuclear medicine	57	0	0	0	0	0
Dental medicine	116	1	0	0	0	0
Veterinary medicine	28	3	0	0	0	0
Industry	13	0	0	0	0	0
Transport	4	0	0	0	0	0
Research	0	0	0	0	0	0
Other	117	1	0	0	0	0
Total	1428	17	0	0	1	0

Data: Institute for Public Health of FBiH (IPHFBiH), data of the State Regulatory Agency for Radiation and Nuclear Safety (DARNS) are missing

Dosimetric data show that the occupational exposure of most persons (98.8%) was at ambient level (<1 mSv/year) and that 99.9% of occupationally exposed persons received a dose lower than 6 mSv/year. Occupational exposure of one person was increased, where although the limit value was not exceeded, it is recommended to examine the cause and optimize radiation protection. Dosimetric data show continuously good radiation protection, that is, a satisfactory degree of protection against ionizing radiation and are the basis for the revision of the categorization of occupationally exposed persons.

Table 24: Distribution of doses by activities for the period 2015 - 2019

	Diagnostic and interventional radiology	Radiotherapy	Nuclear medicine	Dental medicine	Veterinary medicine	Industry	Transport	Research	Other
2015	0.24	0.19	0.47		0.38	0.29			0.40
2016	0.09	0.08	0.38		0.54	0.22	0.22		0.27
2017	0.16	0.09	0.27		0.08	0.09	0.30		0.18
2018	0.16	0.03	0.79		0.11	0.15	0.18		0.15
2019	0.24	0.18	0.25	0.19	0.29	0.28	0.77		0.12
2020	0.22	0.27	0.38	0.14	0.16	0.13	0.09		0.09

Dose distribution data by activity show low exposure and individual variations are below the prescribed limit value and test level values.

2.5.4 Medical exposure control

Medical exposure and patient protection in radiodiagnostics are treated separately in relation to occupational exposure. Clinically sound practice to achieve diagnostic requirements should be conducted in a manner that ensures the least possible patient exposure. The balance between patient dose and image quality is the result of optimization. Medical exposure assessment is a prerequisite for establishing quality control criteria and applying the principles of justification and optimization in diagnostic procedures. The need for the introduction of patient dosimetry is defined by the Rulebook on radiation protection in medical exposure (Official Gazette of BiH, 13/11) and the Rulebook on radiation protection in occupational exposure and exposure of the population (Official Gazette of BiH, 102/11).

Medical exposure monitoring

In the Federation of BiH in 2020, a total of 145 medical exposure assessments were performed. The results indicate a significant variation, which can be attributed to different technical characteristics of X-ray devices and different work protocols.

Table 25: Medical exposure monitoring in 2020

Type of diagnostic test	Number of measurements and analyzes
Mammography	29
Computed tomography	20
Luminescence and interventional radiology	13
Intraoral dental equipment	60
Extraoral dental equipment	23
TOTAL	145

The measurement results were compared with the diagnostic reference levels (DRL) for the corresponding tests, given in the Rulebook on radiation protection in medical exposure (Official Gazette of BiH, 13/11, Annex 1.1, Table 6). Deviations from diagnostic reference levels greater than 50% occur in computed tomography devices and mammography devices. Analysis of the measurement results shows that due to the parameters used in practice, the dose received by patients is higher than the diagnostic reference levels. Accordingly, it is necessary to revise the practice and optimize clinical parameters. The goal is to ensure that doses are as low as reasonably possible, provided that adequate diagnostic information is obtained for the benefit of the patient. In addition to this, it is necessary to establish a DRL at the national level, which would enable the optimization of patient doses and practices for performing diagnostic procedures.

2.5.5 Population exposure control

Monitoring of environmental radioactivity in FBiH

Systematic testing of environmental radioactivity was renewed in 2004 and is carried out according to the Programme for monitoring radioactivity in environmental samples on the territory of FBiH. The testing programme is the result of the project “Environmental Radioactivity Monitoring” (2002) with the International Atomic Energy Agency (IAEA), which defines locations, media, sampling frequency, test methods and data processing. The goal of general monitoring of radioactivity is: (1) to control the values of ambient radioactivity in the environment, to assess the exposure of the population to ionizing radiation, and (2) to have laboratory facilities for radiometric measurement techniques and assessment of radioactive contamination in case of emergency radiological event in or outside BiH with potential consequences in BiH. The FBiH monitoring programme is carried out by measuring the dose rate in the air and measuring the radioactivity of air, soil, water, precipitation and food samples.

The system for monitoring and early warning of the presence of radioactive air contamination in BiH carries out automatic measurements of the dose rate in the air at six locations in the FBiH: Bihać, Jajce, Livno, Mostar, Sarajevo and Tuzla. Average dose rate values for the territory of FBiH range from 93 nSv/h (Livno) to 120 nSv/h (Sarajevo).

Table 26: Ambient dose equivalent speed ($H^*(10)$) for measuring points in FBiH

Period	Parameter	Sarajevo	Mostar	Tuzla	Bihac	Livno	Jajce
2015-2019	$H^*(10)$, min, (nSv/h)	87	67	88	62	73	85
	$H^*(10)$, max, (nSv/h)	138	375	183	167	156	150
	$H^*(10)$, me., (nSv/h)	110	91	109	89	93	109
2020	$H^*(10)$, min, (nSv/h)	104	85	out of function	78	76	85
	$H^*(10)$, max, (nSv/h)	160	137	out of function	194	157	134
	$H^*(10)$, me., (nSv/h)	120	98	out of function	98	93	103

The mean value of the equivalent air dose rate for the FBiH is 103 nSv/h. The measurement results show that the deviation of 20% from the average speed of the ambient dose equivalent has been exceeded. The elevated values were short-lived even in the period of worsened weather conditions, which may result in an immediate increase in the value of the ambient gamma dose. Average values of the equivalent dose rate for the measurement period show that no radioactive contamination in the air was detected.

Tests of aerosol radioactivity in the air are conducted for one location, Sarajevo. Regular tests of aerosols from the air measured the values for natural radionuclides (^{232}Th , ^{226}Ra , ^{40}K , ^{210}Pb , ^7Be) and artificial ^{137}Cs .

Table 27: Radionuclide activity in aerosols (Sarajevo)

Month	^{226}Ra ($\mu\text{Bq}/\text{m}^3$)	^{232}Th ($\mu\text{Bq}/\text{m}^3$)	^{40}K ($\mu\text{Bq}/\text{m}^3$)	^7Be ($\mu\text{Bq}/\text{m}^3$)	^{137}Cs ($\mu\text{Bq}/\text{m}^3$)	^{210}Pb ($\mu\text{Bq}/\text{m}^3$)
January	<1.027	<2.08	86.90±20.30	2060±42	9.31±0.64	833±20
February	<0.504	<1.01	21.70±5.50	2174±44	2.54±0.25	261±7
March	<0.570	<1.13	13.99±3.93	2310±47	1.28±0.23	334±9
April	<0.633	<1.16	13.00±3.70	3508±71	1.53±0.31	450±12
May	<0.700	<1.33	12.27±3.93	3053±62	0.70±0.26	374±10
June	<0.760	<1.39	6.89±2.40	2677±541	0.46±0.25	331±10
July	0.693	<1.31	4.94±	4850±98	0.57±0.27	620±15
August	<0.600	<1.10	10.82±4.89	2621±53	0.42±0.22	661±15
September	<0.500	<0.990	11.48±5.16	2851±57	0.68±0.19	672±15
October	<0.640	<1.40	15.70±4.20	2314±47	2.10±0.30	448±12
November	<0.800	<0.800	39.60±9.20	1566±32	4.30±0.40	731±17
December	<0.800	<1.50	38.40±9.70	1117±23	4.10±0.40	410±11

Table 28: Radionuclide activity in aerosols (Sarajevo), weekly

^{226}Ra ($\mu\text{Bq}/\text{m}^3$)	^{232}Th ($\mu\text{Bq}/\text{m}^3$)	^{40}K ($\mu\text{Bq}/\text{m}^3$)	^7Be ($\mu\text{Bq}/\text{m}^3$)	^{137}Cs ($\mu\text{Bq}/\text{m}^3$)	^{210}Pb ($\mu\text{Bq}/\text{m}^3$)
< 7.60	< 18.24	<8.00 – 153.57±52.99	993 - 4649	< 1.79 – 14.52	87 - 1373

Precipitation radioactivity testing is carried out for one location, Sarajevo. Precipitation sampling is performed quarterly. Tests of radionuclides in precipitation do not show the presence of artificial radionuclides.

Table 29: Radionuclide activity in precipitation

Sampling period	^{226}Ra (Bq/L)	^{232}Th (Bq/L)	^{40}K (Bq/L)	^{137}Cs (Bq/L)
I quarter	<2.35	<4.12	<10.87	<1.32
II quarter	<2.07	<3.50	19.01±17.35	<0.99
III quarter	<2.65	<4.54	<12.30	<1.26
IV quarter	<1.66	<2.60	16.09±11.60	0.82±0.56

Tap water (Water supply) tests are performed for 5 locations: Bihać, Livno, Mostar, Sarajevo, Tuzla.

Table 30: Radionuclide activity in tap water

Sample type	Alpha activity (mBq/L)	Beta activity (mBq/L)	⁹⁰ Sr (mBq/L)	²³⁸ U (mBq/L)	²³⁴ U (mBq/L)	²²⁶ Ra (mBq/L)
Tap water	<19-<30	16-36	1.1-7.0	1.60-10.40	3.06-13.30	<0.15-1.00

The level of radioactivity is low and within the allowed values.

Tests of radioactivity of food from the market show the content of natural radionuclides, but also artificial ones ⁹⁰Sr and ¹³⁷Cs.

Table 31: Mass activity of radionuclides in food

Type of food	²²⁶ Ra	²³² Th	⁴⁰ K	¹³⁷ Cs	⁹⁰ Sr
	Bq/kg				
Milk and dairy products	<0.038-0.110	<0.082-0.223	37.41-120.66	<0,020-0,076	0,019-0,216
Meat	<0.110	<0.223	120.66	<0.067	<0.072
Flour	<0.061	<0.114	30.34	<0.030	0.061
Vegetables	0.028-0.112	<0.057-0.141	49.62-115.57	<0.014-0.042	<0.010-0.102
Fruit	<0.028-0.089	<0.057-0.173	30.34-115.57	<0.014-0.048	<0.052-0.102

The test results show the presence of natural (²²⁶Ra, ²³²Th, ⁴⁰K) and artificial radionuclides (¹³⁷Cs, ⁹⁰Sr). The content of artificial radionuclides is lower than the prescribed limits and is the result of predominantly cross-border contamination after the Chernobyl nuclear accident in 1986.

Estimation of the effective dose for the population is carried out on the basis of data measuring the activity of radionuclides in environmental samples. The estimated annual effective dose for artificial radionuclides is shown in the following tables.

Table 32: Estimated effective dose for different age groups from intake ⁹⁰Sr

Age group	Effective dose, ⁹⁰ Sr (μSv)							Total
	Milk	Vegetables	Tubers	Fruit	Meat	Fish	Cereals	
Adults	0.190	0.114	0.065	0.068	0.130	0.003	0.175	0.745
Children 0-1	0.534	0.146	0.049	0.059	0.072	0.001	0.151	1.012
Children 1-5	0.169	0.117	0.049	0.056	0.084	0.002	0.144	0.621
Children 5-10	0.260	0.186	0.106	0.101	0.169	0.007	0.255	1.084

Table 33: Estimated effective dose for different age groups from intake ^{137}Cs

Age group	Effective dose, ^{137}Cs (μSv)							Total
	Milk	Vegetables	Tubers	Fruit	Meat	Fish	Cereals	
Adults	0.083	0.024	0.022	0.021	0.056	0.000	0.039	0.245
Children 0-1	0.082	0.011	0.006	0.006	0.011	0.000	0.012	0.128
Children 1-5	0.032	0.011	0.007	0.008	0.016	0.000	0.014	0.088
Children 5-10	0.041	0.014	0.013	0.011	0.026	0.000	0.020	0.125

Testing has shown that the contribution of ^{90}Sr is significantly higher than the contribution of ^{137}Cs . The limits of intake of artificial radionuclides ^{137}Cs and ^{90}Sr in the body, prescribed by the Rulebook on maximum permitted quantities for certain contaminants in food (Official Gazette of BiH, 68/14), are not exceeded.

2.5.6 Food and water safety, radioactivity parameter

Food and water safety tests were performed at the request of the client. In 2020, 236 food samples were tested for radioactivity, parameter mass activity $^{134/137}\text{Cs}$. Measured values of mass activity of $^{134/137}\text{Cs}$ ranged from $< 2,70$ Bq/kg to 1828 Bq/kg. Of the total number of analyzed samples, in two samples the content of ^{137}Cs was above the limit value of 370 Bq/kg for milk, dairy products and baby food, or 600 Bq/kg for all other foods (Official Gazette of BiH, 68/14). Water tests for radioactivity are performed on the parameters total alpha and total beta activity, and, as needed, specific tests. In 2020, 103 water samples were tested for total alpha and total beta activity. Results for total alpha activity ranged from <0.001 Bq/L to 0.284 Bq/L. Results for total beta activity ranged from <0.007 Bq/L to 0.484 Bq/L. Of the total number of tested water samples, in all tested samples the total alpha and total beta were below the limit values for total alpha activity (0.5 Bq/L) and total beta activity (1.0 Bq/L), (Official Gazette of BiH, 40/10 and 54/14).

2.5.7 State monitoring of environmental radioactivity

According to the Agreement on Radioactivity Measurement for 2020, for the State Regulatory Agency for Radiation and Nuclear Safety, 55 food samples and 12 drinking water samples were analyzed.

Table 34: Monitoring of radioactivity in BiH, determination of total alpha and total beta activity in water

Sample type	Determination of total alpha and total beta activity
Drinking water	12

Table 35: Monitoring of radioactivity in BiH, determination of $^{89/90}\text{Sr}$ concentration in water and food

Sample type	Determination of $^{89/90}\text{Sr}$ concentration
Milk	6
Composite samples	12
Fruit, vegetables, meat, cereals	25
Drinking water	12

Tests have shown that the limits of intake of artificial radionuclide ^{90}Sr in the body prescribed by the Rulebook on maximum permitted quantities for certain contaminants in food (Official Gazette of BiH, 68/14), have not been exceeded.

2.5.8 Emergency radiological events and radioactive waste management

During 2020, an emergency radiological event was recorded at the location of the industrial facility in Sarajevo, within the Energoinvest TAT factory (street Tvornička 3). Tests have shown that there is a significant increase in external and internal exposure of workers to ionizing radiation pursuant to the Rulebook on radiation protection in occupational exposure and exposure of the population (Official Gazette of BiH, 102/11). Contaminated material (lead shield) was identified at a minimum of three locations within the facility, as well as unrelated Caesium contamination (Cs-137) inside the factory facility, which was notified to interested companies and the State Regulatory Agency for Radiation and Nuclear Safety (DARNS). Upon completion of rehabilitation of the factory facility, by an authorized company, contaminated metal waste, contaminated construction material and loose radioactive material were removed in order to free the examined site from regulatory control. In order to verify the rehabilitation, the Institute for Public Health of the Federation of Bosnia and Herzegovina performed radiometric tests, during and between individual phases of rehabilitation, and after the completion of rehabilitation on 9 November 2020. Final tests show that the presence of highly contaminated material was not detected, i.e. that most of the contaminated construction and other waste material was removed. Dosimetric tests of the dose equivalent of $\text{Hp}(10)$, surface contamination and mass activity show that the contamination of the factory facility is below the derived limit values, both for widespread contamination ($< 0.1 \mu\text{Sv/h}$, $< 1 \text{ Bq/cm}^2$, $< 1000 \text{ Bq/kg}$), as well as for localized contamination ($< 0.2 \mu\text{Sv/h}$, $< 10 \text{ Bq/cm}^2$, $< 10000 \text{ Bq/kg}$). Exposure estimation indicates negligible external exposure ($< 10 \mu\text{Sv/year}$) and low internal inhalation exposure ($62\text{-}75 \mu\text{Sv/year}$). The estimated exposure is lower than the dose limit (1 mSv/year) and the dose restriction (0.3 mSv/year). The collected radioactive material was safely disposed of in a temporary storage of radioactive waste until the establishment of a central storage for BiH.

3. HEALTH RISK FACTORS

3.1. Diet and physical activity

Unhealthy diet and consequently undesirable nutritional status, especially in the form of overweight and obesity, are the leading risks for the development of chronic diseases, which are the leading causes of mortality and morbidity in the Federation of Bosnia and Herzegovina. At the time of the coronavirus pandemic, nutrition is of special importance, having in mind that a healthy diet is the basis of a good defence system of the organism, necessary for the fight against diseases.

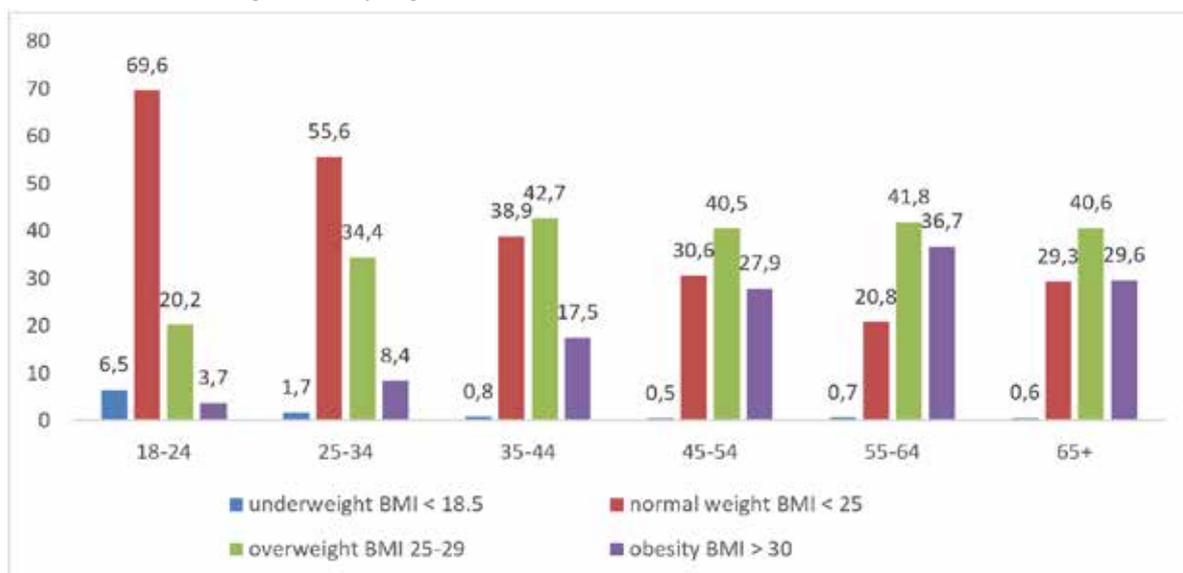
Therefore, a healthy diet plays a vital role in improving health and preventing disease, as well as in achieving the common well-being, progress and development of society. A healthy diet should definitely be complemented with physical activity as another one of the leading determinants of health, especially of cardiovascular system.

3.1.1 Adults

Indicators of the nutritional status of the adult population in the Federation of Bosnia and Herzegovina point to the widespread presence of overweight and obesity, both among men and women, as well as in all age subgroups. A study on the health status of the adult population in the FBiH, conducted in 2012 by the FBiH Institute for Public Health, showed that only 37.5% of adults have a desirable nutritional status (BMI <25). More than one third of respondents in the Federation of BiH or 37.5% of them are overweight (body mass index - BMI 25 - 29), with the highest percentage in the age group 35-44 (41.8%), and the lowest in the age group 18 - 24. There are more overweight men (45.2%) than women (29.6%).

Above one fifth of the respondents in the adult population, i.e. 21.2% are obese (BMI ≥30), most of them are in the age group 55 - 64 (36.7%), and there are more obese women than men (23.3% and 19.1% respectively).

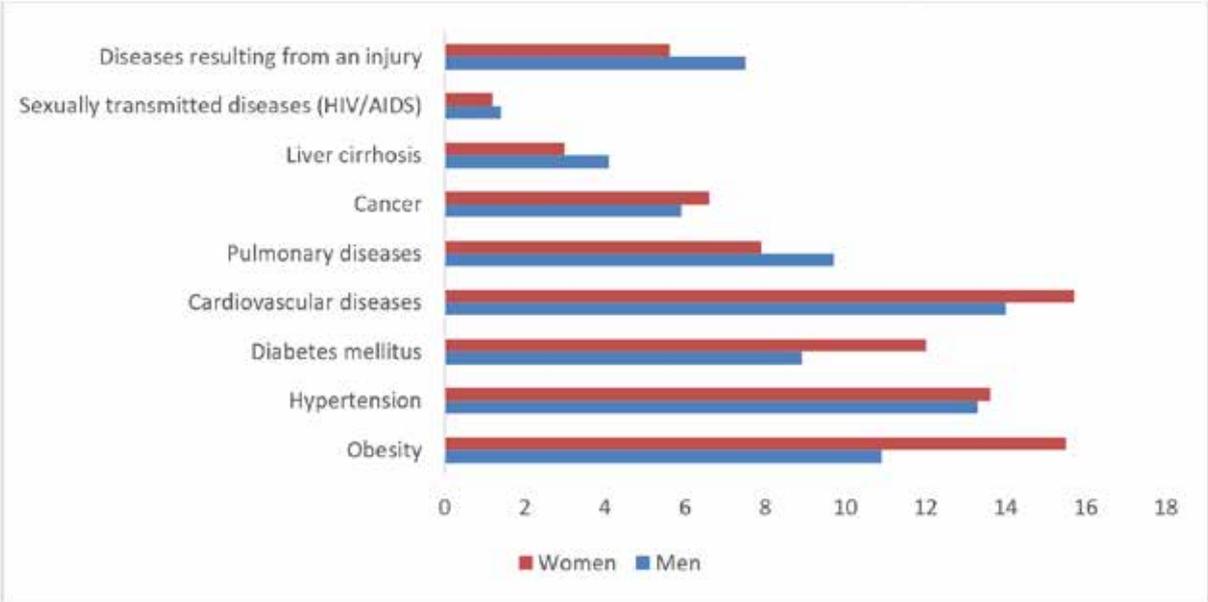
Figure 59 : Distribution of body mass index in the adult population in the Federation of Bosnia and Herzegovina by age, 2012



Indicators related to eating habits obtained in the same study showed that only 27.9% of adults in the Federation of BiH consume vegetables every day, more men (26.4%) than women (23.3%), while fruit is consumed daily by slightly more than a third of adults, i.e. 35.5%, more women (38%) than men (33.1%). If the current guidelines on a healthy diet are taken into account, which recommend daily consumption of about 400 grams or five servings of fruits and vegetables per day (excluding potatoes), it is clear that these data are disastrous.

The study also showed that awareness of the risk of developing the disease due to risky behaviour is very low. Only every seventh respondent believes that due to their behaviour and habits they can get heart and blood vessel diseases (14.8%), followed by high blood pressure (13.4%) and obesity (13.2%). At the same time, women believe that their behaviour is the highest risk of heart and blood vessel disease, obesity and high blood pressure, and men believe that their behaviour is the highest risk of heart and blood vessel disease, high blood pressure, and then obesity.

Figure 60: Awareness of the risk of developing certain diseases due to their behaviour and habits, adult population, distribution by gender, Federation of Bosnia and Herzegovina

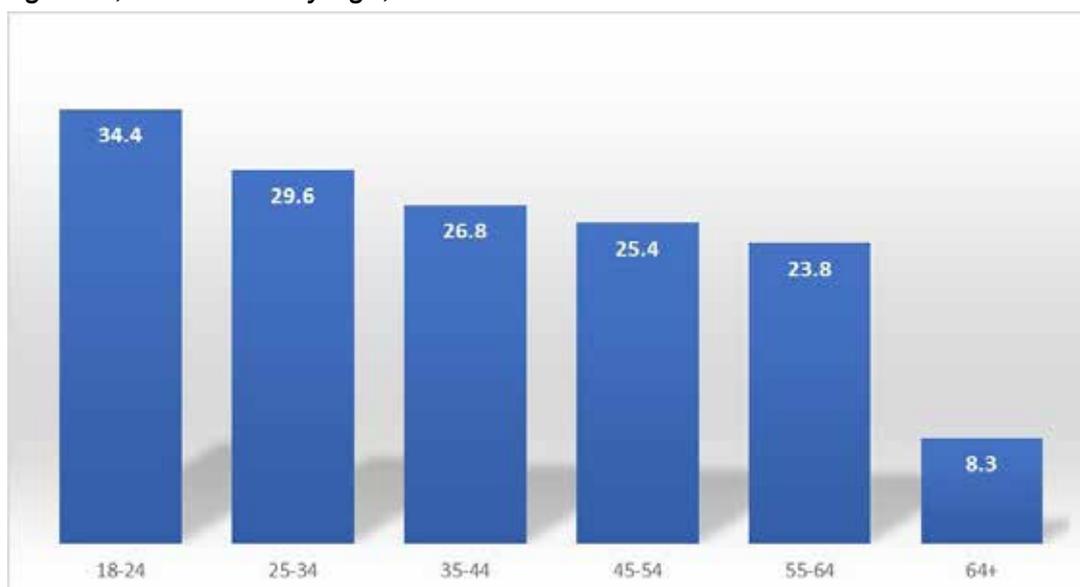


In the Federation of Bosnia and Herzegovina, among the adult population, very few have a satisfactory level of physical activity (defined as 30 minutes of physical exercise leading to mild increase in breathing rate or sweating, more than once a week). Over a third of respondents (38.3%) in the Federation of BiH belong to the category of physically inactive persons, with 4.3% of respondents who are not physically active due to illness/disability. There are more physically inactive women (44.0%) than men (32.7%), and the most physically inactive persons are in the age group of 65+ (61.3%).

When it comes to the physically active adult population, the most physically active persons are in the age group 18-24, and then with age the percentage of physically active ones decreases, and the least physically active persons are in the age group 64, only 8.3%.

Compared to 2002, the percentage of physically active adults increased from 15.1% to 26.5%, but is still very low and unsatisfactory.

Figure 61: Physical activity in the adult population in the Federation of Bosnia and Herzegovina, distribution by age, 2012



In the fight to improve physical activity among adults, it is advisable to follow the examples of good practice from the countries of the European region that have achieved significant success.

In the year of the pandemic, it was not possible to monitor the nutritional status, but there is a justified fear that due to the long stay at home people were eating more than usual, that fresh food was less available, and consequently they consumed more processed and energy-rich but nutritionally poor foods. Restrictions on movement have also undoubtedly led to a reduction in physical activity. All this could result in an additional increase in overweight and obesity, which further underlines the need for continuous action in the field of promoting a healthy diet.

3.1.2 Children

Nutritional status for infants and children at the earliest age, i.e. at the age of 0 - 5 years, is one of the main indicators of their growth and development and is a reflection of the appropriateness of the diet they have and the proper protection and care for them.

Nutritional status indicators show that malnutrition, whether acute, chronic or associated malnutrition, is present in very low percentages. 2% of children were malnourished, of which 1.2% of children were severely malnourished (weight / age > 3SD). A total of 9.9% of children were stunting, of which 4.6% were severely stunted (height/age > 3SD), and 2.6% of children were wasting, of which 2.0% were severely wasted for their height (weight/height > 3SD). The nutritional status in relation to these three indicators is worst in the age subgroup from 0 to 11 months.

Unlike malnutrition which is present in very small percentages, percentages of overweight and obesity are high. Namely, 17.7% of children aged 0-5 in FBiH are overweight.

The highest percentages of overweight children are recorded in the age group of 12 to 23 months, as much as 26.9%.

When it comes to the vulnerable Roma population, malnutrition rates are higher - 8.8% of children are malnourished, of which 2.4% are severely malnourished (weight/age > 3SD). A total of 21.1% of children were stunting, of which 8% severely stunted (height/age > 3SD), a further 8.3% of children were wasting, and 3.5% of children (weight/height > 3SD) were severely wasted.

Even in the vulnerable population of Roma children, as many as 7% are overweight, of which 11.1% are in the age group 48-59 months.

Table 36: Nutritional status of young children (0 – 5) in the Federation of Bosnia and Herzegovina, MICS 2000, 2006 and 2012

Nutritional status	Percentage representation (%)		
	2000	2006	2012
Underweight (weight/age >2SD)	5	2.5	2
Severely underweight (weight/age >3SD)	-	0.7	1.2
Stunted (height/age >2SD)	13	6.9	9.9
Severely stunted (height/age >3SD)	-	2.4	4.6
Wasted (weight/height >2SD)	8	3.6	2.6
Severely wasted (weight/height >3SD)	-	1.0	2.0
Overweight	-	-	17.7

Breastfeeding and complementary food indicators can largely explain the high percentages of overweight children. Only 51.5% of infants are breastfed for the first time within one hour after birth, and breastfeeding begins within one day after birth for 87.3% of infants in the Federation of Bosnia and Herzegovina.

A total of 95.2% of children last born in the two years preceding the survey were breastfed at least once.

15.1% of children under 6 months are exclusively breastfed, more children in rural areas (19.1%).

Predominant breastfeeding means that children receive other liquids or food in addition to breast milk - 42% of children under the age of 6 months are predominantly breastfed, and 13.2% of children are still breastfeed between the ages of 12 and 15 months.

Percentage of children aged 6 - 23 months who were fed age-appropriately (in addition to breastfeeding the child receives solid, semi-solid or soft food) is 21.6%.

In the Roma population, the practice of breastfeeding is also unsatisfactory, and it is accompanied by inadequate and untimely complementary food.

Only 21.3% of children are exclusively breastfeed, 42.5% of children are continuously breastfeed at the age of 12 to 15 months, while 63.9% of children are continuously breastfeed at the age of 20-23 months.

Table 37: Breastfeeding and complementary feeding practice in the Federation of Bosnia and Herzegovina, MICS 2006 and 2012

Breastfeeding and complementary feeding		Percentage representation (%)	
		2006	2012
Exclusive breastfeeding - < 6 months	Total	22	15.1
	Boys	21.4	12.6
	Girls	22.1	17.3
Continuous breastfeeding – 12 -15 months	Total	34	13.2
	Boys	29.8	12.6
	Girls	37.9	14.3
Continuous breastfeeding – 20 - 23 months	Total	13	15.3
	Boys	13.1	17.6
	Girls	13	13.2
Appropriately fed children (*0-11 months, **6-23 months)	Total	19*	21.6**
	Boys	18.4	21.7
	Girls	20.5	18.1

Healthy eating promotion programmes “Eat healthy, grow healthy!” and the programme “Preventive promotional activities in the Roma population in the field of health care”, which deal with the promotion of breastfeeding and adequate complementary feeding, although in online form, were also implemented in 2020.

The process of accreditation of gynaecological and obstetric hospitals and wards in baby-friendly maternity hospitals has continued, and the process is supported by the Federal Ministry of Health and UNICEF, while it is implemented by the Agency for Accreditation and Quality in Health Care of the Federation of BiH.

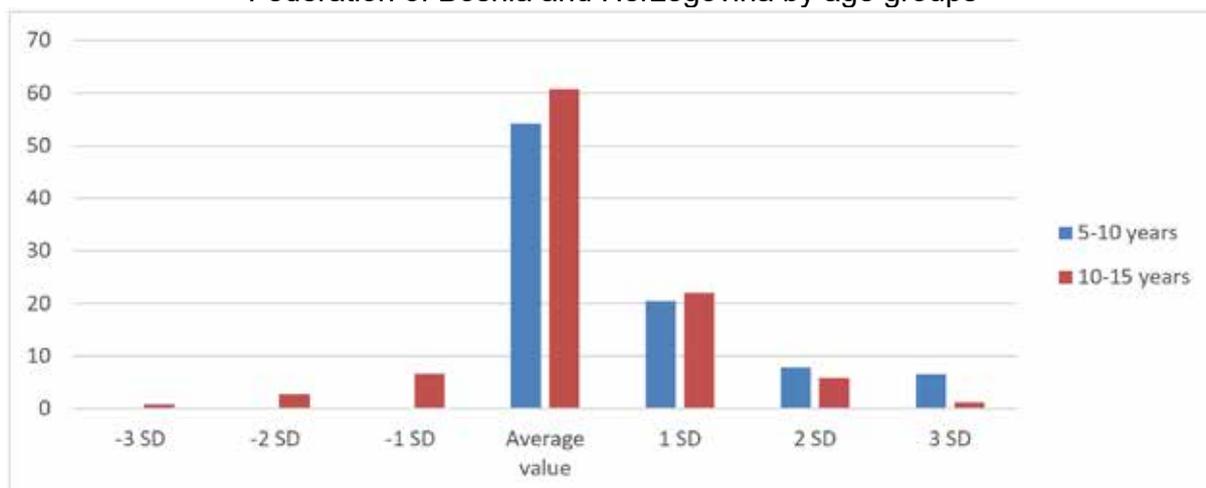
Through the 2012 Survey on Anaemia among Children and Women in the Federation of BiH, measured data related to the nutritional status of school children were collected for the first time.

Malnutrition in all forms is shown not to be a problem in this age group too - 3.2% of children aged 5 - 10 years and 3.5% of children aged 10 - 15 years are short for their age, 1.2% of children 5 - 10 years old is malnourished, while 3.9% of children aged 5 - 10 and 5.5% of children aged 10 - 15 have a low body mass index (BMI) for their age.

However, in the school age group of children, overweight is widely present - in one third or 31.2% of children aged 5-10 years, of which obesity in 13.3% of children.

In children aged 10-15 years, overweight is present in 22.3% of children, of which obesity is present in 3.9% of cases (BMI/age + 2SD).

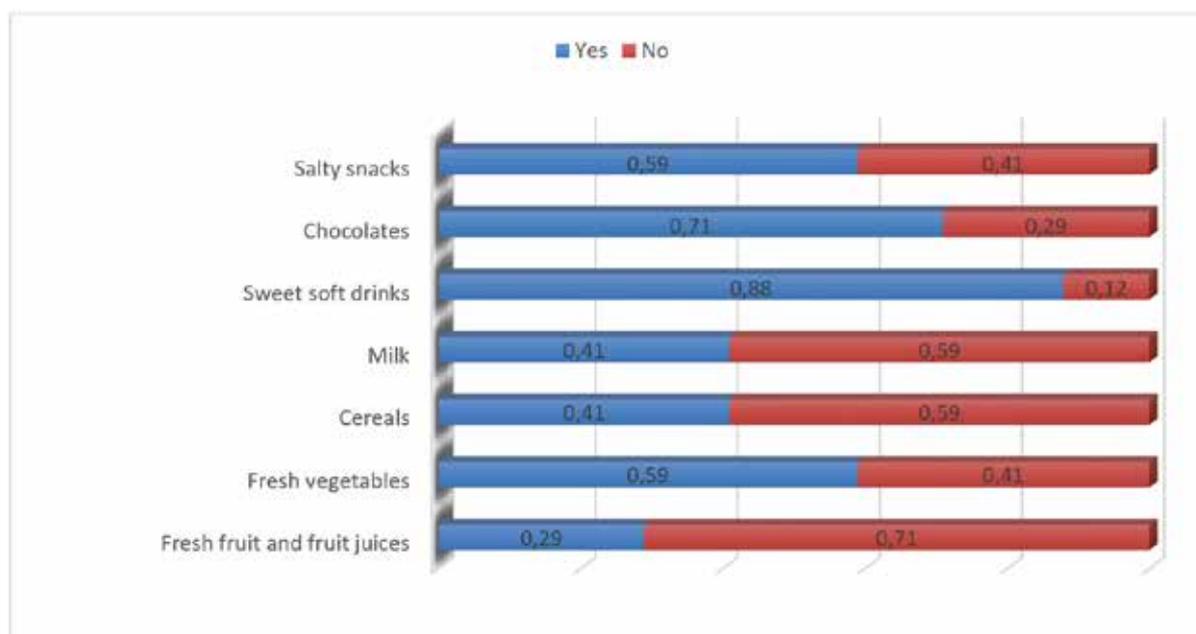
Figure 62: Distribution of body mass index for children aged 5 - 15 years in the Federation of Bosnia and Herzegovina by age groups



The same research showed that the eating habits of school children are characterized by frequent consumption of energy-rich and nutritionally poor foods and an irregular meal schedule. Almost a third (31.3%) of children aged 5 - 15 consume sweets every day, and 16.9% of them have snacks and chips.

Schools are a fundamental place for the promotion of healthy eating. However, the nutritional environment in schools is not supportive of a healthy diet. The research on the food environment in primary schools in the Sarajevo Canton showed that in school canteens in the Sarajevo Canton, fresh fruit and whole fruit juices are sold only in one third (29%), cereals and milk in 41%, and vegetables in 59% of canteens, while sweet soft drinks are sold in 88%, chocolates in two thirds, and salty snacks in 59% of canteens.

Figure 63: Availability of selected foodstuffs in primary school canteens in the Sarajevo Canton



When it comes to physical activity among school-age children, the data available for the Federation of BiH date from the 2002 study “Health behaviour of school children in the Federation of Bosnia and Herzegovina” (HBSC), which showed that only 22% of children are physically active (physical activity leading to mild increase in breathing rate or sweating for 60 minutes all 7 days a week), while as many as 27% of children are not physically active (physical activity that leading to mild increase in breathing rate or sweating for 60 minutes 1-2 days a week or less). There are 33% of physically inactive girls and 21.3% of physically inactive boys.

The coronavirus-caused pandemic has led to a number of restrictions to prevent the spread of the infection. Long stays indoors, attending classes from home, reduced opportunities for outdoor physical activities will certainly have consequences, and it is necessary to start monitoring the nutritional status of school children and developing a questionnaire on nutrition and physical activity of children during the pandemic.

3.2. Micronutrient deficiencies

3.2.1 Iodine deficiency

Iodine deficiency in the diet can endanger the mental health and even the survival of children, and disorders due to iodine deficiency are among the leading causes of cognitive development disorders in children. Severe iodine deficiency during pregnancy can lead to stillbirth, miscarriage, and congenital anomalies and mental retardation of the infant, and iodine deficiency can affect health in much less visible forms (reduced intellectual capacity), exacerbating this public health problem.

The Programme for the prevention of iodine deficiency disorders has significantly improved the iodine status of the FBiH population. The iodine status of the FBiH population was changed from a moderate degree, recorded in 2000, when the prevalence of iodine goiter was 27.06%, to a mild iodine deficiency by 2005, with a prevalence of 9.5%.

In 2008, as part of the programme, a project to examine the iodine status of pregnant and breastfeeding women¹ was implemented throughout Bosnia and Herzegovina. 757 pregnant women and 312 breastfeeding women from 11 health centres participated in the study in the FBiH. Urinary iodine excretion was analyzed, in relation to normal median values according to the WHO and UNICEF criteria from 2007, which for pregnant women range from 150 to 250µg/l.

A total of 48.6% of pregnant women and 22.7% of breastfeeding mothers had urinary iodine excretion values lower than normal, which indicated that iodine intake in pregnant and breastfeeding women was insufficient for their increased needs. According to the results for pregnant women, iodine substitution in the form of tablets was considered, but this public health intervention was not implemented.

The programme has stagnated and the only recent data relate to the monitoring of iodine content in salt from the market conducted in 2018 by the Food Safety Agency.

Of the total number of samples analyzed, 98 samples (38%) complied with the criteria of the relevant legislation, while 162 samples (62%) did not. Of the total number of non-compliant salt

¹ UNICEF Office for BiH research project “Iodine status of pregnant and breastfeeding women in Bosnia and Herzegovina”, 2007/08

samples, 80 are of domestic production, while 82 samples are of imported origin. Of the total number of non-compliant samples, 78% were caused by an incorrect labelling. In as many as 59 samples or 36%, the iodine content was inadequate. Of these, 58 samples had a lower iodine content than the reference values, while only one salt sample was hyper-iodinated. A total of 30 samples were not iodized at all.

These data certainly indicate the need for continuous monitoring of iodine content in salt from the market and underline the need to reaffirm the body for the implementation of programmes to prevent disorders caused by iodine deficiency and gain insight into the iodine status of the population.

3.2.2 Iron deficiency anaemia

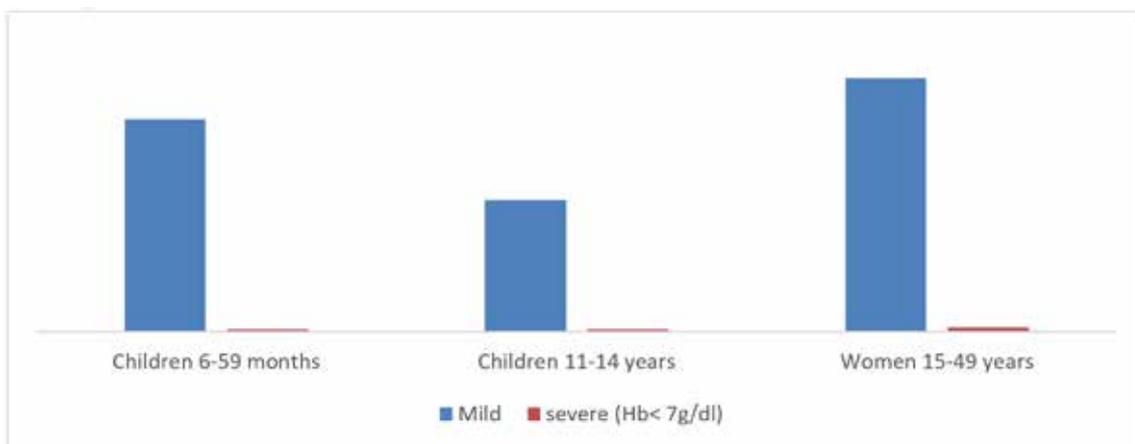
Qualitatively insufficient and unbalanced diet, i.e. low intake of iron-rich foods of animal origin, inadequate intake of vitamin C from fruits and vegetables, intake of foods that reduce iron absorption and deficiencies of other micronutrients, especially vitamins A, B12, folate and riboflavin, carry the risk of anaemia. It is known that dietary iron deficiency anaemia poses a risk for the development of many diseases, and that vulnerable population groups such as young children and women of reproductive age are particularly susceptible to it.

A study on anaemia among children and women in the Federation of Bosnia and Herzegovina, conducted in 2012 by the FBiH Institute for Public Health in cooperation with the Federal Ministry of Health and with the support of UNICEF, was conducted on children aged 0-15 and women of reproductive age (15 - 49), and the presence of anaemia was determined on the basis of the status of haemoglobin in the blood.

According to the criteria of the World Health Organization for assessing the severity of anaemia at the population level, the prevalence of 5 to 19% represents a mild level, and the prevalence of 20.0 to 39.9% represents the presence of moderate anaemia.

The results showed that anaemia present among children is classified as mild, while among women aged 15 to 49 there is a moderate level of anaemia, at the lower limit of the reference range.

Figure 64: Prevalence of anaemia in children and women in the Federation of Bosnia and Herzegovina, 2012



* Mild anaemia - children 6-59 months Hb 7-10.9 g/dl, children 5-11 years Hb 7-11.4 g/dl; children 12-15 years Hb 7-11.9g/dl; women 15-49 years Hb 7-11.9 g/dl.

A similar condition was observed in the particularly vulnerable Roma population, in children aged 6-59 months the incidence of anaemia is 11.4%, in children aged 5-15 years 16.6%, and in women aged 15-49 years it is present in 10.5% of cases, which according to WHO criteria represents a mild degree of anaemia at the population level.

The presence of mild anaemia in the population does not require complicated and expensive iron supplementation programmes, but the improvement requires continuous engagement – carrying out structured promotional activities to improve nutrition and the nutritional environment, with mandatory periodic targeted research and population status monitoring.

3.3 Addiction diseases

3.3.1 Tobacco consumption

Smoking, classified under the code F17.2 as “tobacco addiction syndrome” and the use of various types of tobacco products, is today one of the leading public health problems causing morbidity and premature mortality from chronic diseases, especially cardiovascular diseases and malignant neoplasms. Relevant documents from international organizations confirm that effective tobacco control mechanisms save the lives and health of the population and contribute to the development of the community as a whole.

Smoking as an addiction disease in the population of the Federation of BiH

Recent population surveys have confirmed that smoking is still the largest single risk factor for the health of the population in the Federation of BiH.

According to the results of the Study on the state of health of the adult population in the Federation of BiH, conducted by the Institute for Public Health of the Federation of BiH in 2012, smoking is confirmed by 44.1% of respondents, of which 56.3% men and 31.6% women. (10)

According to the results of the same study, exposure to second-hand smoke at home is confirmed by over half of respondents in FBiH (54.1%), less than half of respondents in FBiH (44.4%) state that they are exposed to tobacco smoke by other smokers in the workplace, and over half of respondents in the FBiH (52.7%) reported exposure to tobacco smoke by other smokers in public places. (10)

Smoking is a dominant addiction among school children and youth. According to the results of the Global Youth Tobacco Survey (GYTS), implemented in 2019 by the Institute for Public Health of the Federation of BiH, almost a quarter of school children (24.4%) currently consume some tobacco products, of which cigarette consumption is confirmed by 13.8% of school children. Water pipe (hookah) smoking among school children is a growing public health challenge, as confirmed by the results of this study, according to which 16.1% of children currently smoke water pipe, of which 17.7% are boys and 14.4% are girls. (11)

Smoking among health care professionals

According to the results of a survey conducted by the Institute for Public Health of the Federation of BiH in 2017 on a sample of 920 doctors and nurses in family medicine teams in the Federation of BiH, 35% of smokers are recorded among health care professionals, of which 28% smoke every day and 7% occasionally.

It is significant that a very small percentage (10%) of health care professionals state that they are ready to quit smoking immediately, 47% of them state that they are thinking about quitting smoking, and 43% are neither ready to quit smoking nor are they thinking about it. (12)

The high prevalence of smoking among health care workers in the Federation of BiH indicates the need for a systematic approach to smoking cessation and quitting in this group of professionals who provide daily health care services, representing not only a source of knowledge but also examples of health-related behaviours to their patients and the public.

Smoking and population health in the Federation of BiH

High percentages of smoking prevalence are associated with the trend of various diseases and conditions directly caused by adverse health effects of this leading addiction disease.

A relevant indicator is the analysis of the trend in mortality rates from malignant neoplasms of the bronchus and lung (C34), which are directly related to smoking as the leading risk factor. There is a trend of a slight decline in mortality from malignant neoplasms of the bronchus and lung, from the number of 1,127 or 5.1/10,000 deaths in 2018 to 1,097 or 5.0/10,000 in 2020.

Table 38: Number of deaths from malignant neoplasms of the bronchus and lung (C34) in the Federation of BiH, 2018-2020

Disease	2018	Rate per 10,000	2019	Rate per 10,000	2020	Rate per 10,000
Malignant neoplasms of the bronchus and lung (C34)	1,127	5.1	1,210	5.5	1,097	5.0

3.3.2 Alcohol, drugs and psychotropic substances

Alcohol consumption in population groups

According to the results of the Study on the state of health in the Federation of BiH from 2012, alcohol consumption is a significant public health problem of the adult population in the Federation of BiH. Over a quarter of respondents in FBiH (28.8%) confirm that they have consumed some of the alcoholic beverages during the past 12 months (beer, wine, brandy), of which 29.7% in urban and 28.1% in rural areas. During the previous 12 months, alcohol was consumed by almost half of men (46.1%), the most of them (54.3%) in the age group 25-34 and the least of them (30.0%) in the age group 65+. Alcohol consumption is reported by 11.0% of women, most of them (20.5%) in the age group 18-24, and the least of them (5.0%) in the age group 55-64. (10)

According to the results of the same survey, in relation to the frequency of consumption of any alcoholic beverages in the past 12 months, the largest percentage of respondents (29.0%) report alcohol consumption several times a month. 23.5% of respondents report alcohol consumption several times a week, 21.5% of respondents confirm alcohol consumption several times a year, while 11.6% of respondents report daily alcohol consumption. (10)

The impact of alcohol, drugs and psychotropic substances on the health of the population of the Federation of BiH

Regular statistical data also monitor the trend of certain diseases related to alcohol consumption as a risk factor. (13)

Thus, according to the Institute for Public Health of the Federation of BiH, there is a decreasing trend of patients with mental and behavioural disorders due to use of alcohol (F10) from a total of 2,271 or 10.3/10,000 population in 2018 to 2,116 patients and a rate of 9.7/10,000 population in 2020; trend of increase in patients with mental and behavioural disorders due to psychoactive substances use (F11-F19) from a total of 2,032 patients and a rate of 9.3/10,000 population in 2018 to a total of 2,251 patients or a rate of 1.5/10,000 population in 2020.

Table 39: Number of cases, codes C34, F10, F11-F19, K70, Federation BiH, 2018- 2020

Diseases	2018		2019		2020	
	Total number of cases	Rate per 10,000 population	Total number of cases	Rate per 10,000 population	Total number of cases	Rate per 10,000 population
Mental and behavioural disorders due to use of alcohol (F10)	2,271	10.3	1887	9.0	2,116	9.7
Mental and behavioural disorders due to other psychoactive substances use (F11-F19)	2,032	9.3	1893	9.0	2,251	10.3
Alcoholic liver disease (K70)	842	3.8	300	1.0	338	1.5

4. ENVIRONMENT AND HEALTH

Changes in the physical, chemical or biological state of the environment affect human health and safety, as well as the economic and social efficiency of society. All population groups are continuously exposed to environmental risk factors. Children, pregnant women, the chronically ill and the elderly are particularly at risk, as they are at greater health risk due to polluted air, water and soil, contaminated food, noise, ionizing radiation, UV radiation, and poor housing and working conditions.

In the territory of the Federation of BiH, there is no single register of local water supply facilities, which prevents full insight into the water supply system, as well as the adoption of adequate measures to improve the quality of water supply. Therefore, public health control of drinking water is not completely satisfactory. One part of the local water supply systems is under the control of utility companies and public health institutes, and regular control and chlorination of drinking water is performed in them. These water supply facilities usually have only the first zone of sanitary protection defined. Most individual local water supply facilities (wells, unconfined springs, reservoirs, cisterns) are not under the control of utility companies and public health institutes. Drinking water from these water supply facilities is in most cases not controlled for health safety, nor is it chlorinated, and sanitary protection zones are generally not defined.

In the Federation of BiH, air quality monitoring is the responsibility of the FBiH Hydrometeorological Institute and the competent cantonal authorities and local self-government units. *In addition to the above institutions, continuous measurements of basic air pollutants (SO_2 , CO, CO_2 , nitrogen oxides, ozone, PM_{10} and $PM_{2.5}$ particulate matter) are also performed by the Institute for Public Health of the Sarajevo Canton.*

Automatic measuring stations are located in Sarajevo, Tuzla, Zenica, Kakanj, Ilijaš, Lukavac, Živinice, Jajce and Goražde. In recent years, there has been an evident development in terms of the number of measuring points and the gradual increase in the number of valid measurements. In 2019, the automatic station in Visoko started operating. The existing conditions in the Federation of Bosnia and Herzegovina do not allow regular monitoring of all parameters prescribed by the Rulebook on the manner of monitoring air quality and defining types of pollutants, limit values and other air quality standards (Official Gazette of the Federation of BiH, 1/12), such as lead, benzene, arsenic, cadmium, mercury, nickel, benzopyrene, etc.), and individual parameters are not measured at all. There is no domestic legislation related to indoor air quality, which is why indoor air quality monitoring is not carried out. (14)

In the Federation of BiH, 270 kg of municipal waste is generated per capita annually. Waste is collected non-selectively, so it often contains certain categories of industrial, medical and other types of waste. Only 10% or less of the generated industrial waste is adequately disposed of, while the rest is disposed of on unprotected land within industrial plants or inadequately incinerated. Improper waste disposal increases the risk of contamination of groundwaters used for drinking, because due to lack of available sites, significant amounts of municipal solid waste are disposed of in illegal sites (along roads, in rural dumpsites,

riverbeds or abandoned mines), while liquid waste is often discharged into watercourses without prior treatment. (15)

Microbiological and chemical food contamination is one of the leading public health problems in our country, as well as in the world. According to the data of the Institute for Public Health of the Federation of BiH, alimentary toxic infections are on the list of ten leading infectious diseases in the Federation of BiH.

4.1 Drinking water

The quality and health safety of drinking water in the Federation of BiH is controlled on the basis of the Rulebook on the health safety of drinking water (Official Gazette of BiH, 40/10 and 30/12 and 62/17), the Rulebook on table water (Official Gazette of BiH, 40/10 and 43/10) and the Rulebook on natural mineral and natural spring waters (Official Gazette of BiH, 26/10 and 32/12). *The Institute for Public Health of the Federation of BiH performs analyzes on basic physico-chemical and microbiological parameters, as well as a large number of other toxicological parameters, according to the requirements of inspection bodies and through contractual services with utility companies and spring, table and mineral water bottling plants. In cooperation with the Agency for the Adriatic Sea Basin, chemical, microbiological and radiological parameters are monitored in the groundwater and surface waters of the Neretva and Cetina rivers, from springs to estuaries, their tributaries, natural lakes and artificial reservoirs, and the sea in Neum municipality.*

According to the Water Management Strategy of the Federation of BiH 2010-2022, about 60% of the population in the Federation of BiH is covered by public water supply systems in which water safety is continuously controlled (in urban areas coverage is 94% of the total population, while in rural areas coverage is much lower and ranges around 20%). The rest of the population satisfies their needs for drinking water through individual, group or local water supply systems, the competence and management of which are not in charge of public utility companies. Protective (sanitary) zones of their springs have not been established in a large number of cases, while water chlorination is generally not carried out. (15)

Public water supply in the Sarajevo Canton is organized through four central water supply systems managed by public utility companies (KJKP) owned by the Canton and municipalities, namely: KJKP "Vodovod i kanalizacija" doo, Sarajevo, JKP "Vodostan" doo, Ilijaš, JKP "Komunalac" doo, Hadžići and JKP "Trnovo" Trnovo. According to statistical indicators, in relation to the number of inhabitants, in the Sarajevo Canton, 98% of the population is connected to these water supply systems. Part of the population (about 2%) is supplied with drinking water from local water supply systems operated by municipal utilities, and a very small number from individual water facilities (smaller springs and individual wells). *Central water supply sources generally have both the first and second sanitary protection zones regulated, and the water is continuously monitored for health safety and chlorinated.* Examination of sanitary safety of water from public fountains in the Sarajevo Canton, which are not connected to the city water supply system, is the responsibility of local government bodies, private and business entities. A large number of public fountains are directly supplied from springs, without provided sanitary-technical and hygienic conditions, continuous maintenance and supervision, and the water from these fountains is of variable quality, especially in the period of intense rainfall. (16)

According to the data of the institutes for public health of Una-Sana, Herzegovina-Neretva, Zenica-Doboj, Central Bosnia, Bosnian Podrinje, Tuzla,

West Herzegovina, Posavina and Canton 10 in the area of these cantons, the hygienic and sanitary condition of water facilities and the system of public health control of drinking water are not fully satisfactory. Central water supply sources generally have a regulated first and second sanitary protection zones. The first sanitary protection zone is satisfactorily secured, while already the second protection zone often contains one or more potential contaminants. The quality of water at water intakes is generally good, but in the future there will probably be less and less quality water resources if the process of water pollution continues and intensifies and if the protection zones of the sources are not established. The most common potential pollutants are unregulated and illegal landfills. In most central water supply systems, chlorination is performed automatically, with regular control of residual chlorine. In local waterworks that are under the control of the Institute for Public Health and public utility companies, regular control and chlorination of drinking water is performed. In local water supply systems owned by local communities or citizens' associations, regular control and chlorination of drinking water is not performed. In individual water supply facilities (e.g. wells, unconfined springs), chlorination is in most cases not performed at all, or is occasionally done manually, while sanitary protection zones are generally not defined. Water control in these water supply facilities is performed exclusively at the request of the owner.

The Institute for Public Health of the Federation of BiH and the institutes for public health of Sarajevo Canton, Tuzla, Central Bosnia and Una-Sana Canton, as well as the Institute for Health and Food Safety Zenica have certified laboratories for water analysis (ISO 17025) (ISO 17025). In other cantons, the laboratories of the institutes for public health have the equipment to determine the basic bacteriological and physicochemical parameters. Due to the lack of modern equipment, it is not possible to determine all the physico-chemical parameters determined by the Rulebook on the health safety of drinking water (e.g. some heavy metals, pesticides, phenols, mineral oils, etc.). In the last few years, the Tuzla Canton Institute for Public Health has intensified its supervision over the health safety of drinking water from public fountains, as well as drinking water in separate school buildings and places that are not covered by systemic control of drinking water. (17)

The quality of water supply can be judged by the epidemiological situation related to diseases whose causes can be found in contaminated water. According to the Institute for Public Health of the Federation of BiH, the leading place in the group of diseases caused by contaminated water and food in 2020 is occupied by acute enterocolitis (enterocolitis acuta), with 1105 registered cases (49.9/100,000), which is less than the total number of patients registered in 2019 (3507 registered cases - 160.1/100,000). The incidence of acute enterocolitis in the five-year period (2016-2020) differs significantly by cantons, from the lowest registered rate in the West Herzegovina Canton in 2020 (3.1/ 100,000 inhabitants) to the highest rate in the Bosnian Podrinje Canton in 2019 (1080.7/ 100,000). Enterocolitis acuta most often occurs in areas where the population is supplied with drinking water from individual water supply facilities (wells, cisterns, unconfined springs,) which are not under the control of institutes for public health and utility companies.

The waters of public swimming areas (swimming pools) are mostly under the regular supervision of the Institute for Public Health, especially during the summer season. Institutes for public health, as part of their regular activities, perform periodic quality control of surface and swimming waters. Due to the lack of legislation for recreational and swimming waters, reference values for these waters are determined according to the Rulebook on health safety of drinking water (Official Gazette of BiH, 40/10, 32/12) and the Decree on water classification (Official Gazette of SR BiH, 19/80). (17)

4.2. Air

The state of air quality in the Federation of BiH largely depends on the geographical position, season and meteorological conditions. The biggest pollution occurs in colder periods when the so-called temperature inversions occur in which the concentrations of individual pollutants exceed the limit values many times over, even in the summer period, but in lower concentrations and with a much lower frequency. Air quality monitoring is performed by a number of operators within the FBiH Network of Stations (managed by the FBiH Hydrometeorological Institute) and local station networks at the level of cantons and municipalities. *The most important air pollutants are thermal power plants, industrial facilities, motor vehicles and individual residential heating (winter period).*

The distribution of measuring stations is uneven and there are areas that are not covered by air quality monitoring, and in which there are indications that air quality is seriously impaired. Existing automatic air quality monitoring stations in the Federation of BiH are located in Sarajevo, Tuzla, Lukavac, Zenica, Kakanj, Ivan Sedlo, Goražde, Jajce and Mostar. At the end of 2017, the air quality monitoring station started operating in Ilijaš. The air pollutants being measured are: sulphur dioxide, nitrogen dioxide, carbon monoxide, ozone, hydrogen sulphide, PM₁₀ and PM_{2.5} suspended particulate matter (Lukavac, Tuzla, Zenica and Goražde). If the average concentrations of these pollutants in the air exceed the maximum allowed values, they can seriously affect human health.

In 2019, the automatic station in Visoko started operating. This station, located near the General High School in the city centre, is also equipped with a hydrogen sulphide monitoring device (H₂S) due to specific emissions from a nearby leather processing plant. This is the first station in the Federation of BiH to measure hydrogen sulphide concentrations, and in addition to Visoko, it would be desirable to have this monitoring in Maglaj too, also due to specific industrial processes. Benzene measurements, sampling and analysis of benzopyrene, sampling and analysis of the composition of suspended particulate matter are not performed.

In the Federation of Bosnia and Herzegovina in 2019, air quality was monitored by a total of 21 automatic stations, managed by the competent institutions. In addition to them, there is also one station operated by the Embassy of the United States of America in our country. The measurement results of the most important air pollutants indicate the following:

Annual concentrations of sulfur dioxide in 2020 exceeded the permitted values in Visoko, Zenica, Tuzla, Živinice and Lukavac. These are mainly places where the limit values have been exceeded in previous years as well. However, in 2020 there was an increase in annual concentrations compared to the previous two years, especially at stations in Tuzla Canton. It should be borne in mind that the Maglaj station started operating in the second half of the year, so it was impossible to have a satisfactory amount of data on an annual basis. Sulphur dioxide

measurements were not performed at the Bjelave station in 2020 due to the worn out measuring device. In 2020, the movement of annual concentrations of sulphur dioxide corresponded to earlier years (the highest values during winter, heating season and stable meteorological conditions followed by temperature inversions during the colder part of the year). In 2020, extremely high daily values of concentrations were reached - at some stations up to 15 times higher than allowed (December 2020). The increase in the highest daily concentrations compared to the previous few years was evident at most measuring points, and the most pronounced at the measuring points in Tuzla Canton.

With the existence of slight oscillations, the average annual concentrations of nitrogen dioxide in 2020, showed similar values as in previous years. At some measuring points in Sarajevo and Zenica, they were close to the limit value, but did not exceed it. At the Sarajevo station Otoka, 17 days were recorded with exceedances of the daily limit value ($> 85 \text{ ug} / \text{m}^3$) and 16 days with exceedances of the tolerance value ($> 86 \text{ ug} / \text{m}^3$), which is an increase compared to previous years (6 days in 2019). At other measuring points, the daily limit values were almost never exceeded - one day each at the stations in Ilijaš and Ilidža. Hourly concentrations of nitrogen dioxide in 2020 remained at a satisfactory level.

When it comes to ozone, there were no major deviations from the measurement results in previous years, although the concentrations of this pollutant show significant variations from year to year. Elevated values are characteristic of the warmer, sunnier part of the year.

As in previous years, in 2020 the average annual values of carbon monoxide were significantly below the prescribed limit values. None of the stations exceeded the allowed number of reached limit values on an annual, daily or eight-hour level. Very rarely in the days of the highest pollution at measuring points in Tuzla, Živinice and Sarajevo, it happened that CO concentrations reach very high values, and we can consider that the pollution with this pollutant is within the prescribed values and limited to smaller areas.

In the summer of 2019, a station in the city centre started operating in Visoko, where, due to the specific industry located in the city and the emissions resulting from the technological process, a device for monitoring hydrogen sulphide was installed. In 2020, hydrogen sulphide monitoring was established in Ilidža and Maglaj too. In Ilidža, it is a natural spring from a hydrothermal spring located in the immediate vicinity of the measuring point, so elevated values are expected. In Maglaj, the main source of hydrogen sulphide emissions is a local industrial plant. The measurement results in Visoko showed regular (daily) exceeding of the daily and hourly limit values of the concentration of this pollutant.

Annual concentrations of particulate matter indicate that this is the most present pollutant that negatively affects air quality in our country. At almost all stations, the concentration limit values for PM_{10} particulate matter were exceeded. Exceptions are the background station Ivan Sedlo, station Dobož Kakanj (which is located outside the city centre and near the river Bosna which has a significant impact on air dispersion), station Jajce and station Vijećnica, which also has a specific position along the river Miljacka and whose values are just below the permitted limit value. The situation is even worse when we observe the concentrations of $\text{PM}_{2.5}$ particulate matter, considering that the average annual concentration below the limit value was not achieved at any of the measuring points. Comparing the data for 2020 with previous years, there is a noticeable increase in the value of concentrations of particulate matter, which is a reason for concern. (14)

Large amounts of grass and tree pollen are also in the air during May and June (end-August high concentrations of ragweed too), which can lead to a deterioration in the health of the population allergic to these substances, especially if they suffer from chronic obstructive pulmonary disease.

Centre for Ecology and Natural Resources “*Academician Sulejman Redžić*”, Sarajevo, in recent years has been monitoring pollen concentrations in the Sarajevo Canton, using two monitoring devices (measuring stations Pofalići and Stari grad). So far, 31 plant allergens have been identified in the area of the city of Sarajevo, which belong to different families or genera. The percentage of woody species allergens is the highest (70%), followed by grass allergens (7%) and weeds (23%). Pollen concentrations are highest during March, April and May. This period is dominated by tree pollen, while grass pollen has a smaller percentage. The highest values of pollen are during May, and the lowest during March. Birch pollen reaches its maximum in April. The highest values of grass pollen are reached during July, and slightly lower during May. Weed pollen concentrations are highest in June, July, August, September and October and lowest during November. This period is also characteristic by the appearance of high concentrations of pollen of the highly allergenic plant *Ambrosia artemisiifolia* L. (ragweed). High values of weed pollen are observed during June, July, August and September. (18)

In addition to unhealthy lifestyles, polluted air is also one of the most important risk factors for developing chronic obstructive pulmonary disease. According to the data of the Institute for Public Health of the Federation of BiH, the incidence of chronic obstructive pulmonary diseases in the Federation of BiH in 2020 was slightly lower (141/10,000 population) compared to 2019 (158/10,000 population).

4.3. Waste

Inadequate waste management can lead to pollution of groundwater and surface water, air and soil and thus adversely affect human health and the environment. The amount of municipal waste produced per capita in Bosnia and Herzegovina is increasing. Landfills that partially meet the requirements for sanitary landfills are located in Sarajevo (“Smiljevići”), Zenica (“Moščanica”) and Tuzla. Other landfills for municipal waste are mostly open and are located in areas that are not regulated by the principles of hygienic and sanitary landfills, i.e. there are no protective systems for soil, water and air protection. The waste is occasionally covered with inert materials using an excavator. Most existing landfills receive various types of hazardous and non-hazardous household waste, including bulky waste, medical and industrial waste, etc. There is no primary selection of waste by type and origin of waste, nor separation of biodegradable waste. On the territory of the Federation, there are about 2,000 locations of uncontrolled (wild) landfills on an area of 974,221 m², except in Sarajevo Canton and Canton 10, where such landfills have not been observed in all municipalities. In other cantons they are located everywhere, and mostly in Zenica-Doboj and Tuzla cantons. Municipal, industrial, inert and animal waste is disposed of at these landfills. (19)

Data collection, monitoring and reporting in the waste sector lags behind other sectors, such as the water and air sectors. There are no reliable statistical data on the amount of medical waste generated in the Federation of BiH, because there is no system for registration of generated medical waste. Available data on industrial and municipal waste, including

hazardous waste, are based on estimates. The Agency and the statistical institutes in BiH annually publish data on waste generated from human and animal health protection and/or related research (as part of the total waste generated from manufacturing activities according to the European Waste Catalogue), but these data are not representative. Based on the average amount of waste generated by health care institutions, which ranges between 2.41 and 3.26 kg/bed/day (of which between 0.19 and 0.88 kg/bed/day of waste is accounted by generated infectious waste), and data on the number of days of hospitalization, it is estimated that the annual amount of medical waste generated is 8,150 tons, of which 650 tons are infectious waste. (20)

The research conducted as part of the development of the Waste Management Plan 2012-2017 in the Federation, indicates that medical waste in FBiH is partially sterilized, melted and incinerated, and handed over to companies authorized to dispose of hazardous waste or, in the worst case, collected by utility companies. Non-hazardous medical waste is mainly handed over to municipal companies together with mixed municipal waste, while a smaller part is sterilized or autoclaved. A number of health care institutions in BiH perform controlled incineration of medical waste. However, in the Federation, as in the whole of Bosnia and Herzegovina, there is not a single hazardous waste incinerator that meets the requirements of the European Union (developing temperatures above 1700°C, emission control, waste gas treatment, etc.). The total production of waste from veterinary institutions is 20 t/y. Waste of animal origin (dead animals and slaughterhouse waste) is currently taken over by utility companies. The treatment of waste of animal origin does not comply with applicable EU regulations and standards, which is why it is a public health and environmental concern. (21)

Equipment for safe destruction of infectious medical waste is provided by three health care institutions (UCC, General Hospital "Abdulah Nakaš" in Sarajevo and Cantonal Institute of Public Health Travnik) and two veterinary institutions. Other health care institutions hand over medical waste for disposal to utility companies or authorized companies that deal with its appropriate destruction (infectious waste) or export to other countries (chemical and pharmaceutical waste).

Rulebook on Medical Waste Management in the Federation of BiH (Official Gazette of FBiH, 77/09) obliges health care institutions to appoint a body responsible for medical waste treatment, develop medical waste management plans, separate waste, treat infectious waste with heat or chemical sterilization on site. According to the latest data, which the Institute for Public Health of the Federation collected from all three levels of health care in 2020 through a short survey, in the Federation of BiH most of these institutions have medical waste management plans, as well as persons responsible for appropriate management of hazardous medical waste (sorting, storage, transport and disposal). Also, most health care institutions do not dispose of infectious and potentially infectious waste together with municipal waste, while the issue of pathological, chemical and pharmaceutical waste is resolved through contracts with authorized companies in charge of its proper disposal.

Industries and plants that represent the most important generators of industrial waste according to the amount and characteristics of generated waste are thermal and hydro power plants, mines, metallurgical industry, metal processing industry and part of the basic chemical

industry. It is estimated that at least 170 ha of unprotected land in the Federation of BiH is covered with accumulated inadequately disposed industrial waste from large industrial plants, primarily slag and ash from large boilers.

The FBiH Ministry of Environment and Tourism exports hazardous waste (asbestos waste, galvanic sludge, waste paints and varnishes, waste lead-acid batteries, pharmaceutical waste and cytostatics, chemicals, etc.) in accordance with the provisions of the Basel Convention on the Transboundary Movements of Hazardous Waste and its Disposal.(19)

At its 60th session held on 30 June 2016, the Government of the Federation of Bosnia and Herzegovina adopted the Decision on Prohibition or Restriction of the Import, Manufacture, Trade and Use of Certain Hazardous Industrial Chemicals in the Federation of Bosnia and Herzegovina, prohibiting or restricting imports, manufacturing, trade and use of certain hazardous industrial chemicals (listed in Annex III of the Rotterdam Convention on the Prior Informed Consent Procedure for certain hazardous chemicals and pesticides in international trade).

According to the results of research and studies conducted in recent years in the Federation of BiH, 47% of the population is connected to the public sewerage system (note: according to estimates given in the Water Management Strategy of the Federation of BiH 2010-2022, this percentage is 33%).

Untreated municipal and industrial wastewater endangers not only watercourses and their flora and fauna, but also groundwater, which poses a great risk to the health of the population. *The number of surface water samples taken and analyzed is not satisfactory (sampling is carried out 1-2 times a year, mainly in the summer). Reference values for surface waters are determined according to the Decree on water classification (Official Gazette of SR BiH, 19/80). Due to microbiological and chemical contamination, most surface water samples, especially those taken downstream from the settlements, do not comply with regulations, which is why the use of most watercourses for recreational purposes is not recommended.* Wastewater treatment plants are located in Sarajevo, Gradačac, Srebrenik, Žepče, Trnovo, Odžak, Živinice, Grude, Čitluk, Ljubuški and Bihać. The wastewater treatment plant in Bihać is equipped with the most modern technical and technological equipment intended for wastewater treatment (SCADA management system) and is the only plant of this type in the Una-Sana Canton.

4.4. Food and water safety

Food safety and hygiene

Unsafe food is associated with the annual deaths of about 2 million people and is responsible for more than 200 different diseases, from enterocolitis to cancer, and it is clear that the public health sector is one of the most important links in preventing and controlling the risks associated with contaminated food.

In the past year, great concern has been related to the potential risk of transmitting the Covid-19 virus through food. Fortunately, given that Covid-19 is a respiratory disease, it is very unlikely that the virus can be transmitted through food or packaged food.

No epidemic of foodborne infectious diseases have been reported in the past year.

In the list of leading infectious diseases, alimentary toxic infections in 2020, with a total of 140 patients and a rate of 6.3‰, are the ninth in the list, which is less compared to 2019 when with 555 patients and a rate of 23.5‰ they were eighth in the list of 10 leading infectious diseases.

The control of the health safety of foodstuffs in domestic production by microbiological analyzes included a total of 221,143 samples, of which a total of 838 or 4.0% were unsafe. Of these, 4482 samples were inspected from industrial production, of which 81 or 1.8% were unsafe. 4166 samples were inspected from craft production, of which 108 or 2.6% were unsafe, while 12,495 samples were inspected from trade, of which 649 or 5.2% were unsafe.

Furthermore, chemical analysis of domestic production included a total of 1814 samples of which a total of 47 or 2.6% were unsafe. Of that, 836 samples from industrial production were inspected, of which 45 or 5.4% were unsafe. 375 samples from craft production were inspected, of which 1 (0.3%) was unsafe, while 603 samples were inspected from trade, of which only 1 sample (0.2%) was also unsafe.

Analyzes on imported food safety included a total of 588 samples. Of these, 382 were tested for microbiological safety and all were safe, while 206 samples were tested for chemical safety, of which 4 (1.9%) were unsafe.

Table 40: Overview of food safety control in the territory of the Federation of BiH in 2020

Domestic production and import				
	Microbiological safety		Chemical safety	
	Total	Non compliant No. (%)	Total	Non compliant No. (%)
Industrial production	4482	81 (1.8 %)	836	45 (5.4%)
Craft production	4166	108 (2.6 %)	375	1 (0.3%)
Trade	12495	649 (5.2 %)	603	1 (0.2%)
Domestic production total	21143	838 (4.0 %)	1814	47 (2.6%)
Import	382	0 (0.0%)	206	4 (1.9%)

* Domestic production sum: industrial production, craft production and trade

The control of health safety of items of general use in domestic production by microbiological analyzes included a total of 17666 samples, of which a total of 360 or 2.0% were unsafe. Out of that, 2916 samples from industrial production were inspected, of which 73 (2.%) were unsafe. 6141 samples were inspected from craft production, of which 71 (1.2%) were unsafe, while 8609 samples were inspected from trade, of which 216 (2.5%) were unsafe.

Furthermore, domestic production chemical analysis included a total of 77 samples of items of general use, of which 22 from industrial production and 55 from trade and all were safe.

No samples of items of general use from imports were analyzed.

Table 41: Overview of general use items safety in the territory of the Federation of BiH in 2019

Domestic production and import				
	Microbiological safety		Chemical safety	
	Total	Non compliant No (%)	Total	Non compliant No (%)
Industrial production	2,916	73 (2.5 %)	22	0
Craft production	6,141	71 (1.2 %)	0	0
Trade	8,609	216 (2.5%)	55	0
Domestic production total	17,666	360 (2.0%)	77	0

* Domestic production sum: industrial production, artisan production and trade/

The presented data show a satisfactory situation. However, given the frequent notifications of the RASFF food and feed safety alert system, in addition to mandatory continuous food monitoring, targeted and swift monitoring according to risk analyzes is recommended. It is also necessary to renew the equipment and continuously educate the staff of the laboratories for testing the health safety of food, drinking water and items of general use at the institutes for public health in the Federation of BiH.

In this regard, we should mention the cross-border cooperation project IPA interreg CBC project Healthy nutrition of preschool children HEPSC, which began last year, and through which the laboratories of the Institute for Public Health through procurement of equipment and staff training will improve the capacity to analyze nutritional content of food.

4.5. Mines and unexploded ordnance

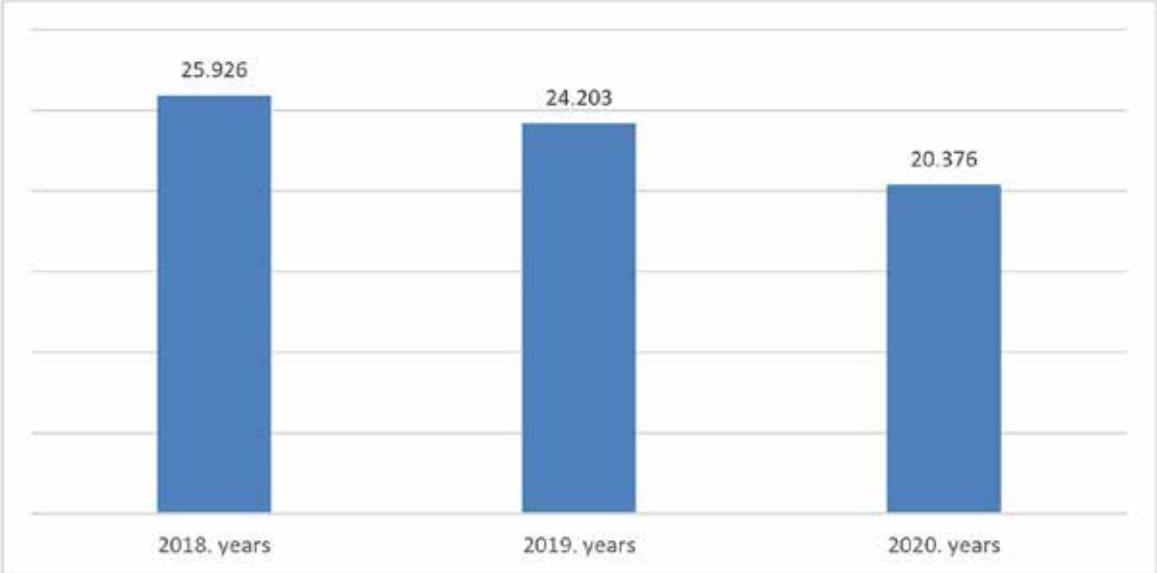
According to the latest available data from the Mine Action Center in BiH, in 2019 there were a total of 5 mine victims in the Federation of BiH. Of these, two people were killed, two were seriously injured and one was slightly injured. All the victims were adult men, and the incidents occurred while performing demining operations.

In 2020, there were no victims of mines and unexploded ordnance in the Federation of BiH. (22)

4.6 Traffic injuries

According to the data of the FBiH Ministry of Internal Affairs, there is a significant downward trend in the total number of traffic accidents in the Federation of BiH from a total of 27,926 in 2018 to 20,376 in 2020.

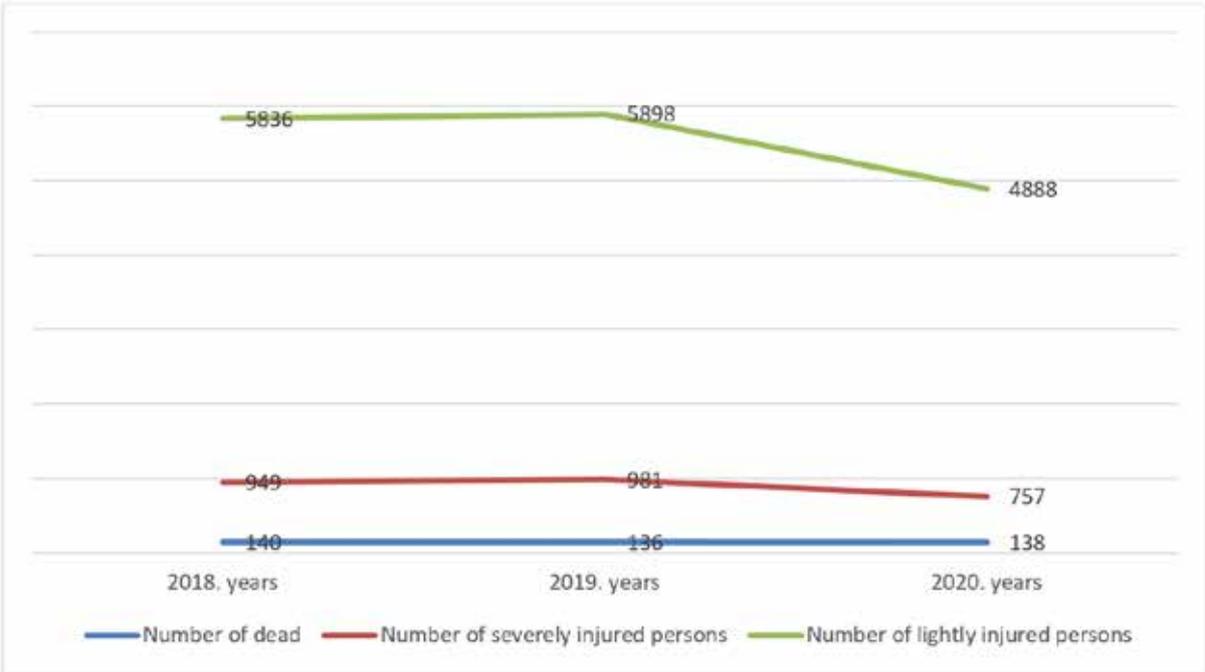
Figure 65: Traffic accidents in the Federation of BiH, period 2018 - 2020



Source: FBiH Ministry of Internal Affairs, 2020

There is a downward trend in the number of fatalities from 140 in 2018 to 138 in 2020 as well as in the number of seriously injured from 949 in 2018 to 757 in 2020, and a decrease in the number of lightly injured from 5,836 in 2018 to 4,888 in 2020.

Figure 66: Fatalities and injuries in traffic accidents in the Federation of BiH, period 2018 – 2020



5. HEALTH CARE ORGANIZATION

Health care in the Federation of BiH, according to the Law on Health Care, is organized at the level of primary, specialist-consultative, hospital health care and public health activities, and health care of the population is mostly financed from compulsory health insurance.

As the health care system of the Federation of BiH was not prepared for the Covid-19 pandemic, in 2020, at all levels of health care there were changes in the organization of work that required changes in working hours and number of employees, which was not always easy to implement because a large number of health workers also fell ill.

Throughout the year, the FBiH Government adopted information on the epidemiological situation and issued orders and recommendations of the Crisis Headquarters of the FBiH MoH, which affected the organization of health care at all levels. Among other things, it is recommended that in case of any of the symptoms of Covid-19, people with symptoms, as well as members of their household, stay at home and call the competent health care provider for further instructions. This has resulted in a reduction in PHC visits and an increase in counselling services.

Also, in line with the epidemiological situation related to Covid-19, each hospital is required to have a plan to meet the increased needs for covid-capacities, which has been reflected in reduced admission of non-emergency patients.

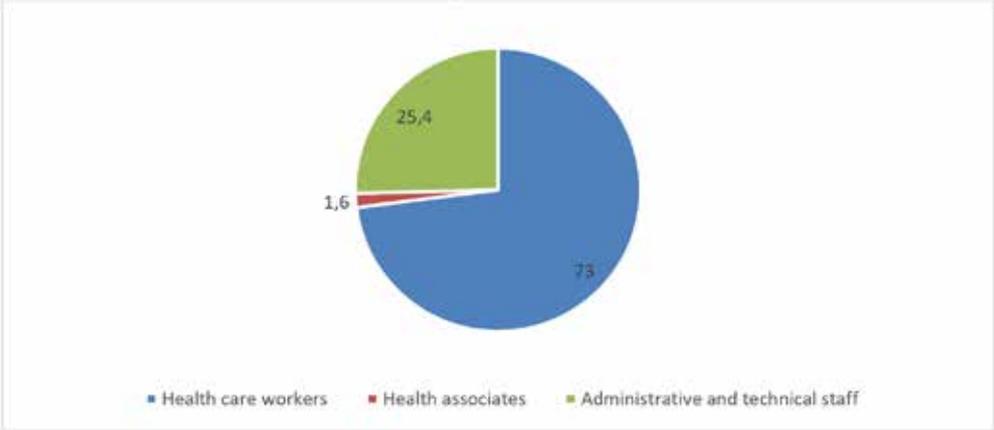
5.1 Health care personnel

In the territory of the Federation of BiH, there were 27,517 employees in the public health care sector during 2020, which is more than in 2019 (26,811).

According to the data of the Health Insurance and Reinsurance Institute of the Federation of BiH, the number of employees in the health insurance institutes in the Federation of BiH in 2020 was 871, which is more compared to 2019 (858). According to the data of this Institute, in 2020, 5089 employees worked in private practice.

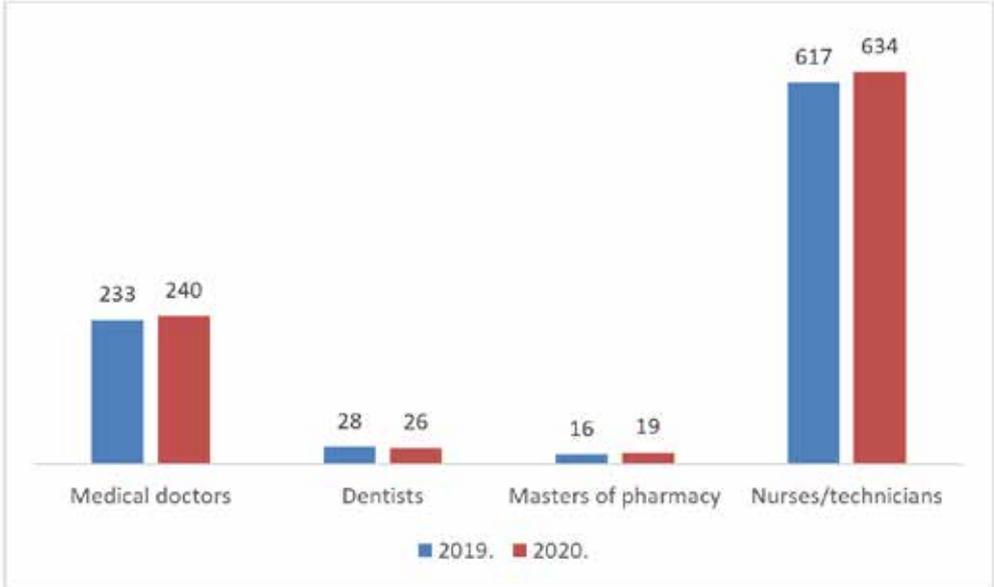
In 2020, the public health care sector in the Federation of BiH employed 73% of health workers, 25.4% of health associates and 1.6% of administrative and technical staff.

Figure 67: Healthcare employees in the Federation of BiH, 2020, structure index (%)



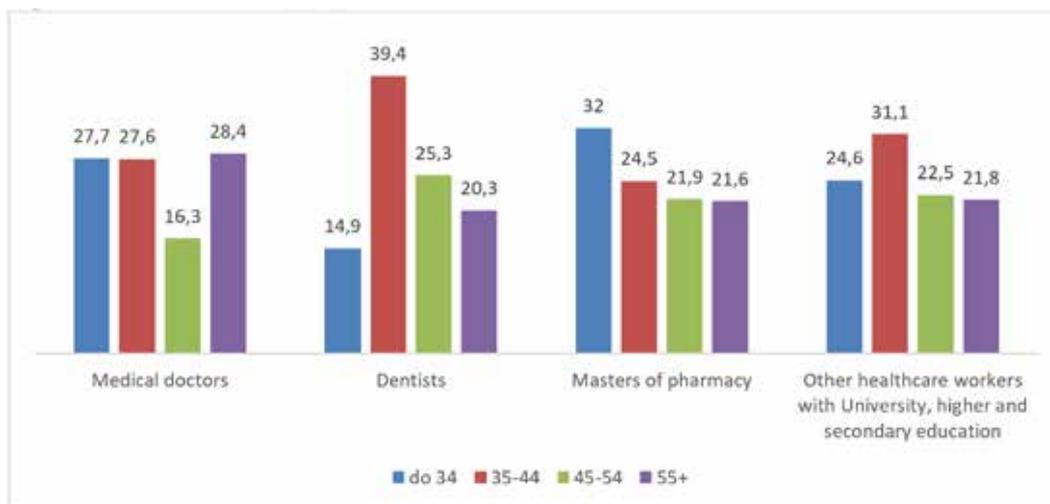
In 2020, the public health care sector in the Federation of BiH employed 240 doctors of medicine, 26 doctors of dentistry, 19 masters of pharmacy and 634 nurses/technicians, per 100,000 population.

Figure 68: Healthcare employees in the Federation of BiH, 2019 and 2020, rate per 100,000 population



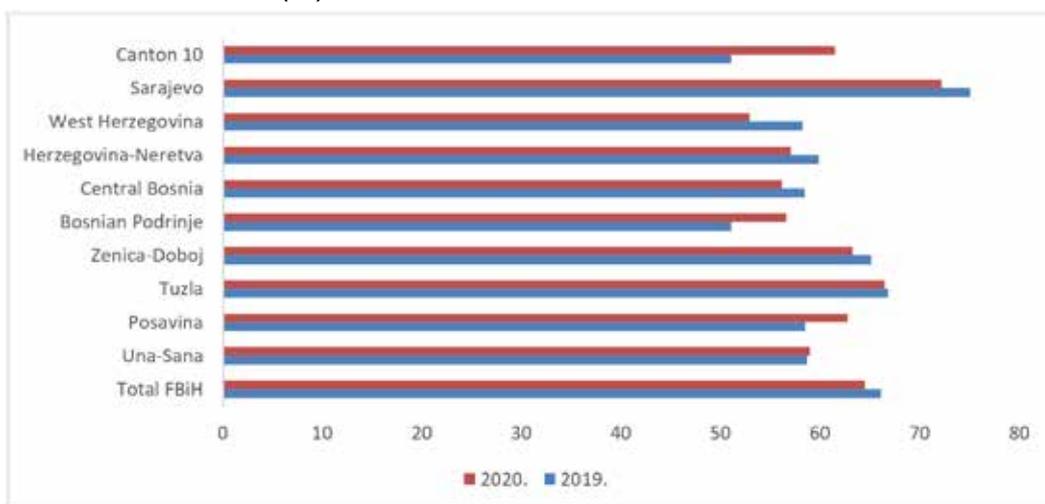
According to the age structure of employees in the health sector in the Federation of BiH (public sector), the majority of medical doctors are older than 55 (28.4%), while the most favourable age structure is among masters of pharmacy, more than half of whom are in the age group up to 44 (56.5%).

Figure 69: Healthcare employees in the Federation of BiH, by age, 2020, structure index (%)



In 2020, almost two thirds of all medical doctors in the public health care sector in the Federation of BiH were specialists in various disciplines (64.5%). The highest percentage was in Sarajevo Canton (72.2%), and the lowest in Central Bosnia Canton (52.2%).

Figure 70: Medical doctors – specialists in the Federation of BiH and by cantons, 2019 and 2020, structure index (%)



In 2020, the share of employees with a degree in health studies was 4.8%, as in 2019 (4.9%).

5.2 Primary health care (PHC)

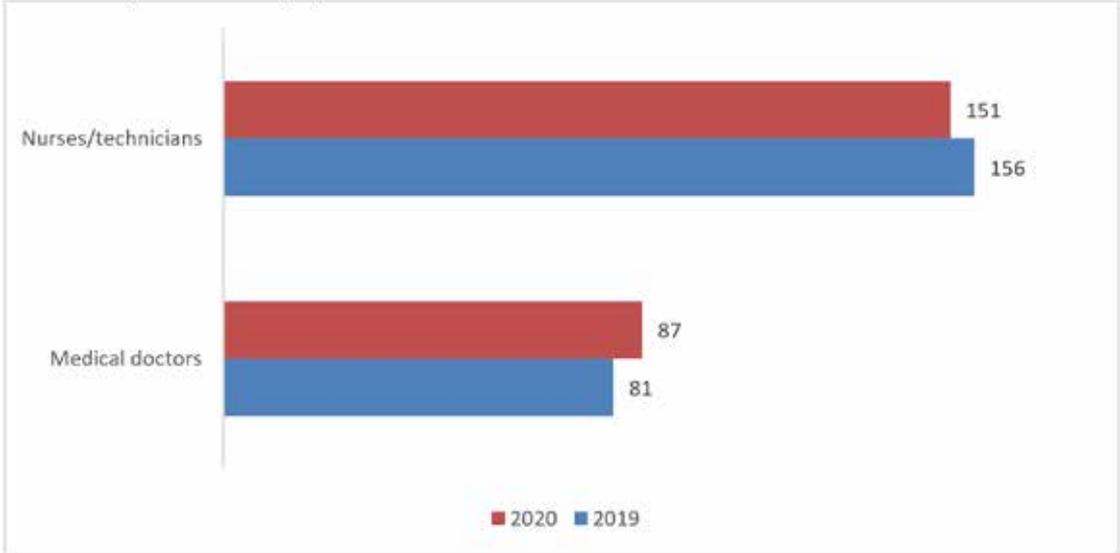
According to the Law on Health Care, health care at the primary level includes the implementation of measures to protect and improve the health of the population, prevention, treatment and rehabilitation of diseases and injuries, detection and control of risk factors for non-communicable diseases, specific youth preventive health care, immunization against infectious diseases, treatment and rehabilitation, palliative care etc. In order to ensure the necessary access to health care, PHC is organized so that it is available to users in the municipality of their residence.

Primary health care includes family medicine, child health care, community polyvalent nurses, hygienic and epidemiological care, emergency medical care, women’s reproductive health care, health care for non-specific and specific lung diseases, community-based physical and mental rehabilitation, specific health care of workers as part of occupational medicine, dental health care, laboratory and radiological diagnostics of the primary level and pharmacy services.

Healthcare professionals in PHC

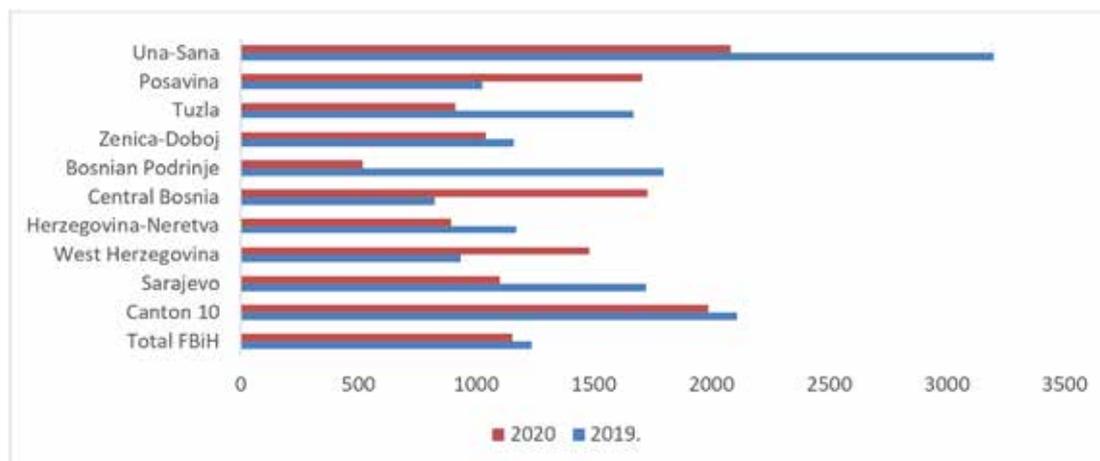
According to the data of regular health statistics for 2020, in the PHC services in the Federation of BiH (family medicine, health care of preschool and school age children, emergency medical care, women’s reproductive health care, community mental health centres, polyvalent community nurses, occupational medicine) there were 1,891 medical doctors (34.8% of the total number) and 3,289 nurses/technicians (25.3%) employed, i.e. 87 medical doctors and 151 nurses/technicians per 100,000 population. In 2019, 1,771 medical doctors and 3,416 nurses/technicians were employed at the PHC level.

Figure 71: Medical doctors and nurses/technicians in PHC in the Federation of BiH, 2019 and 2020, rate per 100,000 population



In 2020, there was an average of 1,155 inhabitants per one medical doctor in PHC, with the largest number of inhabitants per one medical doctor in the Una-Sana Canton (2,082), and the smallest in the Herzegovina-Neretva Canton (894).

Figure 72: Number of inhabitants per one medical doctor in PHC in the Federation of BiH, 2019 and 2020



Family medicine

According to regular health statistics, there were 1,074 medical doctors employed in family medicine services in the Federation of BiH in 2020, of which two fifths, i.e. 426 (40%) had completed a specialization in family medicine, 178 of them (17%) were specialists of other disciplines with completed additional training (PAT), 290 (27%) were medical doctors with completed PAT, and 93 medical doctors were on specialization (8.7%).

Out of 1,409 nurses/technicians in family medicine services, 1,214 (86.1%) had completed additional training in family medicine (PAT), of which 55 (3.9%) were health care workers with a degree in health studies and completed additional training in family medicine (PAT), 53 (3.8%) were nurses/technicians of higher education level with PAT and 1,106 (78.5%) nurses/technicians of secondary education with PAT, and 237 other medical nurses/technicians.

In 2020, the total number of visits to medical doctors in family medicine services in the public health sector was 6,346,521, i.e. 14.1% less than in 2019 (7,243,588), which was affected by the Covid-19 pandemic and change in the organization of work in health care centres in all cantons. The number of visits per medical doctor averaged 5,909 per year or 26 per day, which is less than in 2019 (the average number of visits per medical doctor per year was 7,080 and 31 per day).

Table 42: Visits to medical doctors in family medicine services in the Federation of BiH in 2019, overview by cantons

Canton	No. of points	No. of medical doctors	Visits to medical doctors TOTAL	Average number of medical doctor visits per year	Average number of medical doctor visits per day
Una-Sana	43	71	319172	4495	20
Posavina	10	15	72684	4846	21
Tuzla	122	289	1609979	5571	24
Zenica- Doboј	104	227	1162315	5120	22
Bosnian Podrinje	16	19	129966	6840	30
Central Bosnia	47	59	493073	8357	36
Herzegovina-Neretva	60	137	511959	6792	16
West Hezegovina	12	37	251300	8160	30
Sarajevo	94	205	1672876	7281	35
Canton 10	8	13	123197	9477	41
Federation of BiH	516	1074	6346521	5909	26

Contrary to visits to medical doctors, significantly more preventive examinations were registered in the family medicine services in 2020 than in 2019. Thus, 121,759 systematic health check ups of the adult population were registered (44,874 in 2019), 832,237 consultations by medical doctors (505,908 in 2019), 936,461 consultations by nurses/technicians (444,369 in 2019), other preventive services of medical doctors (173,718), which is more than in 2019 (144,787), and 377,478 other preventive services of nurses/technicians (187,250 in 2019).

During 2020, 29,780 home visits of medical doctors were registered (28,750 in 2019), so the share of home visits in relation to the number of first visits to the doctor's office (1,243,525) was 2.4%.

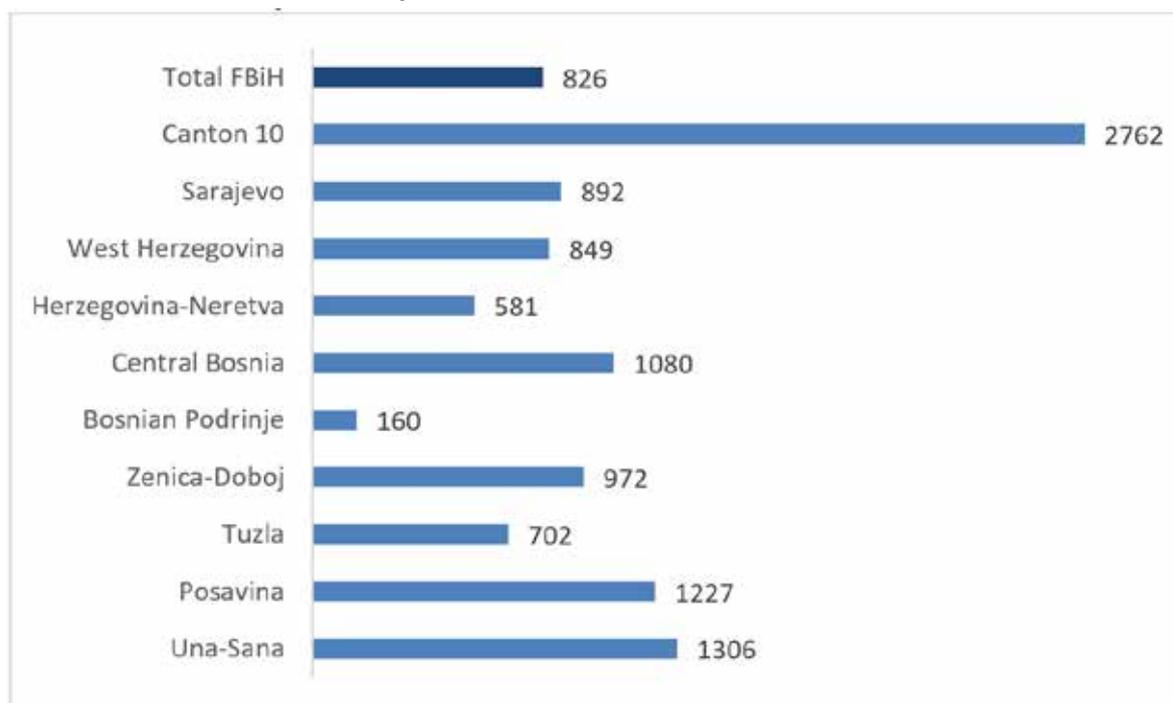
The share of patients referred to the laboratory in relation to the first visits was 76.1%, and the share of patients referred to specialists in relation to the first visits was 112%, which means that the patient was referred to several doctors of different specialties at the first visit.

Health care of preschool children

In the health care services for preschool children in 2020, according to regular health statistics, there were 158 doctors of medicine and 287 nurses/technicians, which is similar to 2019 (160 doctors of medicine and 283 nurses/technicians). Nearly three-quarters of medical doctors were paediatricians (71%).

In these services, there were on average 826 preschool aged children per one medical doctor in the Federation of BiH, and there are differences among the cantons.

Figure 73: Number of children per medical doctor in the health care of preschool children in the Federation of BiH and by cantons in 2020



In 2020, there were 329,791 visits to physicians per one medical doctor in the preschool health care services for children, significantly less than in 2019 (563,594) and it is probably a consequence of the Covid-19 pandemic. On average, there were 9 visits per day per medical doctor. Also, a smaller number of total preventive health check ups was recorded in 2020 (79,475) compared to 2019 (144,195).

In 2020, 58,765 systematic health check ups were performed in the counselling centre, slightly less than in 2019 (63,366), of which most were infants (29,062 or 45.9%), followed by children aged 4 - 6 years (20,200 or 31.9%) and children aged 1 - 3 years (14,104 or 22.9%). There were 257 home visits by medical doctors, an average of 1.6 per medical doctor.

The report presents the results of physical development, infant nutrition, rickets, anaemia, psychomotor development, visual, hearing and speech disorders, disorders and diseases of the teeth and mouth, musculoskeletal disorders, congenital anomalies and genital anomalies, by sex and age subgroups (up to 2 months, 3 - 5 months, 6 - 11 months, 1 - 3 years and 4 - 6 years). In the preschool health care services, a significant activity is the monitoring of early growth and development (ECD) of children aged 0-6 years with a focus on children up to 3 years of age. In 2020, 7,122 children were registered for assessment, of which 13.3% (944) had a deviation in ECD predominantly in the communication area (73.4% or 693).

73.7% of children with developmental deviations were referred for further diagnosis, and 1,714 interventions were registered at the ECD/intervention centre.

Mental health centres

Mental health services in the Federation of BiH in 2020 were provided in 57 geographical locations/outpatient clinics of mental health centres.

According to the regular health statistics report in 2020, there were 50 medical doctors, 117 nurses/technicians, 15 occupational therapists, 69 psychologists and 43 social workers employed.

The Mental Health Centre provides specialist-consultative health care, providing psychosocial assistance to war-traumatized persons, individual and group psychotherapy of psycho-traumatized persons, psychosocial assistance to vulnerable persons, psychological diagnostics, home visits as needed, family assistance, consultative-specialist psychiatric examinations, processing for the disability-pension commission /DPC/, medication therapy, crisis interventions, etc.

In preventive work, the centres have the task of promoting mental health, each in its own community/canton, mostly through educational work.

During 2020, there were 105,675 visits to doctor, slightly less than in 2019 (115,515), and 208,602 visits to other team members, which is more than in 2019 (142,384). There were 445 doctors' home visits (396 in 2019) and 3,677 home visits of other team members registered, and 585 patients were referred for hospitalization (781 in 2019). Despite the Covid-19 pandemic, group therapy (2,634) and community-based prevention and promotion programmes were conducted.

Emergency medical care

Emergency medical care on the territory of the Federation of BiH in 2020 was of great importance in the fight against the Covid-19 pandemic. Emergency medical services were organized in 77 geographical locations/clinics, which is slightly more than in 2019 (71).

According to the regular health statistics report, in 2020, there were 369 medical doctors employed in emergency medical services (314 in 2019), of which only 84 (22.8%) were emergency medicine specialists, 763 nurses/technicians (711 in 2019) and 11 other workers.

The number of 744,103 visits to medical doctors were recorded, which is less than in 2019 (1,027,471), followed by 1,094,308 examinations by other health professionals (1,322,577 in 2019), 90,974 field interventions - at home, which is more than in 2019 (87,977), 21,774 interventions in public places, and significantly more emergency medical transport services - 44,286 than in 2019 (27,172).

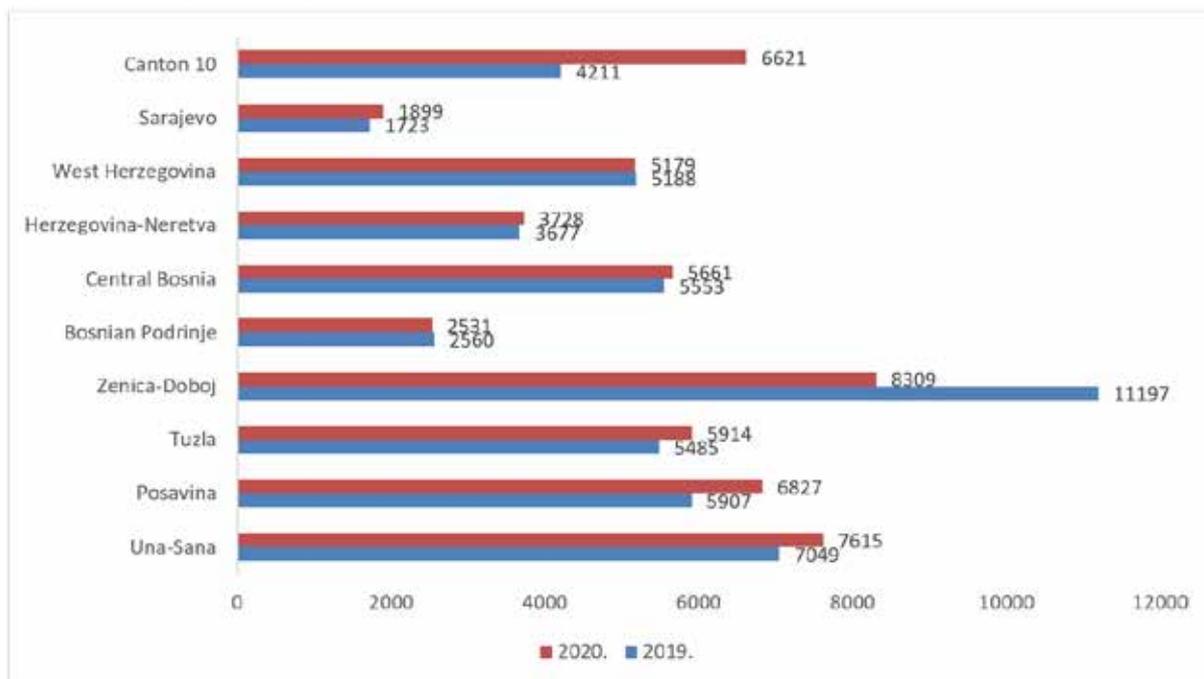
Dental care

In 2020, the inhabitants of the Federation of BiH received dental and oral health care services in the public sector in 192 geographical locations / clinics, which is less than in 2019 (202).

In 2020, there were 521 dentists (24/100,000 inhabitants) and 627 dental nurses/ technicians (28.7/100,000) providing dental care services in the public sector of PHC.

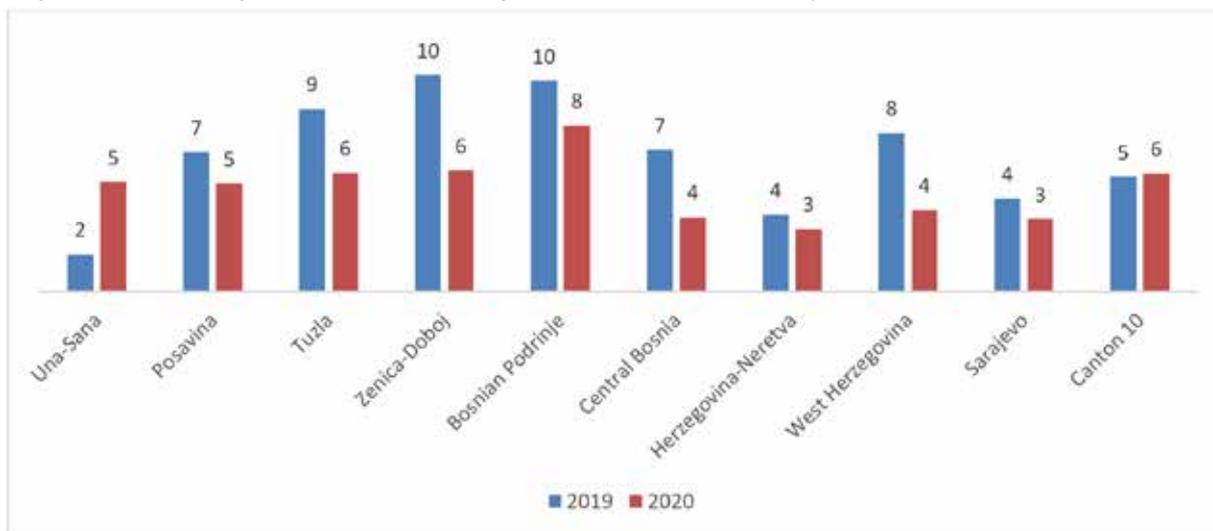
There were an average of 4,193 inhabitants per dentist in 2020 in the public sector of PHC, the most in Zenica-Doboj Canton (8,309) and the least in Sarajevo Canton (1,899), noting that an increasing number of residents use the services of private sector.

Figure 74: Population per dentist, overview by cantons for 2019 and 2020



In 2020, there were 545,849 visits to dentists in the public sector of PHC, so there were fewer visits than in previous years, i.e. an average of 4 visits per day. The highest average number of visits was in the Bosnian Podrinje Canton, 8 for 2020, and the lowest average number of visits, 3, was in the Sarajevo Canton and the Herzegovina-Neretva Canton.

Figure 75: Average number of visits per dentist, overview by cantons for 2019-2020

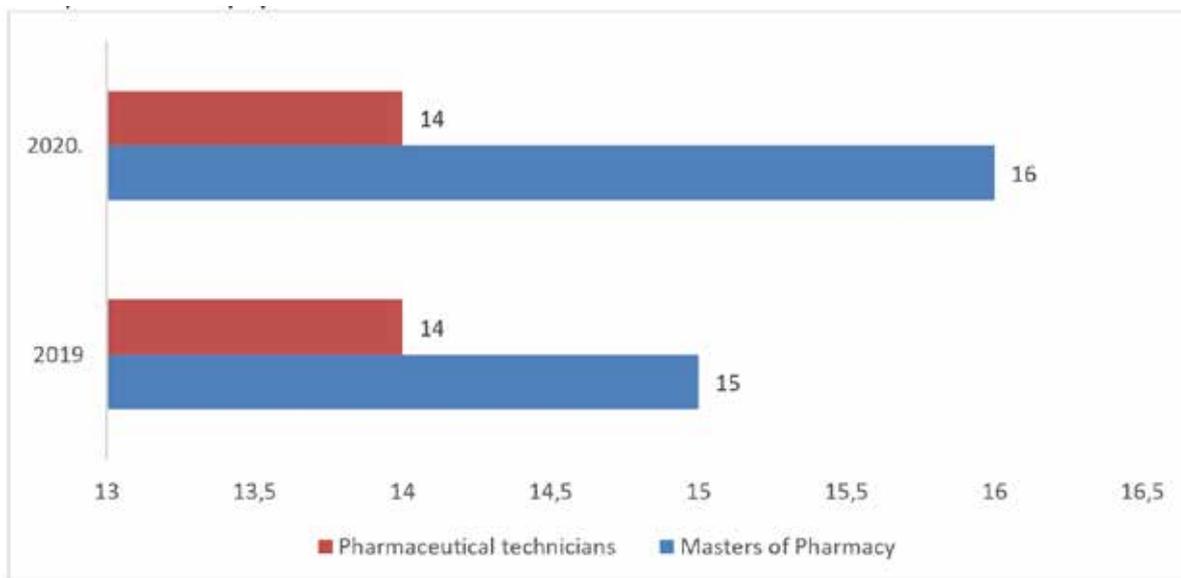


Pharmacies

According to incomplete data from regular health statistics (two cantons did not submit data), in 2020, there were 353 masters of pharmacy (16/100,000) and 313 pharmaceutical technicians (14/100,000) working in 51 pharmacies - health institutions in the public sector, which is similar as in 2019, when there were 15 masters of pharmacy and 14 pharmaceutical technicians per 100,000 inhabitants.

In addition to pharmacies in the public sector, the pharmacy activity was also provided by numerous pharmacies in the private sector.

Figure 76: Employees in public sector pharmacies in the Federation of BiH, in 2019 and 2020, rate per 100,000 population



There were 3,628,169 registered finished essential prescription drugs, 3,904,686 other finished prescription drugs and 80,654 magistral drugs.

The number of prescriptions issued for essential drugs in 2020, in the public sector, was 1.7 per capita, the same as in 2019.

5.3. Specialist-consultative health care

In 2020, specialist-consultative health care was available to the residents of the Federation of BiH at 376 geographical locations/outpatient clinics in 1,088 offices. (2019: 479 geographical locations/outpatient clinics and 991 offices).

Specialist-consultative health care in the public sector in 2020 was provided by 1,331 specialist medical doctors (60.9 specialist medical doctors per 100,000 inhabitants), similar to the previous year (63.8 specialist medical doctors per 100,000 inhabitants), and 2,031 nurses/technicians (93/100,000, and 77.6 in 2019).

There were 29% fewer visits to specialist doctors (2,569,699 compared to 2019) (3,597,301), so the average number of visits per medical doctor in specialist-consultative health care was 8.4 per day, which is less than 2019 (11,2). The reduction in the number of visits, apart from the Covid-19 pandemic, may be conditioned by the continuous strengthening of the private sector in this type of health care.

5.4. Hospital health care

In the Federation of BiH in 2020, hospital health care was provided in 24 hospitals (3 university clinical centres, 6 cantonal hospitals, 9 general hospitals, 3 special hospitals and 3 rehabilitation centres/spas).

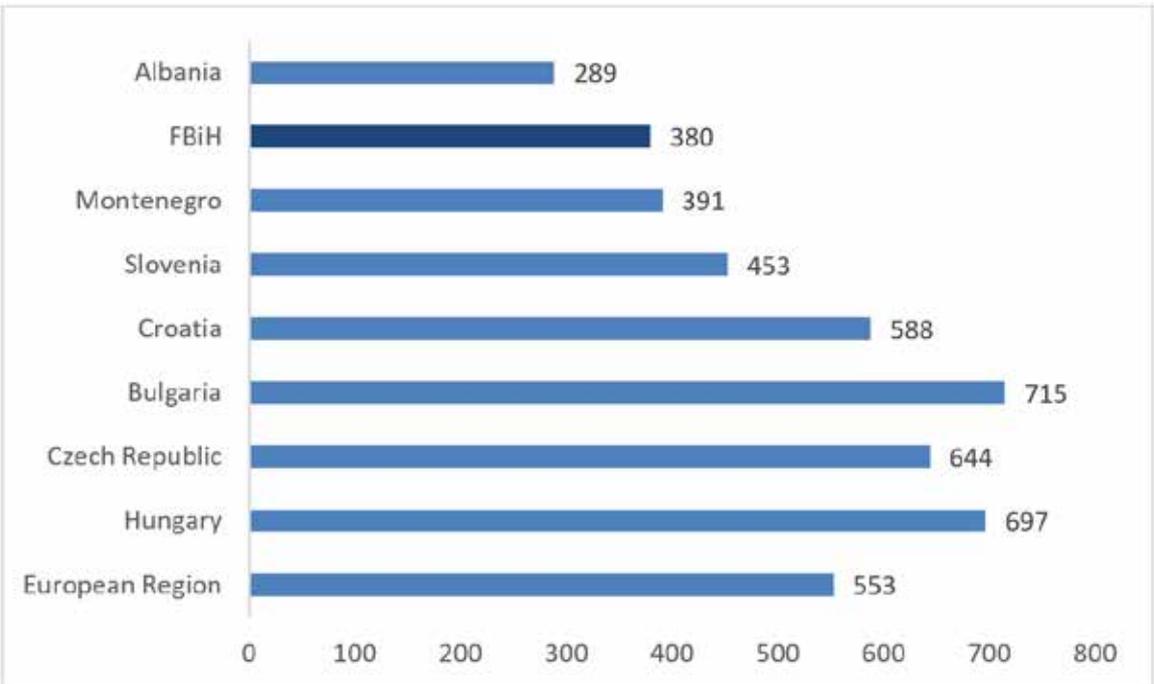
In 2020, all hospitals in the Federation of BiH organized their work so that priority is given to patients with Covid, which was reflected in other hospital services.

In 2020, slightly more than two-fifths of all medical doctors or 2,270 medical doctors (44.7%) worked in hospitals, which is less than in 2019 (2,283), and 5,447 nurses/technicians (40.1% of the total number), which is also less than in 2019 (5,476).

In 2020, there were 104 medical doctors and 250 nurses/technicians per 100,000 inhabitants in hospitals, and an average of 2.4 nurses/ technicians per one medical doctor, which is similar to 2019.

According to the latest available data from the WHO database, the Federation of BiH still has a smaller number of beds per 100,000 inhabitants (380) compared to neighbouring countries, as well as the average of the WHO European Region (553/100,000).

Figure 77: Number of hospital beds in the Federation of BiH and selected countries in the European region, rate per 100,000 population

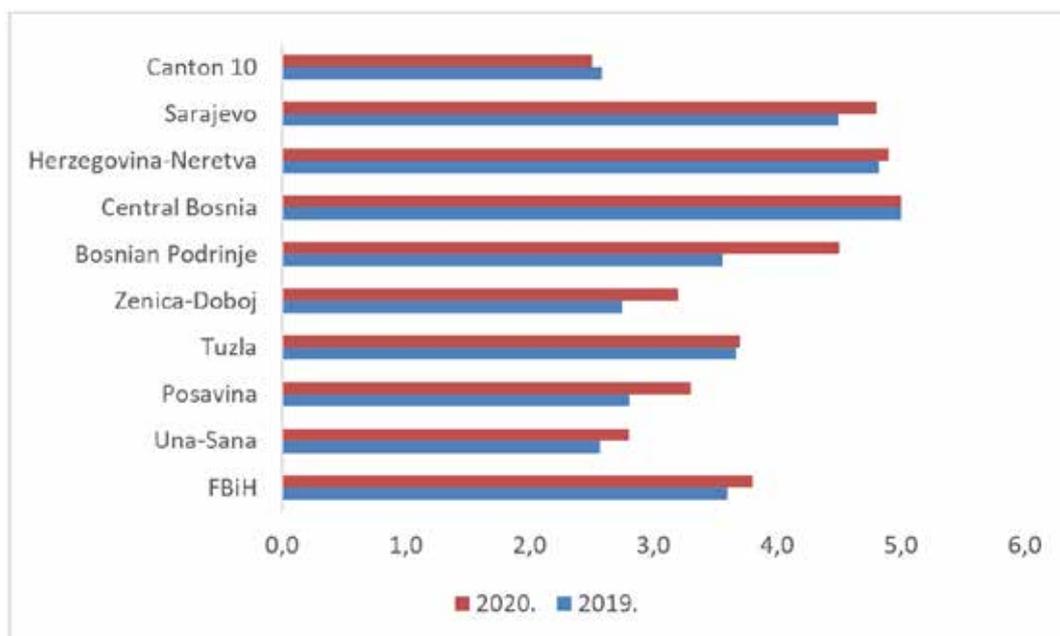


In 2020, the largest number of hospital beds was in the Central Bosnia Canton (5.0/1,000 inhabitants), the Herzegovina-Neretva Canton (4.9/1,000) and the Sarajevo Canton (4.8/1,000).

Sarajevo Canton has another 115 hospital beds for daily hospitalization.

There are 12 inpatient beds also in function in the territory of the Federation of BiH.

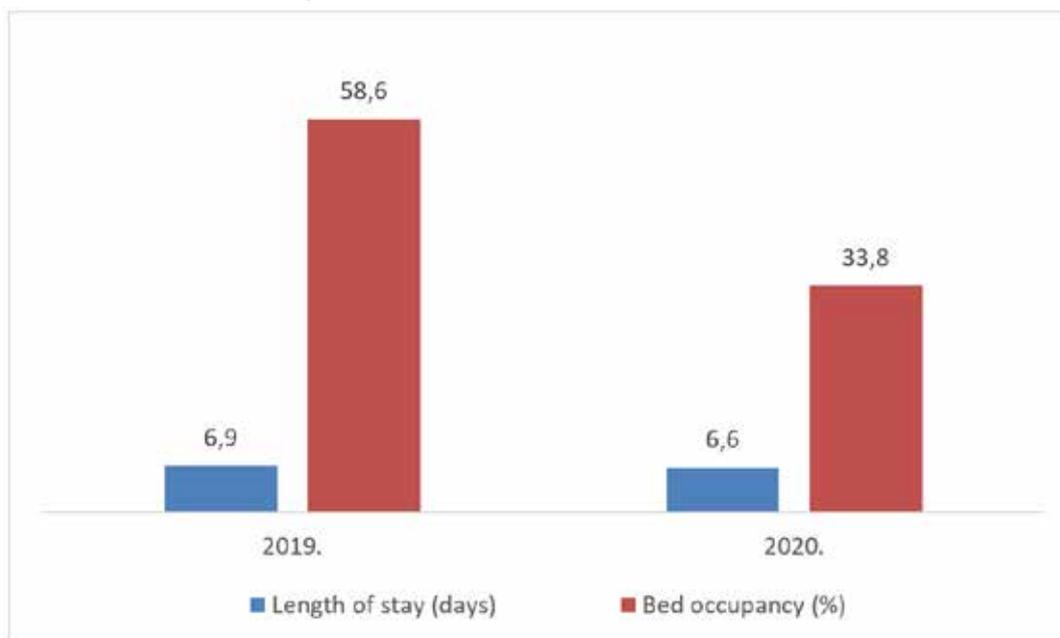
Figure 78: Number of hospital beds by cantons and in the Federation of BiH in 2020, rate per 1,000 inhabitants



In 2020, number of beds per one hospital doctor was 3.6 beds and 1.5 beds per one nurse/ technician, similar to 2019. In 2019, there were 3.6 beds per medical doctor, and 1.5 hospital beds per nurse/technician.

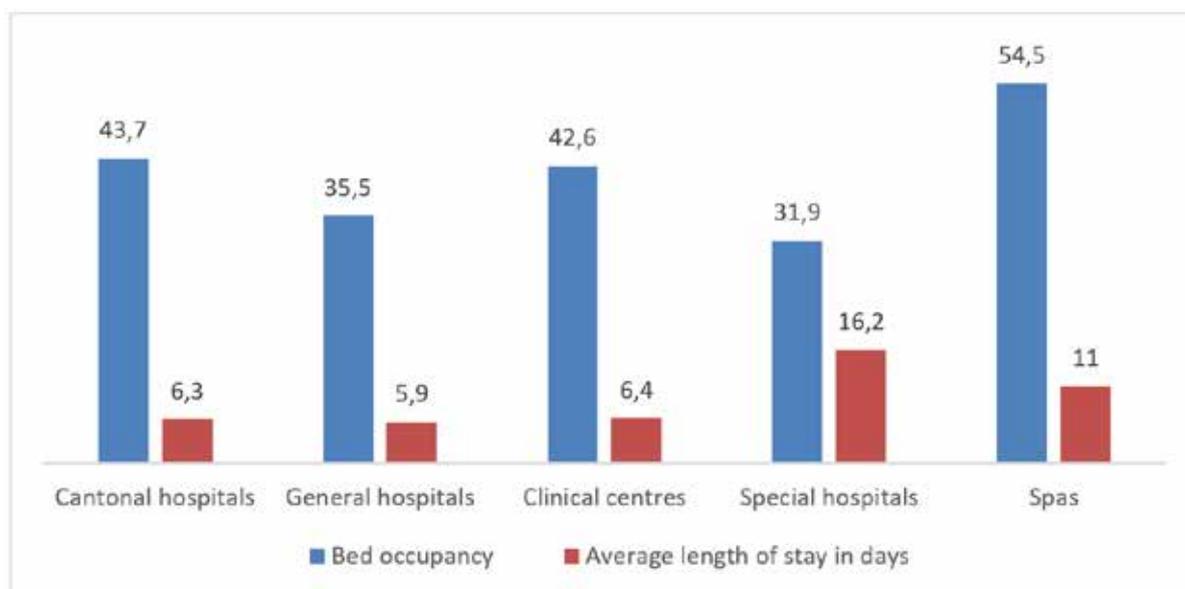
In the Federation of BiH in 2020, the average length of hospital stays was 6.6 days, and the average occupancy of hospital beds was 33.8%, which is the lowest occupancy in recent years.

Figure 79: Utilization of hospital resources in the Federation of BiH, 2017 - 2019



In 2020, the longest length of stay was recorded in special hospitals (16.2 days), and the highest bed occupancy was in health spas (54.5%).

Figure 80: Utilization of hospital resources according to the levels of hospitals in the Federation of BiH, 2020



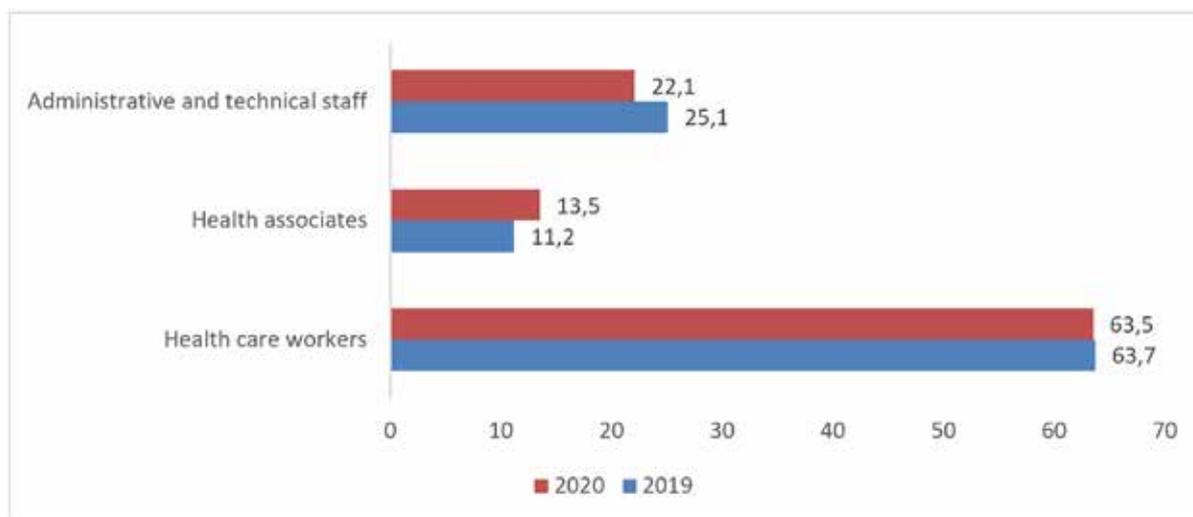
5.5. Public health

According to the Law on Health Care, public health activity at the level of primary health care in the Federation of BiH is performed through hygienic-epidemiological services, which are organized at health care centres or at institutes for public health.

The secondary level of public health activity is performed by cantonal institutes for public health, while the secondary and tertiary public health activity at the level of the Federation of BiH is the responsibility of the Institute for Public Health of FBiH, whose activity is professional and scientific research.

Nearly two thirds of the employees in the public health institutes in 2019 and 2020 were health workers, about a quarter of all employees were administrative and technical workers, and slightly more than one tenth were health associates.

Figure 81: Employees in institutes for public health in the Federation of BiH in 2019 and 2020, structure index



Activities in institutes for public health in FBiH are mainly carried out by medical doctors, who in the structure in 2020 made up about a fifth of health workers in public health institutes (21.1%). Most medical doctors were specialists (81.3%) in some of the public health disciplines: social medicine, epidemiology, hygiene and microbiology. However, the age structure of specialists is unfavourable, so 52.7% of specialists were in the age group over 55.

In 2020, slightly more than half of health workers were nurses/technicians (52.9%), and 49.3% were health workers with a degree in health studies, whose share in the structure of employees has a growing trend.

Among non-health workers in institutes for public health, the largest number are chemical and physics engineers, food technologists, computer scientists, economists and lawyers.

5.6. Health management

The introduction of education for future directors of health care institutions was based on several studies conducted in the Federation of BiH, which confirmed that one of the weaker links of the health care system is insufficient knowledge and management skills of health care managers.

The Law on Health Care (Official Gazette of the Federation of BiH, 46/10), Rulebook on continuing professional education in health management (Official Gazette of the Federation of BiH, 88/11), Rulebook on amendments to the rulebook on continuing professional education in the health management (Official Gazette of the Federation of BiH, 82/13), as well as the Rulebook on amendments to the Rulebook on the conditions regarding the type of graduated faculty of health, which must be met by persons competing for the director of the health institution (Official Gazette of the Federation of BiH, 83/15), the obligation of education in health management and the ways, levels and deadlines thereof are fully regulated.

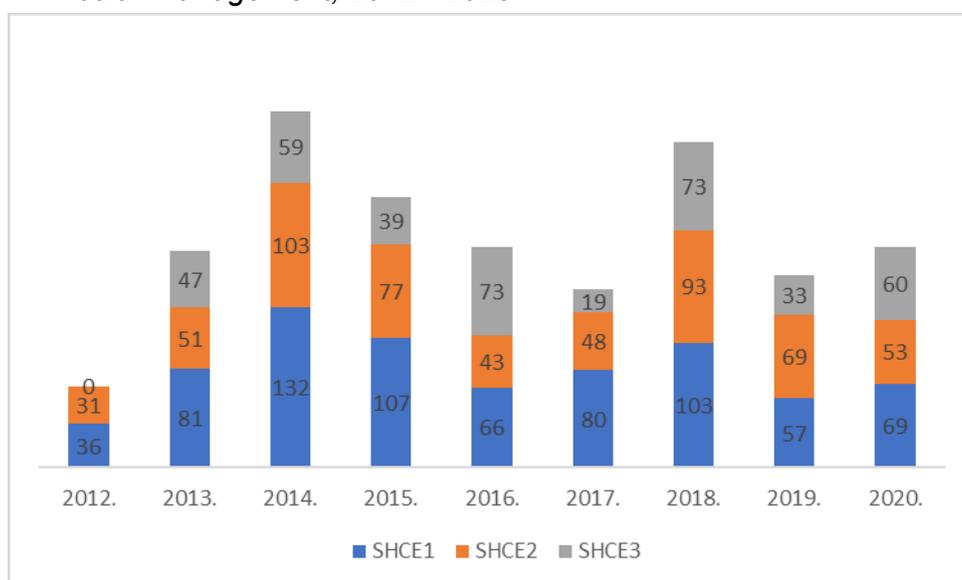
One of the possibilities for obtaining a certificate is the completed continuing professional education in health management (CPE), which, since 2012, in three levels of education, is

conducted by the Institute for Public Health of the Federation of BiH, as a holder, and the School of Economics, University of Sarajevo, as a co-holder.

In mid-2015, based on the evaluation of remarks and suggestions of participants from previous years and the request of the Federal Minister of Health, the curriculum of the CPE was redesigned, which, as well as the organization and implementation of classes, included the Faculty of Medicine and the Faculty of Economics of the University of Mostar, Faculty of Economics of the University of Tuzla, Faculty of Medicine of the University of Sarajevo, and the Agency for Quality and Accreditation in Health Care in the Federation of BiH (AKAZ).

From 2012, when CPE started, until the end of 2020, 601 participants received certificates of basic level of education, 583 participants received certificates of intermediate level of education, and 450 participants received certificates of advanced level (top managers).

Figure 82: Number of participants who completed SHCE1, SHCE2 and SHCE3 level of education in health management, 2012 - 2020



The end result of education, which is the improvement of the management of health care institutions, as one of the keys to having a successful health care system, can be expected already now, and especially in the future.

5.7. Private practice

In recent years, the number of private health care institutions/private practices in the Federation of BiH has increased (1,225 in 2018, and 1,228 in 2019) until 2020, when 1,108 were registered with 5,089 employees (85 more than in 2019).

In accordance with the Law on Health Care and the Law on Mandatory Records in the Field of Health Care, private health care institutions/private practices have the obligation to report regularly on their work. Although reporting is improving, it is still not complete, which makes it difficult to have a full insight into the health status of the population and the organization of health care.

5.8. Migrants

Overview of provided health services and recorded trends of morbidity for persons coming from the population of migrants and asylum seekers located within temporary reception centers in the territory of the Federation of Bosnia and Herzegovina.

During 2020, the Danish Refugee Council (DRC), in cooperation with the medical teams of the competent health care centres, enabled the provision of primary health care services within 8 reception centres in the territory of the Federation of BiH.

The medical team of the competent health care centre consists of 1 medical doctor and 2 medical technicians. In addition, the DRC provides certain medical services through the presence of medical assistants and medical officers (medical technicians by profession) during and outside the working hours of the medical teams of the competent health care centre.

Table 43: P Cross-section of medical staff attendance by centres for 2020

Reception centres	Medical doctor (HCC)	Medical technician (HCC)	Medical technician (DRC)
TRC Blažuj	1	2	3
TRC Ušivak	1	2	1
TRC Miral	1	2	2
TRC Bira	1	2	3
TRC Lipa	1	2	3
TRC Borići	1	2	2
TRC Sedra	1	2	2
RC Salakovac	1	1	1
TOTAL	8	15	17

According to the needs and the number of users in the centre, the medical teams of the competent health care centres were present on weekdays, and even on weekends, for several hours.

Table 44: Cross-section of working hours of medical teams by centres for 2020

Reception centres	Days of the week	No. of hours per day	Total no. of hours per week
TRC Blažuj	Mon-Fri; Sat	7; 4	39
TRC Ušivak	Mon-Fri	7	35
TRC Miral	Mon-Sat	6	36
TRC Bira	Mon-Fri	7	35
TRC Lipa	Mon-Fri	7	35
TRC Borići	Mon-Fri	7	35
TRC Sedra	Mon-Fri	4	20
RC Salakovac	Mon-Wed-Fri	4	12
TOTAL			247

Primary health care within TRC medical clinics included medical examinations, and the provision of medical care and interventions by a team (physician and medical technician) of the competent health care centres.

Table 45: Cross-section of provided services by reception centres for 2020

Reception centres	Medical examination	Medical interventions
TRC Blažuj	25,222	5,971
TRC Ušivak	16,822	2,538
TRC Miral	17,534	3,503
TRC Bira	6,530	4,195
TRC Lipa	17,765	5,192
TRC Borići	6,421	994
TRC Sedra	5,713	939
RC Salakovac	1,210	811
TOTAL 2020	97,217	24,143

* Data for TRC Bira cover the period from 1 January 2020 to 30 September 2020 when the centre is closed

** Data for TRC Lipa include the period from the opening on 21 April 2020 to 23 December 2020, when the centre was closed

Information on the most commonly reported diseases is available through data provided by the medical teams of the competent health care centres. Unfortunately, it is not possible to conclude from the data how many first and control examinations there are. The data include the cross-section of the diseases according to the ICD-10 classification.

Table 46: The overall cross-section of the incidence of the disease for 2020

Diseases according to ICD-10 classification	Code	Absolute number	Share in %
Certain infectious and parasitic diseases	A00-B99	9,903	11.45
* <i>Head lice (Pediculosis capitis)</i>	B85.0	710	0.82
* <i>Body lice (Pediculosis corporis)</i>	B85.1	140	0.16
* <i>Scabies (scabies)</i>	B86	5,101	5.90
Neoplasms	C00-D48	84	0.10
Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism	D50-D89	477	0.55
Endocrine, nutritional and metabolic diseases	E00-F90	791	0.91
Mental and behavioural disorders	F00-F99	1,797	2.08
Diseases of the nervous system	G00-G99	1,567	1.81
Diseases of the eye and adnexa	H00-H59	1,318	1.52
Diseases of the ear and mastoid process	H60-H95	969	1.12
Diseases of the cardiovascular system	I00-I99	1,045	1.21
Diseases of the respiratory system	J00-J99	18,843	21.78
Diseases of the digestive system	K00-K93	7,877	9.10
Diseases of the skin and subcutaneous tissue	L00-L99	13,242	15.31
Diseases of the musculoskeletal system and connective tissue	M00- M99	10,919	12.62
Diseases of the genitourinary system	N00-N99	2,150	2.49
Pregnancy and childbirth	O00-O99	406	0.47
Certain conditions originating in the perinatal period	P00-P96	0	0.00
Congenital malformations, deformations and chromosomal abnormalities	Q00-Q99	0	0.00
Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified	R00-R99	6,124	7.08

Injuries, poisonings and certain other consequences of external causes	S00-T98	5,800	6.70
Codes for special purposes	U00-U99	221	0.26
External causes of morbidity and mortality	V01-Y98	130	0.15
Factors influencing health status and contact with health services	Z00-Z99	2,850	3.29

As part of health care, referral to health care institutions is also possible in order to provide specialist examinations and further diagnostics. These services are provided through contracts with secondary health care institutions.

Table 47: Number of referred for diagnostics and specialist examinations

Reception centres	No. of referrals	No. of users
TRC Blažuj	374	372
TRC Ušivak	274	274
TRC Miral	175	131
TRC Bira	450	387
TRC Lipa	295	241
TRC Borići	255	198
TRC Sedra	277	229
RC Salakovac	84	84
TOTAL 2020	2,184	1,916

* Data for TRC Bira cover the period from 1 January 2020 to 30 September 2020 when the centre is closed

** Data for TRC Lipa include the period from the opening on 21 April 2020 to 23 December 2020, when the centre was closed

From the beginning of the epidemic, until 31 December 2020, the DRC, in cooperation with the medical teams of the competent health care centres, and according to the recommendations of the institutes for public health at the cantonal and FBiH level, implemented measures of enhanced hygienic and epidemiological surveillance and measures to prevent the spread of Covid-19 among the population within the reception centres.

Table 48: Cross-section of Covid-19 relevant numbers in and out of centres for 2020

Reception centres	No. of in- screenings	No. of testing	No. of positive cases
TRC Blažuj	27,078	41	6
TRC Ušivak	10,856	26	1
TRC Miral	6,996	22	5
TRC Bira	2,145	72	10
TRC Lipa	8,915	48	1
TRC Borići	1,651	35	1
TRC Sedra	2,484	59	3
RC Salakovac	1,224	58	4
TOTAL	61,349	361	31

* Data for TRC Bira cover the period from 1 January 2020 to 30 September 2020 when the centre is closed

** Data for TRC Lipa include the period from the opening on 21 April 2020 to 23 December 2020, when the centre was closed

6. OVERVIEW OF SELECTED INDICATORS BY CANTONS

Una-Sana Canton



Table 1: Population by municipalities *

Municipality	Area, km ²	Population estimate
Bihać	900.0	55,805
Bosanska Krupa	561.0	24,587
Bosanski Petrovac	709.0	6,345
Bužim	129.0	19,240
Cazin	356.0	65,239
Ključ	358.0	15,674
Sanski Most	781.0	39,651
Velika Kladuša	331.0	39,994
TOTAL CANTON:	4.125	266,535
Population/ km²	69.7	

* population estimate on 30 June 2020

Table 2: Vital statistics indicators for 2019 and 2020

	2019	2020
Birth rate	6.5	5.8
Death rate	8.7	10.0
Infant deaths	11.5	6.4
Natural increase	-2.2	-4.2

Table 3: Leading causes of death for 2019 and 2020 *

2019				2020			
Rank	Disease	No. of deaths	Structure Index (%)	Rank	Disease	No. of deaths	Structure Index (%)
1	Stroke (I63)	443	19.0	1	Stroke (I63)	430	16.1
2	Acute myocardial infarction (I21)	229	9.8	2	Acute myocardial infarction (I21)	315	11.8
3	Cardiomyopathy (I42)	138	5.9	3	COVID 19-virus confirmed (U07.1)	259	9.7
4	Essential hypertension (I10)	116	5.0	4	Malignant neoplasms of the bronchus and lung (C34)	121	4.5
5	Chronic ischemic heart disease (I25)	98	4.2	5	Non-insulin dependent diabetes mellitus (E11)	94	3.5
	Other causes of death	1304	56.0		Other causes of death	1458	54.5
	Total deaths	2328	100%		Total deaths	2677	100%

* Data from the FBiH Institute for Statistics - causes of death in FBiH 2020

Table 4: Leading infectious diseases for 2019 and 2020

2019				2020			
Rank	Disease / condition	No. of registered	Mb/ 100000	Rank	Disease / condition	No. of registered	Mb/ 100000
1	ILI/ Influenza	1303	486.40	1	Covid 19	2444	898.35
2	Varicellae	747	287.8	2	ILI/ Influenza	1997	734.05
3	Enterocolitis acuta	485	181	3	Varicellae	279	102.55
4	Scabies	89	33.2	4	Enterocolitis acuta	187	68.74
5	Morbilli	84	31.3	5	Scabies	69	25.36
	Total reported	3039	1134.40		Total reported	5202	1912.13

Table 5: Environmental health indicators

Una-Sana Canton	% of population connected to the central water supply system	% of the population connected to the sewerage system	Measurement of SO ₂ concentration in air	Measurement of NO ₂ concentration in air	Measurement of smoke concentration in the air
			not measured	not measured	not measured

Table 6: Health care for 2019 and 2020

No.		2019	2020
PHC	PHC clinics	146	144
	Dental clinics	23	29
	Public sector pharmacies	9	7
	Medical doctors	127	128
	Medical technicians / nurses	251	272
	Dental doctors	38	35
	Dental technicians / nurses	39	42
	*Pharmacists with master degree	20	19
	* Pharmaceutical technicians	28	26
Hospitals	Hospital beds	688	752

*Source: Pharmacy Report for 2020

Posavina Canton



Table 1: Population by municipalities*

Municipality	Area, km ²	Population estimate
Domaljevac-Šamac	44.4	4,486
Odžak	158.4	17,656
Orašje	121.8	18,817
TOTAL CANTON:	324.6	40,959
Population/ km ²	119.1	

* population estimate on 30 June 2020

Table 2: Preliminary vital statistics indicators for 2019 and 2020

	2019	2020
Birth rate	3.0	3.1
Death rate	11.7	14.0
Infant deaths	0.0	0.0
Natural increase	-8.7	-10.8

Table 3: Leading causes of death for 2019 and 2020 *

2019				2020			
Rank	Disease	No of deaths	Structure Index (%)	Rank	Disease	No of deaths	Structure Index (%)
1	Chronic ischemic heart disease (I25)	73	15.1	1	Acute myocardial infarction (I21)	61	10.7
2	Cardiomyopathy (I42)	72	14.8	2	COVID 19-virus confirmed (U07.1)	59	10.3
3	Acute myocardial infarction (I21)	25	5.2	3	Chronic ischemic heart disease (I25)	58	10.1
4	Stroke (I63)	23	4.7	4	Stroke (I63)	38	6.6
5	Chronic kidney disease (renal failure) (N18)	22	4.5	5	Chronic kidney disease (renal failure) (N18)	24	4.2
	Other causes of death	270	55.7		Other causes of death	332	58.0
	Total deaths	485	100%		Total deaths	572	100%

* Data from the FBiH Institute for Statistics - causes of death in FBiH 2020.

Table 4: Leading infectious diseases for 2019 and 2020

2019				2020			
Rank	Disease / condition	No. of registered	Mb/ 100000	Rank	Disease / condition	No. of registered	Mb/ 100000
1	Varicella	46	111.2	1	Covid 19	824	1925.95
2	Enterocolitis ac	36	87	2	ILI/Influenza	39	91.16
3	ILI/Influenza	25	60.4	3	Herpes zoster	3	7.01
4	TBC pulmonum activa	11	26.6	4	Enterocolitis ac	2	4.67
5	Herpes zoster	8	19.3	5	TBC pulmonum activa	1	2.34
	Total reported	140	338.6		Total reported	871	2035.81

Table 5: Environmental health indicators

Posavina canton	% of population connected to the central water supply system	% of population connected to the sewerage system	Measurement of SO ₂ concentration in air	Measurement of NO ₂ concentration in air	Measurement of smoke concentration in the air
			not measured	not measured	not measured

Table 6: Health care for 2019 and 2020

No.		2019	2020
PHC	PHC clinics	32	32
	Dental clinics	6	6
	Public sector pharmacies	...	1
	Medical doctors	24	24
	Medical technicians / nurses	46	48
	Dental doctors	7	6
	Dental technicians / nurses	6	7
	*Pharmacists with master degree	...	3
	* Pharmaceutical technicians	...	0
Hospitals	Hospital beds	116	136

*Source: Pharmacy Report for 2020

Tuzla Canton



Table 1: Population by municipalities*

Municipality	Area, km ²	Population estimate
Banovići	185.0	22,508
Čelić	140.0	9,854
Doboj-Istok	41.0	9,861
Gračanica	216.0	44,985
Gradačac	218.0	38,798
Kalesija	201.0	32,643
Kladanj	331.0	11,568
Lukavac	337.0	42,927
Sapna	118.0	10,538
Srebrenik	248.0	39,479
Teočak	29.0	7,066
Tuzla	294.0	109,527
Živinice	291.0	57,853
TOTAL CANTON:	2,649.0	437,607
Population/ km ²	188.4	

* population estimate on 30 June 2020

Table 2: Preliminary vital statistics indicators for 2019 and 2020

	2019	2020
Birth rate	8,3	7,9
Death rate	9,9	12,0
Infant deaths	9,6	9,9
Natural increase	-1,6	-4,2

Table 3: Leading causes of death for 2019 and 2020 **

2019				2020			
Rank	Disease	No. of deaths	Structure Index (%)	Rank	Disease	No. of deaths	Structure Index (%)
1	Essential hypertension (I10)	731	16.8	1	Acute myocardial infarction (I21)	61	1.2
2	Stroke (I63)	351	8.1	2	COVID 19-virus confirmed (U07.1)	59	1.1
3	Non- insulin dependent diabetes mellitus (E11)	236	5.4	3	Chronic ischemic heart disease (I25)	58	1.1
4	Malignant neoplasms of the bronchus and lung (C34)	244	5.6	4	Stroke (I63)	38	0.7
5	Chronic ischemic heart disease (I25)	213	4.9	5	Chronic kidney disease (renal failure) (N18)	24	0.5
	Other causes of death	2564	59.1		Other causes of death	5019	95.4
	Total deaths	4339	100%		Total deaths	5259	100%

** Data from the FBiH Institute for Statistics - causes of death in FBiH 2020

Table 4: Leading infectious diseases for 2019 and 2020

2019				2020			
Rank	Disease / condition	No. of registered	Mb/100000	Rank	Disease / condition	No. of registered	Mb/100000
1	ILI/Influenza	7492	1707.30	1	Covid 19	11046	2486.74
2	Varicella	1044	237.9	2	ILI/Influenza	4687	1055.16
3	Enterocolitis ac	744	169.5	3	Enterocolitis ac	407	91.63
4	Scabies	199	45.3	4	Varicella	347	78.12
5	Toxiinfectio aliment.	128	29.1	5	Scabies	105	23.64
	Total reported	10140	2310.70		Total reported	16800	3782.11

Table 5: Environmental health indicators

Tuzla canton	% of population connected to the central water supply system	% of population connected to the sewerage system	Measurement of SO ₂ concentration in air	Measurement of NO ₂ concentration in air	Measurement of smoke concentration in the air
			measured	measured	measured

Table 6: Health care for 2019 and 2020

No.		2019	2020
PHC	PHC clinics	378	385
	Dental clinics	78	78
	Public sector pharmacies	14	15
	Medical doctors	470	480
	Medical technicians / nurses	697	730
	Dental doctors	80	74
	Dental technicians / nurses	88	85
	*Pharmacists with master degree	61	62
	* Pharmaceutical technicians	28	30
Hospitals	Hospital beds	1610	1611

Zenica-Doboj Canton



Table 1: Population by municipalities*

Municipalities	Area, km ²	Population estimate
Breza	72.9	13,397
Doboj-Jug	10.2	4,096
Kakanj	377.0	37,018
Maglaj	290.0	22,634
Olovo	407.8	9,201
Tešanj	155.9	43,897
Usora	49.8	6,339
Vareš	390.1	7,723
Visoko	230.8	39,095
Zavidovići	590.3	35,008
Zenica	558.5	109,093
Žepče	210.0	29,774
TOTAL CANTON:	3.343.3	357,275
Population/km ²	119.0	

* population estimate on 30 June 2020

Table 2: Preliminary vital statistics indicators for 2019 and 2020

	2019	2020
Birth rate	9.3	9.2
Death rate	10.1	12.8
Infant deaths	8.4	7.3
Natural increase	-0.8	-3.7

Table 3: Leading causes of death for 2019 and 2020 **

2019				2020			
Rank	Disease	No. of deaths	Structure Index (%)	Rank	Disease	No. of deaths	Structure Index (%)
1	Acute myocardial infarction (I21)	530	14.6	1	Acute myocardial infarction (I21)	813	17.8
2	Stroke, not specified as haemorrhage or infarction (I64)	289	7.9	2	COVID 19-virus confirmed (U07.1)	505	11.0
3	Cardiomyopathy (I42)	234	6.4	3	Stroke (I63)	474	10.4
4	Non- insulin dependent diabetes mellitus (E11)	241	6.6	4	Malignant neoplasms of the bronchus and lung (C34)	201	4.4
5	Chronic ischemic heart disease (I25)	221	6.1	5	Other ill-defined and unspecified causes of mortality (R99)	118	2.6
	Other causes of death	2125	58.4		Other causes of death	2460	53.8
	Total deaths	3640	100%		Total deaths	4571	100%

** Data from the FBiH Institute for Statistics - causes of death in FBiH 2020

Table 4: Leading infectious diseases for 2019 and 2020

2019				2020			
Rank	Disease / condition	No. of registered	Mb/ 100000	Rank	Disease / condition	No. of registered	Mb/ 100000
1	ILI/Influenza	4231	1180.80	1	Covid 19	6485	1791.20
2	Varicellae	961	268.2	2	ILI/Influenza	2784	768.96
3	Enterocolitis ac	502	140.1	3	Varicellae	554	153.02
4	Angina streptoc.	336	93.7	4	Angina streptoc.	175	48.34
5	Toxiinfectio alim.	254	70.8	5	Enterocolitis ac	127	35.08
	Total reported	6964	1943.60		Total reported	10494	2898.51

Table 5: Environmental health indicators

Zenica-Doboj canton	% of population connected to the central water supply system	% of the population connected to the sewerage system	Measurement of SO ₂ concentration in air	Measurement of NO ₂ concentration in air	Measurement of smoke concentration in the air
			measured	measured	measured

Table 6: Health care for 2019 and 2020

No.		2019	2020
PHC	PHC clinics	255	316
	Dental clinics	38	39
	Public sector pharmacies	1	1
	Medical doctors	306	343
	Medical technicians / nurses	505	693
	Dental doctors	32	43
	Dental technicians / nurses	63	62
	*Pharmacists with master degree	32	33
	* Pharmaceutical technicians	29	30
Hospitals	Hospital beds	985	1151

Bosnian Podrinje Canton



Table 1: Population by municipalities*

Municipality	Area, km ²	Population estimate
Foča	169.4	1,821
Goražde	248.8	20,153
Pale	86.4	804
TOTAL CANTON:	504.6	22,778
Population/km ²	64.2	

* population estimate on 30 June 2020

Table 2: Preliminary vital statistics indicators for 2019 and 2020

	2019	2020
Birth rate	8.7	7.6
Death rate	14.0	15.7
Infant deaths	5.0	5.7
Natural increase	-5.3	-8.1

Table 3: Leading causes of death for 2019 2020 **

2019				2020			
Rank	Disease	No. of deaths	Structure Index (%)	Rank	Disease	No. of deaths	Structure Index (%)
1	Stroke (I63)	30	9.3	1	COVID 19-virus confirmed (U07.1)	39	10.9
2	Acute myocardial infarction (I21)	34	10.6	2	Acute myocardial infarction (I21)	32	9.0
3	Malignant neoplasms of the bronchus and lung (C34)	17	5.3	3	Stroke (I63)	25	7.0
4	Sequelae of cerebrovascular diseases (I69)	15	4.7	4	Malignant neoplasms of the bronchus and lung (C34)	16	4.5
5	Cardiomyopathy (I42)	75	23.3	5	Pneumonia, unspecified organism	13	3.6
	Other causes of death	151	46.9		Other causes of death	232	65.0
	Total deaths	322	100%		Total deaths	357	100%

** Data from the FBiH Institute for Statistics - causes of death in FBiH 2020

Table 4: Leading infectious diseases for 2019 and 2020

2019				2020			
Rank	Disease/ condition	No. of registered	Mb/ 100000	Rank	Disease/ condition	No. of registered	Mb/ 100000
1	ILI/Influenza	345	1497.3	1	Covid 19	1051	4452.26
2	Enterocolitis ac.	249	1080.6	2	ILI/Influenza	397	1681.78
3	Varicellae	76	329.8	3	Varicellae	70	296.53
4	Angina streptoc.	54	234.3	4	Enterocolitis ac.	24	101.67
5	Herpes zoster	36	156.2	5	Herpes zoster	18	76.25
	Total reported	780	3385.20		Total reported	1576	6676.27

Table 5: Environmental health indicators

Bosnian Podrinje Canton	% of population connected to the central water supply system	% of population connected to the sewerage system	Measurement of SO ₂ concentration in air	Measurement of NO ₂ concentration in air	Measurement of smoke concentration in air
	not measured	not measured	not measured

Table 6: Health care for 2019 and 2020

No.		2019	2020
PHC	PHC clinics	37	42
	Dental clinics	9	7
	Public sector pharmacies	1	1
	Medical doctors	32	44
	Medical technicians / nurses	80	81
	Dental doctors	9	9
	Dental technicians / nurses	11	1
	*Pharmacists with master degree	4	4
* Pharmaceutical technicians	5	5	
Hospitals	Hospital beds	82	102

Central Bosnia Canton



Table 1: Population by municipalities*

Municipality	Area, km ²	Population estimate
Bugojno	361.0	30,925
Busovača	158.0	17,712
Dobretići	59.0	1,555
Donji Vakuf	320.0	13,770
Fojnica	306.0	11,618
Gornji Vakuf-Uskoplje	402.0	20,071
Jajce	339.0	26,360
Kiseljak	165.0	20,288
Kreševo	149.0	4,957
Novi Travnik	242.0	23,685
Travnik	529.0	52,308
Vitez	159.0	25,813
TOTAL CANTON:	3.189	249,062
Population/km ²	79.2	

* population estimate on 30 June 2020

Table 2: Preliminary vital statistics indicators for 2019 and 2020

	2019	2020
Birth rate	7.7	7.5
Death rate	9.9	11.5
Infant deaths	6.7	5.9
Natural increase	-2.2	-4.1

Table 3: Leading causes of death for 2019 and 2020 **

2019				2020			
Rank	Disease	No. of deaths	Structure Index (%)	Rank	Disease	No. of deaths	Structure Index (%)
1	Acute myocardial infarction (I21)	230	9.3	1	COVID 19-virus confirmed (U07.1)	292	10.2
2	Stroke (I63)	244	9.9	2	Acute myocardial infarction (I21)	290	10.1
3	Cardiomyopathy (I42)	252	10.2	3	Stroke (I63)	288	10.0
4	Malignant neoplasms of the bronchus and lung (C34)	101	4.1	4	Essential hypertension (I10)	142	5.0
5	Essential hypertension (I10)	136	5.5	5	Chronic ischemic heart disease (I25)	82	2.9
	Other causes of death	1507	61.0		Other causes of death	1774	61.9
	Total deaths	2470	100%		Total deaths	2868	100%

Table 4: Leading infectious diseases for 2019 and 2020

2019				2020			
Rank	Disease / condition	No. of registered	Mb/100000	Rank	Disease / condition	No. of registered	Mb/100000
1	Varicellae	662	264.9	1	Covid 19	3699	1463.9
2	ILI/Influenza	296	118.4	2	ILI/Influenza	331	130.99
3	Morbilli	295	118	3	Varicellae	75	29.68
4	Enterocolitis ac	116	46.4	4	Herpes zoster	22	8.71
5	Scabies	91	36.4	5	Angina streptococc	21	8.31
	Total reported	1853	741.5		Total reported	4252	1682.75

Table 5: Environmental health indicators

Central Bosnia canton	% of population connected to the central water supply system	% of population connected to the sewerage system	Measurement of SO ₂ concentration in air	Measurement of NO ₂ concentration in air	Measurement of smoke concentration in air
			not measured	not measured	not measured

Table 6: Health care for 2019 and 2020

No.		2019	2020
PHC	PHC clinics	153	163
	Dental clinics	33	31
	Public sector pharmacies	8	9
	Medical doctors	144	144
	Medical technicians / nurses	265	297
	Dental doctors	45	44
	Dental technicians / nurses	51	50
	*Pharmacists with master degree	20	25
	* Pharmaceutical technicians	18	31
Hospitals	Hospital beds	1248	1248

Herzegovina-Neretva Canton



Table 1: Population by municipalities*

Municipality	Area, km ²	Population estimate
Čapljina	256.0	24,807
Čitluk	181.0	17,916
Jablanica	301.0	9,622
Konjic	1.169.0	23,770
Mostar	1.175.0	105,074
Neum	225.0	4,369
Prozor	477.0	13,414
Stolac	331.0	14,073
Ravno	286.0	3,197
TOTAL CANTON:	4.401	216,248
Population/km ²	50.9	

*population estimate on 30 June 2020

Table 2: Preliminary vital statistics indicators for 2019 and 2020

	2019	2020
Birth rate	7.7	7.5
Death rate	9.9	11.5
Infant deaths	6.7	5.9
Natural increase	-2.2	-4.1

Table 3: Leading causes of death for 2019 and 2020 **

2019				2020			
Rank	Disease	No. of deaths	Structure Index (%)	Rank	Disease	No. of deaths	Structure Index (%)
1	Other ill-defined and unspecified causes of mortality (R99)	474	20.8	1	Acute myocardial infarction (I21)	324	13.1
2	Acute myocardial infarction (I21)	295	13.0	2	Other ill-defined and unspecified causes of mortality (R99)	301	12.2
3	Stroke (I63)	144	6.3	3	COVID 19-virus confirmed (U07.1)	288	11.7
4	Malignant neoplasms of the bronchus and lung (C34)	122	5.4	4	Stroke (I63)	144	5.8
5	Essential hypertension (I10)	85	3.7	5	Malignant neoplasms of the bronchus and lung (C34)	109	4.4
	Other causes of death	1156	50.8		Other causes of death	1305	52.8
	Total deaths	2276	100%		Total deaths	2471	100%

** Data from the FBiH Institute for Statistics - causes of death in FBiH 2020

Table 4: Leading infectious diseases for 2019 and 2020

2019				2020			
Rank	Disease / condition	No. of registered	Mb/ 100000	Rank	Disease / condition	No. of registered	Mb/ 100000
1	ILI/Influenza	1830	843.4	1	Covid 19	15380	6984.75
2	Varicellae	528	243.3	2	ILI/Influenza	2045	928.73
3	Herpes zoster	223	102.7	3	Varicellae	183	83.11
4	Angina streptoc.	159	73.2	4	Herpes zoster	105	47.69
5	Scabies	140	64.5	5	Angina streptoc.	73	33.15
	Total reported	3301	1521.40		Total reported	18006	8177.33

Table 5: Environmental health indicators

Herzegovina- Neretva canton	% of population connected to the central water supply system	% of population connected to the sewerage system	Measurement of SO ₂ concentration in air	Measurement of NO ₂ concentration in air	Measurement of smoke concentration in air
	not measured	not measured	not measured

Table 6: Health care for 2019 and 2020

No.		2019	2020
PHC	PHC clinics	154	179
	Dental clinics	50	48
	Public sector pharmacies
	Medical doctors	187	242
	Medical technicians / nurses	374	439
	Dental doctors	59	58
	Dental technicians / nurses	57	62
	*Pharmacists with master degree	10	...
	* Pharmaceutical technicians	6	...
Hospitals	Hospital beds	1046	1053

West Herzegovina Canton



Table 1: Population by municipalities*

Municipality	Area, km ²	Population estimate
Grude	220.8	16,732
Ljubuški	292.7	27,151
Posušje	461.1	20,342
Široki Brijeg	387.6	28,988
TOTAL CANTON:	1.362.2	93,213
Population/km²	59.8	

* population estimate on 30 June 2020

Table 2: Vital statistics indicators for 2019 and 2020

	2019	2020
Birth rate	7,8	8,1
Dearth rate	9,4	11,4
Infant deaths	0,0	1,3
Natural increase	-1,6	-3,3

Table 3: Leading causes of death for 2019 and 2020

2019				2020			
Rank	Disease	No. of deaths	Structure Index (%)	Rank	Disease	No. of deaths	Structure Index (%)
1	Acute myocardial infarction (I21)	133	15.2	1	Essential hypertension (I10)	152	14.3
2	Essential hypertension (I10)	94	10.7	2	Acute myocardial infarction (I21)	118	11.1
3	Malignant neoplasms of the bronchus and lung (C34)	34	3.9	3	COVID 19-virus confirmed (U07.1)	85	8.0
4	Pneumonia, unspecified organism (J18)	45	5.1	4	Stroke. not specified as haemorrhage or infarction (I64)	59	5.5
5	Cardiomyopathy (I42)	43	4.9	5	Other ill-defined and unspecified causes of mortality (R99)	45	4.2
	Other causes of death	526	60.1		Other causes of death	605	56.9
	Total deaths	875	100%		Total deaths	1064	100%

** Data from the FBiH Institute for Statistics - causes of death in FBiH, 2020

Table 4: Leading infectious diseases for 2019 and 2020

2019				2020			
Rank	Disease/ condition	No. of registered	Mb/ 100000	Rank	Disease/ condition	No. of registered	Mb/ 100000
1	ILI/Influenza	2953	3162.1	1	Covid 19	4690	4978.45
2	Varicellae	174	186.3	2	ILI/Influenza	2578	2736.56
3	Angina streptoc.	23	24.6	3	Varicellae	144	152.86
4	Scabies	18	19	4	Angina streptoc.	8	8.49
5	Herpes zoster	12	12.8	5	Enterocolitis	3	3.18
	Total reported	3229	3457.70		Total reported	7439	7896.52

Table 5: Environmental health indicators

West Herzegovina canton	% of population connected to the central water supply system	% of population connected to the sewerage system	Measurement of SO ₂ concentration in air	Measurement of NO ₂ concentration in air	Measurement of smoke concentration in air
			not measured	not measured	not measured

Table 6: Health care for 2019 and 2020

No.		2019	2020
PHC	PHC clinics	59	58
	Dental clinics	18	18
	Public sector pharmacies	0	...
	Medical doctors	56	63
	Medical technicians / nurses	100	101
	Dental doctors	18	18
	Dental technicians / nurses	25	29
	*Pharmacists with master degree	0	...
* Pharmaceutical technicians	0	...	
Hospitals	Hospital beds	0	

Sarajevo Canton



Table 1: Population by municipalities*

Municipality	Area, km ²	Population estimate
Centar	33.0	53,333
Hadžići	273.3	24,676
Ilidža	143.4	70,887
Ilijaš	308.6	20,732
Novi Grad	47.2	122,751
Novo Sarajevo	9.9	63,871
Stari Grad	51.4	35,015
Trnovo	338.4	1,396
Vogošća	71.7	28,894
TOTAL CANTON:	1.276.9	421,555
Population/km ²	348.4	

* population estimate on 30 June 2020

Table 2: Preliminary vital statistics indicators for 2019 and 2020

	2019	2020
Birth rate	10.3	10.0
Death rate	10.5	12.5
Infant deaths	9.9	5.4
Natural increase	-0.2	-2.5

Table 3: Leading causes of death for 2019 and 2020 **

2019				2020			
Rank	Disease	No. of deaths	Structure Index (%)	Rank	Disease	No. of deaths	Structure Index (%)
1	Stroke (I63)	548	12.4	1	Chronic ischemic heart disease (I25)	589	11.2
2	Chronic ischemic heart disease (I25)	423	9.6	2	Stroke (I63)	585	11.1
3	Acute myocardial infarction (I21)	384	8.7	3	COVID 19-virus confirmed (U07.1)	499	9.5
4	Malignant neoplasms of the bronchus and lung (C34)	350	7.9	4	Acute myocardial infarction (I21)	412	7.8
5	Non-insulin dependent diabetes mellitus (E11)	340	7.7	5	Non-insulin dependent diabetes mellitus (E11)	347	6.6
	Other causes of death	2380	53.8		Other causes of death	2822	53.7
	Total deaths	4425	100%		Total deaths	5254	100%

** Data from the FBiH Institute for Statistics - causes of death in FBiH 2020

Table 4: Leading infectious diseases for 2019 and 2020

2019				2020			
Rank	Disease/ condition	No. of registered	Mb/ 100000	Rank	Disease/ condition	No. of registered	Mb/ 100000
1	ILI/Influenza	7891	1876.5	1	Covid 19	23484	5639.32
2	Varicellae	4328	1029.2	2	ILI/Influenza	6350	1524.86
3	Enterocol.ac.	980	233	3	Varicellae	1242	298.25
4	Morbilli	868	206.4	4	Enterocol.ac.	247	59.31
5	Herpes zoster	487	115.8	5	Herpes zoster	167	40.1
	Total reported	15576	3704.20		Total reported	31899	7660.06

Table 5: Environmental health indicators

Sarajevo canton	% of population connected to the central water supply system	% of population connected to the sewerage system	Measurement of SO ₂ concentration in air	Measurement of NO ₂ concentration in air	Measurement of smoke concentration in air
			measured	measured	measured

Table 6: Health care for 2019 and 2020

No.		2019	2020
PHC	PHC clinics	267	274
	Dental clinics	137	137
	Public sector pharmacies	16	17
	Medical doctors	409	383
	Medical technicians / nurses	662	537
	Dental doctors	244	220
	Dental technicians / nurses	274	273
	*Pharmacists with master degree	183	207
* Pharmaceutical technicians	151	191	
Hospitals	Hospital beds	1890	2017

Canton 10

Table 1: Population by municipalities*



Municipality	Area, km ²	Population estimate
Bosansko Grahovo	780.0	2,123
Drvar	589.3	6,002
Glamoč	1033.6	3,430
Kupres	569.8	4,856
Livno	994.0	32,690
Tomislavgrad	967.4	30,347
TOTAL CANTON:	4934.1	79,448
Population/km ²	15.9	

*population estimate on 30 June 2020

Table 2: Preliminary vital statistics indicators for 2019 and 2020

	2019	2020
Birth rate	4.5	4.1
Death rate	10.8	11.7
Infant deaths	0.0	0.0
Natural increase	-6.3	-7.6

Table 3: Leading causes of death for 2019 and 2020 **

2019				2020			
Rank	Disease	No. of deaths	Structure Index (%)	Rank	Disease	No. of deaths	Structure Index (%)
1	Acute myocardial infarction (I21)	64	7.4	1	COVID 19-virus confirmed (U07.1)	126	13.5
2	Stroke (I63)	31	3.6	2	Essential hypertension (I10)	99	10.6
3	Cardiomyopathy (I42)	241	27.9	3	Chronic ischemic heart disease (I25)	40	4.3
4	Malignant neoplasms of the bronchus and lung (C34)	29	3.4	4	Acute myocardial infarction (I21)	35	3.8
5	Chronic ischemic heart disease (I25)	24	2.8	5	Non-insulin dependent diabetes mellitus (E11)	29	3.1
	Other causes of death	475	55.0		Other causes of death	604	64.7
	Total deaths	864	100%		Total deaths	933	100%

** Data from the FBiH Institute for Statistics - causes of death in FBiH 2020

Table 4: Leading infectious diseases for 2019 and 2020

2019				2020			
Rank	Disease/ condition	No. of registered	Mb/ 100000	Rank	Disease/ condition	No. of registered	Mb/ 100000
1	Enterocol.ac.	163	203.7	1	Covid 19	3085	3726.21
2	ILI/Influenza	139	173.7	2	ILI/Influenza	138	166.68
3	Varicellae	69	86.2	3	Varicellae	43	51.94
4	Herpes zoster	8	10	4	Enterocol.ac.	34	41.07
5	Morbilli	6	7.5	5	Herpes zoster	8	9.66
	Total reported	406	507.40		Total reported	3318	4007.63

Table 5: Environmental health indicators

Canton 10	% of population connected to the central water supply system	% of population connected to the sewerage system	Measurement of SO ₂ concentration in air	Measurement of NO ₂ concentration in air	Measurement of smoke concentration in air
			not measured	not measured	not measured

Table 6: Health care for 2019 and 2020

No.		2019	2020
PHC	PHC clinics	25	29
	Dental clinics	6	10
	Public sector pharmacies	0	...
	Medical doctors	25	40
	Medical technicians / nurses	52	91
	Dental doctors	19	12
	Dental technicians / nurses	11	16
	*Pharmacists with master degree	0	...
* Pharmaceutical technicians	0	...	
Hospitals	Hospital beds	207	159

7. CONCLUSION

The analysis of data relevant for the assessment of the health status of the population was done comparatively, for 2019 and 2020, for most of the indicators. Some indicators are presented for 2019 (data from CAN-REG), as well as data from areas in which there was no research due to the hygienic-epidemiological situation caused by the Covid-19 pandemic.

Demographic and socio-economic indicators

- According to estimates, the total population in 2020 was 2,184,680. The negative difference in the total number of population estimates is 5418, which is a relative decrease of 0.24%. This contraction of the population was accompanied by deterioration in its age structure, an increase in mortality, a fall in birth rates and, consequently, a significant decline in natural increase.
- The share of women in the total population is 51% and men 49%.
- In the Federation of BiH, the natural increase is still extremely negative (-4.0) and is worse compared to 2019 (-1.8), because there were many more deaths compared to live births and compared to the previous year.
- Due to a significant increase in the number of deaths of 18%, in 2020 the overall mortality rate rose to 11.9 ‰.
- In the Federation of BiH, 119 infants died in 2020 (167 in 2019), and the infant mortality rate is 6.9/1,000 live births, which is also a decrease compared to 2018 (9.3/1,000 live births).
- According to the data of the FBiH Employment Institute, at the end of July 2020, there were 323,244 unemployed persons registered in the Federation of BiH. Compared to the number of unemployed in 2019 (307,864), the number of unemployed in July 2020 is higher by 15,380 people or 5%.

Causes of mortality and morbidity of the population of the Federation of BiH

- Unlike previous years, in 2020 the health of the population of the Federation of BiH was most endangered by the Covid-19 pandemic, which affected both the morbidity indicators and the mortality indicators.
- Although the Covid-19 pandemic was the dominant health problem, non-communicable diseases were significantly represented in morbidity and mortality, and the incidence rate of hypertensive diseases, diabetes, and mental disorders recorded an increase compared to 2019.
- Among the diseases that caused death of the population of the Federation of BiH, the leading one is the Covid-19 virus confirmed (U07.1), with a share of 10.2% in the total mortality in the Federation of BiH.
- In 2020, a total of 99,857 cases of infectious diseases were reported to the Institute for Public Health of the Federation of Bosnia and Herzegovina (I 4516.3 / 100,000), as opposed to 2019 when 45,428 cases were reported (I 2074.2 / 100,000), less than in 2018 (46,178 cases reported; I 2097.9/100,000) and in 2017, when a significantly higher number of cases was registered (49,180 cases reported; I 2234.24 / 100,000).

- In contrast to previous years, this year the total morbidity from infectious diseases was mostly affected by influenza-like illness (ILI), and in 2020 it was mostly affected by Covid-19 disease, where it accounts for 72.3% of all registered cases of infectious diseases (by monitoring the progression of infectious diseases during the calendar year).
- In the structure of leading infectious diseases, in 2020, there are significant changes compared to the previous year. Chickenpox (Varicellae), acute enterocolitis and streptococcal angina (angina streptococcica) have a significant place in the structure of infectious diseases in FBiH. Although a decline in the incidence rate of pulmonary TB has been registered in recent years, it is still on the list of the top ten infectious diseases in the Federation of Bosnia and Herzegovina.
- In 2020, a higher number of deaths from infectious diseases was registered (2377) compared to the previous year (41). In the last five years, the highest number of deaths from infectious diseases was registered in 2020 (2377 deaths, mortality rate 107.5/100,000), and the lowest number of deaths from infectious diseases was registered in 2016 (32 deaths; mortality rate 1.4/100,000).
- Poliomyelitis (polio) caused by wild poliovirus has not been registered in the Federation of BiH for almost half a century. In 2020, a total of 140 cases were registered in Afghanistan and Pakistan, slightly less than in the previous year (176 cases).
- In 2020, 1 case of AFP was registered in the Federation of BiH. The surveillance rate is below 1, which does not meet the surveillance criteria. Other indicators are satisfactory; the case was investigated according to WHO criteria.
- In the Federation of BiH in 2020, a slightly lower coverage of children with vaccines from the mandatory immunization programme was registered, except for the vaccine against tuberculosis, where a slightly higher coverage was recorded (95%) compared to the previous year. The lower coverage is caused in part by the coronavirus pandemic. Coverage with three doses of hepatitis B vaccine was 67.2% and with three doses of vaccine containing DTaP components and polio coverage was 62.6%. The coverage of the third dose of the pentavalent vaccine is significantly lower compared to the previous year.
- At the level of the Federation of BiH, in 2020 there was a significant decrease in the coverage of DTP vaccine compared to the previous year.
- The Covid-19 epidemic in FBiH in 2020 was marked by two waves. The first wave during the spring and early summer of 2020 was marked by strict epidemiological measures with the closure of numerous public places and gathering places, the introduction of mandatory wearing of masks indoors and outdoors, and restriction of movement and very effective containment of the epidemic. The second wave, which began in October and lasted until the end of the year, marked a larger increase in the number of laboratory-confirmed cases of Covid-19, peaking in November, when the average number of cases was 989/100,000 population.
- In the period from 1992 to the end of 2020, the number of 249 people were diagnosed with HIV infection in the Federation of BiH. Among them are 105 cases of AIDS. In the same period, 52 patients died. Among infected people, 86.7% are male. The largest number of HIV cases is registered in the age group of 20-29.
- In 2020, 12 new cases of HIV infection were reported in the Federation of BiH, among which 4 cases of AIDS.
- Among the reports in 2020, there were 250 (87.1%) cases of pulmonary tuberculosis, 37 (12.9%) of extrapulmonary tuberculosis.

- In the group of zoonoses in 2020, there were 108 registered cases (I 4.8), significantly less than in 2019, when 253 cases were recorded (I 11.6/100,000).

As in previous years, the most common in this group of diseases is brucellosis - 90 patients (I 4.0/ 100,000). In second place in 2020 is Q fever with 10 patients (I 0.4/100,000).

- Brucellosis is the most commonly registered zoonosis in the Federation of BiH. It has been present in BiH for many years, in greater or lesser numbers. During 2020, significantly fewer patients were reported (90 patients) than the year before (193 cases).
- In 2020, one epidemic was registered in the Federation of BiH, namely Covid-19, with 72,188 confirmed cases of the disease.
- The state of oral health of the population is poor.

Diet and physical activity

- In light of the changes resulting from the Covid-19 epidemic, there are fears that the current unsatisfactory condition of overweight and obesity as well as poor eating habits, in all population groups, and especially among children, could worsen.
- This also applies to physical activity, which in all population groups shows unsatisfactory percentages and is insufficient, and the Covid-19 pandemic has severely limited and jeopardized opportunities for physical activity.
- In the territory of the Federation of BiH, universal iodization of salt continues, but the iodine status of the population has not been assessed for ten years, as well as the situation related to iron deficiency in diet.

Food safety

- In 2020, no epidemic of foodborne infectious diseases was recorded, which is an improvement compared to last year's leap.
- The control of the health safety of foodstuffs and items of general use was performed to a somewhat lesser extent compared to the previous year, and with very small deviations in terms of safety.

Lifestyle and behaviour

Data from recent population-based surveys record the predominance of health risk factors related to lifestyle and behaviour, such as improper eating habits, overweight, obesity, and insufficient physical activity, especially in the adult population.

There is a high percentage of regular smokers in the adult population, as well as an increase in current smokers among school children. Water pipe (hookah) smoking among school children is a growing public health challenge. Over half of the population is exposed to tobacco smoke in all enclosed public spaces.

Health care organization

- According to the data of regular health statistics for 2020, there were 27,517 employees in the health sector of the Federation of BiH, which is slightly more than in 2019 (26,811).
- The age structure of medical doctors was unfavourable, close to one third of employed medical doctors were older than 55 years.

- Access to health care at all levels has been hampered by the Covid-19 pandemic.
- Indicators of utilization of hospital capacities at the level of the Federation of BiH are unfavourable because hospital capacities were prepared for the reception of a large number of patients with coronavirus.
- Due to the Covid-19 pandemic, the public sector health system of the Federation of BiH during 2020 was exposed to changes in the organization of work and working hours. Covid-clinics and covid-wards were formed at hospitals, the number of which increased with the increase in number of patients.
- Data on the organization of health care in the Federation of BiH from the private sector are missing.

Environment

- Environmental risk factors (contaminated water and food, polluted air, noise, hazardous chemicals, waste materials, etc.) are among the leading public health problems, requiring constant monitoring. Children, pregnant women, the chronically ill and the elderly are particularly at risk.
- In the Federation of BiH, 60% of the population is connected to public water supply systems in which water is *continuously controlled for health safety*. In urban areas the coverage is 94%, and in rural areas 20%.
- *Since there is no single register of local water supply systems in the Federation of BiH, full insight into the water supply system is impossible, and thus the adoption of adequate measures in order to improve it.*
- The leading place in the group of diseases caused by contaminated water and food in 2020 is occupied by acute enterocolitis (enterocolitis acuta), with 1105 registered cases (49.9/100,000), which is less than the total number of patients registered in 2019 (3,507 registered cases) - 160.1/100,000).
- *The waters of public swimming areas (pools) are generally under the regular supervision of the Institute for Public Health, especially during the summer season.*
- Extremely high, health-threatening concentrations of suspended particulate matter are evident at almost all measuring points in the Federation of BiH.
- Significant trends in decreasing concentrations of suspended particulate matter in the past few years have not been observed.
- Sulphur dioxide concentrations were high in 2020 too and significantly above the prescribed limit values in Tuzla, Živinice, Lukavac, Zenica, Visoko, Kakanj and Ilijaš. Although the values of concentrations of suspended particulate matter, and especially sulphur dioxide in the period from 2015 to 2019 began to show a slight downward trend, in 2020 they rose again and reached some of the highest measured values in the last 15 years.
- The results of measurements of nitrogen dioxide and carbon monoxide are satisfactory, exceedances of limit values are rare, and do not occur at most measuring points. Ozone concentrations are increased during the summer in higher parts of larger cities in central Bosnia.
- *The incidence of chronic obstructive pulmonary diseases in the Federation of BiH in 2020 was slightly lower (141/10,000 population) compared to 2019 (158/10,000 population).*
- There is no monitoring of indoor air quality.

- According to the results of research and studies conducted in recent years in the Federation of BiH, 47% of the population is connected to the public sewerage system.
- On the territory of the Federation of BiH, there are about 2,000 locations of uncontrolled (wild) landfills on an area of 974,221 m² and most of them are in Zenica-Doboj and Tuzla Canton.
- According to the latest data obtained from health care institutions of all three levels of health care in the Federation of BiH, it was observed that most of these institutions have medical waste management plans, as well as persons responsible for adequate management of hazardous medical waste. Also, most health care institutions do not dispose of hazardous medical waste together with municipal waste.

According to the latest available data from the Mine Action Centre in BiH, in 2019 there were a total of 5 mine victims in the Federation of BiH. Of these, two people were killed, two were seriously injured and one was slightly injured. In 2020, there were no casualties of mines and unexploded ordnance.

- For the introduction of complete monitoring of environmental risk factors (polluted water, food, air, land) in the Federation of BiH, the existing modern equipment and staff in the cantonal institutes of public health are insufficient.

Smoking and population health in the Federation of BiH

- The results of recent population surveys indicate a high percentage of tobacco consumption in all population groups of the Federation of BiH.
- Smoking remains the largest single health risk factor associated with trends in morbidity and mortality from diseases associated with tobacco consumption, especially cardiovascular diseases and malignant neoplasms.

Alcohol, drugs and psychotropic substances

- The results of recent population surveys indicate a high percentage of alcohol consumption, which is related to the trend of diseases associated with alcohol consumption among the adult population in the Federation of BiH.

8. RECOMMENDATIONS

In order to improve the scope, process and quality of data collection submitted by health care institutions in the Federation of BiH, the coordination of the Institute for Public Health of the Federation of BiH continues with the aim of supporting the adaptation of health institutions to reporting using a single information system introduced in 2019. Also, in order to obtain a more objective picture of the health status of the population of the Federation of BiH, it is necessary to maintain the dynamics of periodic population surveys on exposure to health risk factors.

Population

In order to respond to the demographic crisis that has been leading in the direction of depopulation for years, the priority is to adopt an intersectoral population policy in the Federation of BiH.

Morbidity and mortality

- Strengthen activities to reduce the trends of the leading causes of morbidity and mortality in the Federation of BiH through public health interventions aimed at educating and informing citizens and community support.
- Intensify cooperation with cantonal institutes for public health and initiate intersectoral promotional interventions at the local community level, related to leading risk factors (smoking, alcohol, unhealthy diet, physical inactivity, mental health and oral health).
- Strengthen capacities at all levels of surveillance (epidemiological, laboratory, clinical), in particular the establishment and strengthening of early alert and response capacities. Align the Law on the Protection of the Population against Infectious Diseases with EU standards, as well as implement the ECDC's recommendations for surveillance. It is necessary to educate health workers in the field of surveillance at all levels of health care (primary, secondary and tertiary).
- Continuous improvement of data quality and harmonization of activities with the Ministry of Civil Affairs of BiH (MCP) and the Institute of Public Health of Republika Srpska in order to create conditions for reporting key infectious diseases in a single European database - The European Surveillance System (TESSy).
- Harmonize all activities (preventive and curative) related to the Covid-19 pandemic with all cantonal institutes and all institutions involved in the control and surveillance of the pandemic, in accordance with WHO recommendations.
- Improve control of zoonoses through strengthening cooperation between the human and veterinary sectors in the "One Health" approach of international cooperation in the control of zoonoses.

Health risk factors

- It is necessary to strengthen the programme for the prevention of tobacco consumption among young people and health promotion campaigns, which is contained in the Action Plan for the prevention and control of Chronic Diseases in the Federation of BiH for the period 2019 - 2025.

- It is necessary to strengthen the programme for the prevention of alcohol consumption among young people and the health promotion campaigns, contained in the Action Plan for the prevention and control of Chronic Diseases in the Federation of BiH for the period 2019-2025.
- Strengthen and harmonize legislation related to food safety, nutrition, and physical activity, work on finding models for the implementation of action plans and strategies in accordance with the constraints related to the Covid epidemic, especially in educational institutions.
- It is necessary to conduct targeted monitoring and research, and to continue the implementation of existing continuous monitoring in the field of safety of food, drinking water and items of general use needed for risk assessment and appropriate risk management, in accordance with measures for protection against harmful environmental factors.
- Continue the renewal and upgrading of laboratory equipment and space, and continuous training of staff employed in laboratories for testing the health safety of food, water and items of general use, especially for the purpose of determining the nutritional composition of food.
- Conducting research to assess the iodine status of the population should be a priority.
- Find out the modalities for continuing the implementation of activities to improve nutrition and physical activity in the context of the Covid pandemic, continue intersectoral cooperation related to the improvement of the food environment and infrastructure for physical activity. In accordance with the requirements related to the Covid-19 pandemic, modify and implement targeted programmes related to nutrition, physical activity and health for vulnerable groups. Modify and continue the implementation of the accreditation schemes for “Baby Friendly Hospitals” and “Nutrition Friendly Educational Institutions”, and insist on the implementation and reaffirmation of the programme for the prevention of micronutrient deficits.

Environment and health

- In cooperation with the relevant sectors, it is necessary to promote continuous monitoring of drinking water and food on the parameters of safety (chemical safety for toxic metals, organochlorine and organophosphorus pesticides, polychlorinated biphenols, mycotoxins, additives, and microbiological and radiological safety), as well as the detection of pollutants in the air and soil, which is necessary for complete monitoring of environmental risk factors and assessment of their impact on population health.
- For the implementation of complete monitoring of environmental risk factors in the Federation of BiH, further improvements of laboratory equipment and space are needed, as well as continuous training of staff employed in laboratories of relevant institutions.
- Continuous population surveys are necessary in order to collect accurate data on the harmful effects of certain environmental risk factors on human health (polluted air, contaminated drinking water, polluted surface water and soil, the impact of climatic factors, hazardous chemicals, noise, mines, etc.).

- Measures need to be taken to improve air quality in all cities and towns where there is no established air quality monitoring and there are preconditions for pollution (e.g. high level of solid fuel use, position in the mountain valley).
- In order to protect children's health from environmental risk factors, it is necessary to carry out activities related to informing school staff, as well as children and their parents, about the importance and manner of reducing the impact of harmful environmental factors on health, through lectures, brochures, posters, leaflets etc. (e.g. protection against diseases transmitted by contaminated water, food and vectors, protection against inorganic and organic air pollutants, chemicals, etc.).
- Conduct training of staff (medical and non-medical) in health care institutions on the principles of proper medical waste management - through lectures or training courses.
- Improve programmes related to the procurement of modern equipment that works on the principle of sterilization and shredding of medical waste in the Federation of BiH.
- In order to improve the health of the population, strengthen the cooperation of the health sector with all institutions and sectors whose activities contribute to the protection of health from environmental risk factors - education, agriculture, water management, construction, energy, etc. Cooperation of relevant sectors should result, inter alia, in the adoption of legislation on indoor air quality, which is a condition for monitoring harmful pollutants, as well as an increase in the number of sanitary and controlled landfills.

Health care organization

- In accordance with the recommendations of experts, the Crisis Headquarters of the Federation of BiH and the recommendations and guidelines of the WHO, harmonize the organization of health care that will best respond to the challenges of the pandemic and protect the health and lives of residents of the Federation of BiH.
- Continuation of activities to improve the system of health statistics reporting in the public sector with special intensification of activities on inclusion of the private sector too, through the use of a single information system introduced during 2019.
- It is necessary to repeat the population survey of risk factors for the health of the adult population in the Federation of BiH. The Institute for Public Health of the Federation of BiH has repeatedly initiated this activity as an initiative towards the Federal Ministry of Health as well as in the comments on the two-year agreement on cooperation between BiH and the WHO Office for 2020.
- Continuous education and training of staff employed in laboratories for testing the health safety of food, water and items of general use, and support for the renewal and improvement of laboratory equipment and space of these laboratories.
- Initiating activities of planning and production of health workers and associates from the level of the Federation of BiH to the level of cantons, in relation to the development of the network of health care institutions, requirements and needs for health care as key arguments for specializations and continuous professional education of employees as well as new staff hiring policy.

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