



Primary-School-Age Population Change in the Federation of Bosnia and Herzegovina: The Effects of Demographic Factors

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ABSTRACT

The beginning of the 21st century in the Federation of Bosnia and Herzegovina (henceforth referred to as “the Federation”) has been characterised by a decrease in the primary-school-age population. As such, the main objective of this work is to define and explain the factors that have influenced the decrease in the primary-school-age population in this part of Bosnia and Herzegovina. The research methodology applied in this work is oriented towards defining the degree of influence of demographic factors on the development of the primary-school-age population in the Federation. By using statistical methods and GIS analysis of statistical data, negative demographic trends were confirmed in the Federation at the end of the 20th and the beginning of the 21st century. These trends included intense migration, a decrease in the total number of inhabitants, a decrease in the birth rate, an increased mortality rate, a decreased rate of natural population change, and the ageing of the population. Due to adverse economic, social, political, and other circumstances after 1995, population emigration has been intensified,

most noticeably within the population aged between 20 and 40. The most important result of the research is the fact that the decrease in the natural population dynamics and intensive emigration are the most significant factors influencing the decrease in the primary-school-age population in the Federation. Such negative demographic trends influence the primary education system adversely. In the future, it will be necessary to plan and implement a population-revitalisation process as part of the federation’s overall population policy.

KEY WORDS

Federation of Bosnia and Herzegovina | primary-school-age population | demographic factors | natural population change | emigration

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INTRODUCTION

The increase of the school-age population across the world is led by developing countries, where this population is increasing by an annual rate of 1.0%. At the same time, the number of pupils in developed countries is decreasing at the same annual rate (UN-DESA 2005). A continuous decrease in the primary-school-age population has been also noted in Bosnia and Herzegovina and surrounding countries over several decades (Kadušić and Smajić 2018). While numerous studies have recently been conducted on demographic development and changes in Bosnia and Herzegovina (Emirhafizović and Zolić 2017; Pašalić 2017; Kadušić et al. 2016; Pobrić 2002, 2015), there have only been a few studies examining changes in the school-age population in primary schools in Bosnia and Herzegovina (Jahić and Mehić 2018; Kadušić and Smajić 2018; Pašalić et al. 2012). Therefore, this research was mostly influenced by studies on demographic trends in Balkan countries (Klempić Bogadi et al. 2018; Krunić et al. 2018; Josipović 2016; Nikitović 2016; Čepar and Bojnec 2005).

The number of school-age pupils enrolled in primary schools in Bosnia and Herzegovina in the period from the 2006/07 school year to the 2016/17 school year decreased from 367,176 to 287,729, a change of -21.6% (BHAS 2008, 2018). Similar trends have been noted in neighbouring countries: in the same period, the primary-school-age population in Cro-

atia decreased from 380,777 pupils to 318,173, a change of -16.4% (CBS 2008, 2018), while in Serbia the number dropped 12.4% from 622,562 students to 545,234 (SORS 2007, 2017). Similar trends were observed in Slovenia at the end of the 20th century and the beginning of the 21st century, where the primary-school-age population decreased at all levels of the educational system due to adverse demographic trends (Čepar and Bojnec 2005).

Pursuant to the General Framework Agreement for Peace in Bosnia and Herzegovina signed in Dayton in 1995, Bosnia and Herzegovina was divided into two entities: the Federation of Bosnia and Herzegovina (B&H) and the Republic of Srpska. Since 2000, a third entity has existed: the Brčko District of Bosnia and Herzegovina (Figure 1).

The Federation consists of 10 cantons, which are administratively divided into 79 municipalities. It covers an area of 26,110.5 km², which is 51.0% of the surface of Bosnia and Herzegovina. The largest canton – Canton 10 (Livno) – covers a surface area of 4,934.1 km², while the smallest – Posavina Canton – covers just 324.6 km². In 2016, there were 2,206,231 inhabitants or about 62.5% of the country's overall population living in the Federation. The most populous canton – Tuzla Canton – has 443,053 inhabitants, while the smallest population of 23,518 inhabitants is in Bosnian-Podrinje Canton (FZS 2017b).

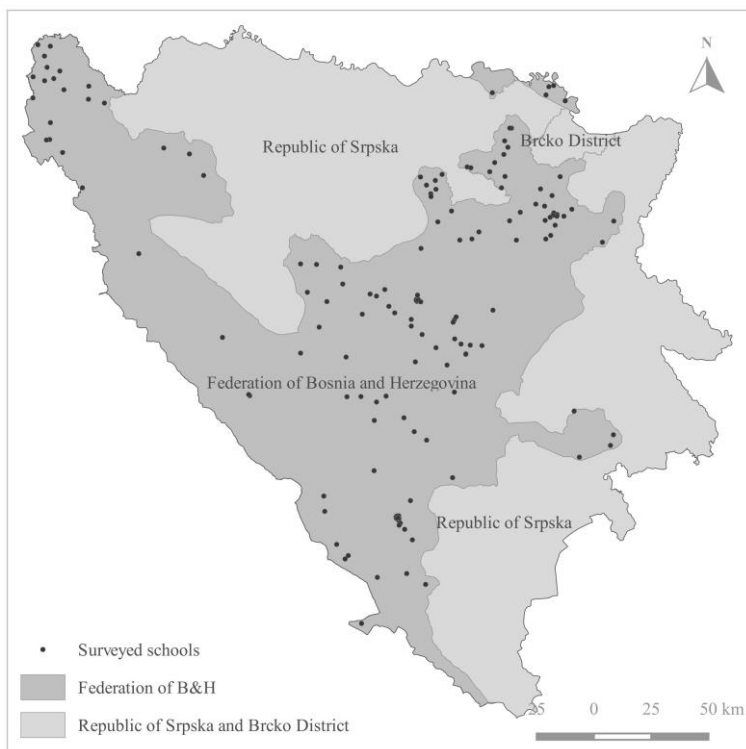


Figure 1 Administrative division of Bosnia and Herzegovina and location of primary schools in the Federation of B&H covered by the questionnaire in 2018

Source: Author's elaboration based on data of FGU (2018)

In the Federation, jurisdiction over the education system is delegated to the cantons. There are 10 governmental institutions in charge of the educational sector: the Federal Ministry of Education and Science and nine cantonal ministries. Pursuant to the Frame Law on Primary and Secondary Education, primary education is compulsory for all children. It begins in the calendar year in which a child turns six years old before April 1, and it must continue for a period no shorter than eight years. The implementation of nine-year primary education in the Federation began in the 2004/05 school year and has been implemented

in all cantons since the 2009/10 school year (FMON 2017).

The primary objective of this work is to define the factors that have influenced primary-school-age population change in the Federation and to determine the degree of influence of demographic factors on the development of this population. The main hypothesis of the work is that there has been a continuous decline in the school-age population in primary schools in the Federation in the post-war period, and that demographic and socio-economic factors are the main cause of the decline.

Between 2006/07 and 2016/17, the total number of children in primary

schools in the Federation decreased from 243,708 to 188,430 pupils, a change of -22.7% (FZS 2007, 2017b). Several factors contributed to this decrease, of which the most significant was a decline in the potential biodynamics and vitality of the population within the entity (Kadušić and Smajić 2018).

As was the case in other ex-Yugoslav countries at the end of the 20th and the beginning of the 21st century, the population of Bosnia and Herzegovina was below the replacement level (Josipović 2016; Nikitović 2016), and the war from 1992 to 1995 enhanced adverse demographic trends, leading to a decline in the number of live-born children from 1991 to the post-war period (Pobrić 2015). This demographic trend is similar in both entities of Bosnia and Herzegovina. In the Federation, between 2006 and 2016, the birth rate declined from 9.2% to 8.9%, the mortality rate increased from 7.9% to 9.6%, while the rate of natural population change declined from 1.3% to -0.7% . In the period between the two censuses in 1991 and 2013, the rate of natural population change decreased from 8.9% to -0.1% (FZS 2017b). Depopulation is always accompanied by demographic ageing (Pénzes et al. 2015). Therefore, a consequence of the Federation's natural population dynamics was a decrease in the proportion of the population aged between 0 and 19 (32.6% in 1991 and 23.4% in 2013) and an increase in the proportion of the population aged 65 or older (6.0% in 1991, 12.9% in 2013 and 14.1% in 2016). According to Emirhafizović

and Zolić (2017), age structure is one of the most important structures of population, because it represents a key measure of a population's bio-reproduction potential, while according to Pašalić (2017), age structure influences a country's potential for economic development. Trends indicate that the population across all regions of Bosnia and Herzegovina is ageing, which in the future will have a range of demographic and socio-economic implications. Therefore, according to Emirhafizović and Zolić (2017), this process represents one of the greatest challenges for Bosnian and Herzegovinian society.

Due to adverse socio-economic and political circumstances, the Federation is losing some of its population to emigration, which, once again, is having an adverse influence on the primary-school-age population. Migration, alongside several other demographic components, is a basic determinant of population development (Klempić Bogadi et al. 2018). It is a complex process determined by the age, sex, and educational structure of the population (Pašalić 2017). The net rate of migration in the researched area in 2016 was -1.6% (FZS 2017a). Those who are emigrating are typically productive members of society between the age of 20 and 40, which in the end influences natural population change and the age structure of the population. One especially significant problem is emigration of young, highly educated people (Kadusić and Suljić 2018). If adequate population policy measures aren't taken to revitalise the age demographics of the Federation –

and indeed the whole country – current demographic processes will lead to a further decrease in the number of school-age pupils in primary schools, as well as creating a surplus of teachers in the primary education system.

METHOD

In order to define the factors influencing the decline of the primary-school-age population in the Federation, the authors of this paper used data compiled by the Federal Institute for Statistics, the Agency for Statistics of Bosnia and Herzegovina, and other ministries responsible for education in this entity of the country. A database of demographic and socio-economic variables for municipalities in the Federation was formed on the basis of collected statistical data (total number of inhabitants, birth rate, mortality, natural population change, age structure, immigration and emigration, number of primary schools, number of pupils and teachers, employment and unemployment, average salary etc.). To quantify the impact of certain variables on the decline of the primary-school-age population and spatial differences in demographic patterns in the Federation, the authors of this paper used mathematical statistical methods (correlation analysis and the survey method) and GIS analysis (spatial querying and the classification method for spatial data representation).

It is necessary to point out that adverse demographic changes in Bosnia and Herzegovina began before the war in 1992, but they intensified be-

tween 1992 and 1995 due to war casualties and forced migration (Kadušić et al. 2016). It is known that wars represent the largest form of social and demographic destruction and that they have a significant effect on demographic post-war movements (Šterc and Komušanac 2012). However, regarding the decline of the primary-school-age population in the Federation, all relevant parameters were monitored in the period from 2006 to 2016. This is because after the war there was a so-called “baby boom”, whereby the birth rate increased to compensate for the significant reduction in birth rate during the war (Gelo 2004). This birth rate compensation caused the primary-school-age population to increase only a few years after the end of war. Besides this, intensive repatriation of displaced persons and refugees took place in Bosnia and Herzegovina until 2006, which caused an increase in population. Again, immediately after the war in Bosnia and Herzegovina, there was no systematic monitoring of many demographic processes. Those statistical assessments that were published are of questionable accuracy, while the first post-war census in the country was carried out in 2013.

Preliminary analyses showed that birth rate and emigration have the greatest direct impact on the decline of the primary-school-age population in the Federation, while the age coefficient (defined as the proportion of the population aged over 65), the proportion of unemployed people in the total workforce, the average net salary, per-sector employment, and other socio-

economic factors have the greatest indirect impact.

To define a degree of connection between the percentage decrease in the number of pupils and stated variables in the Federation in the period from 2006 to 2016, the authors used the correlation method. Preliminary analyses for correlation (Rogerson 2001; McCarroll 2016; Pallant 2011) and the results of the Shapiro-Wilk and Kolmogorov-Smirnov tests (Lantz et al. 2013) showed $p < 0.05$, as did an analysis using Spearman's correlation coefficient (ρ) to determine the degree and direction of relation between the assessed variables.

To determine the level of influence individual factors have on the decrease in the number of primary school pupils in the Federation, the authors designed an online questionnaire. In doing so, the authors defined the number of pupils who enrolled in the first grade of primary school over the past five school years, the number of pupils withdrawn from school and the main reasons for withdrawing (termination of education, leaving school in order to continue education at another primary school in the same municipality, leaving school due to moving to another municipality within Bosnia and Herzegovina, leaving school due to moving abroad), and the average size of school grades, among other figures.

At the end of 2017, the authors used Google Forms to conduct an online survey in primary schools in the Federation. Primary schools received a link for an online survey via email. In total, 152 schools or 14.1% of 1,079 regular primary schools across 54

municipalities within the Federation participated in the survey (Figure 1). Each of the 152 surveyed primary schools completed one questionnaire by the school secretary or principal. Since the survey showed that emigration also influences changes in the primary school population in the Federation, the authors monitored the intensity and causes of migration over the past 10 years; systemic monitoring of external migrations from Bosnia and Herzegovina has taken place since 2009. Based on the proportion of immigrants and emigrants within the total population, the authors calculated the net rate of migration in this area, and on the basis of the proportion of emigrants in the total population, the authors defined the emigration rate (Nejašmić 2005). The arithmetic mean was applied to define the average size of a grade and average number of pupils per grade, while index numbers were applied to define the direction and intensity of changes in the number of primary school pupils in the Federation.

Spatial analysis using GIS technologies allows the exploration of spatial and geographical processes, their spatial differences, and mutual correlation (Krunić et al. 2018). Spatial differences in changes to the school-age population in primary schools and variables influencing the changes in the Federation were defined on the basis of the created database using the classification method and spatial queries in QGIS (Longley et al. 2005; Osaragi 2002). Statistical maps were made to illustrate the geographic distribution of demographic and socio-

economic indicators, which influence the decrease in the primary school population in the Federation. The survey sample was mapped by geocoding, which involves converting the postal addresses of primary schools into geographic coordinates.

ANALYSIS OF PRIMARY-SCHOOL-AGE POPULATION

An analysis of the change in the total school-age population in primary schools within the Federation between the 2006/07 and 2016/17 school years indicates a continuous decrease in this population. The number of children enrolled in the first grade of primary school decreased, while the total primary-school-age population decreased from 243,708 to 188,430. That's a change of -22.7% from 2006/07 to 2016/17 (Tables 1 and 2, Figure 2).

Across cantons, the greatest decrease in the primary-school-age population was noted in Posavina Canton (-39.9%), Bosnia-Podrinje (-34.4%),

and Canton 10 (-27.8%), while the smallest decrease was noted in Sarajevo Canton (-9.9%). The decrease in primary-school-age population was noted in almost all municipalities in the Federation, with the greatest decrease occurring in the following municipalities: Domaljevac-Šamac (-57.7%), Sapna (-48.8%), Olovo (-43.8%), Ključ (-43.7%), Orašje (-42.3%), and Sanski Most (-40.1). An increase was noted in the following municipalities: Bosansko Grahovo (13.2%), Ravno (5.9%), and Vogošća (2.8%). All other municipalities saw a decrease of between 1.6% and 40.0% (Figure 2).

An analysis of the change in school-age population enrolled in the first grade of primary schools within the Federation between the 2006/07 and 2016/17 school years also shows a decrease in the number of pupils, from 26,227 to 20,819, marking a change of -20.6% (Table 2).

Table 1 School-age population in primary schools within the Federation between the 2006/07 and 2016/17 school years

Canton	School Year			Change 2006/2017 in %
	2006/07	2015/16	2016/17	
Una-Sana	31,338	23,605	22,754	-27.4
Posavina	4,021	2,606	2,417	-39.9
Tuzla	52,354	39,331	38,836	-25.8
Zenica-Doboj	43,727	34,057	34,337	-21.5
Bosnia-Podrinje	2,940	1,908	1,929	-34.4
Central Bosnia	28,737	21,996	21,526	-25.1
Herzegovina-Neretva	22,992	17,703	17,262	-24.9
West Herzegovina	10,260	8,386	7,949	-22.5
Sarajevo	40,514	35,466	36,490	-9.9
Canton 10	6,825	5,136	4,930	-27.8
Federation of B&H	243,708	190,194	188,430	-22.7

Source: FZS (2007, 2015, 2016, 2017b)

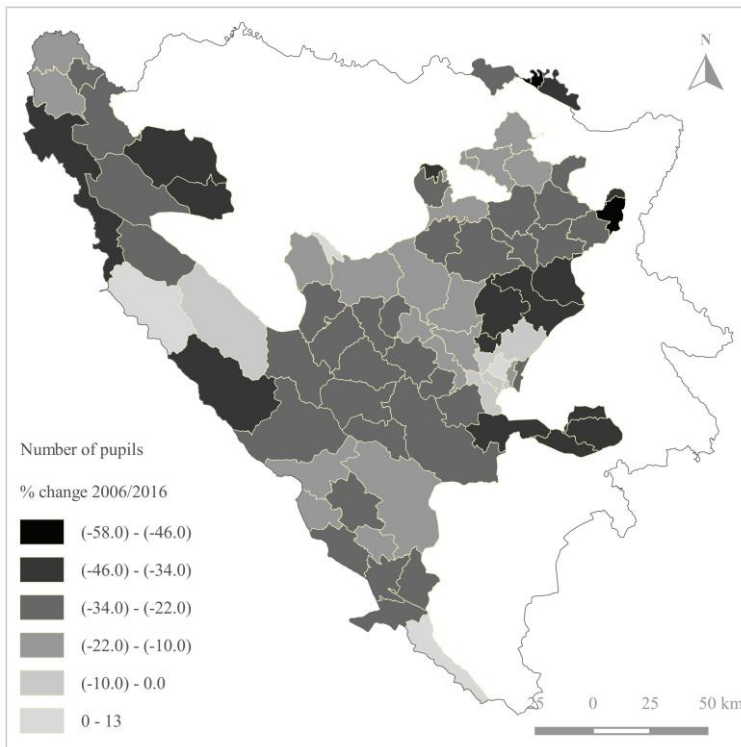


Figure 2 Primary-school-age population change in the Federation of B&H between 2006/07 and 2016/17

Source: Author's elaboration based on data from FZS (2007, 2017b)

Table 2 School-age population enrolled in the first grade in primary schools in the Federation of B&H between the 2006/07 and 2016/17 school years.

Canton	School Year			Change 2006/2017 in %
	2006/07	2015/16	2016/17	
Una-Sana	3,235	2,513	2,381	-26.4
Posavina	775	250	239	-69.2
Tuzla	5,077	4,648	4,491	-11.5
Zenica-Doboj	4,472	4,003	3,478	-22.2
Bosnia-Podrinje	278	242	256	-7.9
Central Bosnia	3,195	2,489	2,381	-25.5
Herzegovina-Neretva	2,641	1,984	1,919	-27.3
West Herzegovina	1,198	837	880	-26.5
Sarajevo	4,184	4,464	4,297	2.7
Canton 10	1,172	455	497	-57.6
Federation of B&H	26,227	21,885	20,819	-20.6

Source: FMON (2011, 2017); FZS (2008b)

An online survey conducted in 152 primary schools across 54 municipalities within the Federation showed that, during the 2017/18 school year, the average number of pupils enrolled in the first grade per primary school was 48.4, while the average number of pupils enrolled in all grades was 438.4. In the same school year, the average number of pupils per grade was 18.8 (in some primary schools there were grades with only 4 pupils). The average number of pupils per grade in the Federation was 19.5 in the same school year (the smallest average of 12.8 pupils per grade was recorded in Canton 10, and the largest of 22.6 in Sarajevo Canton) (FZS 2019).

IMPACT OF DEMOGRAPHIC CHANGES ON PRIMARY-SCHOOL-AGE POPULATION

There are currently two major trends in demographic change: a decrease in fertility and an increase in life expectancy. Most countries are seeing a decrease in or stagnation of fertility, while in most developed countries, fertility is below the replacement level. Many European countries are also

facing natural depopulation due to low fertility rates and demographic ageing (Hospers and Reverda 2015; Muenz 2007; Pearce and Bovagnet 2005), including Bosnia and Herzegovina (Kadušić et al. 2016). A prominent consequence of negative demographic trends in the Federation is a decrease in the number of pupils in primary schools. Recent research shows that two groups of factors are influencing the decrease in primary school population in this entity of Bosnia and Herzegovina: direct and indirect factors. The most important direct factors are natality and emigration, while indirect factors include age coefficient, unemployment, employment per sector of activities, average salary, and other socio-economic factors (Kadušić and Smajić 2018).

Forced migrations and war casualties in Bosnia and Herzegovina from 1992 to 1995 had negative demographic consequences and intensified negative post-war demographic trends in the country. Information about basic demographic indicators in the Federation, according to censuses in 1991 and 2013, is shown in Table 3.

Table 3 Basic demographic characteristics of the Federation of B&H in 1991 and 2013

Demographic characteristics	1991	2013	% change 1991/2013
Total population	2,720,074	2,219,220	-18.4
Natural population change (‰)	8.9	-0.1	-101.1
% of population aged 65 and over	6.0	12.9	115.0
% of population aged 0-19 years	32.6	23.4	-28.2
The mean population age (years)	30.6	38.5	25.8

Source: Author's calculation based on data of FZS (2008a); BHAS (2013)

The most prominent consequence of war and negative post-war demo-

graphic trends is a decrease in the total population. The number of inhabitants

in the Federation decreased from 2,720,074 in 1991 to 2,219,220 in 2013, a change of -18.4% . The decrease in the number of inhabitants, due to both emigration and a fall in the natural dynamics of population, has continued since 2013. Comparing changes in the overall population and the primary-school-age population in municipalities of the Federation from 2006 to 2016, the authors found a

Spearman's correlation coefficient of 0.325, showing that there is a moderate relation between the decrease in the number of inhabitants and the decrease in the primary school population in this entity. This means municipalities of the Federation with a greater decrease in total population also experienced a greater decrease in primary school population (Figure 3).

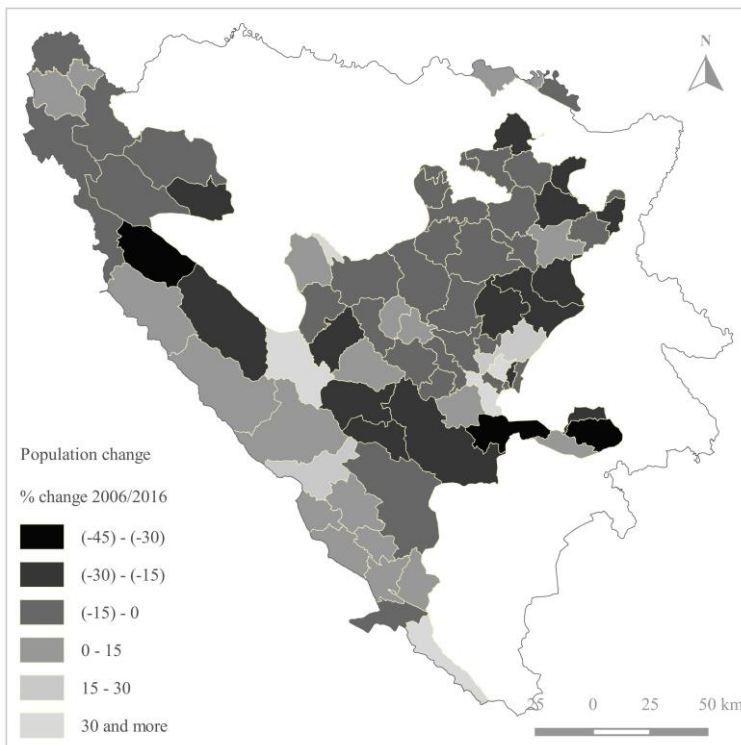


Figure 3 Population change in the Federation of B&H from 2006 to 2016

Source: Author's elaboration based on data of FZS (2007, 2017b)

Among the components of natural population change, natality has the greatest impact on the decrease in the number of pupils. This is because a decrease in natality rate directly influences enrolment in the first grade of primary school (Kadušić and Smajić

2018), therefore decreasing the primary school population in the Federation. From 2006 to 2016, natality rates in the Federation had a decreasing tendency ranging from 9.2% to 8.9%. A correlation analysis showed that there was a moderate relation between the

nativity rate and the change in the number of pupils in the Federation ($\rho=0.494$). For example, the greatest decrease in the primary school population between 2006 and 2016 was noted in Posavina Canton (-26.7%),

where nativity rates decreased from 6.4% to 3.4% . The greatest increase in the number of pupils was noted in Sarajevo Canton (10.0%), where nativity rates increased from 9.9% to 11.4% (Table 4, Figure 4).

Table 4 Natural population change of the Federation of B&H from 2006 to 2016 (in %)

Canton	2006			2016		
	N	M	RNI	N	M	RNI
Una-Sana	9.7	7.3	2.4	7.8	8.1	-0.3
Posavina	6.4	9.9	-3.5	3.4	11.8	-8.4
Tuzla	9.4	6.7	2.7	8.8	9.1	-0.3
Zenica-Doboj	9.6	7.9	1.7	9.6	9.5	0.1
Bosnia-Podrinje	5.2	8.1	-2.9	9.9	13.5	-3.6
Central Bosnia	10.2	8.4	1.8	8.5	9.3	-0.8
Herzegovina-Neretva	8.0	8.3	-0.3	8.4	10.1	-1.7
West Herzegovina	8.0	8.5	-0.5	7.5	9.4	-1.9
Sarajevo	9.9	8.8	1.1	11.4	10.3	1.1
Canton 10	6.7	9.3	-2.6	4.5	10.4	-5.9
Federation of B&H	9.2	7.9	1.3	8.9	9.6	-0.7

Source: Author's calculation based on data of FZS (2007, 2017b)

N – nativity rate, M – mortality rate, RNI – rate of natural population increase/decrease

In the period from 2006 to 2016, mortality rates in the Federation rose from 7.9% to 9.6% as the result of complex biological, economic, and social factors. Biological factors were the most significant of these factors, with the ageing process playing an especially large role. Changes in the fluctuation of natality and mortality rates resulted in changes in the fluctuation of the natural change rate, which, in the assessed period, decreased from 1.3% to -0.7% . A positive natural population change occurred in Sarajevo Canton (1.1%) and Zenica-Doboj Canton (0.1%), while the greatest natural depopulation occurred in Posavina Canton (-8.4%) and Canton 10 (-5.9%). A low birth

rate and increased life expectancy cause a significant change in the age composition of any population (Lee 2003), i.e. ageing is a consequence of the decrease in birth rates, natural population decrease, and negative migration balance (Šterc and Komušanac 2012). In the Federation, decreasing birth rates, increasing mortality rates, increased life expectancy, and emigration also influence the ageing of the population. From 1991 to 2013, the age coefficient increased from 6.0% to 12.9% , reaching 14.1% in 2016 (Table 3, Figure 5). Besides this, the average age of the population between the two censuses (1991 and 2013) increased from 30.6 to 38.5 .

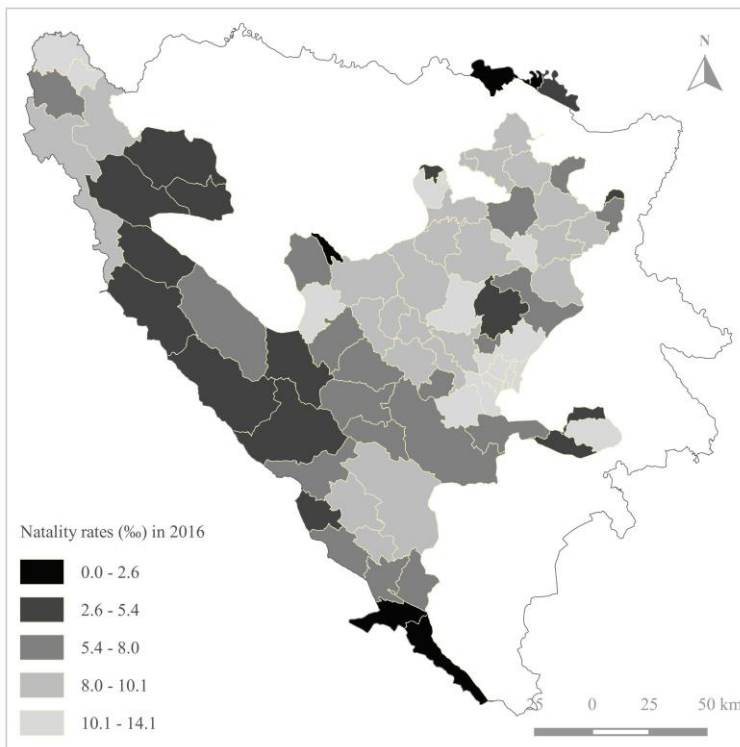


Figure 4 Natality rates in the Federation of Bosnia and Herzegovina in 2016

Source: Author's elaboration based on data of FZS (2017b)

The ageing process of the population is a characteristic of the second demographic transition, and age structure is one of most significant demographic characteristics of the population; it is causally related to almost all population processes. On one hand, age structure is a complex result of the effects of fertility, mortality, immigration, and emigration. On the other hand, it affects other socio-economic and demographic phenomena, such as nuptiality, migration, and the potential size of the labour force etc. (Káčerová et al. 2014). With the correlation method, the age coefficient was found to have a significant degree of dependence with the natural change rate ($\rho = -0.742$), natality ($\rho = -0.500$),

and mortality ($\rho = 0.635$) in the Federation. Therefore, by affecting the above-mentioned population processes, ageing indirectly plays a part in the decrease in the primary school population in the Federation. In this entity, municipalities with decreasing natality rates and increasing mortality rates and age coefficient also had a greater decrease in total population and primary school population.

Emigration is the next significant factor that affects depopulation processes in the Federation and, therefore, the decrease in the primary-school-age population. In Bosnia and Herzegovina, migrations are the cause of economic, demographic, and social changes. Besides the intensive migra-

tion of citizens of Bosnia and Herzegovina to foreign countries, internal migrations that contribute to unequal regional demographic development

have also played a significant role (Pobrić 2002). Since 2010, the migration rate in the Federation has been about -2.0% (Table 5).

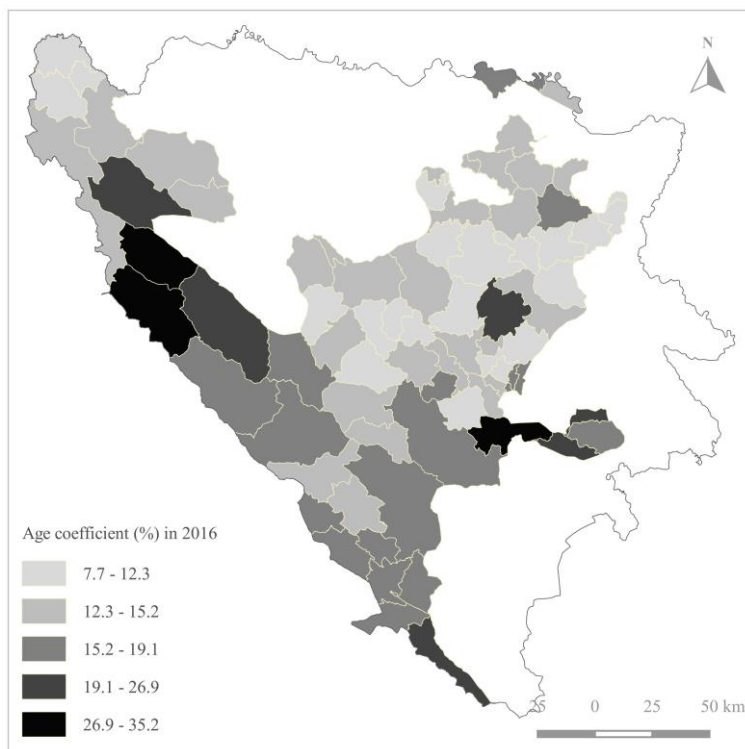


Figure 5 Age coefficient in the Federation of Bosnia and Herzegovina in 2016

Source: Author's elaboration based on data of FZS (2017b)

The net migration rate in 2016 in the Federation was -1.6% . A negative net migration rate was recorded in Canton 10 (-3.8%), Bosnia-Podrinje Canton (-3.1%), and Zenica-Doboj Canton (-2.7%), while a positive net migration rate of 1.1% was recorded only in Sarajevo Canton (Table 5). The data shows that in all cantons of the Federation, except in Sarajevo Canton, emigration is exceeding immigration. In total, 2,957 people emigrated abroad from the Federation in 2010, 2,225 emigrated in 2013, and

2,570 in 2016. In 2016, of 555 emigrants from West Herzegovina Canton, 26.7% emigrated abroad, while 24.8% of the 2,355 emigrants from Una-Sana Canton emigrated abroad. On the other hand, the smallest proportion of emigrants to move abroad in regard to the total number of emigrants was recorded in Bosnia-Podrinje Canton (3.8% of 443 people who moved away) and Sarajevo Canton (5.4% of 7,993 people who moved away) (FZS 2017a).

Table 5 Net migration and emigration rate in the Federation of B&H in 2010 and 2016

Canton	Net migration rate (per 1000 population)		Emigration rate (per 1000 population)	
	2010	2016	2010	2016
Una-Sana	-3.1	-2.5	9.3	8.7
Posavina	-3.2	-1.0	8.2	5.1
Tuzla	-1.4	-2.3	8.0	8.5
Zenica-Doboj	-3.4	-2.7	9.0	8.3
Bosnia-Podrinje	-2.4	-3.1	13.5	18.8
Central Bosnia	-3.5	-1.5	10.7	8.2
Herzegovina-Neretva	-2.1	-1.5	12.1	9.8
West Herzegovina	-3.9	-1.2	10.1	5.9
Sarajevo	2.7	1.1	19.8	19.1
Canton 10	-3.2	-3.8	10.5	7.3
Federation of B&H	-1.7	-1.6	11.5	10.5

Source: Author's calculation based on data of FZS (2011, 2017a)

The emigration of people away from Bosnia and Herzegovina is caused by unfavourable economic, political, social, and other circumstances in the post-Dayton era (Kadušić and Smajić 2018). Economic factors, such as high unemployment and low income, stand out and have a direct effect on emigration (Efendić et al. 2014) and, therefore, the decrease

in the primary school population in the Federation (Table 6, Figure 6). In addition to this, population ageing in certain European Union countries has created the need for a qualified labour force (Koivukangas 2007), which, to a certain extent, makes it easier for people to emigrate from Bosnia and Herzegovina to these countries (primarily Germany) (MSB 2018).

Table 6 Basic indicators of the socio-economic development of the Federation of B&H in 2006 and 2016

Canton	Unemployment (%)		Net salary (BAM)	
	2006	2016	2006	2016
Una-Sana	56.1	57.9	547	811
Posavina	49.1	47.4	556	730
Tuzla	54.8	52.4	565	744
Zenica-Doboj	51.4	48.4	480	730
Bosnia-Podrinje	53.9	34.3	523	746
Central Bosnia	52.4	47.7	490	678
Herzegovina-Neretva	40.7	40.9	659	928
West Herzegovina	37.3	39.0	543	759
Sarajevo	41.8	35.1	765	1018
Canton 10	44.0	48.4	561	848
Federation of B&H	48.2	45.2	603	839

Source: Author's calculation based on data of FZS (2007, 2017b)

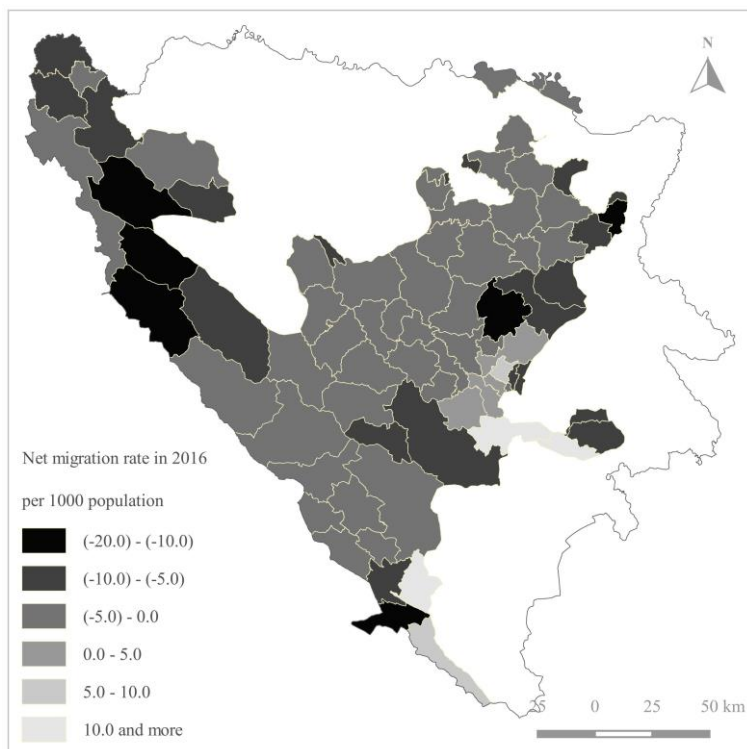


Figure 6 Net migration rate in the Federation of Bosnia and Herzegovina in 2016

Source: Author's elaboration based on data of FZS (2017a, 2017b)

Research has shown correlations between unemployment and migrations, with higher unemployment corresponding to higher emigration rates. The greatest unemployment rate in 2016 was recorded in Una-Sana Canton (57.9%) and Tuzla Canton (52.4%), while the lowest unemployment rate was in Sarajevo Canton (35.1%). Besides this, there is a moderate dependence between the emigration of the population and activities by business sector. Municipalities of those cantons that had a greater number of citizens employed in the primary sector of the economy – such as Trnovo, Bosanski Petrovac, Drvar,

Čelić etc. – had greater emigration rates (BHAS 2013).

Results of the survey conducted at the end of 2017 confirmed that primary schools in the Federation lose pupils because they move abroad. The total number of pupils withdrawn in the period between the 2012/13 and 2016/17 school years from 152 surveyed primary schools was 5,688. The most frequent causes of withdrawals from the primary schools included in the survey were moving abroad (114 schools), moving to another primary school in the same municipality (91 schools), moving to another municipality in Bosnia and Herzegovina (85 schools), and the termination of edu-

cation (8 schools). In the above-mentioned period, 2,285 pupils, or 40.2% of the total number of withdrawn pupils, left school because they moved abroad. In the 2016/17 school year, 1,345 pupils from the 152 primary schools covered by the survey withdrew from school. Of those, 643 (47.8%) did so because they moved abroad. The average number of withdrawn pupils per primary school was 15 from 2012/13 to 2016/17, i.e. 4.2 pupils in 2016/17.

The withdrawal of these children from the primary education system also contributes to the decrease in the primary school population in the Federation. According to data from the Federal Ministry of Education and Science (FMON 2013), there are several especially vulnerable groups in regard to non-enrolment and/or withdrawal from primary school: Roma children, children from socially vulnerable families (mostly from rural areas), and children with special needs. For example, the enrolment rate of Roma children in primary schools in the Federation is 68.9%, while 31.3% do not attend primary school.

The problem of the primary school population decreasing is also aggravated by the fact that Bosnia and Herzegovina, and therefore the Federation, does not have a clearly defined population policy. Entity and cantonal laws on basic social protection, the labour law, and other laws stipulate certain measures and population policy activities (e.g. the right to maternity leave and remuneration instead of salary, subvention for a new-born baby's equipment, the right to subven-

tion for a third child, etc.). For example, according to the labour law of the Federation 2016 (2016), a woman is entitled to maternity leave for one year continuously during pregnancy, delivery, and care for her child. After the expiry of maternity leave, a woman with a child younger than one year old is entitled to work half-time, a woman with twins, a third child, or any subsequent child is entitled to half-time work hours until the child/children turn two if a cantonal regulation does not stipulate that this right should last longer. According to the law on basic social protection 1999 (2016), a woman is entitled to remuneration instead of a salary during pregnancy leave, delivery, and caring for child. The amount of the remuneration is defined as a percentage of the salary realised in the six-month period before delivery. The amount is raised in case of a salary increase in the canton during that period, and the percentage is defined by cantonal regulations. According to the same law, only families whose total monthly household income – excluding income from the social protection of families with children – does not exceed the amount defined by cantonal regulations as the minimum income sufficient for support, are entitled to child allowance. Other than these, there are no significant incentives in the population policy. Therefore, the existing measures are not enough, bearing in mind the general characteristics of natural reproduction of the population within the Federation which, in the existing economic, medical, and social circumstances is characterized by a low and

decreasing natality rate, a slightly increasing mortality rate, and a negative natural population change.

CONCLUSION

Between the 2006/07 and 2016/17 school years, the total number of children in primary schools in the Federation of Bosnia and Herzegovina decreased from 243,708 to 188,430, marking a change of -22.7% . Two groups of factors contributed to this decrease: direct and indirect factors. The direct factors were natality and emigration, while the indirect factors were those that influenced the direct ones, such as age coefficient, unemployment, employment across different business sectors, and living standards.

Natality had the greatest influence on the primary-school-age population change, as birth rates directly influenced enrolment in the first grade of primary school. A correlation coefficient of 0.494 showed that there was a moderate relation between birth rates and the decrease in the primary-school-age population in the Federation. Furthermore, mortality rates had an increasing tendency and, consequently, changes in natality and mortality rates resulted in the fluctuation of natural population change rates in the researched period. Between 1991 and 2016, the natural population change rate in the Federation ranged from 8.9% to -0.7% . A decrease in potential biodynamics also affected the ageing of the population in this area. The proportion of the total population aged 65 and over increased

from 6.0% to 14.1% during the same period. Affecting the components of natural population change, the ageing process indirectly affects the decrease in the primary-school-age population in the Federation. Besides demographic factors, economic, social, and other factors also contribute to the primary school population decreasing, as they affect emigration. In the post-war period, the Federation has had a negative net migration rate of about -2.0% . The survey conducted in primary schools in this entity of Bosnia and Herzegovina proved that migrations affect the aforementioned decrease. In the five school years from 2012/13 to 2016/17, from 152 primary schools included in the survey (about 14.1% of the total number of schools in the Federation), 2,285 pupils were withdrawn due to moving abroad (on average 15 pupils per primary school). Unfavourable economic conditions contribute to emigration, as do high unemployment rates and low living standards. The decrease in the natural population dynamics and the international emigration of people from Bosnia and Herzegovina contribute to the decrease in the total population, and the correlation coefficient of 0.325 indicates a moderate correspondence between the decrease in the total population and the decrease in the primary school population in the Federation. Bearing in mind social and economic circumstances in both the researched area and across Bosnia and Herzegovina as a whole, negative demographic trends may continue, which could cause the closure of a certain number of schools and the loss of

teaching jobs. That's why it is necessary to design adequate measures and take action to overcome negative demographic trends. This could include population policy measures that encourage an increase in natality and immigration. However, even though an effective population policy should be implemented soon, it will not be possible to achieve positive demographic trends (an increase in the population) in the near future.

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Promjena u kretanju broja populacije osnovnoškolskog uzrasta u Federaciji Bosne i Hercegovine: uticaj demografskih faktora

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SAŽETAK

Početak XXI vijeka na području Federacije Bosne i Hercegovine karakterističan je po trendu smanjenja populacije osnovnoškolskog uzrasta, te je osnovni cilj ovog rada utvrditi i objasniti faktore koji su uticali na pad broja učenika u osnovnim školama ovog bosanskohercegovačkog entiteta. Metodologija istraživanja u ovom radu je usmjerena na utvrđivanje stepena uticaja demografskih faktora na razvoj populacije osnovnoškolskog uzrasta u Federaciji Bosne i Hercegovine. Upotrebom statističkih metoda i GIS analizom statističkih podataka utvrđeni su negativni demografski tokovi u ovom bosanskohercegovačkom entitetu krajem XX i početkom XXI vijeka, kao što su intenzivne migracije, smanjenje ukupnog broja stanovnika, pad stopa nataliteta, povećanje stopa mortaliteta, te pad stopa prirodne promjene, proces starenja stanovništva, a

uslijed nepovoljnih ekonomskih, socijalnih, političkih i drugih prilika nakon 1995. godine intenzivirana je emigracija stanovništva, i to uglavnom stanovništva od 20 do 40 godina starosti. Najvažniji rezultat istraživanja jeste, prema tome, činjenica da su pad prirodne dinamike stanovništva, te intenzivne emigracije najznačajniji faktori koji utiču na smanjenje populacije osnovnoškolskog uzrasta u Federaciji Bosne i Hercegovine. Ovakvi negativni demografski trendovi nepovoljno utiču na sistem osnovnog obrazovanja, te je u budućnosti neophodno, kroz mjere populacijske politike, planirati i provoditi proces populacijske revitalizacije.

KLJUČNE RIJEČI

Federacija Bosne i Hercegovine | populacija osnovnoškolskog uzrasta | demografski faktori | prirodna promjena | emigracija

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