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The Demographic Downturn: Recent Trends in Serbia and Bosnia and Herzegovina

Authors: Nemanja Velickovic^{1*}

Corresponding author: Nemanja Velickovic < velickon@natur.cuni.cz >

Abstract

The 1990s conflict in the former Yugoslavia reshaped the demographic landscape of Serbia and Bosnia and Herzegovina, driven by shifts in fertility, rising mortality, and forced migration. This study examines changes in these countries between 2011 and 2023, focusing on fertility, mortality, migration, and their combined impact on population size and age structure. The goal is to highlight both differences and similarities between these neighboring countries, showing how Bosnia and Herzegovina, a predominantly Muslim nation faces depopulation patterns similar to Serbia. Using national statistical reports, census data, and secondary demographic sources, total fertility rates, crude birth and death rates, net migration, and age-specific mortality were calculated. Trends were analyzed with age standardization and relative change calculations to account for population structure differences. Findings reveal that both countries are experiencing pronounced population aging. Serbia shows a modest increase in fertility and positive net migration in last two years, while Bosnia and Herzegovina experiences an unusual fertility decline and higher emigration. Mortality patterns differ by sex, with cardiovascular diseases and neoplasms remaining the leading causes of death. Meanwhile, the child and working-age populations are shrinking, and older age groups are growing, intensifying the demographic shift. Overall, population decline and aging in both countries reflect the complex interplay of fertility, migration and mortality. These patterns highlight the need for policies that

support families, prioritize health, and manage migration effectively to address the region's long-term demographic challenges.

Keywords: Serbia, Bosnia And Herzegovina, Fertility, Mortality, Migration, Depopulation.

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¹Department of Demography and Geodemography Charles University, Faculty of Science Albertov 6, 128 00 Prague 2, Czech Republic, and Email: velickon@natur.cuni.cz

Introduction

The former Socialist Federal Republic of Yugoslavia (1945–1991) was marked by demographic complexity, with its constituent republics exhibiting varying population dynamics driven by differences in economic development, cultural norms, and migration (Josipović, 2016). As a multi-ethnic federation, demographic trends across its regions reflected both internal diversity and unequal modernization.

By 1965, the country had completed its first demographic transition the shift from high birth and death rates to lower levels of both, as documented by Vogelink (1965) as cited in (Josipović, 2016). Soon after, parts of Yugoslavia began undergoing the second demographic transition (SDT), marked by fertility rates dropping below replacement level. Van de Kaa (1987) emphasized that this phase typically involves shifts in personal values and lifestyle choices, such as delayed childbearing and declining marriage rates. In Yugoslavia, second demographic transition was first observed in Slovenia, Croatia, Vojvodina, and central Serbia, and only later spread to the rest of the country (Malačič, 1985, Wertheimer-Baletić, 1999) as cited in (Josipović, 2016).

During this time, cultural and regional differences meant that the transitions were not uniform. The more economically advanced regions moved earlier into low fertility and aging demographics, while less developed areas retained higher birth rates. This divergence continued even after Yugoslavia's breakup, reinforcing demographic asymmetries across the region.

The disintegration of Yugoslavia in the 1990s ushered in profound changes. The federation dissolved into multiple independent states including Serbia, Croatia, Bosnia and Herzegovina, Montenegro, North Macedonia, and Slovenia while Kosovo declared independence in 2008 Caspersen (2008) a status still contested by several countries. Bosnia and Herzegovina faced some of the most severe consequences. After declaring independence in 1992, it endured a devastating war that lasted until 1995, resulting in around 200 thousand deaths and the displacement of nearly two million people (Robinson and Pobrić, 2006). The Dayton Peace Agreement ended the conflict, establishing Bosnia and Herzegovina as a decentralized state with two entities: the Federation of Bosnia and Herzegovina and Republika Srpska. The Brčko District was formed as a neutral, self-governing unit under shared state control, with international supervision (Pobrić and Robinson, 2015).

This legacy of conflict had a major demographic impact. While Bosnia had experienced above-average natural growth during the second half of the 20th century, it entered the demographic transition relatively late compared to its neighbors (Nikitović, 2016). Despite net emigration, the

country's population had increased between census periods until the onset of war. However, the post-war years brought stagnation, accelerated aging, and continued emigration, all of which now contribute to long-term population decline (Pobrić, 2015).

Serbia, although also affected by regional instability, went through demographic transition earlier. Fertility had already begun to fall before the conflicts of the 1990s, and recent decades have seen sustained emigration, a declining birth rate, and an aging population. While Serbia's demographic changes were less interrupted by war than Bosnia's, the consequences today are similar a shrinking labor force and growing concerns about future demographic sustainability.

With Croatia's accession to the EU in 2013, the Western Balkans are now generally defined as including Serbia (excluding Kosovo), Kosovo, Bosnia and Herzegovina, Montenegro, North Macedonia, and Albania. This region continues to be characterized by varied demographic dynamics but faces shared challenges - most notably, low fertility, population aging, and large-scale emigration (Nikitović, 2019).

The period from 2011 to 2023 was chosen to include Bosnia and Herzegovina's long-awaited 2013 population census, along with Serbia's two censuses in 2011 and 2022. This timeframe allows for a more accurate analysis of population estimates and the underlying factors contributing to depopulation in both countries. Also, this period is good for comparing trends in these two neighboring countries, as well as for analyzing how the population will move in Serbia and Bosnia and Herzegovina.

In conclusion, while Bosnia and Herzegovina and Serbia share historical and regional ties, their demographic trajectories have been shaped by different paths through transition, conflict, and recovery. Both countries now face the difficult task of addressing demographic decline while fostering conditions for sustainable development and social stability.

Table 1 Basic Demographic Indicators of Serbia and Bosnia And Herzegovina: 2011 and 2023

Category	Serbia (2011)	Serbia (2023)	Bosnia And Herzegovina (2011)	Bosnia And Herzegovina (2023)
Total Population (in 1000 popluation)	7,24	6,62	3,84	3,422
Birth Rate (in thousand population)	9,1	9,2	8,3	7,7
Death Rate (in thousand population)	14,2	14,7	9,1	10,4
Natural Increase (per 1000 population)	-5,1	-5,5	-0,8	-2,7
Net Migration Rate	0,1	0,6	-17,3	-0,2
Total increase (per 1000 population)	-5,1	-4,83	-17,73	-2,9
Median Age	41,4	44,1	38,8	44,9

Note: Total population figures are estimates provided by the national statistical offices.

Sources: SORS, Agency of statistics of Bosnia And Herzegovina, UN data, Author's calculations

Bosnia and Herzegovina stands out as a newly independent European state with a Muslim-majority population (50.7% according to the 2013 final census). However, contrary to demographic theory and religious fertility assumptions, Bosnia does not display the expected high fertility or strongly youthful age profile. Serbia, in contrast, faces well-documented population decline, yet little comparative work has been done to explain why Bosnia's demographic patterns appear similar to Serbia's despite very different population structures.

This study asks: Why does Bosnia and Herzegovina, despite being a Muslim-majority country, not show the demographic patterns typically associated with high fertility and a youthful population? How do its demographic trends compare to Serbia's, and what measures could each country adopt to address depopulation?

Understanding these dynamics is crucial because both Bosnia and Serbia are experiencing population decline, which has direct implications for economic development, labor force sustainability, and long-term stability. Moreover, challenging simplistic assumptions about religion and fertility contributes to a more accurate understanding of demographic processes in post-socialist, post-conflict societies in Europe.

From 2011 to 2023, both Serbia and Bosnia and Herzegovina have exhibited pronounced demographic decline. Negative natural change intensified due to persistently low birth rates combined with rising death rates. While Bosnia and Herzegovina showed a notable shift in net migration, transitioning from high emigration to relative stability, population aging remained a common feature in both countries. The steady rise in median age underscores the deepening demographic transition and the potential long-term societal implications. (Table 1) Between 2011 and 2023, both Serbia and Bosnia and Herzegovina experienced notable population decline. In Serbia, where the data is census-based, the population decreased by **7.6%** in taken period. (SORS) In Bosnia and Herzegovina, where the 2011 figure was an estimate and the first post-war census was conducted in 2013, the population declined by **10.9%** (BHAS). These figures reflect ongoing demographic challenges, including negative natural growth and sustained emigration.

Data and Methods

Bosnia and Herzegovina did not conduct a national census between 1991 and 2013, primarily due to the 1992–1995 former Yugoslav war and its aftermath. An attempt was made in 1996 with the UNHCR census as part of post-war reconstruction efforts. This census was conducted legally with the consent of relevant authorities and within the framework of international agreements such as the Dayton Accords. However, it faced significant political and logistical challenges and did not fully achieve its intended goals. Consequently, reliable population data for Bosnia and Herzegovina are available only from the 2013 census, which was released in June 2016, with subsequent revisions applied to the population estimates.

For Serbia, population data are drawn from the 2011 and 2023 Censuses of Population, Households and Dwellings, supplemented by estimates from the Statistical Office of the Republic of Serbia.

Kosovo is not included in the data for Serbia because the Statistical Office of the Republic of Serbia does not process the data from that part.¹

For Bosnia and Herzegovina, the data used in this study originate from three statistical offices: the Institute of Statistics of the Federation of Bosnia and Herzegovina, the Institute of Statistics of the Republic of Srpska, and a special edition for Brčko District. The results from these offices are later collected, harmonized, and compiled by the Agency for Statistics of Bosnia and Herzegovina, ensuring consistency and comparability across the country. Additional data were calculated from vital statistics provided by each institute and cross-checked with publications, international databases such as World Population Prospects and Eurostat.

Limitations of the data include several important considerations. The Institute of Public Health of Serbia “Dr Milan Jovanović Batut” provided health data for 2023 in percentages only and limited to the five most common causes of death. Population estimates for Bosnia and Herzegovina were revised after the 2013 census, which created breaks in the time series. UN population data for the Western Balkans can be affected by incomplete or irregular national statistics collection, delays, census boycotts, territorial changes, and border disputes, particularly concerning the entities of Bosnia and Herzegovina and Kosovo (Nikitović, 2016). These limitations were taken into account when interpreting trends and making comparisons across the region.

Demographic data used in this study including fertility, mortality, birth rates, and migration were derived from multiple reliable sources to ensure accuracy. The analysis employed descriptive statistics and comparative analysis to identify trends and meaningful differences across countries and over time.

Fertility trends were assessed using the total fertility rate (TFR) and age-specific fertility rates (ASFR). Changes in the median age at childbearing were also examined to capture shifts in reproductive behavior.

Mortality trends were analyzed through infant mortality rates (IMR), crude death rates (CDR), and age-standardized mortality rates (ASMR). Standardization was performed using European Standard Population (ESP 2013) weights, with results disaggregated by five-year age groups and presented separately for females and males.

Migration patterns were explored using net migration rates and considering the economic and social factors driving population movements, particularly toward Western Europe. Population aging was assessed using the median age, age distribution, and ageing index, reflecting changes in the proportion of older adults relative to younger age groups.

To complement these descriptive indicators, a chi-square (G^2) test of independence was applied to assess whether the distribution of the three main age groups (0–14, 15–64, 65+) differed significantly between Serbia and Bosnia and Herzegovina in 2011 and 2023. Expected values were derived from the combined population totals of both countries, and the calculations were performed using an online chi-square calculator (GraphPad, 2025). Detailed numerical results and

¹ From 1998. Statistical Office of the Republic of Serbia doesn't take into consideration data from Kosovo and Metohija and data from 1990 until 1997 are considered unreliable Penev, G. (2001). The replacement of generations in Serbia in the period 1950–2000. *Stanovnistvo*, 39(1–4), 45–71.

interpretation are presented in the Results section. (Table 8)

Research Results

Over the past decade, Serbia and Bosnia and Herzegovina have experienced noticeable demographic shifts shaped by a mix of social, economic, and historical factors. These changes are visible across all main dimensions fertility, mortality, migration, and population aging and together they reflect the broader transformations both countries have been going through since the early 2010s. To give an initial sense of how the two populations compare, Table 2 brings together several key indicators: total fertility rate, life expectancy at birth, net migration rate, and the share of people aged 65 or older. Net migration is included here as part of the overall picture, even though it is discussed in more detail later in the Migration section. This brief overview helps frame the demographic context before moving into the specific analyses of fertility, mortality, migration, and aging.

Table 2 Comparative demographic indicators of Serbia and Bosnia and Herzegovina (2011–2023)

Indicator	Serbia (2011)	Serbia (2023)	Bosnia and Herzegovina (2011)	Bosnia and Herzegovina (2023)
Total Fertility Rate (TFR)	1,4	1,61	1,21	1,18
Life Expectancy at Birth (both sexes, years)	74,75	76,75	76,7	77,65
Net Migration Rate (per 1,000)	0,1	0,6	-17,3	-0,2
Population Aged 65+ (%)	17,40%	22,70%	15,50%	21,70%

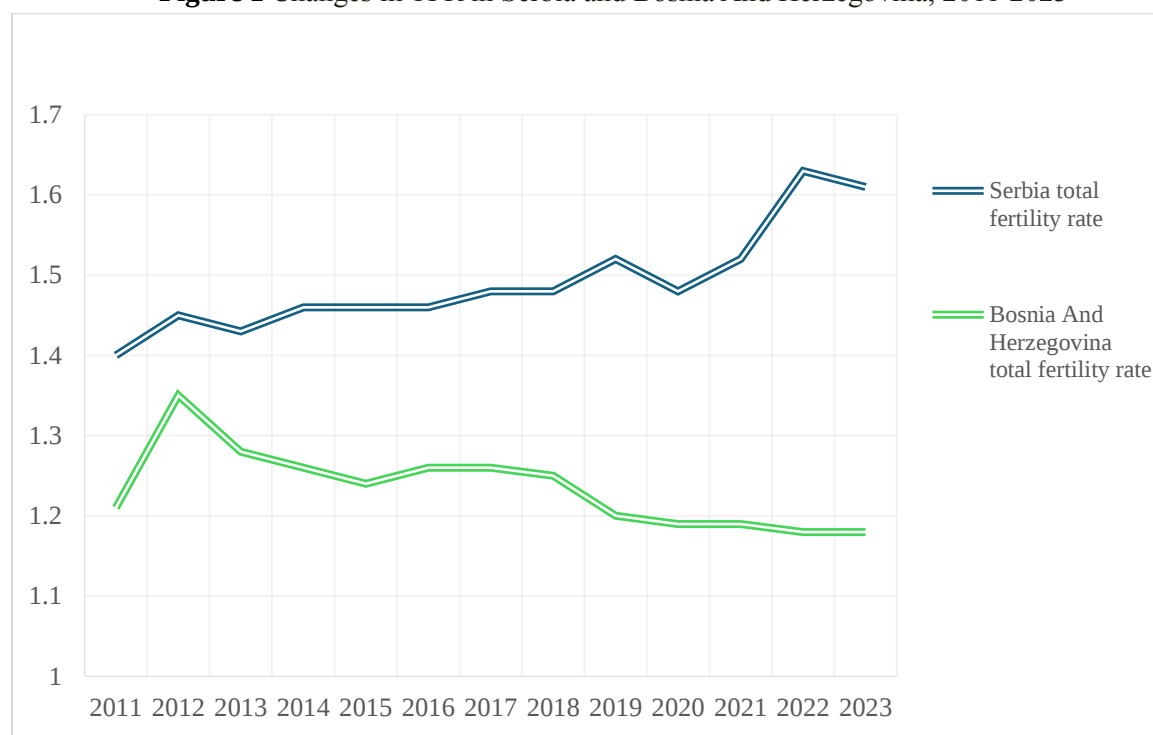
Sources: SORS, Agency of statistics of Bosnia And Herzegovina, UN data, Author's calculations

Fertility - While some regions of the former Yugoslavia maintained relatively high fertility levels after the post World War II baby boom, others experienced an earlier onset of fertility decline (Dušan, 1991). In countries such as Serbia, this decline began as early as the mid-20th century (Jakovljevic and Laaser, 2015). The formerly high-fertility sub-region including Kosovo, which once stood as a European outlier has effectively ceased to exist in demographic terms. The northern part of the Western Balkans was among the first regions in Europe to enter population decline, largely driven by prolonged periods of below-replacement fertility in combination with sustained emigration trends (Nikitović, 2019). There are several English-language studies focusing on fertility developments in the former Yugoslav countries. Most of these either form part of broader cross-European analyses of cohort fertility Frejka and Sardon (2006) or examine recent trends in period fertility (Lerch, 2018), as cited by Čipin et al. (2020).

Serbia fell below the replacement-level fertility threshold of 2.1 children per woman as early as the 1960s. By contrast, Bosnia and Herzegovina maintained higher fertility rates until the early 1980s. Excluding Kosovo as a distinct demographic case, fertility rates above two children per woman at the end of the 20th century persisted only in Montenegro and North Macedonia among the former Yugoslav republics (Čipin et al., 2020).

Bosnia and Herzegovina initiated its demographic transition later than neighboring republics, which contributed to a natural population growth rate that for many years remained well above the European average (Pobric and Robinson, 2015).

Figure 1 Changes in TFR in Serbia and Bosnia And Herzegovina, 2011-2023



Sources: SORS and BHAS

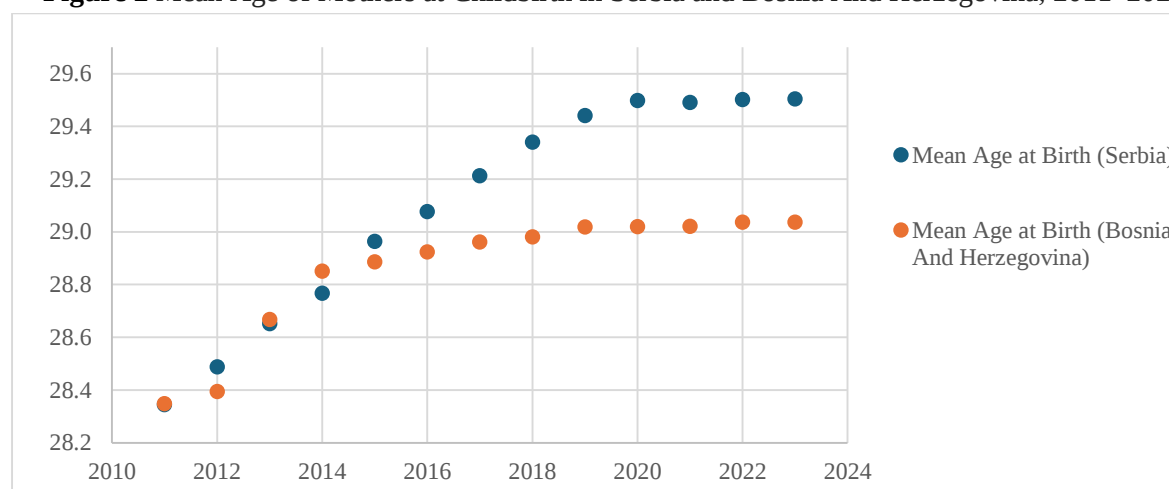
The data reveal persistently low fertility in both Serbia and Bosnia and Herzegovina, with rates remaining well below the replacement level of 2.1 children per woman throughout the entire period. In Serbia, the total fertility rate (TFR) shows a modest but steady increase from 1.40 in 2011 to a peak of 1.63 in 2022, followed by a slight decline in 2023 (Figure 1). This suggests incremental improvements, possibly reflecting delayed childbearing and pronatalist measures, though still insufficient to offset population decline. By contrast, Bosnia and Herzegovina exhibits even lower fertility, starting at 1.21 in 2011 and declining further to just 1.18 by 2023 (Figure 1). The lack of recovery indicates structural obstacles including prolonged emigration, socio-economic instability, and the enduring legacy of war that continue to suppress fertility levels. Overall, the divergence between the two countries after 2015 highlights Serbia's slightly more favourable trend, though both remain entrenched in very low fertility regimes.

The collapse of relatively stable socio-economic conditions exacerbated by war and its aftermath has contributed to a lasting decline in fertility (Helms, 2013, Vuillamy, 2012), as cited in (Pobrić, 2015). Similar trends are observed in European countries of the former Soviet Union and in some Balkan countries (Bulgaria, Romania, Serbia), where declining fertility is projected to lead to long-lasting depopulation (Sobotka and Fürnkranz-Prskawetz, 2020).

In parallel, the mean age of mothers at childbirth has steadily increased across both countries. In Serbia, this average rose from 28.3 years in 2011 to 29.5 years in 2023, reflecting broader societal patterns such as postponed family formation, prolonged education, and greater female labor force participation. Bosnia and Herzegovina exhibited a similar trend, with the average age increasing

until 2014 and stabilizing at approximately 29.0 years thereafter. This shift toward later childbearing is consistent with demographic trends observed across much of Europe, signaling a broader transformation in reproductive norms and timing. (Figure 2)

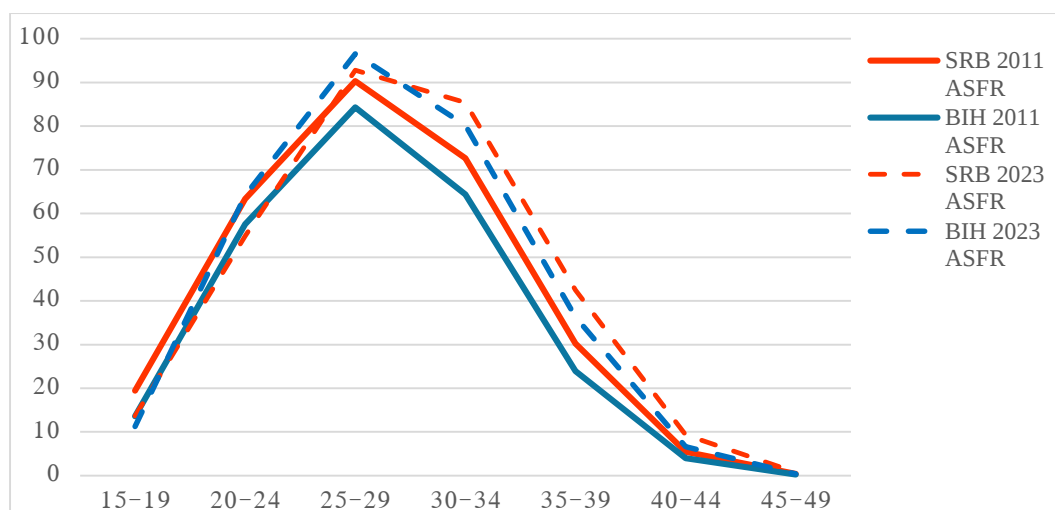
Figure 2 Mean Age of Mothers at Childbirth in Serbia and Bosnia And Herzegovina, 2011–2023



Source: UN Data

Age-specific fertility rates (ASFR) highlight a parallel shift in both countries toward later childbearing. In Serbia, fertility among women aged 25–34 grew strongly (25–29: 90.3 → 92.8; 30–34: 72.6 → 85.4), while adolescent fertility declined by nearly one-third (15–19: 19.5 → 13.7). Bosnia and Herzegovina shows an even sharper postponement, with the 25–29 group rising from 84.3 to 96.6, surpassing the 20–24 group by 2023. Fertility at ages 35–39 also increased in both contexts, confirming the trend of delayed motherhood and extended reproductive behaviour. (Figure 3). Between 2011 and 2023, Serbia and Bosnia and Herzegovina displayed contrasting fertility trends. Serbia showed a modest increase in total fertility, alongside a shift toward later childbearing, while Bosnia maintained a persistently low fertility rate with childbearing increasingly concentrated in the 25–34 age group. Both countries experienced a decline in teenage fertility and a slight rise in the mean age at childbirth. These patterns reflect broader demographic transitions, including delayed motherhood and low fertility, which have important implications for population aging, labour force sustainability, and long-term social planning.

Figure 3 Trends in Age-Specific Fertility Rates (ASFR) in Serbia and Bosnia And Herzegovina for 2011 and 2023.

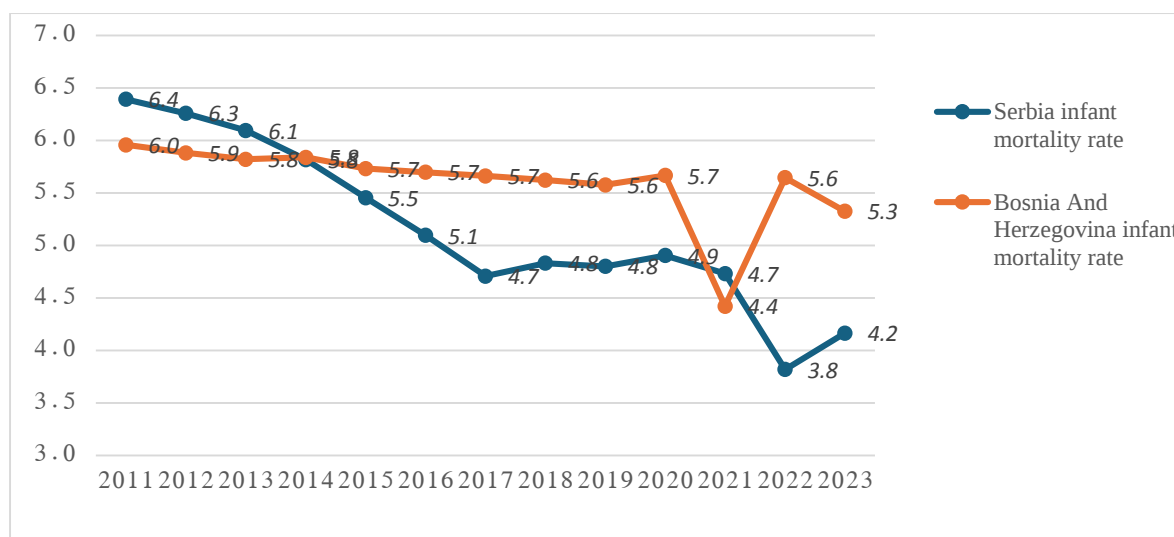


Source: UN data

In Serbia, several pronatalist measures have been introduced over the past decade, including cash transfers, one-time birth grants, and extended maternity benefits. However, research indicates that their demographic impact has been limited. Financial incentives alone have not been strong enough to counter long-standing structural constraints such as high housing costs, insufficient childcare availability, and persistent gender inequalities in unpaid domestic work (Rašević and Galjak, 2024). Bosnia and Herzegovina, by contrast, lacks a unified or comprehensive demographic policy at the state level. Family-related measures are typically designed at the entity or cantonal level, resulting in substantial variation in eligibility rules and benefit amounts. Although some local programmes exist such as child allowances or one-off birth grants their overall scope is modest, and available evidence suggests they have not had a measurable effect on fertility. The absence of a coordinated national approach further limits the country's ability to respond effectively to long-term demographic decline. These differences are reflected in the population data, particularly the sharper reduction in the 0–14 age group in Bosnia and Herzegovina. Comparative evidence from Eastern Europe also suggests that even large-scale pronatalist schemes do not guarantee sustained increases in fertility. Studies of Russia's "Maternity Capital," Poland's "Family 500+," and Hungary's tax incentives show only modest fertility effects, with more substantial impacts on reducing child poverty than on raising birth rates (Cook et al., 2023). Taken together, these regional experiences underscore that broader social measures such as accessible childcare, secure employment, and policies supporting gender equality are essential complements to financial incentives in addressing persistently low fertility.

Mortality - Between 2011 and 2023, both Serbia and Bosnia and Herzegovina recorded declines in infant mortality, though with somewhat different trajectories. In Serbia, IMR fell from 6.4‰ in 2011 to 4.2‰ in 2023, representing a reduction of about one third. The trend was relatively steady, with gradual annual decreases and only small temporary reversals (e.g., in 2020). In Bosnia and Herzegovina, the IMR decreased more slowly, from 6.0‰ in 2011 to 5.3‰ in 2023. After a period of stagnation around 5.7–5.8‰ during the mid-2010s, a sharp improvement was observed in 2021 (4.4‰), but this proved temporary as the rate again rose above 5‰ in subsequent years. (Figure 4) Taken together, these results suggest that Serbia has achieved more consistent progress in reducing infant mortality, converging toward levels typical of many European countries, while Bosnia and Herzegovina has made slower and more uneven gains. The divergence in trajectories may reflect differences in health system performance, neonatal care improvements, or socioeconomic factors.

Figure 4 Infant Mortality Trends in Serbia and Bosnia And Herzegovina (2011–2023)



Source: UN data

In both Serbia and Bosnia and Herzegovina, life expectancy at birth improved between 2011 and 2023, although the trajectories were strongly affected by the COVID-19 pandemic. In Serbia, male life expectancy increased from 71.6 to 73.5 years, while female life expectancy rose from 77.9 to 80.0 years. Bosnia and Herzegovina consistently recorded higher values: male life expectancy grew from 73.2 to 74.4 years, and female from 80.2 to 80.9 years.

In both countries, life expectancy peaked in the late 2010s but dropped sharply in 2020–2021, reflecting pandemic-related excess mortality, before recovering by 2022–2023. The persistent gender gap (around 6–7 years in Serbia, 6–8 years in Bosnia and Herzegovina) mirrors broader European patterns, but the consistently higher values in Bosnia and Herzegovina suggest comparatively more favourable mortality conditions. Overall, while improvements are evident in both contexts, Serbia shows greater vulnerability to mortality shocks, whereas Bosnia and Herzegovina maintains a modest but stable advantage.

In Serbia, male life expectancy increased from 71.6 to 73.5 years, while female life expectancy rose from 77.9 to 80.0 years. Bosnia and Herzegovina consistently recorded higher values: male life expectancy grew from 73.2 to 74.4 years, and female from 80.2 to 80.9 years. In both countries, life expectancy peaked in the late 2010s but dropped sharply in 2020–2021, reflecting pandemic-related excess mortality, before recovering by 2022–2023. (Figure 5) The persistent gender gap (around 6–7 years in Serbia, 6–8 years in Bosnia and Herzegovina) mirrors broader European patterns, but the consistently higher values in Bosnia and Herzegovina suggest comparatively more favourable mortality conditions. Overall, while improvements are evident in both contexts, Serbia shows greater vulnerability to mortality shocks, whereas Bosnia and Herzegovina maintains a modest but stable advantage.

Figure 5 Trends in life expectancy at birth by sex in Montenegro and North Macedonia, 2011-2023



Source: UN Data

The weighted age-specific mortality rates (ASMR) for 2011 and 2023 show clear patterns of both improvement and persistent vulnerabilities across age groups in Bosnia And Herzegovina. In 2011, mortality was highest among older adults, particularly men who had higher ASMR in almost all age groups. Women consistently experienced lower ASMR across all ages, with the highest rates observed in the 85–89 age group (109.4 per 1,000). By 2023, ASMR decreased in nearly every male age group, most notably in mid-to-late adulthood: for example, men aged 60–64 dropped from 81.7 to 48.3 per 1,000, and those 50–54 from 33.9 to 25.5 per 1,000. Female ASMR remained largely stable, with minor reductions in early childhood and older age groups (e.g., 0–4 years fell from 8.2 to 7.2 per 1,000, 85–89 years from 109.4 to 104.9 per 1,000). (Table 3) These trends suggest substantial improvements in male survival in mid-life, likely due to reductions in cardiovascular and other preventable causes of death, while female mortality remained relatively steady, reflecting already low mortality in younger ages and longevity advantages in older ages.

Overall, the total weighted ASMR decreased for both sexes, from 875.3 to 812.9 for women and from 614.3 to 469.6 for men, indicating a significant decline in overall age-adjusted mortality, particularly for males.

Table 3 Summary of weighted age-standardized mortality rates (ASMR) per 100,000 population by sex in Bosnia And Herzegovina, 2011–2023

Age group	Weighted ASMR (F) 2011	Weighted ASMR (M) 2011	Weighted ASMR F 2023	Weighted ASMR M 2023
0-4	8,20	8,91	7,22	6,17
5-9	0,31	0,62	0,08	0,21
10-14	0,52	0,83	0,07	0,25
15-19	1,41	3,12	1,20	2,6
20-24	1,34	4,12	1,67	2,65
25-29	1,72	4,15	1,76	2,44

30-34	2,48	5,08	2,43	2,55
35-39	3,73	9,24	3,76	7,86
40-44	6,23	13,7	4,90	12,52
45-49	10,57	27,94	9,25	20,96
50-54	16,47	33,91	15,25	25,48
55-59	24,52	58,11	23,02	45,81
60-64	36,48	81,69	34,74	48,29
65-69	51,25	71,14	48,44	70,17
70-74	79,06	98,83	73,73	76,73
75-79	83,15	97,62	78,43	61,49
80-84	102,42	82,83	99,04	50,78
85-89	109,36	11,32	104,91	29,81
90-94	84,11	1,06	81,83	2,43
95-99	79,11	0,02	73,44	0,41
100+	37,74	0,01	35,51	0,01
Total:	875.27	614.25	812.86	469.6

Source: UN data, Author's calculations

The weighted age-specific mortality rates in Serbia indicate high mortality among older men, though improvements are visible across most age groups between 2011 and 2023. In 2011, male ASMR peaked at 176.95 per 1,000 in the 75–79 age group, with women reaching 138.2 per 1,000 in the 70–74 age group. Early childhood mortality (0–4 years) was higher in Serbia compared to Bosnia in the same period, with rates of 11.5 per 1,000 for boys and 9.3 per 1,000 for girls. By 2023, substantial declines occurred in almost every age group, particularly in mid-to-late adulthood: men aged 45–49 dropped from 28.4 to 21.2 per 1,000, and women from 14.3 to 11.3 per 1,000. Reductions were also observed in early childhood mortality (0–4 years) to 7.4 per 1,000 for boys and 5.9 per 1,000 for girls. (Table 4) Despite these improvements, male mortality remains consistently higher than female mortality across all ages, reflecting persisting gender differences in survival. Overall weighted ASMR decreased from 1,474.4 to 1,257.5 per 1,000 for men and from 910.3 to 742.9 per 1,000 for women, highlighting a notable decline in age-adjusted mortality, yet the absolute rates remain higher than those observed in Bosnia, particularly for men. These trends are consistent with the later stages of the demographic transition, where reductions in early-life mortality and gains in adult survival coexist with persistent gender differences in longevity, reflecting broader post-socialist demographic dynamics.

Table 4 Summary of weighted age-standardized mortality rates (ASMR) per 100,000 population by sex in Serbia, 2011–2023

Age group	Weighted ASMR (F) 2011	Weighted ASMR (M) 2011	Weighted ASMR F 2023	Weighted ASMR M 2023
0-4	9.268	11.501	5.915	7.399
5-9	0.644	0.677	0.270	0.599
10-14	0.743	1.018	0.572	0.534
15-19	1.362	2.784	1.296	2.430
20-24	1.879	4.869	1.066	3.738
25-29	2.574	6.298	1.963	4.115
30-34	3.439	7.950	4.979	5.948

35-39	5.046	9.972	4.428	8.538
40-44	5.957	15.000	5.836	12.634
45-49	14.251	28.424	11.330	21.236
50-54	21.210	44.780	17.960	35.310
55-59	31.235	65.795	27.724	59.211
60-64	41.668	85.456	38.324	83.068
65-69	62.366	112.508	53.956	105.018
70-74	99.840	166.320	81.120	138.684
75-79	108.158	176.952	85.644	144.590
80-84	129.570	205.500	104.550	172.569
85-89	138.760	203.580	107.920	172.943
90-94	102.625	145.515	81.310	125.318
95-99	85.704	117.987	73.398	105.377
100+	44.025	62.500	35.294	48.276
Total:	910.3	1474.4	742.9	1257.5

Source: UN data, Author's calculations.

In the Republic of Serbia, for the first time since the COVID-19 pandemic, fewer deaths (97,081) were registered in 2023 compared to the average in the period 2016–2019 (101,917). The mortality rate in 2023 was 14.7 per 1,000 inhabitants. (Institute of Public Health of Serbia "Dr Milan Jovanović Batut", 2024) The most common causes of death in 2023, if we exclude the group Symptoms, signs and pathological clinical and laboratory findings (4.7%), belong to the following groups of diseases (according to ICD 10): Diseases of the circulatory system – 49.7% (men 46.3% and women 53.2%)

Compared to European Union countries, where the average life expectancy is 80.6 years, life expectancy in Serbia is about four years shorter. However, after the impact of the COVID-19 pandemic subsided, life expectancy in the Republic of Serbia is increasing and in 2023 it will be 76.3 years, or 73.8 years for men and 78.7 years for women. (Institute for public health of Serbia, 2023)

In 2023, a total of 120,550 cases of infectious diseases were reported, with an incidence rate of 1,808.85 per 100,000 inhabitants, representing an 85% decrease compared to the previous year due to the decline in the number of COVID-19 cases.

Table 5 Main causes of death in Serbia by sex for 2011 and 2023.

Cause of Death Category 2011	Both sexes 2011 %	Male 2011 %	Female 2011 %	Cause of Death Category 2023	Both sexes 2023 %	Male 2023 %	Female 2023 %
Diseases of the circulatory system (I00-I99)	53,93%	48,84%	59,15%	Diseases of the circulatory system (I00-I99)	49,70%	46,30%	53,20%
Neoplasms (C00-D48)	20,83%	23,68%	17,91%	Neoplasms (C00-D48)	21,80%	23,70%	19,90%

Diseases of the respiratory system (J00–J99)	4,89%	5,84%	3,92%	Diseases of the respiratory system (J00–J99)	5,90%	6,60%	5,20%
Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified (R00–R99)	4,56%	4,60%	4,52%	Endocrine, nutritional and metabolic diseases (E00–E90)	3,10%	2,80%	3,3%
Diseases of the digestive system (K00–K95)	3,41%	3,77%	3,05%	Diseases of the digestive system (K00–K95)	3,10%	3,5%	2,8%

Note: Categories vary between years due to changes in reporting.

Source: Institute of Public Health of Serbia "Dr Milan Jovanović Batut"

In the Republic of Serbia, 882 people died from acute infectious diseases in 2023, with a mortality rate of 13.23/100,000. The share of COVID-19 in total deaths was 89.3%. The average mortality rate from infectious diseases in the ten-year period before the onset of COVID-19 was 3.81/100,000 with small interannual deviations (95% CI 3.21 – 4.40), while after 2020 the mortality rate from infectious diseases is significantly higher (in 2021, the maximum mortality rate of 241.12/100,000 inhabitants was recorded. (Institute for public health of Serbia, 2023)

Table 6 Main causes of death in Bosnia And Herzegovina by sex for 2011 and 2023.

Cause of Death Category 2011	Both sexes 2011 %	Male 2011 %	Female 2011 %	Cause of Death Category 2023	Both sexes 2023 %	Male 2023 %	Female 2023 %
Cardiovascular Diseases (I00-I99)	52,72%	48%	58%	Cardiovascular Diseases (I00-I99)	46,1%	42,4%	49,9%
Neoplasms (C00-D48)	20,60%	24%	17%	Neoplasms (C00-D48)	21,1%	23,4%	18,7%

Endocrine,nutritional and metabolic diseases (E00–E90)	5,54%	4%	7%	Symptoms, sings and abnormal clinical and laboratory findings, not elsewhere classified (R00-R99)	7,45%	7,72%	7,2%
Symptoms, sings and abnormal clinical and laboratory findings, not elsewhere classified (R00-R99)	4,75%	4,65%	4,86%	Endocrine,nutritional and metabolic diseases (E00–E90)	6,1%	4,9%	7,3%
Diseases of the respiratory system (J00-J99)	3,66%	4,04%	3,26%	Diseases of the respiratory system (J00-J99)	5,3%	6%	4,7%

Source: Agency for Statistics of Bosnia and Herzegovina

From 2011 to 2023, both Serbia and Bosnia and Herzegovina exhibited similar mortality patterns, with cardiovascular diseases and neoplasms consistently dominating the cause-of-death profile. In both countries, deaths from cardiovascular diseases declined modestly Serbia from 53.9% to 49.7%, and Bosnia & Herzegovina from 52.7% to 46.1% with a more pronounced decrease among women, indicating potential improvements in cardiovascular care and prevention strategies. Neoplasms remained relatively stable, slightly increasing in Serbia (20.8% to 21.8%) and Bosnia (20.6% to 21.1%), with male mortality persistently higher than female mortality in both countries. (Table 5 and 6)

Respiratory diseases rose in prominence, reaching 5.9% in Serbia and 5.3% in Bosnia, suggesting environmental, infectious, or age-related factors influencing mortality. Endocrine, nutritional, and metabolic disorders showed an emerging impact: in Serbia, these accounted for 3.1% of deaths in 2023, while in Bosnia they reached 6.1%, reflecting growing public health challenges associated with metabolic diseases. Mortality categorized as “symptoms, signs, and abnormal clinical and laboratory findings” also increased, especially in Bosnia (4.8% to 7.5%), potentially highlighting diagnostic or reporting shifts. (Table 5 and 6) Overall, the two countries demonstrate a parallel epidemiological transition: gradual reductions in cardiovascular mortality, persistent cancer burden, rising metabolic disease prevalence, and slight increases in respiratory-related deaths.

Migration - It has been a key factor in the rapid depopulation of the countries of the former Yugoslavia. The roots of migration in the Western Balkans trace back to the “Gastarbeiter system” of the 1960s, which allowed citizens of Yugoslavia to legally work in Western Europe (Brunnbauer, 2019). This system initiated large-scale migration that continues to shape patterns today. Over the decades, these trends have been further influenced by economic, political, and social factors, reflecting the region’s complex history and ongoing challenges.

All the events associated with Yugoslavia’s separation were unavoidable and logically led to forced migration as people fled war. Additionally, the unstable economy, recession, and economic collapse spurred further migration to more economically stable countries.

The wars of the 1990s, following the breakup of Yugoslavia, had profound effects on migration. Massive forced migrations occurred as conflict zones spread, particularly impacting Bosnia and Herzegovina, where around 1.2 million people were forced to leave the country (Valenta and Ramet, 2011), and 1 million more were displaced internally (Kadusic and Suljic, 2019). This resulted in a total of approximately 2.2 million refugees and displaced persons (Ibreljic et al., 2006). Most of these war migrants fled to neighboring countries.

Between 1992 and 1995, about 40% of Bosnia and Herzegovina’s citizens emigrated to Serbia, Montenegro, Croatia, and Slovenia. These countries, together with Germany and Austria, hosted 75% of the forced migrants from Bosnia and Herzegovina (Kadusic and Suljic, 2019). About half a million refugees never returned home, with many settling in former Serbia and Montenegro (137,000), Austria (70,900), Croatia (62,000), and Sweden (56,000) (Valenta and Ramet, 2011). Ethnic cleansing and widespread conflict caused a radical shift in the region’s demographic characteristics, leading to a population decrease due to war-time deaths and massive out-migration.

Migration in Serbia

Serbia is a typical emigration country (Nikitović, 2022). The unfavorable natural population growth was only partially offset by a favorable migration balance during the 1990s, as conflicts in other parts of the former Yugoslavia drove migration into Serbia. However, due to the methodological approaches in Serbia’s two most recent censuses (2011 and 2022), a significant number of emigrants were not adequately reflected or included in population figures.

Eurostat data in 2019, show that approximately 4,000 people leave Serbia every month; most are young people under 30 who cite economic reasons for leaving. Serbia ranks 31st among the 50 countries with the highest migration rates (Ceha, 2021), as cited in (Dudak, 2024). According to a 2021 survey by the Youth National Council, only about 11% of young respondents said they would not leave the country. Meanwhile, 50% stated they would leave, though half were not yet actively planning their departure; 39% were not currently planning to leave but did not exclude the possibility.

One major limitation when analyzing external migration’s impact is the lack of comprehensive research. Nevertheless, it is evident that emigration has significantly reduced Serbia’s number of permanent residents. Emigration has had both direct and indirect effects on population size: Serbia lost not only the emigrants themselves but also their children who left with them or were born abroad (Rašević, 2017).

Since Russia's invasion of Ukraine in February 2022, economic migration from Russia to the Western Balkans particularly Serbia and Montenegro has sharply increased. Serbia, as the only European country not implementing sanctions on Russia, has become a popular destination for Russians leaving their country (Ganev, 2024). Since March 2022, approximately 357,000 Russian citizens have entered Serbia, with at least 50,000 deciding to stay permanently Kovačević, 2023, as cited in (Ganev, 2024).

Serbia does not keep complete records of emigrants, like many other states. Therefore, data from Eurostat provide insight into emigration patterns: in 2020, 18,186 Serbian citizens were registered as newly arrived immigrants in European countries submitting data to Eurostat. The top destination countries were Croatia (4,191), Austria (3,443), Slovenia (2,979), Sweden (1,675), Montenegro (1,068), Switzerland (938), and the Czech Republic (933).

Migration in Bosnia and Herzegovina

Bosnia and Herzegovina experienced massive forced migration during the Yugoslav wars, as noted above. Most war migrants chose neighboring states as their host countries, although many moved further afield. The ethnic cleansing and widespread conflict led to a dramatic demographic shift, with severe population losses and altered ethnic compositions in many areas.

In previous decade the most migrants to Bosnia are economic or asylum-seeking individuals mainly single men (70–80%), with families and unaccompanied minors forming smaller share, with the origins include Pakistan, Afghanistan, Bangladesh, Syria, Iran, and other countries outside Europe.

In recent years, Bosnia and Herzegovina has also seen an influx of Russian nationals. Approximately 13,000 Russians arrived in the country during the autumn and winter of 2022/2023 (Ministry of Security, 2022). At least 2,500 Russians arrived illegally from Serbia, staying permanently in Republika Srpska Kovačević (2024), as cited in (Ganev, 2024).

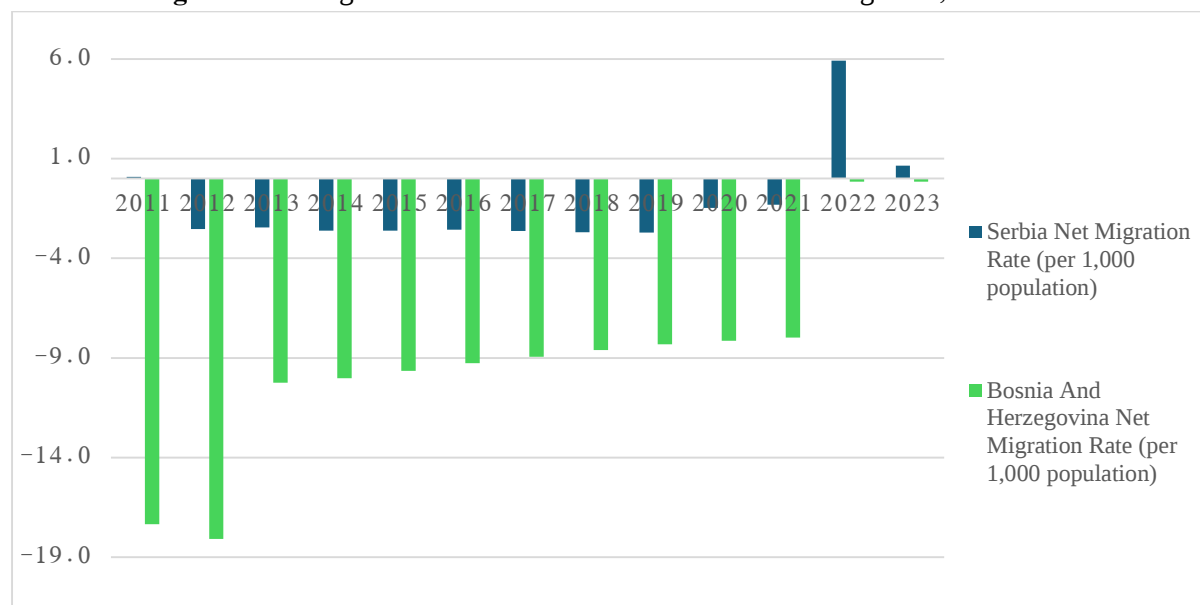
Migration, both forced and voluntary, has played a central role in the demographic changes seen across the Western Balkans since the breakup of Yugoslavia. The wars of the 1990s displaced millions and initiated long-term migration patterns that continue to shape the region. Serbia and Bosnia and Herzegovina have each faced unique challenges: Serbia remains a country of emigration, struggling with a continued brain drain, while Bosnia still bears the demographic scars of war-induced displacement. Current geopolitical events, such as the war in Ukraine, continue to add new layers to the migration dynamics in these countries, highlighting how migration remains deeply intertwined with regional stability, security, and economic opportunity.

Net migration trends from 2011 to 2023 highlight divergent migration dynamics between Serbia and Bosnia and Herzegovina, both contributing to their population declines. Bosnia and Herzegovina has experienced persistently high levels of emigration throughout the period, resulting in a continuous negative net migration balance. Although the rate of out-migration has gradually slowed, it remains a significant factor in the country's demographic challenges.

Serbia also recorded negative net migration for much of the period; however, an exceptional shift occurred in 2022, when the country registered a pronounced positive net migration of approximate 40,000 individuals according to World Population Prospects (Figure 6).

These migration patterns reflect post-socialist demographic dynamics, where economic opportunities, labour mobility, and international migration flow strongly influence population change, and illustrate how migration interacts with low fertility and aging populations to shape overall demographic trajectories.

Figure 6 Net migration rate in Serbia and Bosnia And Herzegovina, 2011-2023



Source: UN Data

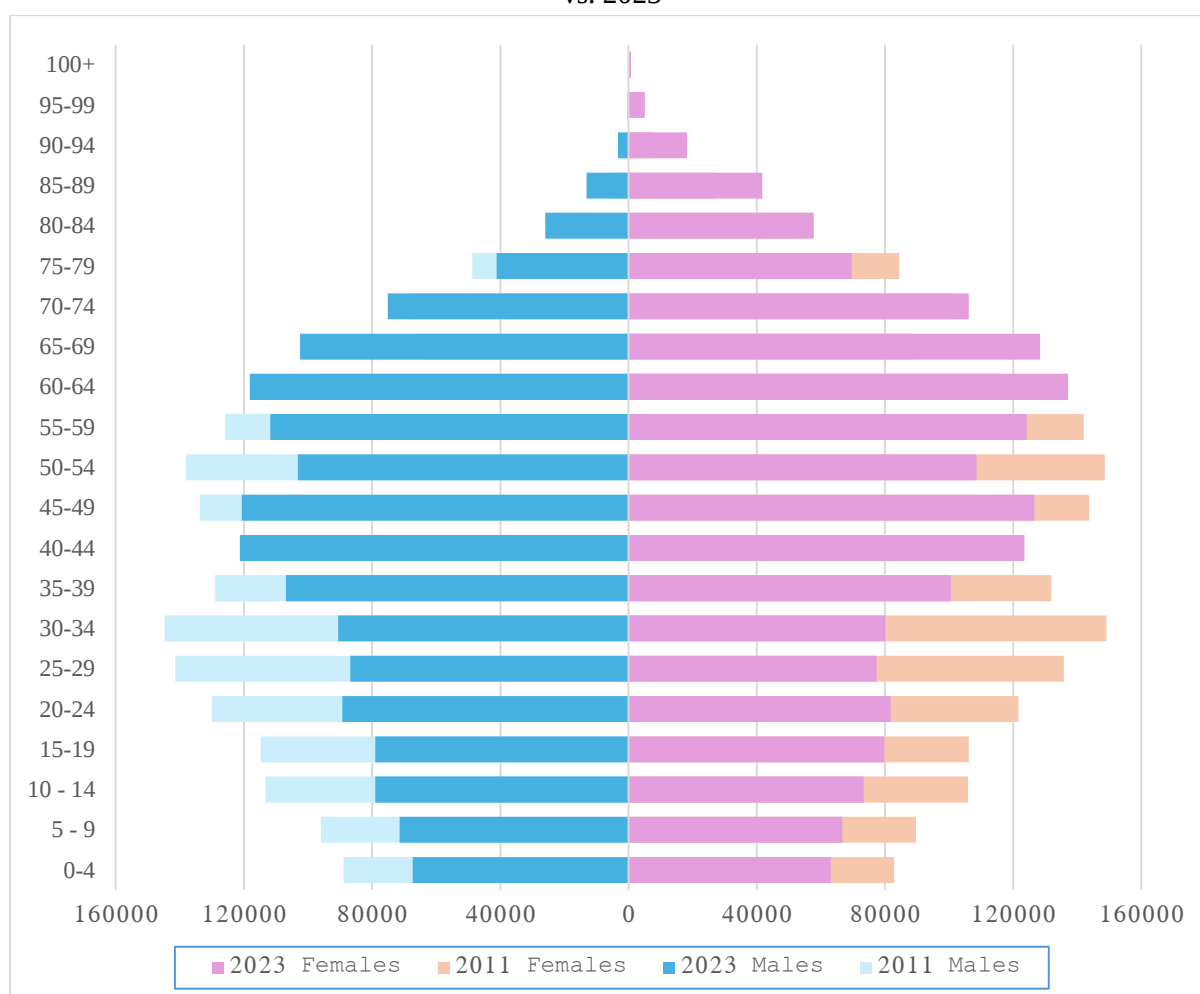
This unexpected increase is directly connected to the events caused by the Russia–Ukraine conflict. Serbia became a primary destination for Russian nationals seeking to evade military conscription, due in part to the country’s relatively open migration policies. This influx temporarily mitigated Serbia’s population loss and altered the usual migration pattern.

Despite this brief reversal, the positive migration trend was temporary. By 2023, Serbia’s net migration dropped sharply to about one-tenth of the previous year’s figure, underscoring the temporary nature of the conflict-driven migration surge. As a result, these events were insufficient to offset the ongoing demographic decline shaped by long-term economic, political, and regional factors in both countries.

Age Structure - Between 2011 and 2023, Bosnia and Herzegovina and Serbia underwent significant demographic changes, reflecting both declining fertility and population aging.

In Bosnia, the youngest age group (0–4 years) decreased by approximately 24%, from 171,754 in 2011 to 130,436 in 2023, while the 5–9-year-old cohort fell by about 26%, from 185,717 to 138,127. The 10–14 age group also experienced a sharp decline of around 33%, highlighting a consistent reduction in children entering the population. The working-age population (15–64 years) decreased by roughly 20%, with notable declines in the 20–34 age groups, indicating both lower fertility and potential out-migration of younger adults. In contrast, the elderly population (65 years and older) expanded markedly, rising from 578,247 to 689,330, an increase of 19%, with particularly pronounced growth in the 65–69 age group, which more than doubled, reflecting cohort aging and increased life expectancy. (Figure 7)

Figure 7 Comparison of Population Distribution by Age and Sex in Bosnia And Herzegovina: 2011 vs. 2023

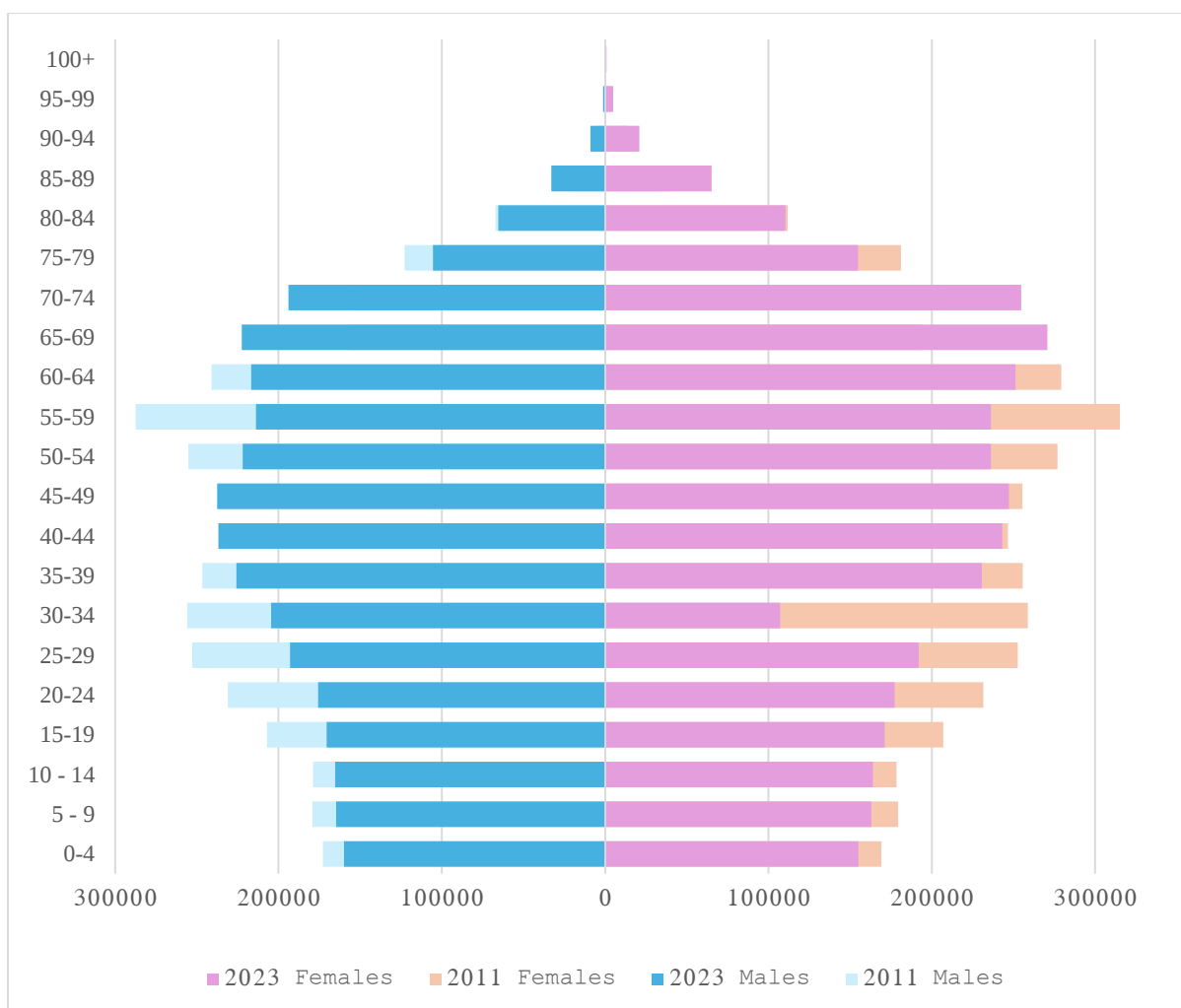


Source: UN data

In Serbia, a broadly similar trend is evident, though the absolute numbers differ. The 0–4-year-olds decreased by about 8%, from 342,964 to 315,091, while the 5–9 age group fell by 8% and the 10–14 cohort by 7.5%, showing less dramatic declines than in Bosnia. The working-age population (15–64 years) contracted by 16.7%, with the largest reductions in young adults aged 20–34, mirroring both declining fertility and out-migration patterns. The senior population (65+) increased by 18%, from 1,281,449 to 1,513,029, with the 65–69 and 70–74 groups experiencing the most rapid growth, emphasizing the population aging process. (Figure 8)

These patterns illustrate that Bosnia’s fertility and youth population do not follow the expectations for a Muslim-majority country, challenging simplistic assumptions linking religion to demographic behavior. Instead, socio-economic conditions, post-conflict legacies, and migration appear to exert stronger influence. Understanding these demographic trends is critical, as both countries face population aging and decline, with direct consequences for labor force sustainability, economic development, and long-term social stability.

Figure 8 Comparison of Population Distribution by Age and Sex in Serbia: 2011 vs. 2023



Source: UN Data

Between 2011 and 2023, both Bosnia and Herzegovina and Serbia experienced notable shifts in age structure. The population of children (0–14 years) declined sharply by 21.0% in Bosnia and 8.1% in Serbia highlighting the impact of persistently low fertility on the younger population (Table 7).

Meanwhile, the elderly population (65+) increased considerably in both countries by 19.2% in Bosnia and Herzegovina and 18.1% in Serbia while the working-age population (15–64) declined sharply, falling by 20.1% in Bosnia and 16.7% in Serbia. At the same time, the youngest age group (0–14) contracted substantially, decreasing by 27% in Bosnia and 8.1% in Serbia, further shrinking the base of the population pyramid.

Table 7 Population Distribution by Broad Age Groups in Bosnia and Herzegovina and Serbia, 2011–2023

Country	Age Group	2011 Total	2023 Total	Change (%)
Bosnia and Herzegovina	0–14	576684	421065	-27%
	15–64	2586875	2067588	-20,10%

	65+	578247	689330	19,20%
Serbia	0–14	1057597	971976	-8,10%
	15–64	5026096	4188110	-16,70%
	65+	1281449	1513029	18,10%

Source: UN Data, Author's calculations.

These shifts in the age structure clearly illustrate the accelerating process of demographic aging in both countries and reinforce the broader demographic challenges highlighted throughout this study: persistently low fertility, a declining population, and a growing share of older adults. Together, these patterns provide a quantitative confirmation of the demographic trends discussed earlier and directly inform the policy and regional implications outlined in the conclusion.

Table 8 Observed and Expected Population by Age Group, Bosnia And Herzegovina and Serbia (2011 and 2023)

Year	Country	Age group	Observed	Expected	% Contribution
2011	Bosnia And Herzegovina	0–14	576684	550182,789	4,95%
		15–64	2586875	2565208,57	23,10%
		65+	578247	626414,637	5,64%
	Serbia	0–14	1057597	1084098,21	9,76%
		15–64	5026096	5047762,43	45,45%
		65+	1281449	1233281,36	11,10%
2023	Bosnia And Herzegovina	0–14	421065	449634,3	4,56%
		15–64	2067588	2018501	20,49%
		65+	689330	710847,7	7,22%
	Serbia	0–14	971976	943406,7	9,58%
		15–64	4188110	4237197	43,01%
		65+	1513029	1491511,3	15,14%

Source: UN Data, Author's calculations.

To formally assess whether the observed differences in age structure between Bosnia and Herzegovina and Serbia are statistically significant, a chi-square test of independence was conducted. The test confirms extremely significant differences in the age distribution for both 2011 ($\chi^2 = 7,785.41$, $df = 5$, $p < 0.0001$) and 2023 ($\chi^2 = 5,404.60$, $df = 5$, $p < 0.0001$). These results quantitatively support the trends shown in Table 8, highlighting the sharper decline of the youngest age group in Bosnia and the ongoing demographic aging in both countries.

Conclusion

This study has shown that Serbia and Bosnia and Herzegovina are both experiencing profound demographic decline, although the mechanisms differ in each context. In Serbia, the population decrease is primarily driven by excess mortality, while in Bosnia and Herzegovina low fertility and persistent emigration remain the dominant factors. These dynamics confirm that the two countries, despite their shared history, have entered distinct demographic trajectories shaped by war legacies, institutional capacities, and socio-economic conditions.

In Serbia, the principal driver of population decrease remains excess mortality, with consistently higher male than female mortality at all ages. The positive migration balance recorded in 2022 linked to extraordinary geopolitical circumstances only modestly cushioned overall decline and does not, on current evidence, represent a structural reversal. Moreover, the profile of recent inflows predominantly from lower-income origins and with uneven educational composition limits their capacity to offset aging, skill shortages, or long-term natural decrease. In short, migration gains are fragile and insufficient to counter the magnitude of mortality and aging pressures.

Bosnia and Herzegovina presents a different picture, but one equally characterized by fragility. The long-delayed 2013 census, the first since 1991, revealed a new demographic reality: Bosnia and Herzegovina had become a new majority Muslim country in Europe. Yet, unlike in many Islamic societies where high fertility and a youthful age structure are common, Bosnia's fertility rates remain among the lowest in Europe. This paradox is shaped by the combined legacy of war, political instability, and socio-economic uncertainty, which have suppressed family formation and encouraged out-migration. The war and its aftermath have contributed to a lasting decline in fertility (Pobric and Robinson, 2015).

Placed in a regional historical perspective, these trajectories align with the deeper demographic contraction of the former Yugoslav space. Prior to the dissolution of the Socialist Federal Republic of Yugoslavia in 1990, the territory reached its historical population peak at ~23.81 million. Early-2000s censuses in some successor states like Serbia, likely masked underlying losses due to large, temporary refugee redistributions within the region (Lukic et al., 2012). Subsequent work estimates net demographic losses on the order of 4–5 million when accounting for emigration, war casualties, and unrealized births during prolonged sub-replacement fertility (Josipović, 2016, Nikitović, 2016). Within this broader pattern, Serbia exhibits a decline dominated by mortality and aging, while Bosnia and Herzegovina faces an especially potent combination of low fertility and continual emigration.

The results point to several issues that go beyond the numbers themselves. One of the clearest is the need for more focused public policies whether to reduce premature mortality (especially among men in Serbia) or to make it easier for young adults to form families and actually stay in the country. Another issue that emerges very strongly is the problem of statistical coordination. In Bosnia and Herzegovina in particular, the divided institutional system makes it difficult to follow demographic trends in a consistent way, which then limits what policymakers can realistically do.

These findings also show that demographic pressures in the Western Balkans do not stop at national borders. The region shares similar experiences emigration, economic instability, and the long shadow of the 1990s and these similarities keep producing the same kinds of demographic outcomes. This means that some responses will have to be coordinated at a broader regional or even EU level, otherwise countries will continue to lose population in parallel without the capacity to change the trend.

Taken as a whole, the combination of low fertility, rising life expectancy gaps between men and women, continued out-migration, and an expanding share of older adults fits the picture of a late-stage demographic transition typical for post-socialist societies. In both Serbia and Bosnia and Herzegovina this is no longer a temporary fluctuation but a long-term pattern. It is worth stressing that this demographic decline is not just a technical matter for statisticians; it shapes the labour market, social cohesion, and the sustainability of public services. Without more targeted

interventions and without stronger cooperation among countries that face the same problems the risk is that both states will gradually settle into a prolonged period of population loss that will be increasingly difficult to reverse.

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