

# DEMOGRAPHIC CHANGES IN THE COUNTY OF TOPLICA

Maja Novović, Marija Mihajlović

**Abstract:** Modern demographic development of the municipalities of Toplica region follows major changes in population trends, natural and mechanical movement of population and population structures. Statistical analysis of previously collected and processed data came to the conclusion that these changes result from a number of mutually conditioned factors that led to changes in the development of the population, which have had a negative impact on the demographic development of the Toplica district in recent decades.

**Keywords:** Population, movement, natural population growth, age structure, education, demographic development.

## Introduction

The county of Toplica is located in the southern part of the Republic of Serbia. It covers an area of 2,231 km<sup>2</sup>. It includes the following municipalities: Prokuplje, Blace, Kursumlija and Zitoradja, with a total of 267 settlements, of both urban and rural type. It has a total population of 91,754 (according to the census of 2011). It has a favorable position even though it is not on the major international routes. We can say that on the basis of the comparative method if we look at other regions. Its location in the beginning of the twentieth century greatly improved, building rail and road routes. In this way, it is linked with neighboring regions. According to the results of archeological research, the county of Toplica was inhabited in prehistoric times. The first inhabitants were Dardin, an Illyrian tribe, known as good herders and warriors. Due to specific historical circumstances in the past, the county of Toplica has a very simple ethnic structure. Serbs and Montenegrins are the majority of the population.

## Geographical location of the county of Toplica

The county of Toplica covers the southern part of the Republic of Serbia and includes historical and geographic area, known as Toplica. Towards the east, it reaches the Nisava River, in the north to the Rasina River, south-east to the Jablanica River, and south to the Kosovo district. The county of Toplica includes the basin of the Toplica River, the region between the north part of mountain Jastrebac, Kopaonik Mountain on the west, Rudarska

Mountain, Djaka, Sokolovica, Vidojevica and Pasjaca Mountain to the southwest and south, and the valley of the South Morava River eastward. The town of Prokuplje is the center of the district.

### **Physical-geographical characteristics**

In addition to geographical location, physical and geographical characteristics are an important element of the geographical environment, which affects the entire society, and certainly the demographic development of certain areas.

### **Geomorphological features**

Place of Toplica is not unique either in the geological structure or the configuration of the terrain. It consists of two different valleys: the valley of the Toplica River, and the valley of the Kosanica River, as well as several smaller expansions and cliffs in the valleys of tributaries of the Toplica River. In the basin of the Kosanica River, there are mostly volcanic, fluvial and abrasive forms of relief. One of the abrasive terraces, dissected river courses and almost destroyed the Devil's Town. "This is actually a collection of several hundred clay pyramids, built of sandstone and marl, on the top of which are andesite plates, which in the form of caps protect the surface beneath them from taking the end destruction." (J Markovic., 1996). Due to volcanic activity, the area is rich in various minerals, especially mica, feldspar and iron.



Figure 1 - The geographical position of the Toplica region (model of this picture was taken from the local administration of the municipality of Prokuplje).

## **Climate characteristics**

The county of Toplica has a moderate continental climate, with the influence of the mild climate. Summers are quite hot and dry, and winters are moderately cold. The warmest month is July and the coldest are January and February. The average annual air temperature is 10.6° C.

## **Hydrological characteristics of the Toplica**

The largest river of Toplica region is the Toplica River, after which the whole region got its name. The Toplica River is the largest left tributary of the South Morava River, in length, and by the amount of water. It stems from two streams: the Djerekarusa River and the Lukovska River. Its length is 130 kilometers.

## **The origin of the population in the area of Toplica County**

According to the results of archeological research, Toplica was inhabited in prehistoric times. This is proved by archeological findings in Prokuplje, Vica, Bace and Plocnik. These settlements belong to Starcevo culture and Vinca culture. Starcevo culture belongs to the Neolithic period between 6200 and 4500 BC. Vinca culture dated to the period between 5700 – 4500 BC. Roman bricks were found in Prokuplje, a Roman bath, various bronze objects, and the Hissar was the Roman fortress-castle. Due to the specific historical conditions in the past, the county of Toplica has a lot of simple ethnic structure.

## **Population and territorial distribution**

Distribution of the population changes in the total population are complex and conditioned by many factors. The total population of a certain area changes under the influence of natural population growth (birth and death) and under the influence of migration (immigration and emigration). Movement of the total population by municipalities in the region of Toplica can be analyzed on the basis of a list of eight executed censuses after WWII, as follows: 1948, 1953, 1961, 1971, 1981, 1991, 2002 and 2011.

## Population trends of the Toplica region from 1948-2011

Historical events had a strong influence on the movement of residents and numerous households in the area of Toplica District. After the liberation from the Turks, the first census in the newly liberated areas was carried out. Then, the territory of Toplica region had about 17,000 Serbs. After the liberation, Toplica remained deserted, and then an organized colonization was carried out and population increases. This population growth is a result of the large immigration of population from Montenegro, county of Uzice, Rasina, Morava, Vlasina and other parts of Serbia.

Table 1. Population growth in county of Toplica

Year	Population	Average annual increase	Absolute increase in population
1948.	141,502		
1953.	149,421	1,584	7,919
1961.	141,141	-1,035	-8,280
1971.	129,542	-1,160	-11,599
1981.	121,933	-761	-7,609
1991.	111,813	-1,012	-10,120
2002.	105,208	-600	-6,605
2011.	91,754	-1,495	-13,454

Source: (The Census of Population, Households and Dwellings in 2002, the book 9, National Bureau of Statistics, Belgrade, 2004)

## Changing population density

The main indicator of the intensity of population is the population density. It expresses the number of inhabitants per square kilometer. According to the census of 2011, the population density in the Toplica district was 41.12 inhabitants per km<sup>2</sup>. This is a half of the total population density of the Republic of Serbia, which is 81 inhabitants per km<sup>2</sup>.

Table 2. The overall population density in the municipalities of the Toplica district 2011

	Area in km <sup>2</sup>	Population	Density of population
County of Toplica	2,231	91,754	41.12
Blace	206	11,754	57.05
Zitoradja	314	16,368	52.12
Kursumlija	952	19,213	20.18
Prokuplje	759	44,419	58.52

Source: (The Census of Population, Households and Dwellings in 2011 in the Republic of Serbia, Republic Institute for Statistics, Belgrade, 2013)

Table 3. The movement of population density by municipalities of the Toplica region from 1948 to 2011.

	Area in km <sup>2</sup>	Population on km <sup>2</sup>	
		1948	2011
County of Toplica	2,231	63	41.12
Blace	306	77	57.05
Zitoradja	214	99	52.12
Kursumlija	952	39	20.18
Prokuplje	759	78	58.52

Source: (The Census of Population, Households and Dwellings in 2011 in the Republic of Serbia, Republic Institute for Statistics, Belgrade, 2013)

### Natural demographic trends

Natural demographic trends imply a change of the total population in a certain territory due to the effect of its two main components: births (birth) and death (mortality). The difference between these two components represents the natural growth or decline in some populations.

Table 4. Navigating the birth rate, mortality and natural growth after ten years (‰)

		1963-1970	1971-1980	1981-1990	1991-2001
		B.R	15.0	13.5	12.0
County of Toplica	M	8.3	9.8	12.8	15.4
	N.G	6.7	3.7	-0.8	-4.3

Source: For some years, the documentation of the Republic Institute

“Taking into account the annual rate on a world scale, there are three different types of birth:

High (more than 25‰)

Middle (15-25‰)

Low (less than 15‰) birth rate “. (Kicosev S., Golubovic P., 2004)

The birth rate from 1963 to 1971 had a value of 15.0‰ and the highest value in the birth rate period. Mortality rates have a different trend. The mortality rate rose steadily throughout the period. The lowest mortality rate of 8.3‰ was in the period from 1963 to 1970 and the highest 15.4‰ in the period from 1991 to 2001. As the birth rate and the natural growth in the entire period, tends to fall, in the period from 1981 to 1990 it recorded a negative rate of natural growth. This trend continued in the postwar period, when it was -4.3‰. Toplica region is economically an underdeveloped area, and therefore, employment opportunities are slight. This is why population, especially the young, are forced to emigrate. As the vast majority of the population was moving out of fertile age in the Toplica district became depopulated. In many

villages the mortality rate is above the birth rate, and there was a biological depopulation too.

### **Navigating the birth rate in the municipalities of Toplica region from 1963 to 2001**

The birth rate of the population of Toplica region in general was high until WWII. After that, there were significant changes in the movement of birth. Except for the first post-war years, the birth rate recorded a constant decrease. The number of live births in the district of Toplica in the period from 1963-2001 had a declining trend. Accordingly, birth rates had low values.

Table 5. The birth rate from 1963 to 2001 (‰)

	1963-1970	1971-1980	1981-1990	1991-2001
County of Toplica	15.0	13.5	12.0	11.1
Blace	12.3	10.6	7.6	8.5
Zitoradja	15.9	14.6	11.1	10.7
Kursumlija	16.1	13.0	12.2	11.3
Prokuplje	15.1	14.2	13.0	12.0

Source: For some years, the documentation of the Republic Institute

In the period from 1963 to 1970, three municipalities had a birth rate above 15‰. They belonged to the zone of medium fertility. Those were the municipalities of Prokuplje, Zitoradja and Kursumlija. Blace municipality belonged to the low birth rate zone (less than 15‰). At the end of the period, in the censuses from 1991 to 2001, there were significant changes in the movement of the birth rate. The lowest birth rates were recorded in the municipality of Blace, only 8.5‰, while the highest rate was recorded in the municipality of Prokuplje 12‰.

### **Changes in mortality rate in the municipalities of Toplica region from 1963 to 2001**

Mortality is the negative component of natural population growth, which leads to a decrease in a number of people in one territory. The period before WWII on the territory of Toplica region was characterized by high mortality. In the post-war period the mortality trend recorded a faster fall. The decrease in population mortality is due to improved health and hygiene conditions of life, good health organization. In addition to medical factors, the

reduction in mortality rates affected the general level of culture of the population and various forms of social protection. In the period from 1963 to 2001, there was a significant change in this component of natural population growth. At the level of the Toplica district mortality rates recorded constant growth from 1963-2001. The lowest mortality rate of 8.3‰ was at the beginning of the period under review, while the highest in the period from 1991 to 2001 when it was 15.4‰.

Table 6. Changes in mortality rates from 1963 to 2001. year (‰)

	1963-1970	1971-1980	1981-1990	1991-2001
County of Toplica	8.3	9.8	12.8	15.4
Blace	9.2	10.7	14.8	16.9
Zitoradja	7.4	8.7	11.8	13.9
Kursumlija	8.2	9.7	13.2	15.6
Prokuplje	8.3	9.9	12.3	15.4

Source: For some years, the documentation of the Republic Institute

### **Natural increase**

Natural increase is the difference between the number of births and number of deaths in a certain area in a certain period of time. Thus, natural population growth is directly associated with fertility and mortality. Natural growth as an essential component of demographic development, it can be positive (when the birth rate is higher than mortality) or negative (when the mortality rate exceeds the birth rate).

### **The movement of natural growth in the municipalities of Toplica region from 1963 to 2001**

The area of Toplica region after WWII is largely characterized by a high birth rate and mortality. Nevertheless, the birth rate had over the rates of mortality, natural growth was positive, which inevitably led to an increase in the number of inhabitants.

Table 7. The movement of the population growth rate from 1963 to 2001(‰)

	1963-1970	1971-1980	1981-1990	1991-2001
County of Toplica	6.7	3.7	-0.8	-4.3
Blace	3.1	-0.1	-7.2	-8.4
Zitoradja	8.5	5.9	-0.7	-3.2
Kursumlija	7.9	3.3	-1.0	-4.3
Prokuplje	6.8	4.4	-0.2	-3.4

Source: For some years, the documentation of the Republic Institute

After WWII, there was a higher population growth rate, especially in the buffer period. However, keeping in mind that this period was short, but from the sixties things began to change affecting the overall demographic development. At the level of the district population growth rates were constantly decreasing during the period. The highest are at the beginning of the period (6.7‰) and the lowest at the end (-4.3‰).

### **Migration**

Migration movements in the Toplica district were intensified between the two world wars, and after WWII. The reasons for the intense migration were mainly conditioned by the economic situation. After the liberation, economic life rapidly intensified as it did in other parts of Serbia too. Due to high natural increase and the lack of employment opportunities, there was also a relative surplus of population. Increasing volumes of migrations in the period from 1961 to 2011 can be traced from the change in the percentage share of the indigenous and migrant population. In 196 the share of the total migratory population in Toplica was 30.1% and ranged from 24.3% in Zitoradja, 28.9% in Kursumlija, 30.2% in Blace to 33.2% in Prokuplje. According to the census in 2002, the share of the total migrant population in the area of Toplica region is 40.1%. Regarding the 2011 census, a decline was observed in the total migrant population in relation to the previous census period. At the level of the district, the largest share of migrant settlers was from the territory of the same municipality (50.4%) and the lowest from other countries 0.8%. According to the 2002 census, the largest share of immigrants from the territory of the same municipality was in Kursumlija 1.5%, and the lowest in Prokuplje 45.7%. On the other hand, Kursumlija municipality had the smallest proportion of immigrants from the territory of other municipalities of the same republic (24.9%), while the percentage is the highest in the municipality of Zitoradja and amounts to 44.2%. The share of immigrants from other republics or



provinces was far less than the two previously mentioned categories, but it was the largest in the municipality of Prokuplje. It is interesting that in the context of less developed municipalities migration taking place within the municipality, i.e. the share of immigrants from the territory of the same municipality is relatively high. This mobility of population led to significant changes in the structure of the population of villages and towns. There is a deterioration in the economic and age structure of the population in the countryside, but also an increase of the concentration of people in less space, in the city center.

### **Gender structure of population in the municipalities**

Masculinity coefficient of the total population of the district of Toplica in 1961 amounted to 894.3, the lowest value of this ratio in the period. After that, the coefficient of masculinity was growing, and in the next census period in 1971 reached the value of 941.7. According to census data from 1981 the value of masculinity coefficient was 984.6, and already in the next census period 986.6. Since 1991, the value of masculinity coefficient in the area of Toplica region increased and in 2002 amounted to 977.7. On the whole, the coefficient of masculinity during the whole period was lower than 1000, indicating an excess of female compared to male population.

Table 8. The changes of the coefficient of masculinity in the municipalities of Toplica region from 1961 to 2011

	1961	1971	1981	1991	2002	2011
County of Toplica	894.3	941.7	984.6	986.6	997.7	1,011
Blace	869.2	923.3	965.8	964.4	981.7	993.2
Zitoradja	930.5	980.0	1,028.6	1,034.7	1,029.3	1,043
Kursumlija	883.0	937.4	988.0	994.4	1,025.1	1,055
Prokuplje	897.6	936.4	974.8	972.5	987.7	986.3

Source: (Calculated on the basis of the results list, the documentation of the Republic Institute)

As per municipalities of the district, there are some differences. Thus, the coefficient of masculinity in all municipalities of Toplica region was lowest in 1961. After that, the coefficient of masculinity was growing, and already in 1971, in the municipality Zitoradja reached the maximum value (980.0), and since 1981 exceeded 1,000 in the same municipality. Among other municipalities of the county, only the municipality of Kursumlija had the

masculinity ratio above 1,000 (2002 census). According to the results of the 2011 census, the largest value of the coefficient of masculinity was recorded in the municipality of Kursumlija, which amounted to 1,055. The lowest value of the same year was recorded in the municipality of Prokuplje (986.3). Gender structure by age groups was mainly different. The highest rates of masculinity occur in the age group of 0-19, and the lowest in the age group of 60 and over according to the census of 1961. However, according to the 2011 census, the situation changed. The largest share of men in the total population was in the age group of 20-39, while the share of the age group of 0-19 was slightly lower. The smallest share of the total male population was in the age group of 60 and over. As for the coefficient of femininity in the entire county, it was 989. The largest number of femininity is in the age group of 60 and over and it was 1,199.1. As per the municipalities of the district, the femininity ratio was lower than 1000 in all age groups except the last (60 years and over). Only the municipality of Blace in this age group had a lower coefficient of femininity from other municipalities of the county and it was 977.

Table 9. The changes in the coefficient of femininity by age population in 2011

	In total	0-19	20-39	40-59	60 and more
County of Toplica	989.0	914.2	910.2	928.3	1,199.1
Blace	1,006.9	956.8	873.4	930.7	977
Zitoradja	95.9	966.8	905.6	846.05	1,111.9
Kursumlija	948.2	864.2	862.2	477.8	1,190.2
Prokuplje	1,014	907.8	941.2	976.1	1,238.9

Source: (The Census of Population, households and apartments in 2011 in the Republic of Serbia, the Republic Institute for Statistics, Belgrade, 2012.)

### **Changes in the age structure in the municipalities of Toplica region**

There were significant changes in the natural and mechanical movement of the population in the area of Toplica region in the second half of the twentieth century, which was reflected in the age structure of the population of the district as a whole. These changes mostly had negative tendencies, and influenced the deterioration of the age structure of the population.

“The demographic studies of the age structure of the population, is an important indicator of the aging index, which shows the number of persons aged 60 years and over in relation to the number of persons younger than 20 years. The importance of this indicator is reflected in the fact that it shows the

relative proportions of the old and young population. As a critical value is taken 0.4<sup>4</sup>. (Kicosev S., Golubovic P., 2004). Looking at the county in the period from 1961 to 2011 we can see a steady erosion of the share of the young population in the total population from 40.6% (1961) to 20.8% in 2011. The share of the older population increased from 8.8% at the beginning of the period, to 27.9% in 2011. Municipalities had a reduction in the share of young and an increase in the share of the older population in the total population. By the municipalities of the district, we can see differences in index values. At the beginning of the period, all municipalities have the index value under 0.4. Already in 1981, the value of the index exceeds, and has the highest value in the municipality of Blace (0.87). However, in 2011, the index value exceeds the age of 1, both at the district level, as well as on the territory of all municipalities.

Table 10. The index age Population in the municipalities of Toplica region in 1961, 1981 and 2011.

	1961	1981	2011
County of Toplica	0.21	0.60	1.35
Blace	0.24	0.87	1.9
Zitoradja	0.21	0.59	1.38
Kursumlija	0.18	0.55	1.28
Prokuplje	0.22	0.55	1.22

Source: (Calculated on the basis of census data for individual years, the documentation of the Republic Institute)

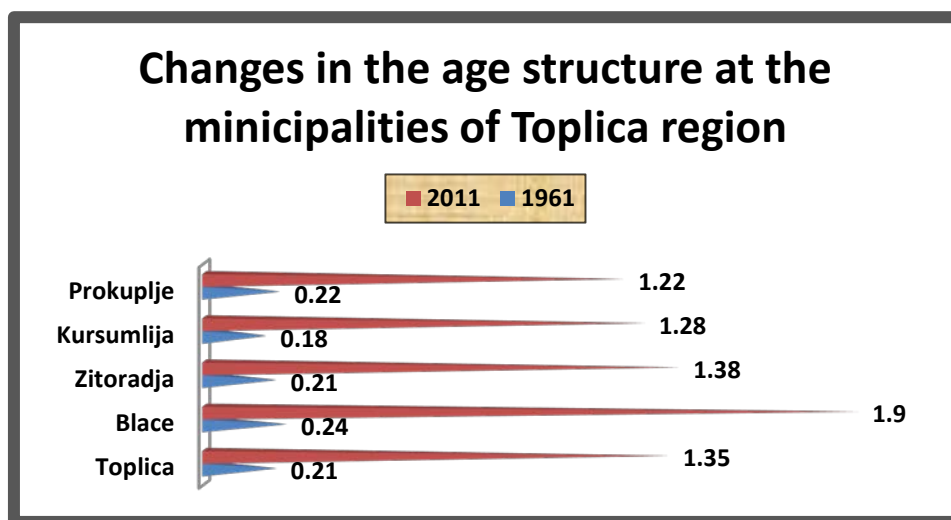


Figure 2 - The index age population in the municipalities of Toplica region in 1961 and 2011

## The economic structure of the population

After World War II, due to changes in the structure of the economy, as well as various demographic processes, there has been a change in the population of Toplica region by economic factors. According to the criterion of activity of the population is divided into three categories:

The active population (labor force)

Persons with personal income and

The dependent population.

Table 11. Population Toplica region by activity in 2011

	Active population		Persons with personal income		Dependents	
	Number	%	Number	%	Number	%
County of Toplica	32,014	34.9	24,476	26.7	35,264	38.4
Blace	4,098	34.9	3,822	32.5	3,834	32.6
Zitoradja	4,949	30.2	4,376	26.7	7,043	43.1
Kursumlija	6,440	33.5	4,916	25.6	7,857	40.9
Prokuplje	16,527	37.2	11,362	25.6	16,530	37.2

Source: (The Census of Population, households and apartments in 2011 in the Republic of Serbia, the Republic Institute for Statistics, Belgrade, 2012)

Analysis of the total population of this region by activity in the period from 1961 to 2002 indicated a decline in the share of the active and dependent population in the total population and increasing proportion of persons with personal income. According to census data from 1961, the active population consisted of 50.0% of the total population and the activity rate in 1971 increased to 52.4%. In the coming periods there was a decrease in the activity rate, so according to the 2002 census, it was the lowest in the municipality of Zitoradja (39.9%). In other municipalities of the county the activity rate was slightly higher. Another tendency observed at the level of the district is an increasing number of people with personal income, which is recorded in the whole observed period. The causes of this increase in people with personal income are the result of an increase in the number of people using various forms of social assistance, changes in the age structure of employees. The third category of the population in terms of activities is dependents, where the opposite trend is evident, unlike in the case of the previous categories. Bearing in mind that this category had mainly young people (pupils, students), it is clear that the downsizing was a direct result of the misbalance in the age structure

of the population which was reflected in the declining share of young people in the total population. Based on the results of the 2011 census, there is a downward trend of increasing the share of active and dependent people in the total population and reducing the share of persons with personal income.

### The educational structure of the population

The educational structure of the population is an important feature of any population which is directly related to the achieved level of socio-economic characteristics of the development of the population. The basic characteristics of the population by the educational structure are literacy and qualifications.

Table 12. Population aged 15 and over by educational attainment

	1961				1981					2011					
	No education or incomplete primary education	Primary education	High school	Higher education	No schooling	Primary education	High school	Higher education	High education	No schooling	Primary education	High school	Higher education	High education	Unknown
County of Toplica	90.6	4.8	4.1	0.5	31.7	20.9	16.1	1.7	1.2	19.9	24.02	45.1	5.01	5.67	0.39
Blace	90.3	4.3	3.1	0.3	36.8	17.6	14.6	1.3	0.9	23.3	21.1	45.0	5.01	5.4	0.2
Zitoradja	94.2	3.6	2.0	0.2	36.5	19.0	10.5	0.9	0.2	28.2	26.4	40.0	2.9	2.0	0.4
Kurumljia	92.5	3.8	3.3	0.4	33.9	22.2	14.6	1.2	1.2	18.6	26.7	44.8	4.3	5.5	0.1
Prokuplje	87.6	5.9	5.7	0.8	27.2	22.1	19.3	2.3	1.7	16.3	22.7	47.1	6.1	7.1	0.5

Source: (Calculated on the basis of the results of the census of 1961, 1981 and 2011, the documentation of the Republic Institute).

### Literacy

According to census statistics, literate people are those who are 10 or older, who can read and write. In the area of Toplica region, the number of illiterates was reduced from 32,527 to 3,629 people in the period from 1961 to 2011. At the same time, there was a decrease in the share of illiterate people in the total population from 28.7% in 1961 to 4.36% in 2011. One of the factors that contributed to the decrease in the share of illiterate people in the total population is the introduction of compulsory eight-year education, as well as courses for literacy for the adult population.

## **Educational attainment**

This structure can be traced on the basis of the list after WWII, in this case on the basis of census data of 1961, 1981 and 2011, with a difference that using the methodology of the census of 1961 covered people older than 10 and the censuses of 1981 and 2011 individuals older than 15. The total share of the population of Toplica region without school education and primary school leavers in 1961 was 90.6% and in 2011 was 19.9%.

## **Conclusion**

Modern demographic development of the municipalities of Toplica region follows major changes in population trends, natural and mechanical movement of population and population structures, changes in the number, size and structure of households and families. A sharp decrease in the birth rate is evident and also an increase in the mortality rate and a decline in natural growth, both at the level of municipalities and the Toplica district. There is a significant process of demographic aging, another demographic process the population of Toplica district is also affected by. All demographic trends observed in the municipalities of Toplica district are a major problem that requires adequate scientific treatment, as well as the engagement of the state in the implementation of population policy measures aimed to a better demographic future.

## **References**

- Kicosev S., Golubovic P. (2004): Geodemographics, The University of Nis, PMF, Nis
- Markovic J. (1966): The geographical area of the SFRY, the Institute for publishing of textbooks, Socialist Federative Republic of Yugoslavia, Belgrade
- Petrovic D., Manojlovic P. (2004): Geomorphology, the University of Belgrade, The Faculty of Geography, Belgrade
- The Republic Institute for Statistics (2013): Economic activity data by municipalities and settlements, Book 7, Belgrade
- The Republic Institute for Statistics (2003): activity and gender of active people calculated by occupation, 2002 census, Book 6, Belgrade
- The Republic Institute for Statistics (2013): Educational attainment, literacy and computer literacy data by municipalities and settlements, Book 3, Belgrade
- The Republic Institute for Statistics (2012): Activity and sex data by municipalities and settlements, Belgrade
- The Republic Institute for Statistics (2012): The Census of Population and Housing in 2011 in the Republic of Serbia, Belgrade