

**LA POPULATION DES BALKANS
À L'AUBE DU XXI^{ÈME} SIÈCLE**

**THE POPULATION OF THE BALKANS
AT THE DAWN OF THE 21ST CENTURY**

Skopje
2017

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SUICIDES IN SERBIA DURING AND AFTER THE TIME OF CONFLICTS AND IN THE TRANSITION PERIOD OF THE EARLY 21ST CENTURY

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Abstract

The paper explores the dynamics of the number of suicides in the period of 1990-2014 and discovers differences in the direction and intensity of changes in the number of suicides in several subperiods. For Serbia, from a political, social, and economic aspect, that 25-year period encompasses at least three distinct subperiods: the breakdown of former Yugoslavia and conflicts that ensued during the 1990s (1990-2000); the change of political regime and the delayed transition in the early 2000s (2001-2006); the recession period after the beginning of the global finance crisis (2007-2014). The official statistical data for Serbia (excluding Kosovo) imply that the highest number of suicides was in the first subperiod, especially in the time of the culmination of the crisis connected to the disintegration of former Yugoslavia (1991-1993), while a trend of decrease has been noticeable in the last two subperiods. Positive changes in the suicide rate recorded in two other subperiods do not imply that the societal and economic crisis had a negative effect on the suicide mortality. The increase in suicides in the first subperiod, the period of the war conflicts, can be connected to a certain extent to the greater availability of firearms, highly lethal suicide means. The paper also looks at the other most frequently used suicide methods as well as the changes in the observed period. The analysis showed that there was a multifold increase in the use of firearms in committed suicides in the period of an increase in the number of suicides during the first years of greatest crisis, especially for young and young adult population.

In this context, the paper determines a change occurred in Serbia's ranking on the European list according to the suicide rate, as well as what types of differences exist in the dynamics of these changes in comparison to other countries. Special attention is paid to the trends in ex-communist European countries, including former Yugoslav republics. Trends in Serbia resemble those recorded in some other transition countries, but the increase in the suicide rate in Serbia in the first subperiod and its subsequent decrease was less intensive.

Suicides do not equally affect the old and the young, men and women. Therefore, the paper observes suicides in Serbia in relation to the most significant characteristics of the deceased, age and sex, aimed to explore not only the differences at the level of suicides but also similarities of the changes in the observed subperiods. This is especially relevant for determining the level differences of male and female suicide rates by age and simultaneity of the highest overall and age-specific suicide rates. The number of suicides for men and women have changed in the same direction, but the decrease among women was greater, which increased the pre-existing differences.

Keywords: suicide, age pattern of suicide mortality, suicide methods, crisis, Serbia

Introduction

A suicide represents a highly complex phenomenon, related to the interaction of various factors, changeable over time and usually simultaneously acting. Some risk factors differ depending on age, sex, socio-economic status, marital and family status, type of settlement and geographic area, religious and ethnic affiliation, etc. At both the individual and the macro level, suicide is connected to biological, psychological demographic, cultural, social, political, and economic determinants.

Although every suicide is a personal act, and suicidal behavior is an individual response to own life problems, it is also a social phenomenon (Radulović, 1990; Baechler, 2009), largely a consequence of the disturbed relationship between the individual and society. Therefore, researching suicide in the broader social context is a necessary step towards its better understanding. In this regard, of particular importance is the influence of specific direct external factors as a variable that affects suicidal behavior of the individual, in the situation in which they are against their own will. The specific direct external factors of suicide primarily imply those acting massively and brutally. Massively because they affect the entire population, and brutally because they prevent the adaptation of "normal" individuals to the newly created conditions. The impact of these specific factors on suicide is not unambiguous, it can be inhibitory, but also encouraging (Baechler, 2009). Wars, deep political and economic crises are real examples of such external factors of suicide.

The paper explores the dynamics of the number of suicides in Serbia in the period 1990-2014 and discovers the differences in the direction and intensity of changes in the number of suicides in the period that is for Serbia also a period of great political, social, and economic crashes and transformation.

Serbia in the past quarter century (1990-2014): wars, disintegrations, political and economic crisis

The period 1990-2014 is primarily distinguished as an exceptional period in which instead of a single state 6 new, internationally recognized states were established, and in which Serbia's sovereignty over part of its territory was drastically undermined. The last decade of the 20th century was also characterized by the brutal economic decline of the country and the beginning of the fall of the former regime. The early 2000s was the beginning of a peacetime period and the radical transformation of the political and economic system, abolishment of international sanctions, but also attempts to stop the so-called Serbia's European path, culminating in the murder of the Prime Minister Djindjić (in March 2003). The implementation of transitional reforms resulted in a sharp increase in unemployment, mass impoverishment of the population and the intensification of economic emigration (Morokvasic, Penev, 2014). The beginning of the global financial crisis (2007) further

worsened the economic situation in Serbia, taking it into the lasting recession from which the country failed to come out even until the end of 2014.

In this sense, the 25-year period 1990-2014 can be clearly divided into at least three distinct subperiods: the breakdown of former Yugoslavia and armed conflicts and wars that followed during the 90s (1990-2000); the change of political regime and the delayed transition in the early 2000s (2001-2006); the recession period after the beginning of the global financial crisis and very visible consequences of unsuccessful transition policies (2007-2014).

The early 1990s were a period of violent disintegration of the former SFR of Yugoslavia, followed by open, more or less intense armed conflicts and wars in all the former Yugoslav republics, from Macedonia to Slovenia, in which Serbia was directly or indirectly, more or less involved in the period from 1991 to 1999. Certainly, the bloodiest wars were waged in the territory of Croatia (1991-1995) and Bosnia-Herzegovina (1992-1995). Serbia, i.e. the former Yugoslavia (SFRY at first, and after that FRY) directly involved in the wars at the beginning of the armed conflict (primarily 1991 and 1992), and later mainly indirectly through the support of ethnic Serbs. As for Serbia, the armed conflicts culminated by the NATO military campaign and the months-long bombing in the spring of 1999, several thousand casualties and huge material damage (70-100 billion USD).

1990s were also the years of unstable political situation in Serbia, heavy economic and political sanctions imposed by the international community, hyperinflation, large production decline, marked increase in unemployment (open and hidden), public health crisis, huge impoverishment of the population, influx of over 850 thousand forced migrants (refugees and IDPs).

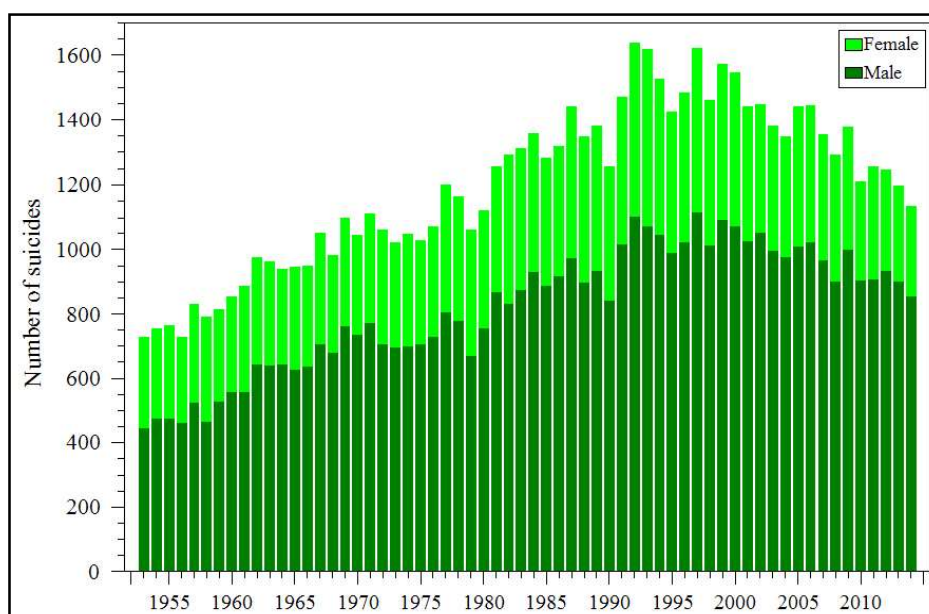
The fall of the Milošević regime (October 2000) brought about the beginning of the complete opening of Serbia to the world, influx of large financial assets (loans and donations), improving living standards, but also the intensification of late transition (Vukadinović, 2004; Drouet, 2004). The transition manifested most notably through the privatisation of state property, reduction of production and a large increase in unemployment (from 722,000 in 2000 to 947,000 in 2003).

The insufficiently successful transition, deterioration of relations with Western European countries and the US, initiated self-proclamation of independence of Kosovo (in February 2008), as well as the consequences of the global financial crisis introduced Serbia in the long recession, maintaining a very high unemployment (over 30%) and reducing the living standards of the majority of population (Bošnjak, 2011). In this respect it is particularly important to emphasize the high unemployment rate of persons over 50 who made up more than 20% of the total number of the unemployed (Maksimović, 2009), as well as the significant reduction of pensions.

Suicide in Serbia 1990-2014 by subperiods: number and rate

According to the data published by the national statistical organization (Statistical Office of the Republic of Serbia - SORS), there were 35,187 suicides in Serbia in the 25-year period 1990-2014. While in the period from the mid-20th century until the late 1980s, the annual number of suicides nearly doubled (from 725 in 1953 to 1,381 in 1989), with a strong growing trend (especially until 1987), in the next quarter century (1990-2014), generally it could be characterized as declining (Figure 1).

Figure 1. Number of suicides by sex. Serbia, 1953-2014



If in this case the period 1990-2014 is divided into the same three subperiods (1990-2000, 2001-2006 and 2007-2014), then the average annual number of suicides declined continuously. This decrease was not as intense as the increase was in the period 1953-1989. The yearly number of suicide deaths in the first subperiod was 1,511, in the second 1,418, and in the third 1,258 (Table 1). The maximum annual number of suicides was also registered at the beginning of the first subperiods (1,638 in 1992), and the minimum in the last year of the observed period (1,134 in 2014). The maximum reached in 1992 also represents the largest annual number of suicides in the period 1953 to 2014. At the same time, the number of suicides in 2014 was the smallest since 1981, when it was 1,123.

The decreasing trend is also present in terms of changes in suicide rates. The decrease from the highest to the lowest level is less pronounced than in the case of the number of suicides, because the population in the early 1990s was about 10% larger than in the

mid-2010s. Therefore, despite the almost ten percent reduction of suicide deaths (from 1,254 in 1990 to 1,134 in 2014), the suicide rate was the same in 1990 and 2014 (15.9 per 100,000). However, the calculated value of the suicide rate for 1990 should be taken with caution; because for that year the used denominator was overestimated number of total population according to the official population estimates of the Yugoslav Federal Statistical Office (FSO).

Table 1. Number of suicides and suicide rates by sex. Serbia, 1990-2014 (by subperiod)

	Sex	1990-2014	1990-2000			2001-2006	2007-2014
			Total	1990-1995	1996-2000		
Number of suicides - total	Both sexes	35187	16620	8936	7684	8505	10062
	Male	24862	11395	6074	5321	6088	7379
	Female	10325	5225	2862	2363	2417	2683
Number of suicides – yearly	Both sexes	1407	1511	1489	1537	1418	1258
	Male	994	1036	1012	1064	1015	922
	Female	413	475	477	473	403	335
Share in total number of suicides (%)	Both sexes	100.0	100.0	100.0	100.0	100.0	100.0
	Male	70.7	68.6	68.0	69.2	71.6	73.3
	Female	29.3	31.4	32.0	30.8	28.4	26.7
Suicide rate (per 100,000)	Both sexes	18.6	19.4	19.0	19.8	18.9	17.3
	Male	27.0	27.1	26.3	28.0	27.8	26.1
	Female	10.7	12.0	12.0	12.0	10.5	9.0

Source: Calculated by authors based on national statistical offices data (Federal Statistical Office of Yugoslavia; Statistical Office of the Republic of Serbia)

Broken down by years, the war-torn 1990s had the highest number of suicides, and especially the early 1990s (1992 and 1993) when, as well as in 1997 suicide deaths amounted to more than 1,600. At the same time, the beginning of the last decade of the 20th century recorded the highest annual change of the suicide deaths (17% in 1991 and 11% in 1992). Other war-torn years of the 1990s, with some fluctuations, were distinguished by a relatively large number of suicides (constantly over 1,400 yearly), but certainly the largest since the official statistics regularly published data on the number of suicide deaths in Serbia.¹

Certain stability, but at a lower level, was achieved during the first 6 years of the first decade of the 21st century. In that six-year period, the annual number of suicides ranged from 1,449 (2002) to 1,346 (2004). However, downward trend has been noticeable since 2007. With the exception of 2009 and 2011, all other years registered a reduced number of suicides. It was more intense than in the previous subperiod, reaching the minimum suicide deaths in 2014, but also the minimum level of suicide rates (15.9 per 100,000).

¹ Before that, the annual number of suicides was larger than 1,400 only in 1987.

Suicide in the European context

The 25-year period, from 1990 through the mid-2010s, was distinguished not only in Serbia or other successor states to the former Yugoslavia, but also in the whole of Europe as a period of seismic political and socio-economic changes and the resulting difficulties faced by population of a large number of countries, in the east and the west, to the south, and the north of the continent. The fall of the communist regime, national unifications but also the disintegration of several federal socialist countries, peaceful and violent formation of new states, transition to market economy and radical economic reforms, huge increase in unemployment, intense migration without precedent in Europe after the Second World War, the global financial crisis, the long-term recession, but also a lot of positive socio-economic and political transformation are just some of the most important changes at the macro level that directly or indirectly, to a lesser or greater extent, influenced many aspects of lives of hundreds of millions of inhabitants of Europe.

Researching suicide in such a turbulent period represents a special challenge both because of the possibility that this major public health problem is perceived in extreme external conditions, and also because of the real danger of making hasty conclusions about the causes of the trends in suicide and suicidal behavior. Therefore, this section of the paper only reviews trends in the number and rates of suicides among European countries in the last decade of the 20th and the first decade of the 21st century. Particular attention is paid to Serbia and the other Balkan countries.

According to the available official national statistical data, as well as the data taken from the Eurostat database, in Europe, in 1990 a total of 124,100 persons committed suicide or 17.2 per 100,000. In many European countries, as in the most of the former communist countries, primarily in the former Soviet republics, it is the beginning of extensive and intense increase in suicide deaths, especially suicide rates, which in some countries continued throughout the last decade of the 20th century. In some countries, which had previously shown above-average rates of suicide, values of this mortality indicator reached the highest level since the end of World War II (Penev, Stanković, 2007). In this regard, three Baltic countries and Russia stood out. The suicide rates in all the four countries (1990) were just over 26 deaths per 100,000 (Table 2). Accordingly, they were at the very top of the list of European countries by suicide rate, headed by Hungary (39.8 per 100,000) and Finland (30.3 per 100,000).

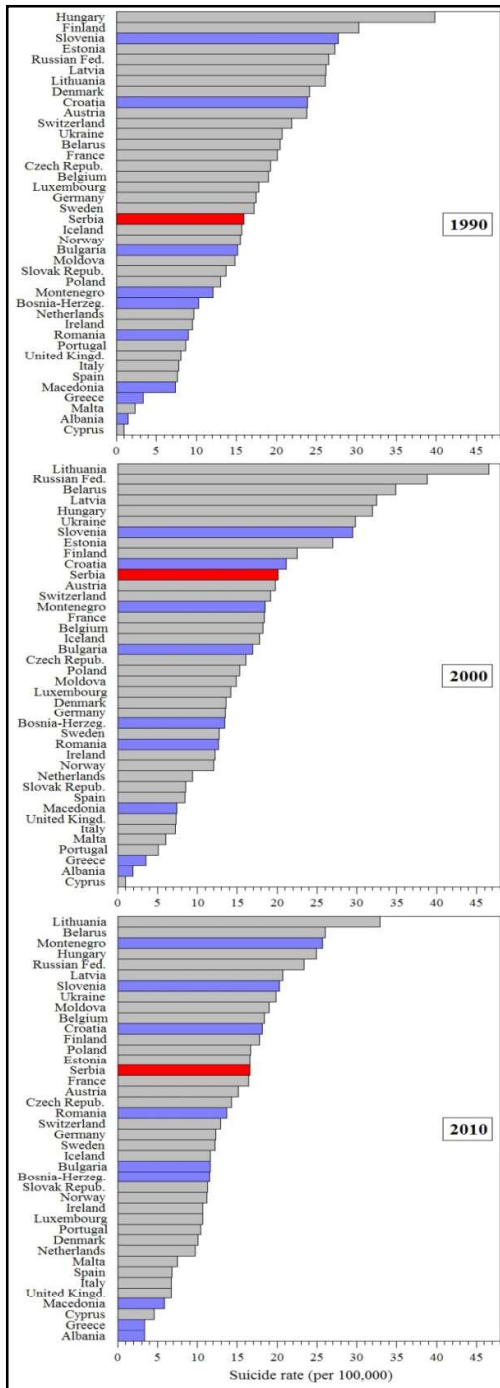
In the same 1990, the lowest suicide rates were in the Mediterranean countries: Cyprus, Albania, Malta and Greece (all with less than 4 suicide deaths per 100,000), as well as in Macedonia, Spain and Italy, all three with suicide rates were below 8 per 100,000.

Table 2. Suicide rates in European countries, 1990, 1995, 2000, 2005 and 2010 (per 100,000)

Region / Country	1990	1995	2000	2005	2010
Transition countries					
Albania	...	2.8	1.9	...	3.4
Belarus	20.5	31.5	34.9	...	26.0
Bosnia-Herzegovina	10.3	...	13.4	12.2	11.5
Bulgaria	15.2	17.0	16.9	12.7	11.6
Croatia	23.9	20.1	21.1	20.3	18.1
Czech Republic	19.3	16.8	16.1	15.3	14.3
Estonia	27.3	41.4	27.0	20.2	16.6
Hungary	39.8	32.6	32.0	26.0	24.9
Latvia	26.1	41.2	32.5	25.2	20.7
Lithuania	26.2	46.7	46.6	39.7	32.9
Macedonia	7.4	6.7	7.4	7.0	5.9
Moldova	14.8	18.2	14.9	17.6	19.0
Montenegro	12.1	16.5	18.5	19.2	25.7
Poland	13.0	14.2	15.3	15.8	16.7
Romania	9.0	12.3	12.6	12.2	13.7
Russian Federation	26.5	41.1	38.8	32.1	23.4
Serbia	15.9	18.3	20.1	19.4	16.6
Slovakia	13.7	7.7	8.5	10.7	11.3
Slovenia	27.7	28.4	29.5	25.1	20.3
Ukraine	20.7	28.6	29.8	22.6	19.9
Southern Europe					
Cyprus	1.0	2.3	4.6
Greece	3.4	3.5	3.5	3.6	3.4
Italy	7.8	8.0	7.2	4.9	6.7
Malta	2.3	4.6	6.0	4.7	7.5
Portugal	8.7	8.1	5.1	8.7	10.4
Spain	7.6	8.0	8.4	7.8	6.8
Western Europe					
Austria	23.8	22.5	19.8	17.0	15.1
Belgium	19.0	21.3	...	19.4	18.4
France	20.1	20.4	18.4	17.5	16.4
Germany	17.5	15.8	13.5	12.5	12.3
Ireland	9.5	11.2	12.2	10.8	10.7
Luxembourg	17.8	15.4	14.2	10.5	10.7
Netherlands	9.7	9.8	9.4	9.6	9.7
Switzerland	21.9	20.2	19.2	17.5	12.9
United Kingdom	8.1	7.4	7.3	6.7	6.7
Northern Europe					
Denmark	24.1	17.7	13.6	11.6	10.1
Finland	30.3	27.2	22.5	18.9	17.8
Iceland	15.7	10.1	17.8	11.1	11.6
Norway	15.5	12.6	12.0	11.5	11.2
Sweden	17.2	15.3	12.7	13.5	12.2

Source: Calculated by authors based on Eurostat, WHO or national statistical offices data

Figure 2. Rang order of European countries according to suicide rates, 1990, 2000 and 2010



Serbia, with 15.9 suicides per 100,000 was below the European average, but was exactly at the middle of the list of 40 countries by suicide rate. Suicide rates in most of the other Balkan countries (Albania, Greece, Bulgaria, Romania, and the former Yugoslav republics Bosnia-Herzegovina and Montenegro) were lower. The exceptions were Croatia (23.9) and Slovenia (27.7) which belonged to the group of ten countries with the highest suicide rates in Europe.

In Europe, the first half of the 1990s was a period of very divergent trends of suicide mortality by countries. On one side there are most of the countries in transition with a marked increase in suicide rates, which in some countries (three Baltic countries and Russia) resulted in record high level (over 40 per 100,000). On the other side there are most of the countries of Northern and Western Europe, where there was a reduction in suicide rates. At the same time, countries in Southern Europe showed no significant changes in the number of suicides. These divergent trends at the level of entire Europe contributed to deepened differences in suicide mortality by country.

Regarding Serbia, during the first half of the 1990s changes were in line with trends in the most other former communist countries. The number and rate of suicides reached maximum levels, and it ranked among the European countries with the above-average suicide rate.

The second half of the 1990s for the most countries represented a period of declining suicide mortality. This is the case with the transition countries with the highest suicide rates (especially Estonia and Latvia), but also those with moderately high suicide rates. Most countries in other parts of Europe continued with the decline in suicide rates, mainly very intense. However, the reduction in the number of suicides per 100,000 population could not undo the effects of the earlier increase in suicide mortality, so that in 2000 in Europe there were 145 thousand suicides or about 20,000 more than in 1990.

Serbia was among the group of countries where in the last years of the 20th century, the suicide rate was higher than in the mid-90s. The suicide rate in 2000 (20.1 per 100,000, was about European average (Table 2), but that year Serbia significantly worsened its ranking position compared to 1990 (from the 20th got to the 11th place in Europe - Figure 2). Changes in almost all other Balkan countries went in the same increasing direction. The fastest increase in suicide rate was in Montenegro. Slovenia and Croatia maintained high positions, while Albania and Greece continued to be the countries with the least suicides per 100.000 population.

Since for the majority of European countries the 1990s were years of intense increase in suicide mortality, the 2000s were mainly the years of less suicide deaths (Bertolote, De Leo, 2012). The total European number of suicides in 2010 was reduced to 110 thousand, which is by 35 thousand less than in 2000 and 14 thousand less than in 1990. The decrease was achieved in all groups of countries, but the reduction in the annual number of suicides and suicide rates were highest in countries in transition (former communist countries). On the whole, in 2000 these countries had a total of 98 thousand suicides, while in 2010 the suicide deaths were reduced to 65 thousand. At the same time, in other European countries the decrease was more moderate (from 47 thousand to 45 thousand).

In 2010, on top of the list were still the so-called countries in transition, with Lithuania at the head (with 32.9 suicides per 100,000). In 2000, that country also had the highest suicide rate, with as many as 46.6 suicides per 100,000. The lowest suicide rates were still in Albania, Greece and Cyprus (under 5.0 per 100,000), followed by Macedonia (5.9 per 100,000).

In Serbia, the reduction in the number of suicides was also intense, but slower than the European average, and especially than the average for countries in transition. However, by its suicide rate Serbia improved its position among the European countries (from 11th place in 2000 to 15th in 2010).

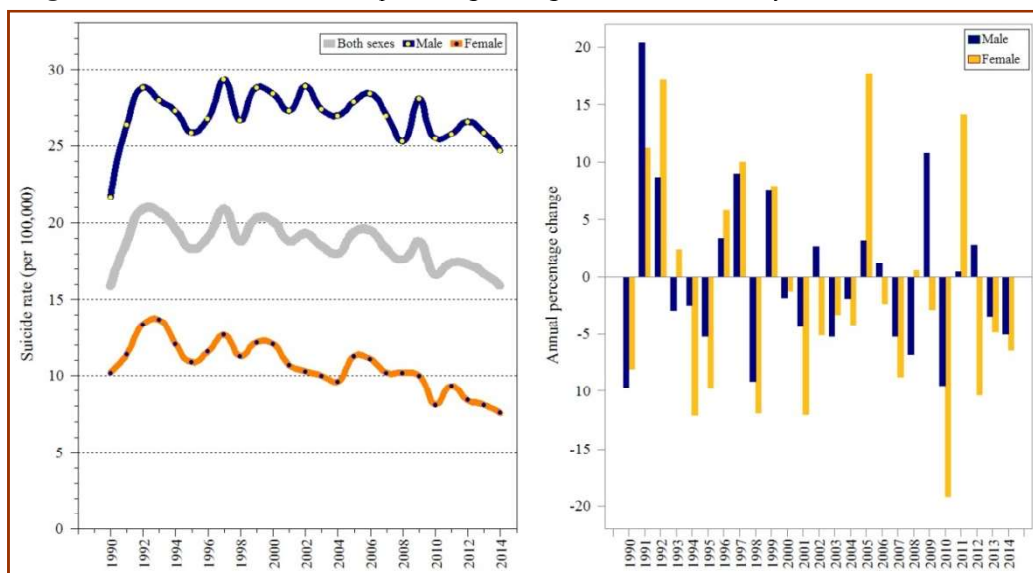
Increase in gender differences

The suicides are much more common among men than among women. At the global level, in 2012 the ratio was 64:36 (WHO, 2014). A larger number of suicides among women is only in 6 Asian countries (Iraq, China, Bangladesh, Indonesia, Pakistan, and Afghanistan). As for Europe, in all countries, except in Albania, there are at least twice as many men as women among those who have committed suicide.

Regarding the sex structure of persons who have committed suicide, Serbia is not substantially different from most of the other European countries. In the period 1990-2014 there were 24,862 (70.7%) male and 10,325 (29.3%) female suicide deaths. On the whole, the changes related to the reduction in the number of suicides in both sexes. The decline was much more intense among women than among men, which resulted in growing disparities in the percentage share of suicides by sex (Figure 3, left). In the first subperiod (1990-2000), the share of men was 68.6%, in the second (2001-2006) 71.6%, while in the past eight years (2007-2014) the share increased to 73.3% (Table 1).

The highest percentage of women in suicide deaths was registered in 1993 (33.8%) and the lowest in 2014 (24.4%). Also, the reduction of the average number of suicides, as a rule, was accompanied by decreasing of the proportion of female suicides (Table 1). The largest share of suicides of women was in the years with the largest number of suicides (32.5% in the years when the annual number of suicides was over 1,600), and the lowest share in the years when the number of suicides was the smallest (24.6% in the years when the number of suicides was smaller than 1,200).

Figure 3. Suicide rate and annual percentage change of suicide deaths by sex. Serbia, 1990-2014



Observed by the subperiods, the average annual number of suicides in each subsequent subperiod was smaller than in the previous one, and for both sexes. However, this decrease was more intense in women. For example, the average annual number of suicides of men in the period 2007-2014 was by 11% smaller than in 1990-2000 (922 to 1,036), and in women, the decrease was 29.4% (335 to 475). The difference by sex is very pronounced, and even an absolute reduction of the average annual number of male suicide deaths is smaller (114) than the decrease in female suicide deaths (140).

Synchrony of direction of change in the number of suicides by sex is even more apparent by years. In the 19 years between 1990 and 2014, the direction of change in the number of suicides, compared to the previous year was the same for both sexes. When the number of male suicides decreased, the number of female suicides decreased as well and vice versa (Figure 3, right).

The same direction of changes was most pronounced between 1990 and 2000. The different direction of change in the number of suicides of men and women was only registered in 1993. The number of male suicides was then decreased by 2.9% and the number of female suicides increased by 2.4%. Of the remaining five years when changes did not occur in the same direction (2002, 2006, 2008, 2009 and 2012) relations in four were reversed - the number of male suicides was larger, and the number of female suicides smaller than the previous year.

If the changes in the number of male and female suicides were of the same direction, they were generally more intense in women. Namely, if the number of suicides increased, the percentage change was larger in women than in men (in 6 out of 7 years). On the other hand, in the years when the number of suicides decreased, it was relatively faster in women than in men (9 out of 12 years). Such relations are expected considering that in the period 1990-2014 the yearly number of female suicides was 2 to 3 times smaller than the number of male suicides. However, in as many as four years, the increase or decrease in the number of suicides was absolutely higher in women than in men.

The identified gender differences suggest the question as to whether women respond better to changes that lead to decrease in the number of suicides, and vice versa. So does it mean that women are more vulnerable in the conditions that are conducive to a larger number of suicides? This data only indicates the situation based on the official statistical data, but it certainly is not sufficient for reaching definite conclusions about the causes of such changes.

Suicide by age

In suicides, as in other causes of death, there is a very close relationship between age and mortality level. Epidemiological data shows that almost everywhere in the world the elderly bear the higher risk that their suicide attempt will end in death. In the world

there is not a unique age pattern suicide mortality (da Veiga, Saraiva, 2003), but in most countries the highest suicide rate is among the elderly, especially among men (WHO, 2014). In Serbia also the mortality rate due to suicide is highest among the elderly and lowest in young people, while the specific suicide rates increase with age (Stanković, Penev, 2011; Пенеv, Станкович, 2010).

As for the age structure of suicide deaths it is directly conditioned by the age structure of the population and by age-specific suicide mortality pattern. In terms of age structure of the population, especially important is the age structure of the population over 10.

In Serbia, in the period 1990-2014, of the total number of suicides, almost half (48.1%) were suicides committed by persons over 60. Every fifth person who committed suicide was 60-69 years old, and more than every fourth person (28.4%) was over 70 (Table 3). Among suicide deaths the least are the youth (under 25) and the relatively low proportion of young adults (25-39).

Table 3. Suicides of persons aged up to 40 and 60 or more. Serbia, 1990-2014

Age	1990-2014	1990	2014	1990-2000	2001-2006	2007-2014
Number of suicides						
All ages	35187	1254	1134	16620	8505	10062
10-24	2013	80	36	1207	445	361
25-39	4828	191	147	2454	1059	1315
60-69	6916	268	213	3672	1556	1688
70+	9992	310	372	4183	2601	3208
Share in total number of suicides (%)						
All ages	100.0	100.0	100.0	100.0	100.0	100.0
10-24	5.7	6.4	3.2	7.3	5.2	3.6
25-39	13.7	15.2	13.0	14.8	12.5	13.1
60-69	19.7	21.4	18.8	22.1	18.3	16.8
70+	28.4	24.7	32.8	25.2	30.6	31.9
Share of deaths caused by suicides in all deaths, by age (%)						
All ages	1.4	1.5	1.1	1.6	1.4	1.2
All ages (10+)	1.4	1.5	1.1	1.6	1.4	1.2
10-24	11.2	8.9	9.2	11.7	11.4	9.6
25-39	10.5	7.7	12.1	9.9	10.8	11.5
60-69	1.4	1.4	1.2	1.4	1.3	1.3
70+	0.6	0.7	0.5	0.7	0.7	0.6

Source: See Table 1

In the same period the elderly aged 60 or more were also the most numerous in the total mortality, but their share was much higher than in suicide mortality, especially for those

over 70. Of the total number of deaths of persons over 10, four out of five people were over 60 (83.5%), while only a share of the elderly over 70 accounted to over 60% (62.3%).

Such important differences between the age structure of deaths due to suicide and overall mortality resulted in a completely different picture in terms of the share of suicides in total mortality by age. The largest share of suicide is in youth (11.2%) and young adults (10.5%). In the observed 25-year period it was more than 7 times higher than the share of suicides in total mortality of those aged 10+ (1.4%). At the same time, the share of suicides in old age mortality 70+ (0.6%) was more than twice lower than the average, and more than 15 times lower than the share of suicides in total deaths under 40 (Table 3).

If the first and last year of the period 1990-2014 are observed, then the principal changes in the age structure of suicide are the increase in the share of the elderly 70+, decrease in the share of persons aged 60-69, as well as decrease in the share of age groups 10-24 and 25-39. Absolutely the biggest changes are in the share of the elderly 70+ (an increase from 25% to 33%), while the relatively largest decrease is in the share of the total number of suicides of young under 25 (halved from 6.4% to 3.2%).

Observed by the selected subperiods (1990-2000, 2001-2006 and 2007-2014) the same general relations and trends of changes can be ascertained. The highest is the percentage share of the elderly (70+), and the lowest of the youth (under 25). Reduction of the share in total number of suicides was in the youth and the elderly aged 60-69, while the share of the elderly 70+ increased. The smallest changes occurred in young adult age group (25-39), and were not one-directional. The share of this age group in the total suicides first decreased and then slightly increased.

There are also changes in the shares of suicides in the total mortality by age. The decline in the percentage share was recorded in all the observed age groups, which is in line with the decrease in the share of suicides in the total number of deaths, especially aged 10 or over. The only exception is the age group 25-39 in which the share of suicide deaths increased (it was 9.9%, 10.8% and 11.5%, respectively).

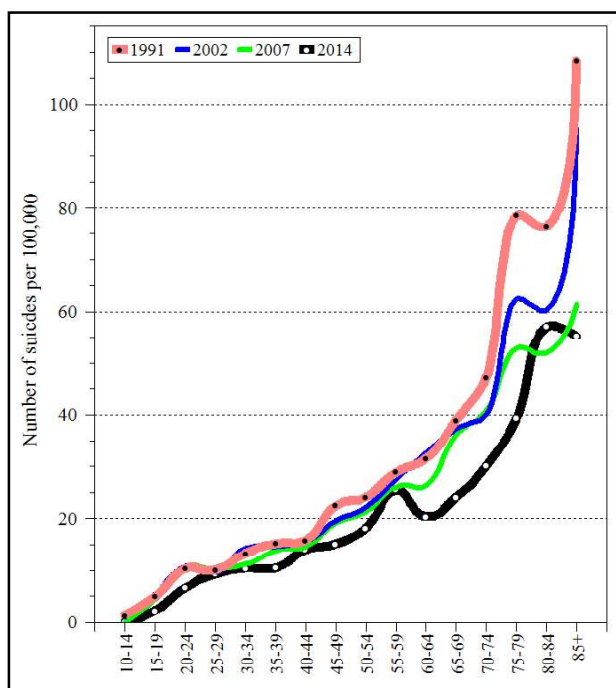
In all subperiods, the highest share of suicides in total mortality is at ages 10-24 and 25-39 (around 10%) and lowest at age 70+ (under 1%). At the same time, the share of suicides in the elderly 60-69 slightly deviated (from 0.04 to 0.18 percentage points) from the average proportion of all deaths due to suicide (Table 3).

The changes in the number of suicides and their contribution to all-cause deaths occurred within particular subperiods as well. In this respect, the war period (1990-2000) especially stands out. The shares of suicides in the total deaths over 10 were identical in the first and the last year (1.5% each), but during the biggest crisis (1992, 1993, 1997), primarily related to the armed conflicts in Bosnia-Herzegovina, Croatia and Kosovo, a sudden increase in the annual number of suicides (more than 1600) has reached an all-time high and their share in the total number of deaths (1.7% and 1.8%). However, by age group,

changes in the number of suicides were not of the same intensity, and in some cases, of the same direction. The most distinctive were the changes in the number of suicides of persons aged 20-29 and their share in the total number of deaths in the same age, and in both sexes. In the first year of this subperiod (1990-2000) there were 69 suicides, in 1992 - 118; in 1994 - 133; in 1996 - 142; in 1998 the number of suicides was reduced to 129, and in the last year of this subperiods was reduced to 114. At the same time the share of suicides in the total number of deaths of the same age increased from the initial 7.8% to a record level of 17.1% in 1996, and it was reduced to 13.3% in 2000. In the subsequent subperiod, the number of suicides among young adults aged 20-29 years was relatively stable (from 93 to 111 per year) and in the third subperiod (2007-2014) downward trend was present. Interestingly enough, in the last year (2014) the number of suicides of young people (71) was almost the same as in the initial year (1990).

The changes in the number of suicides by age also reflected on the level of age-specific suicide rates. Number of suicides per 100,000 inhabitants of the same age did not change with the same intensity, and observed by years, the changes were not of the same direction. Nevertheless, the values of age-specific suicide rates generally declined. However, in Serbia, the age patterns of suicide in the observed 25-year period (Figure 4), but also longer, i.e. from the mid-20th century (Penev, Stanković, 2007) was fairly stable.

Figure 4. Age-specific suicide rates. Serbia, 1991, 2002, 2007 and 2014



The current age-specific suicide mortality pattern is characteristic for both sexes, and the value of the suicide rate is significantly higher in male than in female population, and differences by age much more pronounced in men (Figure 5). In addition, suicide rates by age were reduced in both sexes, but were far more intense in women, especially in the age groups at higher risk of suicide (persons aged over 50 years). As a result of these changes, in 2014, for example, the highest age-specific suicide rate (in the 85 or over age group) among women (31 per 100,000) was nearly three times lower than the suicide rate for men of the same age (100 per 100,000), and also lower than the suicide rates of all male five-year age groups over the age of 50.

Methods of suicide

One of the very important areas of researching suicide, particularly in terms of prevention is related to the choice of method for suicide. What will be the concrete choice made by a person who has attempted or committed suicide depends on many factors reflected by the existing social, economic, cultural and environmental conditions (Cantor, 2000; Ajdacic-Gross et al., 2008). In this sense, socio-cultural acceptability and availability of methods (means) stand out as the main factors for the choice of method of attempted and completed suicides. Also, of great importance are the so-called personal factors, such as age, sex, education and health status of the person who has committed a suicide (Mergl et al., 2015).

Bearing in mind the above remarks, when researching suicides in Serbia during the time of conflicts and in the transition period suicide methods should be also considered, especially whether there are changes in the use of certain methods.

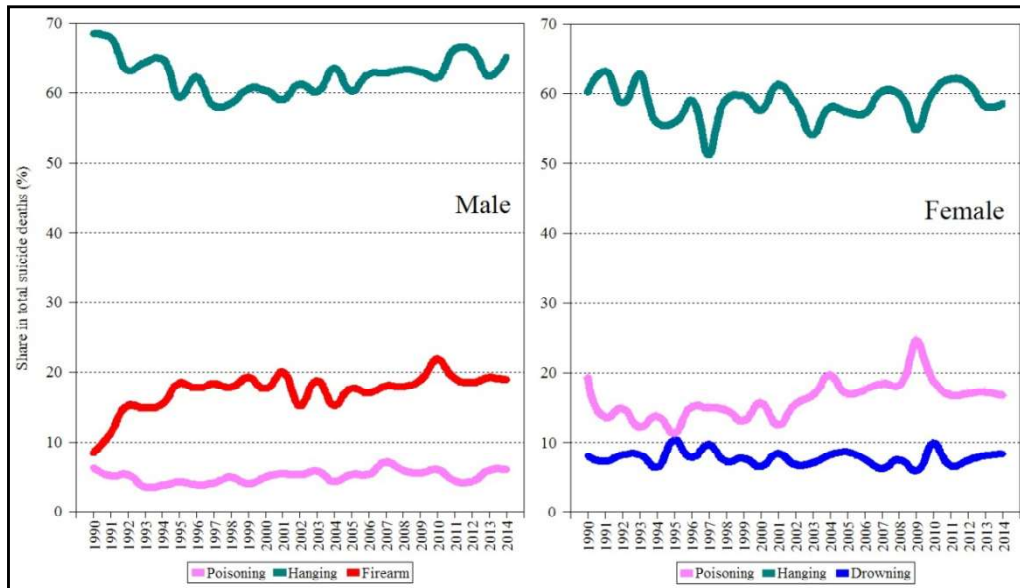
During the observed period 1990-2014, the distribution of suicides by method retained the basic characteristics present since the mid-20th century. Hanging is continuously the leading external cause of death by suicide, and the main trends of changing the share of the three most common methods of suicide more or less continued (hanging, poisoning and use of firearms).

Hanging was the most common method of suicide (61.3%) in the period 1990-2014. Despite the relatively large fluctuations every year, without exception, hanging was the most common method of suicide, always with more than 50% of the total number of suicides (between 56% and 66%), for both male and female population (Figure 6). In the first year of the observed period (1990) hanging constituted 65.8%, while in the last year (2014) its share was 63.5% of all suicide deaths in Serbia.

From the mid-20th century in Serbia *poisoning* was constantly in the group of three most common methods of suicide, but with increasingly smaller percentage of total suicides. Descending trends in the prevalence of poisoning suicide were extended in the period 1990-2014, so that from 1991 this method was continuously less frequently represented

than the use of firearms. It is, on the one hand, directly conditioned by the reduction in the annual number of suicides by poisoning, as well as a significant increase in the number of firearm suicides (Table 4).

Figure 6. Share of top 3 methods in total suicide deaths by sex. Serbia, 1990-2014



By sex, poisoning as a suicide method is much more common among women. In the years between 1990 and 2014, it was always the second most frequent method of suicide in females. In males, the poisoning is in the third place, but with more than three times smaller number of deaths than firearm suicides (1,245 versus 4,278).

The most significant changes achieved during the 1990s and the first two decades of the 21st century were related to the prevalence of firearm suicide. In the period 1990-2014 *use of firearms* in Serbia was by far the second most frequent among the methods of suicide. In that period, its share was 13.2%, but with the growing trend. In 1990 the share was 6.0%, in 1992 - 11.2%, in 1995 - 14.7%, in 1999 - 15.2%, and reached its maximum share of 17.5% in 2010.

The extensive use of firearms as suicide method is present in both sexes. The increased share was absolutely higher among men (from 8.4% in 1990 to 21.8% in 2010). In women, the increase was very intense during the 1990s, but at a significantly lower level than in men (from 1.0% in 1990 to 6.0% in 1994, and with a peak of 6.9% in 1997). Therefore, the firearm suicides among women, according to the number of deaths, remain behind hanging, poisoning, drowning and jumping from a high place.

Despite significant changes in the percentage share of certain methods of suicide realized in the period 1990-2014, the three most common methods (hanging, poisoning and firearm) participated with more than four fifths of all suicide deaths (82.8%). In this respect there are no significant differences by sex. For men, the share of deaths by the three most common methods of suicide was 84.7% and for women 82.2%. These data indicates that in Serbia over the entire observed period, there was a clearly defined three-modal model of suicide by method, but with different top 3 methods by sex (Figure 6).

Suicide methods by sex and age

The rang order of large age groups by percentage share in total suicide deaths is the same if the suicides are viewed by methods. The proportion of suicides of persons aged 60 or over is the highest in the suicides by hanging (52.8%) and drowning (53.5%). The elderly are also the most numerous in other most common methods, but their share does not exceed 50% of all suicides. A minimum share of people aged 60 or over is among those who have committed firearm suicide (34.3%).

Regarding the persons who at the time of suicide were under 40, their highest percentage share was in the suicides committed by jumping from a high place and using firearms (33.1% and 32.2%, respectively). The lowest share of deaths of this age is in the group of suicides committed by drowning or hanging (14.1% and 15.4%, respectively).

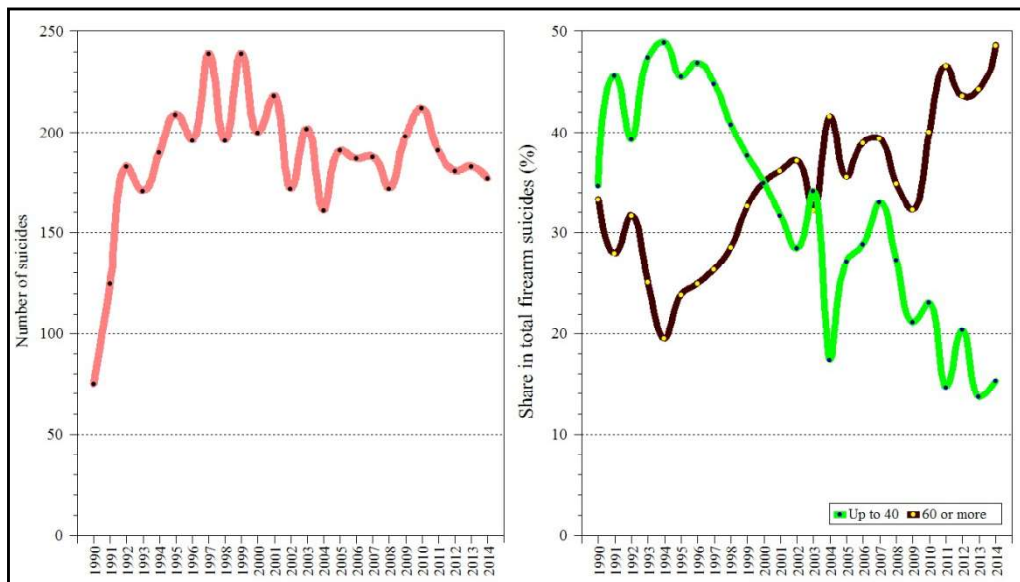
While the changes in the age structure of suicide deaths were generally in the direction of increasing the share of persons over 60, and the reduction of the share of those under 40, changes by particular suicide methods had a different direction. Looking only at the age structure of deaths by the three main suicide methods, the differences are very pronounced, primarily in terms of proportion of the elderly.

The firearm suicides had the most intense increase in the share of suicide deaths aged 60 or more. If we look at only three subperiods, then the increase in the share of the elderly in the total number of firearm suicides was continuous, and the share of that age group increased from 27.9% to 41.1%. In this way, the difference to the average percentage share of the elderly 60+ in total suicides decreased from 19.4 to 7.7 percentage points. However, these changes were not one-directional by subperiods, which was most intense in the 1990s. In fact, between 1990 and 1994 the share of elderly in the total number of firearm suicides was intensively decreasing (Figure 7, right), but after reaching a minimum proportion of 19.5% there was a sharp increase in the share of this age group and, until 2000, again the initial share of about 35% was reached. The increased share of the elderly aged 60 or more in the total number of firearm suicides continued, with some fluctuations, in the coming years.

Such changes in the share of the elderly aged 60 or over are most closely associated with the changes in the share of suicides of persons under 40 in the total firearm suicides. In the

initial 1990 the number of suicides of the two age groups was identical (26 under 40 and 25 over 60), with shares of around 35%. In the subsequent years the number of firearm suicides increased rapidly (Figure 7, left), mainly due to the increase of firearm suicides of persons under 40 years of age (54% of the total increase between 1991 and 1996). In just a few years, the number of suicides aged up to 40 multiplied (in 1997 it was more than 4 times larger than in 1990), which in 1994 already resulted in the maximum share of this age group of 49% of all firearm suicides. After 1997, the number of firearm suicides committed by the youth sharply decreased, so that in 2013 and 2014 the annual number was the same as in the initial 1990 (26 per year).

Figure 7. Number of firearm suicides and share of suicides aged up to 40 and 60 years or more in total firearm suicides. Serbia, 1990-2014



The period of rapid increase in the number of firearm suicides coincides with a period of rapid increase in the total number of suicides in the first half of the 1990s. These were also the years of wars in the former Yugoslavia (first in Slovenia, then in Croatia, Bosnia-Herzegovina, and Kosovo). Back then the firearms were more accessible, especially to men who were directly involved in military or paramilitary forces.

While the decrease of firearm suicides committed by the youth for the period after 2000 can be explained by the cessation of war hostilities, the question is whether a substantial increase in firearm suicides of the elderly aged 60 or more can be at least partly explained by the increase in the number of firearms per family, which was especially prevalent during the 1990s, and their easier availability to all household members.

Gender differentiation is also highly emphasized in the age structure of suicide deaths observed by external causes of death. Given that in the majority of the most common methods of suicide men significantly outnumbered women, it would be expected that observed by external causes of death, the age structure of male suicides is not substantially different from the already analyzed structure of deaths by age observed for both sexes.

The findings obtained in the age structure of the total number of suicide deaths by hanging and firearm generally apply to men. This refers primarily to the trends of proportion of hanging and firearm suicides by main age groups, as well as the subperiods when the maximum and minimum proportions of different ages in the total suicide deaths by method were reached.

Table 4. Average yearly suicide male and female deaths by used method. Serbia, 1990-2014, by subperiod

Suicide method	Sex	1990-2014	1990-2000			2001-2006	2007-2014
			Total	1990-1995	1996-2000		
All suicide deaths /E950-E959/ /X60-X84/	Both sexes	1407	1511	1489	1537	1418	1258
	Male	994	1036	1012	1064	1015	922
	Female	413	475	477	473	403	335
Poisoning /E950, E951, E952/ /X60-X69/	Both sexes	115	115	114	116	119	114
	Male	50	47	47	46	53	52
	Female	66	68	67	69	66	62
Hanging /E953/ /X70/	Both sexes	863	924	937	908	853	788
	Male	622	646	654	638	620	589
	Female	242	278	284	270	233	199
Drowning and submersion /E954/ /X71/	Both sexes	60	71	73	70	61	45
	Male	28	34	34	33	29	20
	Female	32	38	39	37	31	25
Firearm /E955/ /X72-X75/	Both sexes	186	184	159	214	189	188
	Male	171	166	143	193	176	175
	Female	15	18	16	21	13	12
Jumping from a high place /E957/ /X80/	Both sexes	45	48	49	48	33	50
	Male	25	24	24	25	19	31
	Female	20	24	25	22	13	19
Other and unspecified /E956, E958, E959/ /X76-X79, X81-X84/	Both sexes	137	169	159	182	164	73
	Male	98	119	112	129	118	55
	Female	39	50	47	53	47	18

Source: See Table 1

Note: WHO International Statistical Classification of Diseases and Related Health Problems, ICD-9 (1990-1996) and ICD-10 (1997-2014)

In women, the differences in relation to the age structure of the total number of suicide deaths (of both sexes), and even more so in relation to men, are much more prominent. All the most common methods are characterized by the fact that among women who have committed suicide the share of the elderly over 60 is much higher than in men – nearly 60% or over that percentage share. The only exception is the age structure of female firearm suicides. In these suicide deaths the share of young adult women (under 40) is very high. The share of this age group of women in the period 1990-2014 amounted to 55.6%, while the share of women over 60 was almost three and a half times lower (16.1%). However, the direction of change in the age pattern of women's firearm suicides was the same as for men - among women younger than 40 years the share declined and in the elderly it was increased. However, in such analysis it must be taken into account that it is a relatively small number of deaths, which can easily result in a relatively high fluctuation in terms of the age structure of female suicides by method.

Conclusion

In the time of the breakdown of former Yugoslavia and conflicts during the 1990s the number of suicides in Serbia was increasing, while in the transition period it was decreasing. The increase in suicides in the first subperiod (1990-2000), i.e., in the period of the war conflicts, can be connected to a certain extent to the greater availability of firearms, highly lethal suicide means. There was a multifold increase in the use of firearms in committed suicides, especially in young and young adult population. On the other side, positive changes in suicide rate recorded in two other subperiods do not imply that the societal and economic crisis had a negative effect on suicide mortality. According to sex, the number of male and female suicides changed in the same direction, but the decrease among women was greater, which increased the pre-existing differences. According to age, the age-specific suicide rates generally declined. Absolutely the greatest reduction in mortality rates by age is in the elderly. The relatively greatest decrease was recorded in the youngest age group (10-24 years), but it was limited only to the third subperiod (2007-2014). The most distinctive changes in the first subperiod were in the number of suicides of persons aged 20-29 and their share in the total number of deaths in the same age.

In comparison with other European countries, the great similarity of the dynamics of the number of suicides in Serbia and the direction of changes in observed period is noticed with other transition countries. However, the increase in the suicide rate in Serbia in the subperiod 1990-2000 and its subsequent decrease was less intensive.

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