

**SUICIDE RATE IN BOSNIA & HERZEGOVINA WITH SPECIAL REVIEW ON  
FEDERATION OF BOSNIA AND HERZEGOVINA – COMPARATIVE ANALYSIS**

**Original scientific paper**

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**Summary**

In this paper, the authors observe the trend of suicide rate in Bosnia and Herzegovina. Bosnia and Herzegovina is the country with complex internal structure, multinational and multi-religious population, and it is also one of the states formed out of the bloody disintegration of former Yugoslavia, which passed the horror of war demolitions and population suffering. Furthermore, it is one of the poorest European states as well. Given such conditions, it is reasonable to expect bigger suicide rate. The movement of this rate in five-year period, 2007-2011, is given in this paper. Suicide data are collected through questionnaires of police agencies in Federation of Bosnia and Herzegovina, Republic of Srpska and Brčko District while population data are collected from statistical yearbooks of statistics agencies in Bosnia and Herzegovina. Methods of content analysis, comparative method as well as other relevant statistical methods are used for treatment of collected data. Obtained results represent an objective view of situation in the five-year period. Also, this paper is an integral part of the research initiated in the framework of project "Suicides in Bosnia and Herzegovina" which should be provided by the end of 2013, that the suppositions for its completion are realized.

**Keywords**

Analysis, suicide, death, rate

## 1. INTRODUCTION

Death is frequently known as the only certain reality or fact. It is about irretrievable end of life. Because of this fact, death instills fear in human being afflicting intimidation. The questions: What is death? Is there any form of life after death? Are as old as the humankind? Much has been and it will be written about death and its causes. All of this, made scientists and theologians explain death from their point of view.

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There are great disturbances when the public finds out about a violent death. The public with good reason expects resolving the violent death, finding the executor and justly sanctioning. Meanwhile, criminal death is not the only thing that disturbs the public. One of the big taboos is suicide<sup>3</sup>. What is it that makes a person take their own life?

In Phaedo, Plato stands against suicide. According to him, suicide is not allowed because humans are God's property (Plato, 1970). It is not allowed for a human being to take their own life before God finds it necessary. Plato judged suicide and he named it a disgraceful act, pleading for interring suicide executors into unnamed graves. Aristotle (1970) was also against suicide, considering that the act of suicide is against rules of life. It is the crime against state as from the religious point of view, suicide is "poisoning city", making the city economically weaker, destroying city economically, which produced it into the act of social irresponsibility. On the other hand, Seneca claimed that suicide has its justification and that it is a legitimate act, and that is able to contribute to ending horrible sufferings, especially if they are linked to getting old or losing social status a person had and which brought them satisfaction (Nikić, M. 1995; 193).

Ancient Romans idealized and dignified suicide. Suicide possibility becomes one of the optimal consolations when all other potentials of ideological and psychological defences were drained (Damjanović, A. 2005). The Stoics, on the other hand, consider suicide act as one of the greatest expressions of freedom.

For Schneidman, suicide is solitary and desperate solution for suffering which for one person looks like a situation with no alternative (Shneidman, 1996). Suicide etiology is the problem to observe and study, and it has been the topic for explanations for centuries. The sciences that are mostly represented in the attempt to explain suicide motives, phenomenon and states which are suitable for suicides are psychology and sociology, biology and criminology. Renowned French sociologist Emil Durkheim is the first to have a serious approach to the problem of suicide in his anomie theory where he blames anomie as the cause of suicide– the state of an individual reflected as the difference between their wishes and needs, and possibilities for their accomplishment (Durkheim, E. 1997). Later, the theory was further elaborated by American sociologist Robert Merton. Anyhow, none of psychological, sociological, biological or criminological suicide theories describe suicide completely for itself. The human being is bio–psycho–sociological being, and it is understandable than one theory can enlighten only one side, so it is logical that suicide must be considered multidisciplinary.

The suicide falls under the autodestruct form of behaving, more or less aware. Nevertheless, human being is the only being able to take its life consciously. Suicide is

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<sup>3</sup> Latin *suicidium*, from *sui caedere*, "to kill oneself".

one of the rare phenomena completely liberated from cultural, valuable, temporal and age limits (Psychological Counselling Office for Youth, 2012).

Theological prohibition of suicide derives from prohibition of possessing one's own life, which is based on theological attitudes that life is "God's gift, God's will, God gives life, and take life, because decision about life and death belongs only to God". Suicide stands against the instinct of subsistence and against love for yourself. In the period of early Christianity, suicide was not condemned, and some Christians committed suicide as martyrs because they believed in transience of earth life and bliss of heaven after death. The Christians suicide attitude starts to change as of Middle Ages when Augustine of Hippo condemned suicide after which, suicides are excommunicated out of the Church, and their burying on sanctified places becomes prohibited. Final condemnation of suicide by the church, which also became a part of the Canon law, happened in 1148, in Council of Nimes, based on which it is treated as criminal act in criminal law of different countries. Such state remained for a long time, especially in Western Europe. Total property subtraction of suicides is legalized, without any reparation or compensation in family benefit. With such solutions, Church led to burying suicides in isolated places, without religious ceremony. In the daybreak of the revolution in France, the conviction of suicides was abolished, their property was not subtracted any longer, and they had the right to be buried as other dead (Šakić, M. 2011). On the other hand, in Great Britain, suicide has been considered illegal act since 1961 (Suicide Act), and in some USA states, suicide is still considered as illegal act (Nikić, M. 1995). What still stayed in the domain of punishing is agitating and helping in suicide execution (Šakić, M. 2011). On the other hand, Islam says "who performs the suicide with some object in this world; with the same object he will be tortured at the Judgment Day". Suicide is a sin according to Quran, Sunnah and IDZAMU of scholars, and it is considered as the greatest sin after shirk to Allah, regardless of the reasons, be it despair, loss of fate, keeping of honour, etc. The Excellence says: "Don't kill yourself; Allah is indeed merciful to you. To one who do it unjustly and by force, we will throw in fire, that's easy for Allah" (En – Nisa', 29 – 30), and it says: "And don't throw yourself into the destruction" (El – Bekare, 195) (Mujkić, L. 2012).

Statistically, suicides are expressed by suicide rate on 100,000 inhabitants.<sup>4</sup> It is about relative index of observed phenomenon, as the result of coefficient of absolute indexes. Absolute indexes are unreliable. Those are raw data collected from statistical bulletins or law enforcement agencies which conduct criminal procedures and verify death cause. Mortality is expressed with rate as consequence of suicide in 100,000 inhabitants. Number of execute suicide on 100,000 inhabitants is positive index of inhabitants mortality, and it is especially important for comparing with different causes of mortality. This index pays attention to suicide significance in one

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<sup>4</sup> In further text, the rate will imply 100,000 inhabitants as it is standardized in research work of suicide researching.

population area. With this criterion it is possible to compare different spaces and populations.

There are testimonies about the suicide as a great problem in the data of World Health Organization (WHO). The organization's reports show that approximately every 40 seconds in the world one person commits and more than 20 persons try suicide (WHO, 2009). At the beginning of the 21<sup>st</sup> century, about 1 million persons die of consequences of suicide, the rate of which is 16 on 100,000 inhabitants or one suicide in every 40 seconds. In the last 45 years, suicide rate in the world is rising by 60%. In some countries, suicide is the one of three leading causes of death in population between 15 and 44 years and second cause of death in population between 10 and 24 years. This data doesn't include attempts for which it is estimated that they are 20 times more frequent than the suicide act (WHO, 2012). The estimates are such to show that suicide is more frequent and that it is in increase in transitioning states of ex-socialist block. Mental disorders are the most frequent factors of risk in Europe and North America compared to Asian population where the leading factor is impulsiveness. Related to Bosnia and Herzegovina, World Health Organization has data from 1991. From those data, it is possible to conclude that suicide rate in this period is considerably higher for men than for women, in relation 3-4:1 (WHO, SUPRE, 2012).

Bosnia and Herzegovina is the country with great political changes, great social problems, deep classifications, county of poverty, country of young democracy (precisely autocracy or partitocracy), or as it is understood at international level the "country in transition".

Criminal justice and criminological significance in researching suicide phenomenon lies in the cause of death in itself and its delimiting from the other forms of death: natural death, unfortunate case or murder. It is necessary that every suicide is completely resolved what would eliminate any suspicion of other character of death. In referring to previous assertion, many facts should refer in contribution to suicide which with no doubt proof that suicide is in the middle, and not any other form of death. As so, there is no alternative to suspecting in any other form of death, especially murder. Facts that can indicate suicide are goodbye-letter or note, all windows and doors closed from the inside, pillow under the head of dead body in front of the opened source of gas, space isolated from the presence of other people, etc. Verifying suicide and its distinction from the unfortunate case of murder is done, by a rule, through combination of expertise and applying operative and evidentiary actions. One of the basic tasks is collection of as more information as possible about all circumstances of the case and possessing the best heteroanamnestic data as they can be, and if it is possible medical documentation as well (Kapamadžija, B. et. al. 1990).

Yet, the aim of this paper is not to search for suicide causes in Bosnia and Herzegovina. Its aim is to scientifically describe and explain suicide rate trend in 2007-2011

period at the level of Federation of Bosnia and Herzegovina, and to try to get scientific conclusions and comparisons, as well as some regularities. In this paper, statistical methods are applied in treatment of official data from Federation of Bosnia and Herzegovina Office of Statistics, Ministry of Interior of Federation of Bosnia and Herzegovina and Republic of Srpska, Police of Brčko District and other agency reports (for example World Health Organization, etc.).

Scientific aims of presented paper are reflected in scientific description of executed suicides and in the dynamics of executed suicide rate in Bosnia and Herzegovina and Federation of Bosnia and Herzegovina.

So, the purpose of this paper is to show suicide rate in Bosnia and Herzegovina and Federation of Bosnia and Herzegovina and to accomplish rate comparison with other relevant indicators.

The main topic of this paper is the suicide rate in Bosnia and Herzegovina with special focus on the state in Federation of Bosnia and Herzegovina. It is necessary to verify suicide rate trends in the observed five-year period. It is about a very dynamic problem and the issue that is dependent on many factors and that must be observed in the view of increase or decrease in population numbers in the observed region.

Research problem can be determined in questions: "Is the suicide rate in Bosnia and Herzegovina high?" "Is the suicide rate constant or is it changing?" "Is the suicide rate increasing or decreasing in the five-year period?" "Which part of Bosnia and Herzegovina has the highest suicide rate?"

For better understanding, we have to emphasize the fact that Bosnia and Herzegovina is the country with very complicated administrative structure. Its structure includes Republic of Srpska as the first entity which has centralized organization, then Federation of Bosnia and Herzegovina, as the second entity with its decentralized structure (10 cantons), and Brčko District as the third part of Bosnia and Herzegovina.<sup>5</sup>

## 2. METHODS

The research is based on the data collected from ministries of interior of Republic of Srpska, Federation of Bosnia and Herzegovina (it's cantons), and Brčko District. Tables are delivered to all ministries of interior (in the form of protocol, questionnaire) in which they were asked to fulfil: (1) total number of suicides in canton (municipal-

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<sup>5</sup> In further text abbreviations are possible, where Bosnia and Herzegovina is referred to as BiH, Republic of Srpska is RS, Federation of Bosnia and Herzegovina is FBiH, and Brčko District is BDC

ity) for the period 2007=2011; (2) suicide data according to administrative municipality units for 2007-2011, (3) suicides according to the days of the week for 2007-2011, (4) time of committing suicide for 2007-2011, (5) days according to month for the period 2007-2011, independently for each year (5 tables), (6) suicides according to the age for the period 2007-2011, (7) means and methods of suicide for 2007-2011, (8) location of committing suicide for 2007-2011, (9) elements of psychological autopsy of suicide and motives for the period 2007-2011. Each table includes classification according to sex. This research is interested only to describe and provide an overview of suicide rates, and uses only table “(1)” data – total number of suicides in canton (municipality) for the period 2007-2011. Besides this method of collecting data, content analysis, method and method of classification are also used.

Comparative data at the level of entities of Bosnia and Herzegovina and the state of Bosnia and Herzegovina are taken from bulletins of the institutes of statistics.

Methods used for data treatment are statistical methods, methods of descriptive statistic for viewing data in the form of tables and graphs, and co variation analysis.

For data analysing, deductive method (method of deductive conclusion), inductive method, method of comparison, as well as method of classification are used.

To establish significance of the rate in this paper, we used chi-square test. For calculation we used the online calculator<sup>6</sup>.

Given that annual rate varies, we established the level of approximate rate change at the observed suicide rate in 100,000 inhabitants in the observed five-year period, as well its increasing or decreasing trend in the observed period of time. To be able to calculate approximate rate change, we applied chain index method.

In relation to the forms of deaths, which institutes of statistics follow as natural ones, violent and unfortunate correlation method is applied where Parson’s correlation quotient is used for establishing correlation between violent deaths and suicides. Also, linear regression method is used in relation to the observed phenomenon.

It is important to emphasize that in Bosnia and Herzegovina have not had the census since 1991, so population data are taken from bulletins of institutes of statistics in Bosnia and Herzegovina.

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<sup>6</sup> <http://www.testovi.info/hi-kvadrat-test-kalkulator.html> (30 December 2012)

This research represents an integral part of research titled “Suicides in Bosnia and Herzegovina”. In composition of this research, all suicides on Bosnia and Herzegovina territory will be treated in five -year period, from 2007 to 2011.

### 3. RESULTS

If we want to reach the suicide rate, we need to establish the number of inhabitants in the region we study. Census in Bosnia and Herzegovina has not been executed since 1991, so we take our orientation as regards the state of population based on the official data of living residential population that is treated by statistics institutions in Bosnia and Herzegovina<sup>7</sup>. On the estimation bases of statistics institutions, 3,765,271 inhabitants live in Bosnia and Herzegovina in the observed period. In Federation of Bosnia and Herzegovina, approximate number of inhabitants in the observed period was 2,308,989, which represents 61% of Bosnia and Herzegovina population. In Republic of Srpska, approximate number of inhabitants in the observed period was 1,382,308, which represents 37% of Bosnia and Herzegovina population, and demographic data related to Brčko District tells us that in the observed period 75,659 inhabitants lived there. On the basis of collected demographic data, it is possible to execute further analysis. Comparing countries with similar population as Bosnia and Herzegovina and their suicide rate, the situation is as follows: Norway with around 5 million inhabitants<sup>8</sup> and 11.9 rate, Ireland with around 4.5 million inhabitants<sup>9</sup> and 11.8 rate, Georgia with around 4.4 million inhabitants<sup>10</sup> and 4.3 rate, New Zealand with around 4.4 million inhabitants<sup>11</sup> and 13.2 rate. These are followed by Costa Rica with about 4.3 million inhabitants<sup>12</sup> and 6.1 rate, Croatia with around 4.2 million inhabitants<sup>13</sup> and 17.8 rate, Puerto Rico with around 3.7 million inhabitants<sup>14</sup> and 7.3 rate, Kuwait with around 3.5 million inhabitants<sup>15</sup> and 1.6 rate, Moldova with 3.2 million inhabitants<sup>16</sup> and 17.4 rate, Panama with around 3.4 million inhabitants<sup>17</sup>

<sup>7</sup> Statistical bulletins of Federation of Bosnia and Herzegovina, Republic of Srpska Institute of Statistics, Bosnia and Herzegovina Agency for Statistics, see the list of literature no. 12 throughout 20

<sup>8</sup> Statistics Norway, statistisk sentralburå, POPULATION [http://www.ssb.no/befolkning\\_en/](http://www.ssb.no/befolkning_en/)

<sup>9</sup> Central Statistic Office, Press Release This is Ireland – Highlights from Census 2011 <http://www.cso.ie/en/newsandevents/pressreleases/2012pressreleases/pressreleasethisisireland-highlightsfromcensus2011part1/>

<sup>10</sup> National Statistics Office of Georgia [http://www.geostat.ge/index.php?action=page&p\\_id=152&lang=eng](http://www.geostat.ge/index.php?action=page&p_id=152&lang=eng)

<sup>11</sup> Statistics New Zealand, Estimated resident population of New Zealand [http://www.stats.govt.nz/tools\\_and\\_services/tools/population\\_clock.aspx](http://www.stats.govt.nz/tools_and_services/tools/population_clock.aspx)

<sup>12</sup> INEC requiere contratar persona. <http://www.inec.go.cr/Web/Home/Noticia.aspx?id=1>

<sup>13</sup> Census for 2011. Republic Croatia Institute for Statistics [http://www.dzs.hr/Hrv/censuses/census2011/results/htm/H01\\_01\\_02/h01\\_01\\_02\\_RH.html](http://www.dzs.hr/Hrv/censuses/census2011/results/htm/H01_01_02/h01_01_02_RH.html)

<sup>14</sup> Annual Estimates of Resident Population for Municipios of Puerto Rico: April 1, 2010 to July 1, 2011 <http://www.census.gov/popest/data/municipios/totals/2011/tables/PRM-EST2011-01.xls>

<sup>15</sup> Kuwait, City population <http://www.citypopulation.de/Kuwait.html>

<sup>16</sup> Biroul National de Statistica al Republicii Moldova. <http://www.statistica.md/category.php?l=ro&idc=103&>

<sup>17</sup> Censos nacionales 2010, Resultados finales básicos <http://estadisticas.contraloria.gob.pa/Resultados2010/cuadros.aspx>

and 5.5 rate, Mauritania with around 3.3 million inhabitants<sup>18</sup> and 6.8 rate, and ending with Uruguay with about 3.2 million inhabitants<sup>19</sup> and 15.9 rate and Armenia with about 3.2 million inhabitants<sup>20</sup> and 1.9 rate.<sup>21</sup>

Introduction in further analysis will require additional explanations. It is necessary to emphasize here that conclusions are based on the statistical (mathematic) data.

At the beginning of analysis, we will pay attention to the suicide rate in Bosnia and Herzegovina and its administrative units, entities. When we relativize absolute data about suicides, we express them in rates as per 100.000 inhabitants, shown in Table 1.

Table 1 Suicide rate in Bosnia and Herzegovina as per 100,000 inhabitants for the period 2007 – 2011<sup>22</sup>

Year	BiH Sum	BiH rate on 100 000	FBiH Sum	FBiH rate on 100 000	RS Sum	RS rate on 100 000	BDC Sum	BDC rate on 100 000
2007	505	14.6	213	9.7	281	24.1	11	14.5
2008	471	12.3	206	9.2	252	17.5	13	17.2
2009	493	12.8	213	11.1	258	17.9	22	29.1
2010	482	12.5	238	11.9	230	16.0	14	18.5
2011	491	12.8	196	9.4	282	19.7	13	17.2
	2442	11	1066	10.5	1303	19.0	73	19.3

$X^2 = 3,649$  with 2 degrees of freedom and p –value 0.161

<sup>18</sup> Republique Islamique de Mauritanie, <http://www.ons.mr/doc/publication/Projectionpopulation.pdf>

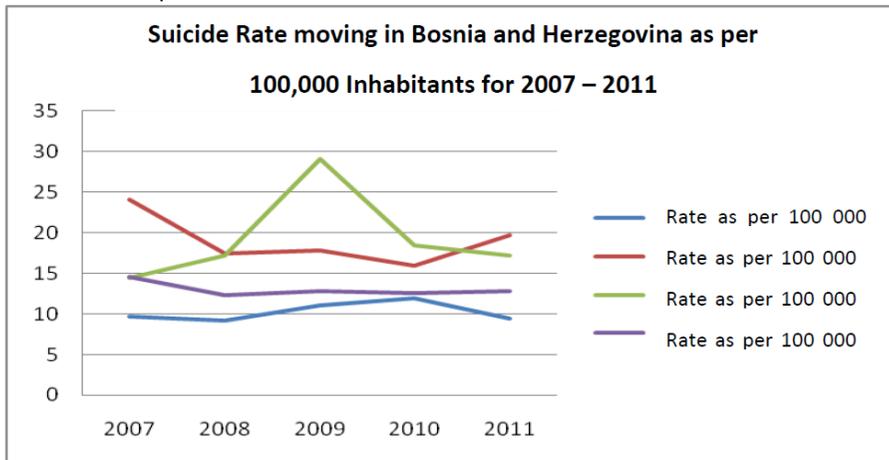
<sup>19</sup> Censos 2011, contame que te cuento, <http://www.ine.gub.uy/censos2011/index.html>

<sup>20</sup> National Statistical Service of the Republic of Armenia.,<http://www.arm-stat.am/en/?nid=126&id=11001>.

<sup>21</sup> All suicide rate data are taken from WHO suicide rates per 100,000 by country, year and sex (Table). [http://www.who.int/mental\\_health/prevention/suicide\\_rates/en/](http://www.who.int/mental_health/prevention/suicide_rates/en/)

<sup>22</sup> We have to emphasize that data pointed out to us from entity and cantonal police administration of Ministries of Internal Affairs retreat from data that we found in official statistic bulletins of entity statistics institutions. In our paper, we used suicide data from the entity and cantonal police administration of Ministries of Internal Affairs.

Graph 1 Suicide rate in Bosnia and Herzegovina on 100 000 inhabitants for the period 2007 – 2011



In the observed period in Bosnia and Herzegovina, 2442 suicides were committed in total, with rate 11 as per 100,000 inhabitants. Such rate categorizes Bosnia and Herzegovina in countries with low medium suicide rate. As it is shown in Table 2 and in Graph 1, it is possible to see that suicide rate slowly decreases in 2011 relative to 2007. If we exclude 2011, where increased number of suicides was noted after a decreasing trend, suicide rate is still under 14.6 as it was in 2007. Observing Bosnia and Herzegovina's entities, we can see that suicide rate is considerably lower in Federation of Bosnia and Herzegovina than in Republic of Srpska and Brčko District. In the observed five-year period, approximate rate in Federation of Bosnia and Herzegovina is at the lower limit of middle rate is 10.5. Meanwhile, observing Republic of Srpska and Brčko District, we can see that in these administrative units middle-high suicide rate is observed from 19 in Republic of Srpska to 19.3 in Brčko District. Further analysis of demonstrated data from Table 1 and observing Graph 1, we noticed that in 2007 Republic of Srpska had a high suicide rate, while in following three years the trend was slowly decreasing, after which suicide rate again started to increase. In Brčko District suicide rate in the observed period is quite variable, where 2009 stands out with its abrupt jump to 29.1 rate, and it threatened to overgrow the critical suicide rate<sup>23</sup>. After that, abrupt decrease of suicide rate is noted in Brčko District as well with amounts of high middle value. So, on the basis of the above said, we can confirm that suicide rate in Bosnia and Herzegovina is not low. Also, we can confirm that suicide rate in Republic of Srpska and Brčko District is higher than in Federation of Bosnia and Herzegovina. Yet, observing the results of  $\chi^2$  test, where we get that  $\chi^2 = 3,649$  with 2 degree of freedom, so it has bigger value than degree of freedom, we cannot confirm that there is an important difference in suicide rate between Federation of Bosnia and Herzegovina on one side, and Republic of Srpska and

<sup>23</sup> Critical suicide rate is 30 and more suicides on 100,000 inhabitants

Brčko District on the other. If we see that global suicide rate in the world is 16<sup>24</sup> in men's benefit oscillating in proportion 3 – 4:1 (Jugović, L. A. 2011), we can see that in the observed five-year period, Bosnia and Herzegovina with its middle rate of 12.7 is the country of world's average. Therefore, suicide rate in Bosnia and Herzegovina goes lower than the suicide rate, for example, in Serbia which has approximate suicide rate around 18.8, which is higher than the world's average, and in 2005, this rate was 19.4, but at that time the state included Montenegro (WHO, suicide rates by gender, Serbia 1998 – 2009). In Europe (and in the world), the highest suicide rate is in Lithuania with 31.9 (WHO, 2011). As regards countries of former Yugoslavia, Bosnia and Herzegovina is preceded by Slovenia with rate of 21.9 (WHO, Suicides Rates by Gender, Slovenia 1985 – 2009), and Croatia with rate of 17.8 (WHO, Suicide by Gender, Croatia 1985 – 2009). Meanwhile, FYR Macedonia is significantly below Bosnia and Herzegovina with rate of 8.0 (WHO, 2011). Although it does not belong to the countries of former Yugoslavia, it is interesting to mention that, for example, Albania has very low suicide rate of just 4.0 (WHO, 2011), and the lowest rate in Europe is in Malta with 3.4, and Greece with 3.5 (WHO, 2011). Data for Montenegro still do not exist. Countries without any recorded suicide in WHO statistics are Honduras, St. Kitts and Nevis, Antigua and Barbuda, and Haiti. It is also interesting that Egypt has suicide rate of 0.1 with its 90 million populations. Non-European country with the highest suicide rate is North Korea with 31.2 (WHO, 2011).

According to the suicide rate, New Zealand (13.2), Czech Republic (12.8), Sweden, Cuba and Bulgaria (12.3), Romania and USA (12) could be categorized in the same group as Bosnia and Herzegovina.

### **3.1. Results for Federation of Bosnia and Herzegovina**

Considering Federation of Bosnia and Herzegovina, where we observed the phenomenon, the data is presented in Table 2 and Graph 2.

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<sup>24</sup> Suicide frequency in population is measured by suicide rate, which is number of suicides against 100,000 inhabitants. As Kapamadžija et. al. (1990) asserting, in nominated classification at IASP congress in Jerusalem in 1973, following classification of rates is established: suicide rate from 0.1 to 10 is low; from 10.1 to 20 is middle; over 20 is high; and over 30.1 is critically high suicide rate.

Table 2 Suicide rate in Federation of Bosnia and Herzegovina for 2007 – 2011

CANTON	2007		2008		2009		2010		2011	
	N	rate								
TK	54	10.9	53	10.6	74	14.8	62	12.4	52	10.4
ZE-DO	38	9.5	42	10.5	20	5	33	8.2	33	8.3
KS	34	8.1	26	6.2	19	4.5	29	6.6	19	4.3
USK	21	7.3	19	6.6	19	6.6	27	9.4	21	7.3
BPK	3	8.9	4	12.0	4	12.1	6	18.2	5	15.2
SBK	22	8.6	18	7.0	23	9.0	23	9.0	21	8.3
HNK	20	8.8	27	11.9	24	10.7	28	12.4	25	11.1
PK	8	19.4	5	12.3	9	22.6	4	10.1	3	7.6
K10	9	11.0	6	7.4	12	14.9	14	17.4	8	10.0
ZHK	4	4.9	6	7.3	9	11.0	12	14.7	9	11.1
<b>TOTAL:</b>	213	9.7	206	9.2	213	11.1	238	11.9	196	9.4

Table 3 Approximate suicide rate in Federation of Bosnia and Herzegovina for 2007 – 2011

CANTON	N	RATE	RANG
TK	295	11.8	4
ZE-DO	166	8.3	8
KS	127	5.9	10
USK	107	7.4	9
BPK	22	13.3	2
SBK	107	11.0	5
HNK	124	11.0	5
PK	29	14.4	1
K10	49	12.1	3
ZHK	40	9.8	7
<b>TOTAL:</b>	1066	10.5	

Graph 2 Review of suicide rate in Federation of Bosnia and Herzegovina for 2007 – 2011

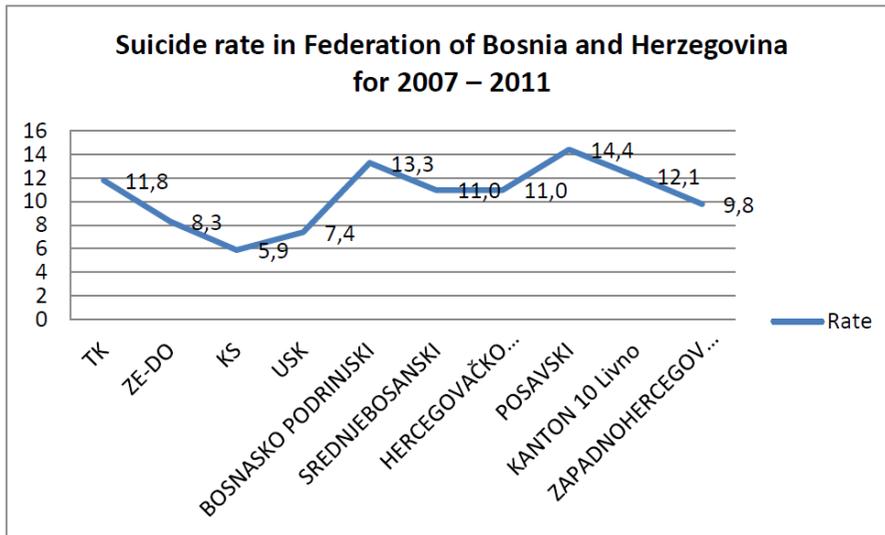


Table 4 Suicide rate in Federation of Bosnia and Herzegovina in 2007 – 2011

Year	Rate
2007	9.7
2008	9.2
2009	11.1
2010	11.9
2011	9.4
Average:	10.5

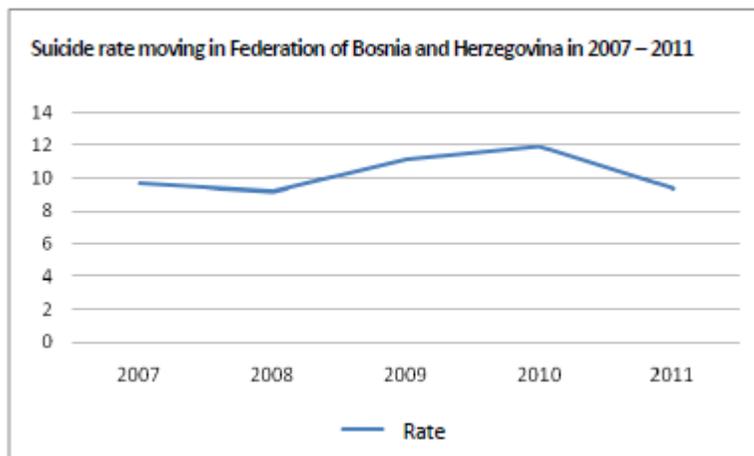
$\chi^2 = 0.591$  up with 4 degrees of freedom and p value 0.964 up with supposed rate frequency 10

Average rate of change at annual level is -0.782.

Considering that in this case,  $\chi^2$  is smaller than the number of degrees of freedom, we can see that there are no significant differences in suicide rate trends in Federation of Bosnia and Herzegovina in the observed period. To be able to establish suicide approximate rate of change in Federation of Bosnia and Herzegovina, we used calculating method of approximate rate over the chain indexes. The result is that the approximate rate of change annually is 0.782, which further means that in the observed period from 2007 to 2011, the approximate suicide rate in Federation of Bosnia and Herzegovina is approximately decreasing by 0.8%. Observing Table 2, which

shows suicide rates in Bosnia and Herzegovina and its administrative units, and applying the rate calculation method over the chain indexes, we can see the following: generally, at the level of Bosnia and Herzegovina, approximate change rate is -3.24, in Republic of Srpska it brings -4.91, and in Brčko District 4.36. What does this mean? It means that the approximate suicide rate at Bosnia and Herzegovina level in the observed period was decreasing by 3.2% at annual level, in Republic of Srpska by 4.9%, while in Brčko District is increasing by 4.4%. With this result, we can conclude that the suicide rate in Bosnia and Herzegovina in the observed period is decreasing by 3.2%.

Graph 3 Suicide rate moving in Federation of Bosnia and Herzegovina in 2007 – 2011



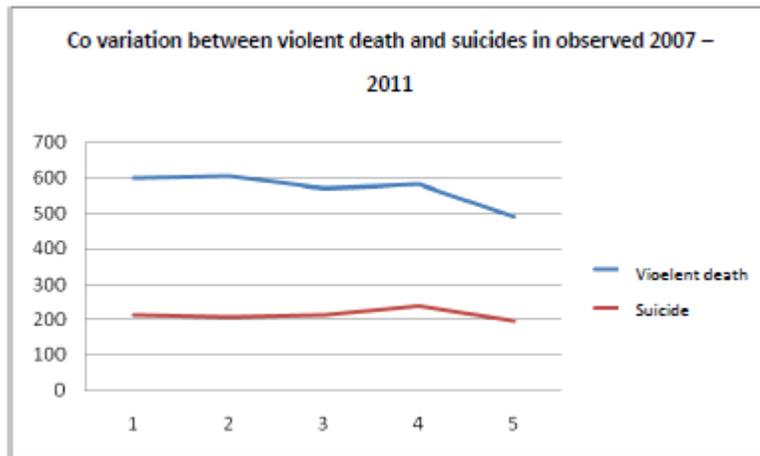
At the basis of the account from Table 2 and Graph 2, it is possible to see that in the period between 2007 and 2011 in Canton Tuzla, The approximate suicide rate was 11.8, which represents our highest rate in observed cantons of Federation of Bosnia and Herzegovina. On the other hand, Canton Sarajevo has the lowest approximate rate in the observed period which was 5.9. By performing parallel observing of obtained data presented in Table 1, and visually shown through Graph 2, data from 2009 are especially expressed. Namely, in the mentioned year, we have two big deflections where at the same time, Canton Tuzla notes its highest rate, and at the same time the highest rate in observed sample. By that time, Zenica – Doboje Canton notes its lowest rate which was 5, and Canton Sarajevo notes even lower rate in the observed sample which was 4.5. Otherwise, in 2011, Canton Sarajevo noted the lowest suicide rate in the observed sample from 4.5. In summary, the number of suicides in this four cantons total to 695, with approximate rate of 8.3. By further calculation of approximate change of rate, we get some interesting data. Total number of suicides in the area of Canton Tuzla in the observed period is increasing by 0.9%, which is almost insignificant or neglected. Total number of suicides in the area of Zenica – Doboje Canton in the observed period was decreasing by 3.5, which is to a certain

degree significant, in other words higher and better comparing to Canton Tuzla. Total number of suicides in Canton Sarajevo gives a bit weird and unexpected decreases amplitude of 13.5, which is also significant. Total number of suicides in Una – Sana Canton in the observed period stagnated. Meanwhile, it is important for us to go back to the fact about suicide decrease in Canton Sarajevo where significant fall of 13.5% is noted, taking as a fact that Sarajevo is the biggest and populous city (not canton) of Bosnia and Herzegovina and it has the great number of administrative and financial flows. It is to be expected that large number of suicides happens here, in reference to somewhere else. Anyway, although Canton Tuzla leads in that by 6 suicides on 100,000 inhabitants, in other words, suicides at the observed level, suicide sum in Canton Sarajevo is not to be neglected. Furthermore, even when it comes to the significant decrease of suicides in Canton Sarajevo, at the level of Bosnia and Herzegovina suicide rate increased to approximate 1.2%, and at the level of Federation of Bosnia and Herzegovina, the number of suicides increased approximately increased by 2.6%. For the sake of comparison, the research provided in 1996 by M Miković (1999, 19), established that suicide rate in post-war Sarajevo was 16.1, and according to data presented by S. Loga (1999), in 1997 suicide rate was 15.7 which in the post-war period classified Canton Sarajevo as region with middle suicide rate. According to our research, it is possible to conclude that suicide rate in Canton Sarajevo is in decrease relative to post-war period.

In the observed period, we identified the number of deaths in manner of natural death, violent death and suicide, which is presented in Table 5. Table 5 Types of death in Federation of Bosnia and Herzegovina

<b>Year</b>	<b>Natural death</b>	<b>Violent death</b>	<b>Suicide</b>
2007	19428	598	213
2008	19480	605	206
2009	20022	570	213
2010	20482	583	238
2011	19298	491	196

Graph 4 Covariation between violent death and suicides in the observed 2007 – 2011 period



In the year 2007, in all four cantons, 19428 natural death cases happened, 598 violent deaths and 213 suicides. In the year 2008, number of natural deaths increased to 19480, as well as number of violent deaths to 605, but number of suicide decreased to 206. In the year 2009, number of natural deaths increased to 20022, meanwhile, the number of natural deaths decreased to 570, but number of suicides increased to 213. In the year 2010, natural deaths increased in numbers to 20482, followed by increase of violent deaths to 583 and increase of suicide to 238. In the year 2011, number of natural deaths decreased to 19298, follow by decrease of violent deaths to 491, and suicide increase to 212.

By applying Pearson's correlation quotient between total number of deaths and death caused by suicide, we get the data that correlation quotient is 0.5 which means positive correlation and relatively strong, which is shown in Graph 5. It further implies that increasing number of violent deaths impacts the increase of suicide number in Federation of Bosnia and Herzegovina. Also, using linear regression, we established that from the mathematic point of view, if the number of violent deaths would be 275, we could expect that number of suicide is 0. In that manner, if the number of violent deaths would increase by 1, we can expect increase of total number of violent deaths.

#### 4. DISCUSSION

Observing the results of research, we established that Bosnia and Herzegovina is in the circle of countries with middle suicide rate. Calculating the average rate of change in five-year period we establish the increasing suicide rate at Bosnia and Herzegovina level, as well as at the level of Federation of Bosnia and Herzegovina. It is possible to state that the increase of rate isn't distinctly significant, if we consider

that Bosnia and Herzegovina falls in the poorest countries of Europe, with low GDP. Meanwhile, if we consider the fact that it has bigger mortality over birth rate, increasing suicide rate at the level of BiH and FBiH could be considered as significant. As significance, we can say that our suicide rate is identical or similar to countries that have distinctly strong social policy and positive birth rate, as well as strong economic and law system, and stable political system. Therefore, we can sum up that suicide rate in such countries, according to significance, is not nearly significant to suicide rate in BiH and FBiH, which has no such characteristic.

Suicide researches for the territory of Bosnia and Herzegovina are rare. The one that we mentioned in this paper shows similar results to ours. Results of that research indicate the middle suicide rate in Bosnia and Herzegovina. Data by WHO are similar to our results. The only interesting difference is between data of Ministry of Interior and official suicide data in statistical bulletins. This can be significant for other researches, but difference between these two sources is not expected and it can be considered as significant surprise.

Perspectives for future researching are bright, especially if we conclude that suicide as phenomenon is completely marginalized in Bosnia and Herzegovina. Researching should be widened in direction of place and time of committing suicide, means and methods of committing suicides according to age, following days in week, and months in year, etc., and making connections between these variables and executing of characteristics, or making regularity will be significant. Especially significant is the research when we already said that suicide rate in Bosnia and Herzegovina is not small. Therefore, it is important to explore this phenomenon in order to prevent it or in order to impact it with the aim of reducing. Expectations that this research will show the middle rate of suicides are justified, and there is no bigger surprise here. Research gave us one really interesting result. That is the fact that decreasing suicide rate in Canton Sarajevo does not impact suicide decrease at the level of Bosnia and Herzegovina and Federation of Bosnia and Herzegovina. This is very interesting because Sarajevo is the most populous city, with the biggest flow of property and services, and it is the centre of the biggest number of social and state activities in Bosnia and Herzegovina. Future researches almost certainly will be directed in trying to establish regularity of suicides in Bosnia and Herzegovina. Rates, for themselves, are not significant finding (although they can be) but all this consists a suicide act, together with rates, and this is very important finding and this will also be a direction of future researches. Sex representation is also important, and will be included in future researches as well.

Presented data in part "Results" gave us bases for concluding. Middle suicide rate for BiH and FBiH is interesting, considering the state of complete implosion of values, general poorness and unemployment, as well as the great and personal suffers sustained during the war in BiH, huge number of inhabitants are in credit debts, as the whole country as well. Besides this, it is possible to say that difficult life and difficult economic conditions in BiH and FBiH are not the main suicide cause as was expected.

Resistance of people to such state is, most probably, generated by difficult life. Middle suicide rate is not expected for country with such unstable political and economic life, especially for a country created with the down-fall of Yugoslavia. This is bounded to the fact that suicides are more often in the countries of former Soviet Union created by its decomposition. However, regularities almost do not exist, if we consider low suicide rate in Egypt, Greece or Albania, and high in Russian Federation and other countries of Soviet Union or in North Korea. Also, those are perspectives of future researches – to find factors that impact suicide increase or decrease. Are there religious, cultural, personal, historical, economic, political or other values? Is it possible to find common denominator? Are those denominators rule or exception? Is it possible that suicide rates have regularity?

These questions, as well as many others, are a line of direction for future researches and it is very important to find answers to them. It is significant to explore the question whether it is possible to reduce suicide rate, or control it in general, with influence on one or more factors? How to control it if it is in connection with diseases or pathological illness? Causality is very important for future researches.

In relation to inadequate law solutions, with no institution for suicide prevention and control or declarative programs, and marginalizing the problem and other structural problems, Bosnia and Herzegovina and Federation of Bosnia and Herzegovina have significant suicide rate that is relatively low by official criteria.

## **5. CONCLUSION**

Bosnia and Herzegovina is among the countries with middle–low rate of suicides and it is possible to conclude that suicide rate in Bosnia and Herzegovina is not low. However, we can conclude that suicide rate in the observed five-year period is in decrease at the level of Federation of Bosnia and Herzegovina, and at the level of BiH.

In relation to administrative separation of entities and a district, we established that suicide rate in RS and BDBiH is remarkably higher than in Federation of Bosnia and Herzegovina. At the level of administrative separation of cantons in Federation of BiH, we can conclude that there is a significant difference in rate movement in the observed four cantons, especially in Canton Sarajevo.

Number of suicides in Federation of Bosnia and Herzegovina is in relatively strong correlation with violent deaths, which means that with decreasing the violent deaths number, number of suicides increases. It is very hard to bring these two phenomena in covariance. However, we can try to explain it as causality. Violent death is very negative and stressful occurrence. It can be a real tragedy for loss of loving ones. Some people just cannot move forward and forget the loss, they cannot release the pain, and they start to live with great suffer and stress. That is especially expressed in child lost. Over time, they become depressed, isolated and hopeless. Seeing that

nothing is going to chance and that they cannot back the lost, they decide to commit suicide.

Canton Sarajevo presents significant discovery with its approximate rate of 5.9. If we observe such data through socio-economic prism, we can assume that smaller number of suicides is committed in urban territories, maybe because of bigger chances for better life. Rural territories are completely forgotten, population is unemployed, production does not exist, and young people abandon villages. Therefore, chances to access social values are smaller. We cannot but not to mention that BiH social values are quite deranged. Meanwhile, approximate suicide rate at BiH level is in significant decrease which is shown in results, especially on the territory of Republic of Srpska (4.9 %) which has significant suicide rate. It is surprising fact that suicide rate in Brčko DC is increasing significantly by 4.4%. If we look at Brčko District, in relation to its territory and number of inhabitants, it has high budget and significant benefits in relation to other administrative units in BiH. In two most populous cantons in FBiH, approximate suicide rate is 8.3 and it has decreasing trend which tells us that relatively small number of suicide happens as per relatively huge number of inhabitants. That means that the problem of suicides is concentrated in other administrative units in BiH with lower number of inhabitants but with expressed suicide rate. We can conclude this to be data of concern because other administrative units have considerably less inhabitants.

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