

UPDATE OF SUICIDE TRENDS IN CROATIA 1966-2002

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SUMMARY

Objective: To analyze trend the suicide rates in Croatia during the pre-war period of socialistic Yugoslavia (1966-1990), war period in the former Yugoslavia (1991-1995) and the post-war period of Croatian independence and democratization (1996-2002).

Method: Using official suicide statistics, this study examined suicide rates in Croatia over a 36-year span (1966 to 2002) as a function of gender, age, marital status, time, war and social changes. Suicide rates were displayed graphically and compared with some neighbouring countries (Slovenia, SCG, Hungary and Italy).

Results: During the period of socialistic Yugoslavia, suicide rate in Croatia was constantly increasing with small variations. During the war time suicides with firearms were significantly increased. Since 1993 (the period of independence and democratization) there has been a trend of evident decrease in total suicide rate.

Conclusion: This study demonstrated that Croatia has still had high suicide rates with declining trend since 1993, probably related to democratization, more national, religious and cultural rights, better availability of SSRIs and systemic campaign for education of general practitioners for early recognition and treatment of depressive disorders.

Key words: suicide – trends - Croatia

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INTRODUCTION

There has been mounting professional and public concern about suicide in different parts of Europe. Suicide rates vary from country to country, from culture to culture and from time to time. According to the WHO, the highest suicide rates for both men and women are found in Europe, more particularly in Eastern Europe, in a group countries that share similar historical characteristics, such as the former USSR republics Estonia, Latvia, Lithuania and, to a lesser extent, Finland, Hungary and the Russian Federation (Schmidtke et al. 1999, Bertolote & Fleischmann

2002) as well as the former Yugoslav republics Slovenia and Croatia (Marušič 1999, Marušič et al. 2004, Sedić et al. 1998, Sedić et al 2003). The lowest rates have been reported in the Mediterranean Region which comprises mostly countries that follow Islamic traditions as well as Catholic (Italy, Spain) and orthodox Christian (Greece) traditions.

In recent years, studies on trends in suicide rates from a number of countries have been published (Allebeck et al. 1996, Zacharakis et al. 1998, Wasserman & Varnik 1998, Kalediene 1999, Cantor 2000, Guaiana et al. 2002, Snowdon

& Hunt 2002, Jianlin et al. 2001, Qin & Mortensen 2001, Levi et al 2003, McCrea 1996, De Leo et al. 1997). In several high suicide mortality European countries including Hungary, Germany, Denmark (Levi et al. 2003), substantial downward trends in suicide rates were reported, no major changes were observed in Slovenia (Marušić et al. 2004) and substantial rise in suicidal mortality was found in Russian Federation and Lithuania (Kalediene 1999, Levi et al. 2003).

The Republic of Croatia is small, but diverse European country having the Adriatic Sea, continental Highland and the Pannonian Plain under the same roof. It is a very interesting country for suicidology because of its relatively high rate of suicides as well as because of a specific geopolitical location, history and socio-demographic changes. Until recently, Croatian high rate of suicides was not in the focus of the world's attention because during the period of the socialist Yugoslavia it was hidden in the lower average Yugoslav rate. Croatia is located between Hungary and Slovenia on the north, a continental European country with a high suicide rate (46 in 1984, 35.2 in 1995), and Italy on the south-west, a Mediterranean country with a low suicide rate. Up to 1918, Croatia was under the rule of the Austrian-Hungarian Empire. During the period between the two World Wars, some parts of Mediterranean Croatia were under Italian rule, but the major part of Croatia came to constitute the first Yugoslavia together with other South Slavic countries under the Serbian king rule. After the Second World War in the communistic Yugoslavia, Croatia was the second largest of the six Yugoslav republics. After the first democratic election in the communistic Yugoslavia 1990, Croatia was attacked by the Yugoslav army and one third of its territory was occupied. In 1992 the Republic of Croatia won its independence after the war and since that time has been developing parliamentary democracy. The war ended in August of 1995, but Croatia was not fully reintegrated until 1998.

This paper outlines data-based information

from current official statistics regarding the levels and trends of suicide in Croatia from 1966 to 2002, with the analysis of age, sex, family status and methods of suicide.

SUBJECTS AND METHOD

All suicide cases recorded in Croatia during the period 1966-2002 were included in this study. Population data and crude data on suicides were obtained from the Register of Suicide and Mortality of the Croatian Bureau of Statistics. Four population censuses were performed during the period studied (1971, 1981, 1991 and 2001) and population data for the remaining years correspond to the official mid-year estimates of the CBS. The total population of Croatia was 4,430,000 in the 1971 census, 4,608,000 in the 1981 census, 4,513,000 in the 1991 census and 4,437,460 in the 2001 census.

In the socialistic Yugoslavia, statistical suicide data collection across republics began 1966. During the 1966-2002 period a total of 34,734 suicides were recorded in Croatia. Suicide rates across the gender, age and months were only available from 1972. The relationship between suicides and marital status was investigated from 1975. Suicide methods were available from 1983. Regional differences in suicide rates were calculated from 1993 according to the last permanent residence of the deceased in one of the official 21 counties.

Data on suicide rates for Slovenia were obtained by Lester (1998) and Marušić (personal communication), for Hungary by Zonda (1998), Rihmer et al. (1993, 2001a, 2001b), for Italy (Guaiana et al. 2002, De Leo et al. 1997, Barbui et al. 1999), for Serbia and Montenegro (SCG) by Nikolić and Dimitrijević (2002) and for the former Yugoslavia by Lester (1998).

Trends in suicides and average annual changes in suicidal mortality were based on quadratic regression analysis. The effects of age on suicide mortality were assessed for males and females. Suicide rates were classified by age groups: younger than 15, 15-24 years, 25-44

years, 45-64 years, and over 65 years.

CBS data on suicide methods were defined according to ICD-9, and include the following categories: 950-poisoning by solid or liquid substances; 951 and 952 – poisoning by gas; 953 – hanging; 954 – submersion; 955 – firearms and explosives; 956 – cutting and piercing instruments; 957 – jumping from high places; 958 – other non-specified method.

Statistic analyses were made using the SPSS software program.

RESULTS

During the 1972-2002 period a total of 30,365 suicides were recorded. There were 21,711 male suicides (71.5%) and 8,654 female suicides (28.5% of the total).

Figure 1 shows suicide rates in Croatia in

comparison to those in the former Yugoslav republics Slovenia and Serbia & Montenegro (SCG), as well as to those in Hungary and Italy. The suicide rates in the Republic of Croatia oscillated but evidently showed tendency of increase from 1966 to 1992 for 10.7 cases per 100 thousand inhabitants with peaks in 1987 (24.3) and 1991 (24.4) and 1992 (25.86). From 1993 to 2002 it shows oscillating but evident tendency of decrease. The suicide rate declined from 25.86 per 100 000 in 1992 to 19.88 in 2001, and 19.69 in 2002, a fall of 6.17 (23.9%).

Figure 2 shows suicide rates in the Continental and Mediterranean Croatia during 1993-2002 period. The suicide rates were lower in the Mediterranean than in the Continental Croatia, but the trend of suicide rate decrease was found in both parts of the country.

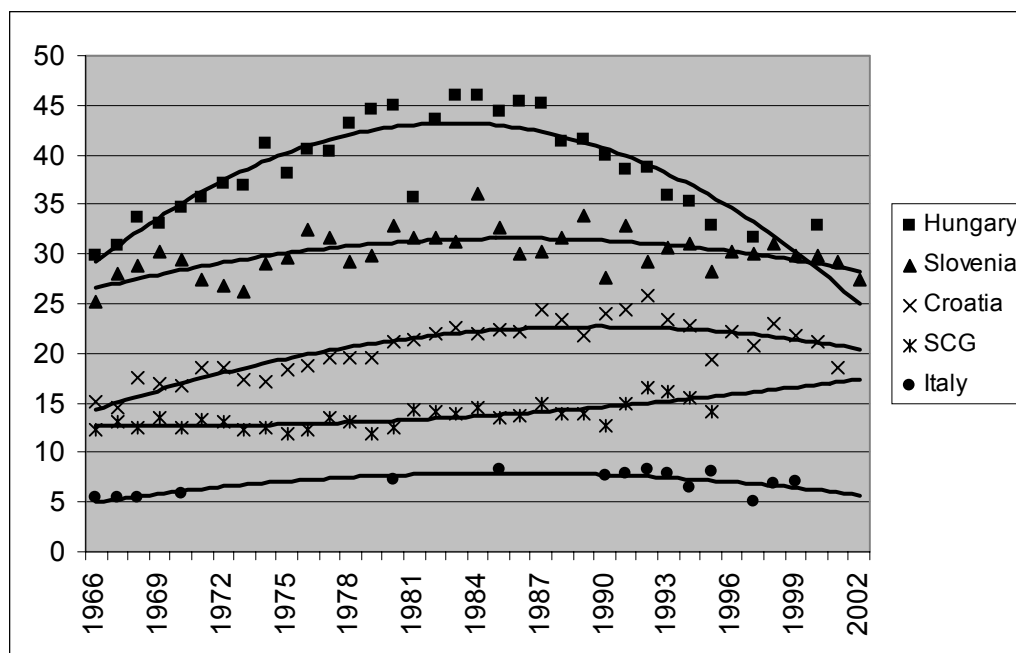


Figure 1. Suicide rates trends in Croatia in comparison with those in Serbia&Montenegro (SCG), Slovenia, Hungary and Italy

Figure 3 shows male and female annual suicide rates in the Republic of Croatia during the 1972-2002 period. Among male suicides the rate was highest (37.04) in 1992 during the war period and since that time decreased for nearly 5 cases

per 100 000 inhabitants in 2002. The highest rate among females was recorded in 1988 (14.03) during the period of the socialistic Yugoslavia and decreased for 4 cases per 100 000 inhabitants in 2002. Figure 4 shows an increasing male/female

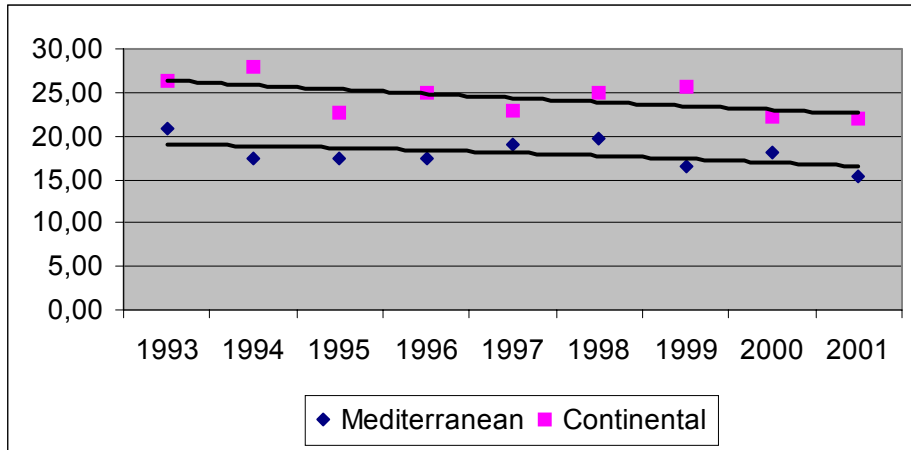
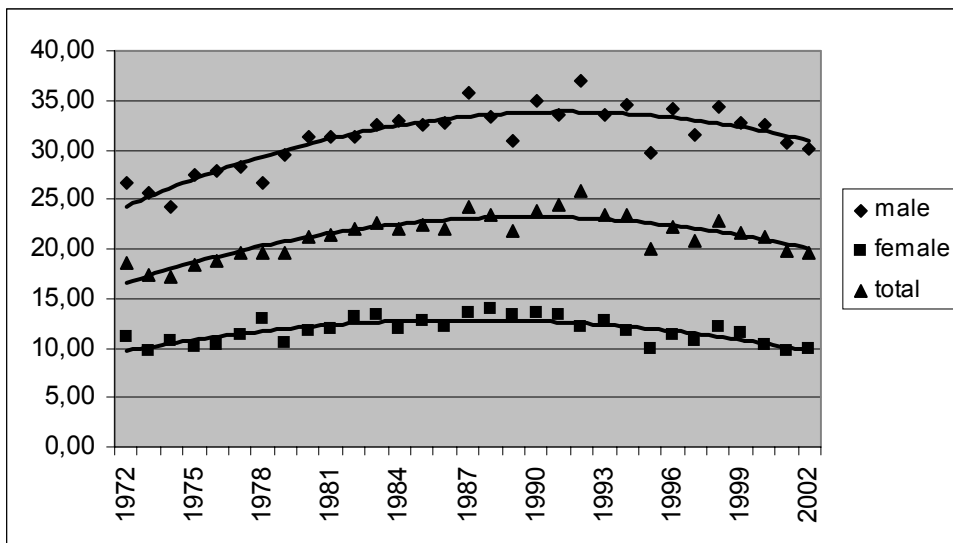


Figure 2. Suicide rates trends in Continental and Mediterranean parts of Croatia



Male: $Rsq=0,771$; $df=28$; $F=47,2$; $p<0,01$ $b=23,32$; Female: $Rsq=0,603$; $df=28$; $F=21,22$; $p<0,01$; $b=9,24$
 Total: $Rsq=0,760$; $df=28$; $F=44,22$; $p<0,01$; $b=15,78$

Figure 3. Male and female suicide rates in Croatia 1972-2002

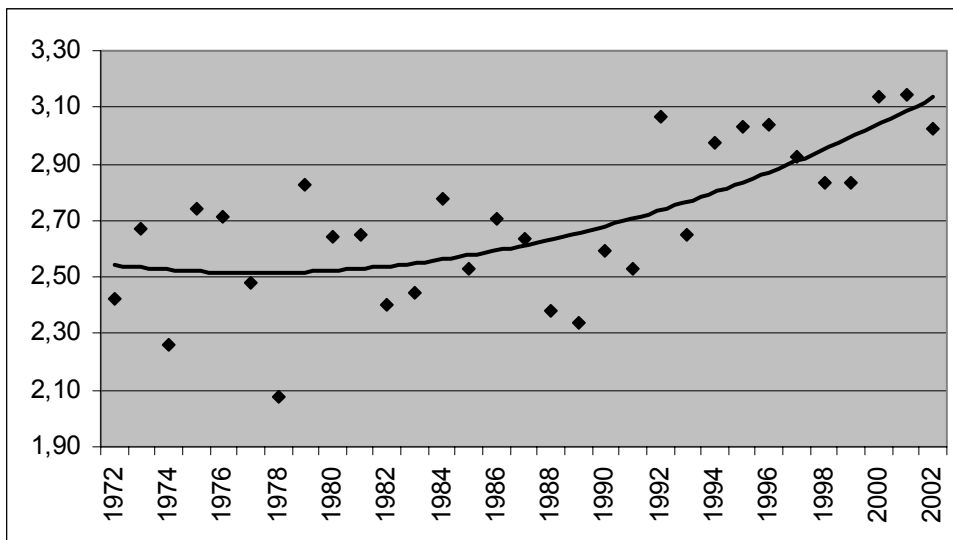
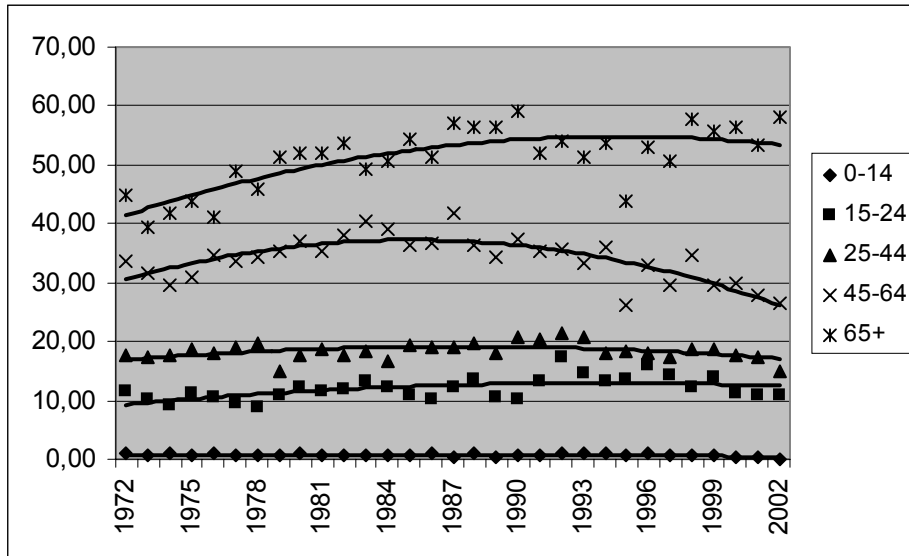
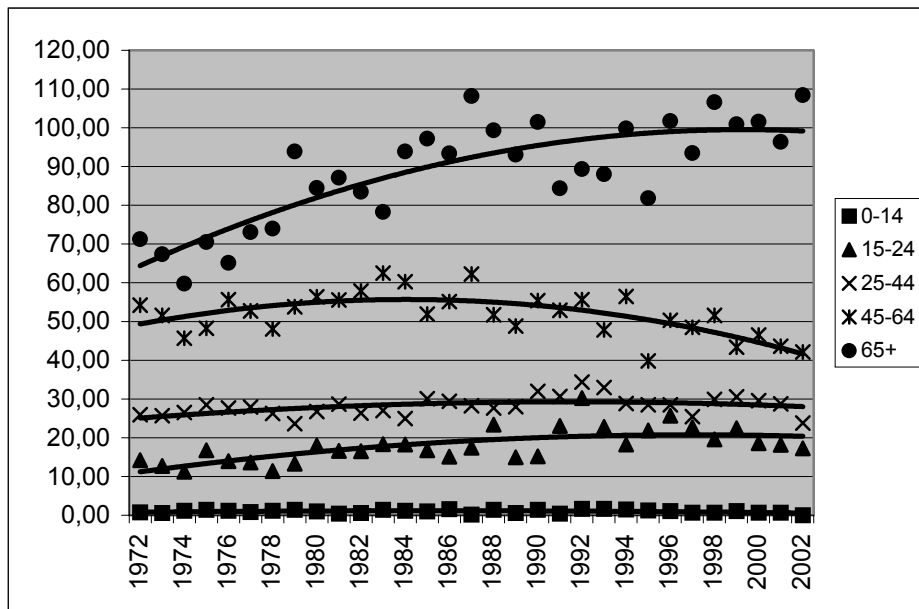


Figure 4. Male/female ratio of suicide rates in Croatia 1972-2002



Age 45-64: $Rsq=0,657$; $df=28$; $F=26,84$; $p<0,01$; $b=29,53$; Age 65+: $Rsq=0,596$; $df=28$; $F=20,63$; $p<0,01$; $b=40,28$

Figure 5. Age distribution of suicide rates in Croatia 1972-2002 (standardised rates per 100 000 inhabitants)



Age 65+: $Rsq=0,682$; $df=28$; $F=30,09$; $p<0,01$; $b=61,78$; Age 45-64: $Rsq=0,482$; $df=28$; $F=13,04$; $p<0,01$; $b=48,30$

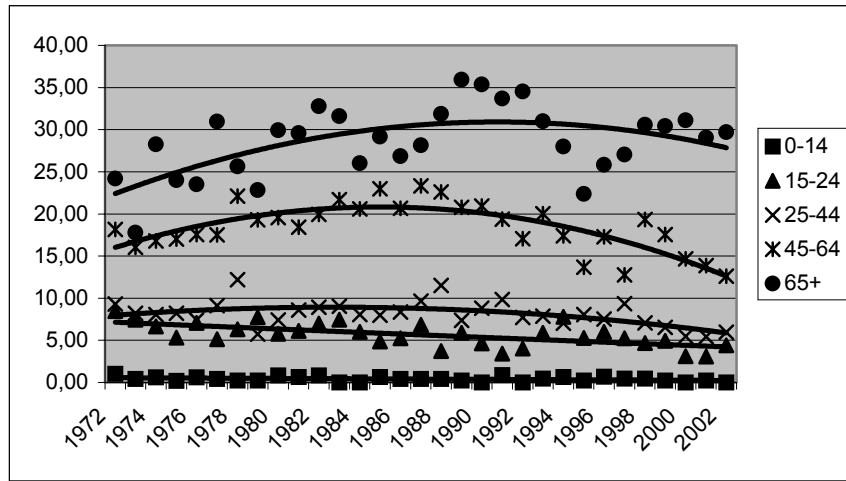
Figure 6. Age distribution of male suicide rates (standardised rates per 100,000 inhabitants)

ratio of suicide rates during the 1972-2002 period. The annual age-specific suicide rates distribution for the 1972-2002 period are shown in Fig. 5, 6 and 7. The male suicide rates were higher than the female suicide rates in all age groups. Figure 6 shows an increasing suicide trend among the males over 65 years. Age distribution of female suicide rates on Figure 7 shows decreasing trend of suicides in all age groups except the group below 15 years.

Figure 8 shows suicide rates according to

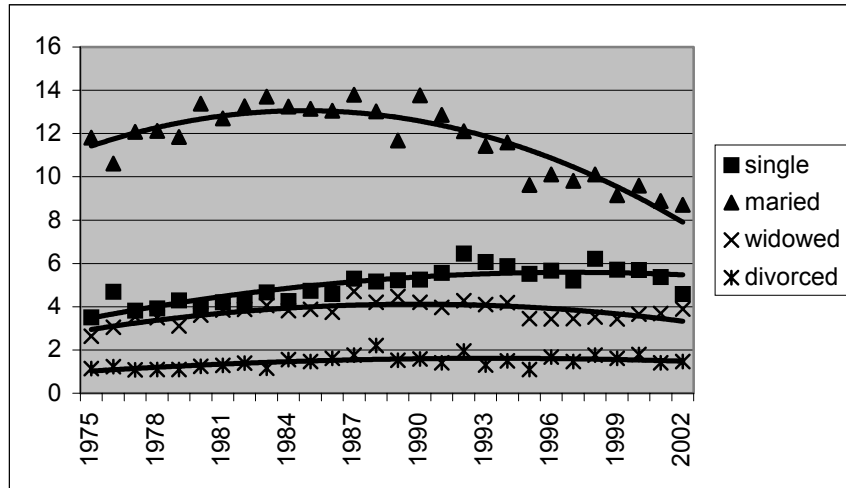
marital status for the 1972-2002 period. The most striking decrease of suicide rates was found in the category of married suicidants. An increasing suicide rate trend was observed among singles.

CBS data on suicide methods were shown on Figure 9. The most frequent methods were hanging and firearms. During 1983-2002 suicide by firearms significantly increased, especially during the war time, 1991-1996, for more than four times. Suicide by hanging shows a decreasing and suicide by jumping an increasing trend.



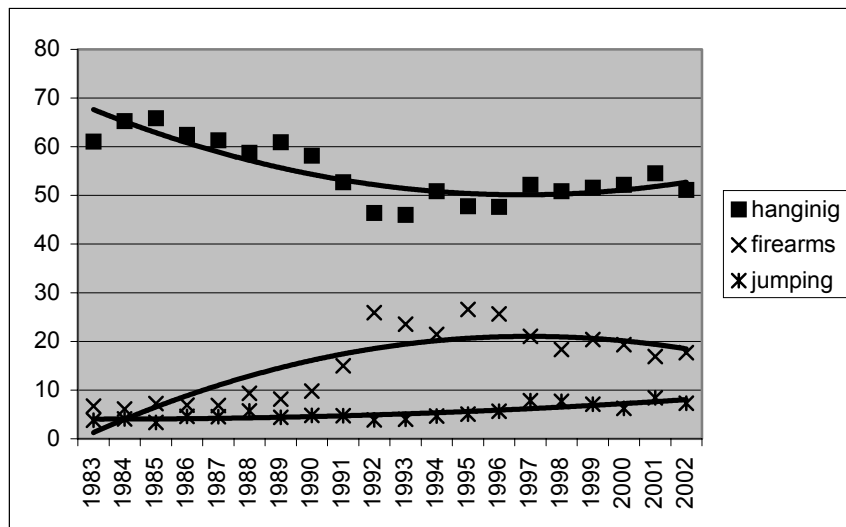
Age 45-64: $Rsq=0,619$; $df=28$; $F=22,76$; $p<0,01$; $b=15,25$

Figure 7. Age distribution of female suicide rates (standardised rates per 100 000 inhabitants)



Single: $Rsq=0,707$; $df=25$; $F=30,23$; $p<0,01$; $b=3,28$; Married: $Rsq=0,837$; $df=25$; $F=64,11$; $p<0,01$; $b=11,07$
 Widowed: $Rsq=0,570$; $df=25$; $F=16,55$; $p<0,01$; $b=2,7$

Figure 8. Marital status and trends of suicide rates (per 100,000 inhabitants)



Hanging: $Rsq=0,738$; $df=17$; $F=23,94$; $p<0,01$; $b=70,27$; Firearms: $Rsq=0,708$; $df=17$; $F=20,57$; $p<0,01$; $b=-1,65$
 Jumping: $Rsq=0,723$; $df=17$; $F=22,23$; $p<0,01$; $b=4,06$

Figure 9a. Distribution of suicides by method

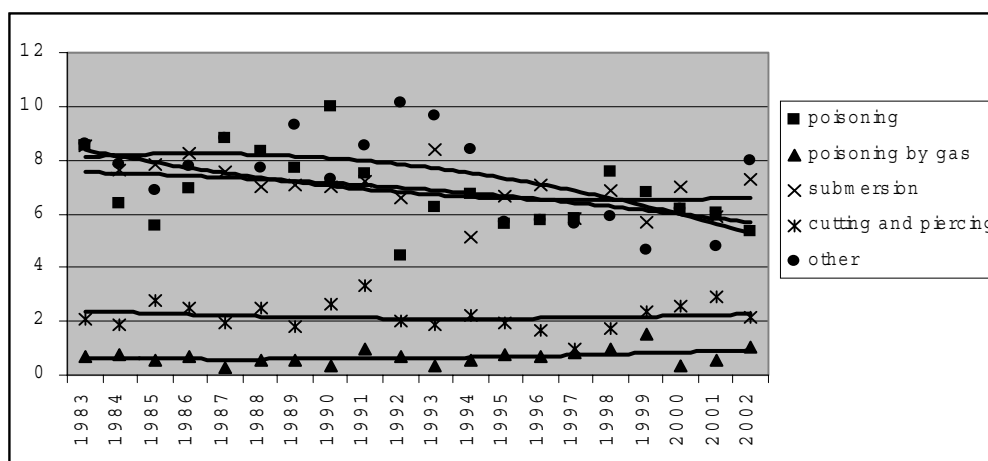


Figure 9b. Distribution of suicides by method

DISCUSSION

With regard to striking variations in suicide rates between countries and over time, as well as between different regions within the same country, comparative international suicide epidemiology has become increasingly relevant. Notwithstanding many limitations and mainly descriptive value of this study, it shows some interesting data. In the second part of 20th century the suicide rate increased throughout Europe, a phenomenon which was also observed in the Republic of Croatia. The suicide rates in the Republic of Croatia oscillated but evidently showed tendency of increase from 1966 to 1992 for 10.7 cases per 100 thousand inhabitants with peaks 1987 (24.3) and 1991 (24.4) and 1992 (25.8). From 1993 to 2002 suicides show oscillating but evident tendency of decrease. The suicide rate declined from 25.86 per 100 000 in 1992 to 19.88 in 2001, and 19.69 in 2002, a fall of 6.17 (23.9%). Our observations and conclusions are in contrast with those in some previous studies claiming «that suicide rate in the Republic of Croatia oscillated but did not show tendencies to increase or decrease during 1985-2000 period, which spans the pre-war, war and post-war years (Kozarić-Kovačić et al. 2002, Grubišić-Ilić et al. 2002). The difference may be due to the different sources of data (the Ministry of Interior Affairs vs. The Croatian Bureau of Statistics) and the length of study period (16 vs. 36 years). One

always should bear in mind the problems with the official statistics and that the comparison over time can be difficult (Gelder et al. 2001). It is generally accepted that official statistics underestimates the true rates of suicide. In our case the Register of Suicide of the Ministry of Interior shows the lower rates of suicide in the Republic of Croatia.

It is not yet possible to offer reliable explanations why suicide rate has fallen in Croatia, but it is intriguing to note some changes that may be related to the suicide rate decrease. Period of Croatian independence is characterized with an increase of national, religious and cultural rights of the majority population, free elections resulting in more democratic governments, more freedom of speech in mass media, more independence of the judicial system, more religious practice in everyday life, more availability of new antidepressants, especially SSRIs, a systemic campaign for education of general practitioners (GPs) for early recognition and treatment of depressive disorders. Our results of decreasing suicide rate trend in Croatia support the hypothesis that the hope and process of democratization has a beneficial influence on people (Makinen 2000).

Extensive GP training on depression and suicide was followed by an increase in the use of antidepressants and a decrease in suicide rates in Hungary (Rihmer et al 2001a) and Sweden, Norway, Denmark and Finland (Isacsson 2000).

The Croatian Society for Biological Psychiatry and Clinical Psychopharmacology in cooperation with the Croatian Psychiatric Association started with continuing education of GPs: «Early Recognition and Treatment of Depression in Primary Care» in 1993. Lectures were held in all Croatian counties and appropriate literature was published and distributed to GPs. It is difficult to assess possible impact of this educational program and better availability of SSRIs on decreasing suicide rates in Croatia. In Italy suicide rate remained stable from 1986 to 1996 (Guaiana et al. 2002) and no reduction in overall suicide rates due to SSRI antidepressant was registered (Barbui et al. 1999) as well as in Slovenia (Marušič et al. 2004).

According to some opinions, the rise of suicide in many countries was related to the decline of Catholicism like in Portugal (Ferreira de Castro et al. 1989). During the time of the socialistic Yugoslavia, Catholicism was suppressed in Croatia what coincided with an increasing suicide rate. Croatian separation from Yugoslavia has been followed with more religious practice in everyday life and probably contributed to decreasing suicide rate trend.

Marriage protects from suicide by providing better social integration, emotional and practical support as well as the sense of increased responsibility towards the family (Zacharakis et al. 1998, Maris 1997). Our findings of decreasing trend of suicides among married as well as increasing trend of suicides among single support this opinion.

According to the wide-spread opinion, the suicide rates during war decreases, but it is not clear whether the war is associated with a real decrease of suicides. During the war in Croatia there had been an increase in suicide rates among males with the highest level of 25.8 in 1992. Among females the highest suicide rate was observed before the war in 1988, with decreasing trend during the war. After the full reintegration of Croatia in 1998, there has been an important decrease tendency in suicides with the rate of 19.69 in 2002, being comparable with mid-70's of

the last century.

Suicide rates in Croatia have consistently involved greater mortality in males, which corresponds to data from Slovenia (Marušič et al. 2004), Hungary (Levi et al. 2003), Italy (Guaiana et al. 2002), SCG (Nikolić & Dimitrijević 2002) and many other countries (Cantor 2000). Despite the trend of absolute decrease of suicide rates in males, the trend of increase of male/female ratio indicates relative increase of suicide mortality in males.

Generally, suicide increases with age and this is also the case in Croatia. In the context of a global decrease of suicide rates, there is a striking increase of suicide rates among males over 65. Rises were evident in 15-24 year old males and to a lesser extent in 25-44 year old males, but during the last years these increasing trends were stopped. The most striking decrease of suicide rates was observed in 45-64 year old males and females. Age distribution of suicides may significantly contribute to achieve the goal of preventive programs to reduce or limit the number of suicides.

In spite of a decreasing trend, the suicide method most favoured in Croatia is hanging (E953), more than in 50% cases, what is in accordance with the experience of some other countries: Italy, Slovenia and Greece (Marušič et al. 2004, Zacharakis et al. 1998, Guaiana et al. 2002). The reasons for high percentage of suicide committed by hanging probably include the easy access to this method, cultural factors, imitation and less likely probability of misclassification as accidental or undetermined death. The significant increase of suicides committed by firearms after 1990 was due to the increased availability of firearms during the war. In the last years in Croatia, strict legal measures have been undertaken for firearms reporting and possession of illegal weapons what coincides with lowering the number of suicides by firearms. This observation is consistent with the reports from the USA (Solan et al. 1990), Canada (Lester & Leenaars 1993) and Australia (Cantor & Slater 1995), where the implementation of strict

regulations on the civilian gun possession has decreased the suicide rate.

There have been also other factors that should be taken into account, like the rise in drug and alcohol abuse, PTSD, other mental disorders, seasonal variations and climate changes, the rapid rate of social changes with the consequent alteration of beliefs and interpersonal relationships, housing and employment difficulties and a particularly high rate of unemployment, etc. These aspects are going to be objectives of our other studies.

The question of the quality and reliability of official suicide mortality reporting has often been raised (Schmidtke et al, 1999), what is also the case in this study. Thus, the available data offer only a rough picture about the situation with the suicide problem in Croatia.

CONCLUSION

During the period of 1993-2002 in Croatia an evident decrease of suicide rate is recognized. This period is characterized with an increase of national, religious and cultural right of the majority population, free elections resulting in more democratic governments, more freedom of speech in mass media, more independence of the judicial system, more religious practice in everyday life, more availability of new antidepressants, especially SSRIs, a systemic campaign for education of general practitioners for early recognition and treatment of depressive disorders. Suicides in Croatia follow the observed rule in many countries by being more prevalent among the males, aged, single and mostly committed by hanging and firearms.

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