

## Suicide in Croatia and in Croatian Immigrant Groups in Australia and Slovenia

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**Aim.** To compare suicide rates in Australia, Slovenia, and Croatia with suicide rates in Croatian immigrant groups in Australia and Slovenia in a 10-year period.

**Method.** We analyzed records for completed suicides of the residents of Australia in a decade between 1988 and 1997 and Croatia and Slovenia in a decade between 1985 and 1994. The Croatian Catholic Centers in Australia had 31 completed suicides reported in their Parish Registries in the decade between 1985 and 1994. In Slovenia, 141 completed suicides of Croats were reported in the same decade by the Institute of Public Health of Republic of Slovenia.

**Results.** The suicide rate and method of suicide in the Croatian immigrant group in Slovenia (26.01/100,000/year; 60% of hanging) converged towards those of the host country (31.43/100,000/year; 76% of hanging), perhaps as a function of the years since migration from Croatia (22.53/100,000/year; 42% of hanging). Somewhat higher male-female ratio in this immigration group (3.55) could be explained by their lower social status. Surprisingly low suicide rate was calculated for the immigration group in Australia (3.10/100,000/year).

**Conclusion.** Croat immigrants to Australia have the lowest suicide rate, but the highest male-female suicide ratio, which could be a consequence of underreporting of suicides by Croatian Catholic Centers in Australia. Different suicide data sources can be a source of significant bias in cross-cultural comparison of suicide behavior.

**Key words:** Australia; Croatia; cross-cultural comparison; emigration and immigration; epidemiologic methods; registries; Slovenia; suicide

Immigrants, refugees, and emigrants are groups at higher risk of suicide, compared both with their compatriots back in the old country and natives of the new homeland. Swedish immigrants in the USA have twice as high a suicide rate as in their homeland and Norwegians have three times the rate (1). After a cross-cultural breakdown of suicide in Sweden, Ferrada-Noli (2) reported significantly higher rates in the immigrant than the native population.

Kliwer and Ward (3) investigated factors influencing suicide rate in 25 immigrant groups in Canada and reported significant convergence of immigrant suicide rates to the Canadian native-born rates. The migration-convergence hypothesis of suicide risk was replicated in the study of suicide rates in adolescent Russian-born Jewish immigrants to Israel (4). At the same time, the inclination towards suicide among immigrants follows the pattern of the country they come from. For example, the studies from the United States and Australia showed significant rank correlations between the suicide rates of immigrants and those of their country of birth (5,6).

The aim of our study was to compare suicide rates in Croatia with suicide rates in Croatian immigrant groups in Australia and the neighboring Slovenia. The Croatian immigrant group in Australia

represents economical and political intercontinental emigration from Croatia, whereas the Croatian immigration group in Slovenia represents only economical emigration to the neighboring country (ie, another state in the former Federative Republic of Yugoslavia). The immigration group in Slovenia is interesting due to the specific cross-cultural situation in this country. Apparently, Slovenes are at a higher risk of committing suicide than other nationality groups in Slovenia, including the Hungarian minority (7). This should come as a surprise knowing that Hungary has a higher suicide rate than Slovenia (8).

### Methods

This study was based on records for completed suicides of the residents of Australia in a decade between 1988 and 1997 and Croatia and Slovenia in a decade between 1985 and 1994. The mortality data came from different sources.

#### *Croats in Australia*

For the purpose of our study, we could only obtain information about suicides among Croats in Australia from the Croatian Catholic Centers (Blacktown-Sydney, Brisbane, Canberra, Geelong, Hobart, Perth, St. John's Park-Sydney, Summer Hill-Sydney, Wollongong). In each of these centers, suicide records are obtainable from Parish Registries, which had 31 completed suicides reported in a decade between 1985 and 1994 (unpublished data). These suicides occurred in the population of approximately 100,000 Croats living in Australian cities. The numerator

was estimated according to the census statistics of the population in 1986, when 180,000 immigrants in Australia were reported to be from former Yugoslavia and almost 60% of them of the Croatian origin (9).

One may ask how these centers collect suicide data. First, a verdict of suicide is recorded by the official coroner in Australia. Next, if a funeral is organized by Croat's relatives, they will contact a priest from a Croatian Catholic Center. The priest would take all the data about the deceased, including information about the suicide, and an entry would be made into the Parish Registries. For the purpose of the present study, the first author collected these data recorded and kept by those centers by personal communication during his stay in Australia in 1995.

#### *Croats in Slovenia*

Sources of other suicide data were the official suicide statistics of the corresponding country. For example, records for all 141 completed suicides of Croats in Slovenia in the decade between 1985 and 1994, including all analyzed variables (year of the suicide event, sex, and suicide method) were obtained from the Institute of Public Health and the Statistical Office of the Republic of Slovenia. In accordance with the constitutional principle of equality of nations and nationalities, data on ethnic nationality are the result of freely expressed statements on ethnic nationality (10). It is worth noting that the chaos created by the break-up of the Yugoslav federation during this period does not make these data less reliable. Since March 1985, the Statistical Office of the Republic of Slovenia had published data on the size of the permanent population of the Republic of Slovenia according to data from the Central Register of Population of the Republic of Slovenia. Until 1992, this was a collection of data on citizens of the Socialist Federative Republic of Yugoslavia with permanent residence on the territory of Slovenia. Since 1992, this has been a collection of data on Slovene citizens and all inhabitants who under previous regulations were recorded as citizens of SFR Yugoslavia. Refugees, who have arrived since 1992, were excluded (10).

#### *Populations of Australia, Croatia, and Slovenia as Reference Groups*

Data for the two immigration groups were compared with the official suicide statistics for Australia (11,12), Slovenia (13), and Croatia (14-16). One may raise the question how comparable these suicide statistics could be? The cause of death and external causes should be determined by the physician who treated the deceased person, a coroner who is also a licensed physician, or a medical examiner. Causes of death and external causes are then classified according to The Ninth Revision of the International Classification of Diseases and Related Health Problems (ICD-9) (17). In many cases of uncertainty, there is a rule that suicide must be proved by evidence; if there is any doubt about the intentions of the deceased, the case should not be returned as a suicide and an accidental or an open verdict will be recorded. However, practices in the recording of cause of death are often influenced by legal, moral, and cultural taboos (18,19), which might have also influenced our suicide data obtained from different sources.

## Results

Table 1 shows suicide rates, male-female ratios and proportions of the most frequently used suicide method in both Croatian immigrant groups, together with the official statistics for Australia (1988-1997), Croatia, and Slovenia (1985-1994). The last row shows

the same statistics separately for Slovenes in Slovenia. Hanging was the most frequently employed method of suicide in all three countries, in all groups.

The highest suicide rate was reported in Slovenia (31.43/100,000/year), where the Slovene majority (33.42/100,000/year) had higher suicide rates than the Croatian minority (26.01/100,000/year). The Croatian minority in Slovenia had higher suicide rate than Croats in their homeland (22.53/100,000/year). Australia had the lowest national suicide rate (13.06/100,000/year). Surprisingly, even lower suicide rate was reported for the Croatian immigration group in Australia (3.10/100,000/year). Also, the only outstanding male-female ratio (6.75) was the one in Australian Croats. The percentage of hanging went in line with the suicide rate: the higher the suicide rate reported, the more frequent hanging was likely to be.

## Discussion

The design of our study was a simple comparison of suicide statistics from different sources. We are aware that there are considerable problems in relying on these. Suicide data should be gathered from similar suicide statistics to allow for cross-cultural comparison of suicide behavior. However, this was the only possible way of comparing suicide rates between three different groups of the same nation, with two of them being immigrants – one to the most distant country and one to the neighboring one. In one of the two comparisons, we showed that the characteristics of suicide behavior in immigrants converged towards that of the host country, perhaps as a function of the years since migration. In the other one, comparison was impossible as data were obtained from two very different sources of information.

Differences between various countries and nations in regard to suicide behavior can be enormous. Schmidtke (20) listed several factors that may influence this variance level: socio-demographic factors, ethnic differences, religious beliefs and affiliations, attitudes towards suicide, legislation regarding suicide, coping strategies, prevention strategies, and reliability and validity of death certification and reporting. The latter is particularly relevant because practices in recording the cause of death can be influenced by legal, moral, and cultural taboos. As an extreme example, it was discovered that countries with religious sanctions were less likely to return rates of suicide to the WHO (21). However, the view of most contemporary researchers is that these errors are random, at least to an extent that allows epidemiologists profitably to compare rates between and within countries and over a period of time (22-25). According to the re-

**Table 1.** Number of suicides, suicide rates, male-female suicide ratios, and proportions of hanging in Australia, Croats in Australia, Croatia, Croats in Slovenia, Slovenia, and Slovenes in Slovenia<sup>a</sup>

	No. of suicides	Suicide rate (No./100,000/year)	Male-female ratio	Hanging (%)
Australia	22,845	13.06	3.99	30
Croats in Australia	31	3.10	6.75	26
Croatia	10,981	22.53	2.47	42
Slovenia	6,179	31.43	3.18	76
Croats in Slovenia	141	26.01	3.55	60
Slovenes in Slovenia	5,771	33.42	3.16	76

<sup>a</sup>The Croat population in Australia was estimated at 100,000 (9).

sults of our study, this is possible if only one source of information is used as in our comparison of suicides of Croats in Slovenia and Croats in Croatia. On the other hand, the comparison does not seem plausible when two different sources of information are used, e.g., state statistics and Parish Registries in our comparison of suicides of Croats in Croatia and Australia.

#### *Croats in Australia*

Krupinski and Burvill have previously intensively studied suicide rates among immigrants in Australia (6,26,27). Immigrants from central European countries with high suicide rates have continued to commit suicide more frequently than the Australian-born residents. On the other hand, immigrants from southern European countries with low suicide rates are less likely to commit suicide than the Australian-born persons. Similar differences in the prevalence of suicide behavior among immigrant subgroups were also reported in the United Kingdom, where Irish, Caribbean and Pakistani men were more likely to consider that life is not worth living (28). Similarly, Asian women were more likely to attempt suicide than their Caucasian counterparts (29), which could be attributed to the increased cultural conflict (30).

From this perspective, the Croatian immigrant group could be interesting as their country of origin – Croatia – is situated between central European countries with a high suicide rate, e.g., Hungary with 37/100,000/year (8) and Slovenia with more than 30/100,000/year (7) and low suicide rate southern European countries, such as Italy with 7/100,000/year (8).

For the purpose of our study, we could only obtain information about suicides among Croatian immigrants only from the Croatian Catholic Centers in Australia. However, it seems likely that these data were not sufficiently valid. The reported suicide rate was four times lower than the suicide rate in Australia. They also reported surprisingly high male-female ratio. There are two possible explanations for the low validity of these data, which are not mutually exclusive. First, the approximate number of Croats in Australia might be overestimated, which would in turn underestimate the suicide risk of this group of immigrant population. It seems even more likely that Catholic Centers underreported suicides in their members, which would in turn again lead to an overall underestimation of suicide risk. For example, relatives' decision whether to contact or not the Croat priest could have influenced the suicide statistics. Also, it is possible that some of the single and socially isolated Croat suicide victims were not in contact with Croat Catholic Centers before their death, which would have also resulted in further underestimation of the suicide rates in this immigration group.

#### *Croats in Slovenia*

On the other hand, the suicide rate, a percentage of hanging and the male-female ratio in Croatian immigrant group in Slovenia seem to be valid enough to allow for the comparison between and within the two countries. Of course, suicide statistics in Slovenia in Croatia had made part of the same national suicide

statistic until 1991 and have not changed significantly since.

The suicide rate and the percentage of hanging in the Croatian immigration group in Slovenia were somewhere between the current national suicide statistics of Slovenia and Croatia, which shows that suicide proneness in immigrants has converged towards that of the host country, perhaps as a function of the years since migration (3,4). Higher rate of suicide in the native rather than the immigrant population of Slovenia should not come as a surprise. Marušić (7) already showed that Slovenes are at a higher risk of committing suicide than any other nationality groups, including Croats, Serbs, Muslims, and Albanians. On the other hand, Croats in Slovenia have lower suicide rate than Hungarians in Slovenia, which goes in line with findings of Sainsbury and Barraclough (5) and Burvill (6), who showed significant rank correlations between the suicide rates of minority ethnic groups and those of their countries, where they represent the majority of population.

The male-female ratio is somewhat higher in the immigration group, but this could be again explained by the social status, which is typically lower in immigrant groups. For example, the male-female ratio in Slovenia is inversely related to the educational attainment (7), which goes in line with Retterstol's (1) view about the male-female ratio: the closer the roles of the sexes come together, the smaller the differences are likely to be in the incidence of suicide. The high male-female ratio can also explain the predominance of hanging. In Slovenia, hanging is typical for men (70%) but less frequent in women (50%) (7).

The last but not the least, Croatia went through war between 1991 and 1995, which is known to influence the frequencies and methods of suicide behavior (31). This in turn could have had an impact on the above comparisons. As far as the frequency of suicide behavior is concerned, national suicide rate was stable during the observed period (16). However, some of the Croatian researchers pointed at the certain fluctuation of suicide rates in different parts of Croatia in the war years (1991-1995) (32). For example, Skorupan and his collaborators (32) noted down the increased number of suicide in the period between 1991 and 1995 compared with the preliminary period of five years. Similarly, changes in the suicide method in this period were reported, e.g., in the Osijek region (the eastern part of Croatia), hanging was the most frequent method of suicide in the years of peace (48%), but the gun was the first method of suicide (44%) and hanging was the second method of suicide (42%) in the war years (33). However, these intranational changes over time do not seem to be large enough to make the international comparison impossible in the given decade, although a cross-cultural breakdown of suicide should be controlled for social status.

#### References

- 1 Retterstol N. Suicide – a European perspective. Cambridge: Cambridge University Press; 1993.

- 2 Ferrada-Noli M. A cross-cultural breakdown of Swedish suicide. *Acta Psychiatr Scand* 1997;96:108-16.
- 3 Kliewer EV, Ward RH. Convergence of immigrant suicide rates to those in the destination country. *Am J Epidemiol* 1988;127:640-53.
- 4 Ponizovsky AM, Ritsner MS, Modai I. Suicidal ideation and suicide attempts among immigrant adolescents from the former Soviet Union to Israel. *J Am Acad Child Adolesc Psychiatry* 1999;38:1433-41.
- 5 Sainsbury P, Barraclough B. Differences between suicide rates. *Nature* 1968;220:1252.
- 6 Burvill PW. Migrant suicide rates in Australia and in country of birth. *Psychol Med* 1998;28:201-8.
- 7 Marušić A. Suicide in Slovenia: lessons for cross-cultural psychiatry. *International Review of Psychiatry* 1999;11:212-8.
- 8 World Health Statistic Annual. Health for all 2000 database. Geneva: WHO Regional Office for Europe; 1994.
- 9 Banović B. Structural changes as an indicator of post-war socio-economic status of immigrants from Southern European countries to Australia [in Croatian]. *Migracijske teme* 1991;7:301.
- 10 Statistical Office of the Republic of Slovenia. Statistical Yearbook of the Republic of Slovenia. Ljubljana: Statistical Office of the Republic of Slovenia; 1994.
- 11 Australian Bureau of Statistics. Special article – Suicide (Year Book Australia, 2000). In: Australia now. Health [online]. Available at: <http://www.abs.gov.au/ausstats/abs@.nsf/0/BE00331A0C387533CA2569DE0024ED5B?Open&Highlight=0,suicide>. Accessed 2001 July 4.
- 12 Suicide rates (per 100,000), by gender/Australia, 1950-1996 [online]. Available at: [http://www.who.int/mental\\_health/documents/suicide/austral.pdf](http://www.who.int/mental_health/documents/suicide/austral.pdf). Accessed 2001 May 25.
- 13 Inštitut za varovanje zdravja Republike Slovenije. Zdravstveni statistični letopis, Slovenija, 1995. *Zdrav Var* 1996;35 Suppl 6:52-4.
- 14 Suicide rates (per ppl 100,000), by gender/Croatia, 1985-1997 [online]. Available at: [http://www.who.int/mental\\_health/documents/suicide/croa.pdf](http://www.who.int/mental_health/documents/suicide/croa.pdf). Accessed 2001 May 25.
- 15 Health Status-Highlights on Health in Croatia [online]. Available at: URL:[http://www.who.dk/country/cro\\_01.pdf](http://www.who.dk/country/cro_01.pdf). Accessed 2001 May 29.
- 16 Gojanović Definis M, Smoljanović A, Marušić Z. Suicide in the Republic of Croatia (mortality data analysis) [in Croatian]. *Vladavina prava* 1999;3:157-70.
- 17 World Health Organization. The ninth revision of the international classification of diseases and related health problems (ICD-9). Geneva: WHO; 1977.
- 18 Atkinson MW, Kessel N, Dalgaard JB. The comparability of suicide rates. *Br J Psychiatr* 1975;127:247-56.
- 19 Platt S. Suicide trends in 24 European countries, 1972-1984. In: Moller HJ, Schmidtke A, Welz R, editors. Current issues in suicidology. Berlin: Springer-Verlag; 1987.p. 3-13
- 20 Schmidtke A. Perspective: suicide in Europe. *Suicide LifeThreat Behav* 1997;27:127-36.
- 21 Kelleher MJ, Chambers D, Corcoran P, Williamson E, Keeley HS. Religious sanctions and rates of suicide worldwide. *Crisis* 1998;19:78-86.
- 22 Sainsbury P, Jenkins JS. The accuracy of officially reported suicide statistics for purposes of epidemiological research. *J Epidemiol Community Health* 1982;36:43-8.
- 23 O'Carroll PW. A consideration of the validity and reliability of suicide mortality data. *Suicide Life Threat Behav* 1989;19:1-16.
- 24 Diekstra RF. The epidemiology of suicide and parasuicide. *Acta Psychiatr Scand Suppl* 1993;371:9-20.
- 25 Moscicki EK. Identification of suicide risk factors using epidemiologic studies. *Psychiatr Clin North Am* 1997;20:499-517.
- 26 Krupinski J. Changing patterns of migration to Australia and their influence on the health of migrants. *Soc Sci Med* 1984;18:927-37.
- 27 Burvill PW, McCall MG, Stenhouse NS, Ried TA. Deaths from suicide, motor vehicle accidents and all form of violent death among migrants in Australia 1962-66. *Acta Psychiatr Scand* 1973;49:28-50.
- 28 Nazroo J. Ethnicity and mental health. London: PSI; 1997.
- 29 Merrill J, Owens J. Ethnic differences in self-poisoning: a comparison of Asian and White groups. *Br J Psychiatry* 1986;148:708-12.
- 30 Bhugra D, Desai M, Baldwin D. Attempted suicide in west London, I. Rates across ethnic communities. *Psychol Med* 1999;29:1125-30.
- 31 Definis Gojanović M, Čapkun V, Smoljanović A. Influence of war on frequency and patterns of homicides and suicides in South Croatia (1991-1993). *Croat Med J* 1997;38:54-8.
- 32 Skorupan V, Petrovečki V, Škavić J. Suicide epidemiology before and during the war in Croatia. *Croat Med J* 1997;38:59-63.
- 33 Požgain I, Mandić N, Koić O. Suicide in Osijek region in war and peace [in Croatian]. *Socijalna Psihijatrija* 1994;22:113-21.

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