

Suicide in Europe: an on-going public health concern

/ Samoubojstvo u Evropi: Stalni javno zdravstveni problem

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Every 40 seconds, somewhere in the world someone dies by suicide, with certain groups such as youth and men being most at risk. Research abounds as to the risks and protective factors, but there is still a huge gap in our knowledge as to what leads one person to act on suicidal ideation and another to refrain. Risks factors vary by country, culture, gender and class, and represent a complex and potentially synergistic interplay between biological, psychological, social, environmental and personal factors. These will be discussed in this paper.

Many prevention programmes have been established, but no one intervention stands out. At a minimum, country-wide efforts raising awareness of suicide and deliberate self-harm, highlighting risk and protective factors and identifying and treating mental health problems early, particularly in youth, are essential. Targeted methods include public education and media campaigns, providing training for front-line staff in early recognition and, in the case of primary care clinicians, appropriate referrals for treatment of mental illness, generating policies on restricting easy access to lethal means or substances such as alcohol which disinhibit behaviour and reducing the stigma of, and promoting, help-seeking. These efforts should go some way towards slowing what might otherwise become a self-destructive epidemic. We all have a role to play.

/ Svakih 40 sekundi negdje na svijetu netko počini samoubojstvo pri čemu su određene skupine, poput mladih i muškaraca pod većim rizikom. Istraživanja ukazuju na brojne kako rizične, tako i zaštitne čimbenike, ali i dalje postoji veliki nedostatak u znanju što neku osobu vodi da djeluje prema svojim suicidalnim idejama, a drugu da se suzdrži od počinjenja suicida. Rizični čimbenici variraju ovisno o državi, kulturi, spolu, klasi i predstavljaju kompleksno, potencijalno sinergističko međudjelovanje bioloških, psiholoških, društvenih, okolišnih i osobnih činitelja o čemu raspravlja ovaj članak. Utemeljeni su mnogi preventivni programi, ali ni jedna intervencija se posebno ne ističe svojom većom učinkovitošću. Potreban minimum treba uključivati: napore na nacionalnoj razini u podizanju svjesnosti o suicidu i namjernom samoozljeđivanju, ukazivanje na rizične i zaštitne čimbenike, rano identificiranje i tretman problema duševnog zdravlja, osobito u mladih. Ciljane metode prevencije uključuju: javnu edukaciju i medijske kampanje, provođenje edukacije i treninga stručnjaka prve linije u ranom prepoznavanju, u slučaju primarne zdravstvene skrbi adekvatno upućivanje na liječenje mentalnih poremećaja, stvaranje politike restriktivnog pristupa smrtonosnim sredstvima ili supstancijama poput alkohola koji dezinhibira ponašanje, reduciranje stigme i promoviranje traženja pomoći. Sve bi ove aktivnosti trebalo smanjiti ono što bi u suprotnom moglo postati epidemija autodestruktivnog ponašanja. Svi mi u ovome imamo svoju ulogu.

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INTRODUCTION

The exact prevalence of suicide, that is the act of ending one's own life in a deliberate and self-initiated action, is difficult to ascertain. The World Health Organisation (WHO) has been collecting annual statistics on the numbers of suicides in different countries globally since 1948, reaching a peak of 74 countries in 1985, but with minimal data from South East Asia, eastern Mediterranean and Africa (2). More recently, since 1994, Eurostat has included death by suicide in their mortality data and over time have included most of the 28 countries in the European Union along with some candidate countries (3). However, both organisations recognise the limitations in the accuracy of data collected, in that registrations of suicide as a cause of death vary significantly between countries, cultures, religions and over time. Attempted suicides and deaths linked with unde-

termined intent are not included and available data always lags about 2-3 years behind.

When reported, rates are presented as a standardised rate per 100,000 inhabitants. WHO (2014) estimated a global rate of 11.4 per 100,000 with men (15.0) outnumbering women (8.0) (1). For that year, this was equivalent to 1.4% of all deaths worldwide, with proportionally higher rates (although not absolute numbers) in higher income countries (12.7 or 1.7%) than lower income countries (11.2/100,000 or 1.4%). Accepting limitations in the accuracy of data collected, there were huge variation between countries and continents, ranging from 17.1/100,000 in South East Asia to a low of 4.8/100,000 in the eastern Mediterranean (see Table 1). Even within Europe, there was almost a 20-fold difference between Lithuania's rate of 33.5/100,000, the highest global rate (4), and Azerbaijan's rate of 1.7/100,000, 88th (see Table 2).

TABLE 1: Suicide Mortality Rate (per 100,000 populations) by WHO region, 2012.

Global Average = 11.4	Regional Ranking	Regional Average	Outlier country	Suicide MR	Country ranking
South East Asia	1	17.1	Sri Lanka	29.2	4
Europe	2	13.8	Lithuania	33.5	3
Western Pacific	3	9.9	Korea	36.8	1
Americas	4	8.9	Guyana	34.8	2
Africa	5	7.0	Mozambique	17.3	<15th
Eastern Mediterranean	6	4.8	Sudan	11.5	<20th

Ref: World Health Statistics 2016 data visualizations dashboard. <http://apps.who.int/gho/data/node.sdg.3-4-viz-2?lang=en> Accessed Jan 3 2016.

TABLE 2: European Suicide Mortality Rate (per 100,000 populations) by WHO region, 2012 and worldwide country ranking*.

Country	Suicide MR	Ranking	Country	Suicide MR	Country Ranking
Lithuania	33.5	1	Germany	13.0	33
Hungary	25.4	5	Ireland	11.5	48
Russia Federation	22.3	3	Macedonia (FYROM)	7.3	64
Latvia	21.8	8	UK	7.0	62
Poland	20.5	25	Spain	7.0	53
Serbia	16.8	16	Italy	6.4	61
Croatia	16.5	17	Israel	6.2	67
France	15.8	18	Greece	4.9	78
Iceland	15.1	37	Armenia	3.3	86
Bosnia & Herzegovina	13.9	39	Azerbaijan	1.7	88

*Data of country ranking sourced from WHO data: <http://www.suicide.org/international-suicide-statistics.html>

TRENDS IN SUICIDE RATES

Suicide rates have risen dramatically worldwide since initial data collection, reaching a peak in the 1980s and followed by a decline in most countries. The reduction since the 1990s has been attributed to restriction of lethal means, tighter gun control laws, removal of carbon monoxide and introduction of natural gas, and blister packs of medication reducing impulsivity (5). The association between increased prescription rates of anti-depressant medication and the reduced suicide rate have lead some researchers to suggest a beneficial effect from early identification and treatment of depression. (6,7, 8, 9). This is somewhat supported by the fact that in individuals with depression (by psychological autopsy) who took their own life, fewer of them were on anti-depressants than the depressed population norm (10). The concern, however, about anti-depressants inducing new onset suicidal thinking is at odds with this position (11,12) and has led to various regulatory standards (13,14). Strangely, and also reinforcing the complex nature between restrictive practices and suicide rates, although better firearm controls seem plausible

and evidenced (15,16), it is a fact that parents of depressed youth often do not follow these standards (17); in some countries there was evidence of method substitution (18) and in other countries in which there was no change in gun laws, a reduction in suicide rates was still present.

Rates of suicide appear to continue to increase in some countries, e.g. Lithuania, where the overall rate reported in 2015 was 33.7/100,000. Although rates have dropped in other countries in the former Soviet Union, they continue to share very high rates with Lithuania, (Kazakhstan-3rd; Belarus-4th; Russia-6th; and Ukraine-8th) and have been linked to social, political and economic reforms after the collapse of the Soviet Union in 1991 (19). Rates among young Lithuanian men (15-19) have risen from 8.62/100,000 in 2011 to 21.38/100,000 in 2013, being among the highest in Europe, with Ireland having the second highest rate, both more than twice the EU average. Currently, suicide rates among Irish women are the highest of all EU countries, almost 2.5 times the EU average (2.09 per 100,000 compared to 0.84), with rates among Lithuanian women in second place (20).

The recent economic downturn in 2008 has been associated with a higher than expected suicide rate in all but one of 10 European countries studied between 2007 and 2009 (21). A longer time period (2000-2009) and larger study, using WHO available data from 27 European and 27 non-European countries also reported a roughly 5% increased rate, predominantly affecting working age men and in countries with higher levels of job loss (22). Men aged 15-24 were most adversely affected in European countries, and new EU member states also showed the highest increase (22). There was no change among European women, and a smaller increase (2.3%) in women living in the Americas (22). Counter to the evidence of increase in suicide rates linked with economic depression, the case in Ireland seems more confusing given an indication that suicide rates were highest at the height of Ireland's Celtic Tiger, a period of unprecedented economic expansion (1995-2008). This period was followed by a rapid economic downturn and a corresponding increase in unemployment levels, reaching a peak of 14% in 2011. The rate of suicide in Ireland rose from 11.2 per 100,000 in 1995, reaching a peak in 2001 (13.5 suicides) before declining almost every year to a new low of 9.7 per 100,000 in 2015 (23).

Similarly, suicide rates appear to increase with immigration. A large cohort ($N= 250,000$) of Finns, who immigrated to Sweden over an 11 year period, 1982-1992, were found to have almost double the rate (48.2/100,000) compared with both the Swedish or Finnish rate (24).

Individual countries need to examine suicide rates within differing age groups in order to effective target interventions where rates are highest.

The difference between rates and absolute numbers needs to be considered. Although rates of suicide increase exponentially with age across Europe, with older people being at

highest risk, given the larger number of individuals in younger cohorts the majority of suicide occurs in people under 50, most between the ages of 35-44 (25). Additionally, given the relative health of younger cohorts, suicide as a cause of death is much higher at a younger age in all countries, varying only by degrees. In 2014, suicide was globally the 2nd leading cause of death in youth aged 15-24 (WHO 2014), accounting for 15% of deaths in those aged 15-19 and 18% in those in their 20s (Eurostat: 2015, using 2012 data 26). It remains the leading cause of death in Irish men aged 15-24 (27). This can be compared to all age groups where suicide is the 10th leading cause of death (25). In Ireland, and in many other European countries, there is a bimodal relationship with age, with the highest rate or „first peak“ in the 19-24 year old group as well as another peak in old age. However, the relationship between age and risk is by no means clear, with some countries showing an increased risk with increasing age in both men and women (25/27 of the 62 countries examined), others a decreased risk, and others such as Ireland showing bimodal peaks (28,29). In 2011 in America, 56% of suicides occurred in middle-aged adults, with the highest rate in (typically white) middle-aged men (30).

Similarly, although suicide rates are higher in middle to upper income countries, given the populous nature of countries such as India and China, 30% of the world's suicides occur in these 2 countries (31).

RISKS ASSOCIATED WITH SUICIDE

The specific and different links between age and sex have been alluded to, with older age carrying a 6 times greater risk for completed suicides. In most countries, men are more at risk of suicide, possibly linked with their choice of more lethal methods of deliberate self-harm (DSH). Men typically use more vi-

olent and lethal methods than women, but this also differs by country and culture. International methods of suicide derived from the WHO mortality data base reveal hanging to be the most common method used by both sexes in most countries with the notable exceptions of the United States, Argentina, and men in Switzerland where firearm suicide predominated (32). In some countries, jumping, poisoning with pesticides or drowning featured prominently.

However, the ratio of men to women differs between countries, with Ireland and UK having a ratio of 4:1 but Poland a ratio of 8:1, equal to that of in Pakistan and India, and a lower ratio in China where more women die by suicide than men (31). This is attributed to preferred and fatal use of self-poisoning in rural China with Paraquat. Religion has also being linked in that much lower rates are reported in countries with strong religious beliefs: in countries with predominant Muslim beliefs, the average rate is 0.1/100,000; with predominantly Hindu (India) or Christian (Italy) beliefs the rates are 10/100,000, rising to 17.9 in countries such as Japan with Buddhist beliefs and a rate of 25.6 in China, which is predominantly atheist (31). Although these data are suggestive of a link, the data need to be interpreted with caution due to a realisation that suicide may be under reported where it is culturally taboo, and so the lower rates are more administrative than real. In China, consideration also needs to be given to factors associated with poorer access to medical care in vast rural areas and the ready presence of poisonous insecticides which are fatal in overdoses.

Previous suicidal ideation and engagement in deliberate self-harm, whether linked with social ideation or not, or occurring in the presence of a mental illness, is a very potent risk factor for suicide (34, 35). Identification and management of previous episodes of self-harm linked with suicidal ideation, present

in many and representing the most important risk factor for subsequent suicide, might change the outcome for the patient. Rates of DSH and suicide have now reached such an unacceptable level that both are being deemed by the World health Organisation (WHO) as a major public health problem (1). The importance of competent and therapeutic assessment of DSH followed by appropriate management is in part derived from the fact that the vast majority (98% in one systematic review) of suicides have one or more psychiatric diagnosis, with depression (60%), schizophrenia, SUD and CD being among the most common (36). However, a psychiatric disorder may be a necessary but not a sufficient risk factor. Childhood sexual and physical abuse increases the risk, independent of a child's mental health problems, and is thought to be mediated via parental mental ill health, poor interpersonal relationships and social isolation. Personality factors such as poor coping and impulsivity leading to rash behaviours also contribute. In these situations having access to lethal means presents a huge risk, whether it is firearms, medication or other substances which increase disinhibition. Findings of reduced 5HT transporter receptors and receptor density from post-mortem studies implicate dysregulation of the serotonin system, along with the finding that low levels of CSF HIAA in depressed adults predicted completed suicide, might explain the link between impulsivity and suicide (37).

Having already engaged in DSH increases the risk of suicide and is probably one of the most important predictors, particularly in adolescents. Those who engage in repeat acts (12-14% in the first year, and up to 50% within 3 years) are most at risk (38, 39). Hence the importance of taking each act of self-harm seriously, engaging in a therapeutic assessment, encouraging adherence to suggested treatment offered and paying especial attention to

the first 3 months, when the risk of repeat DSH is highest.

Both family environment and genetics play a role in the risk of suicide. A family history of either suicide or DSH increases the risk especially if maternal, compared with paternal (40). The presence of parental psychopathology, especially depression or substance misuse, has been linked with an increased rate in the offspring, and divorce or separation has an effect through this mechanism. The heritability is moderate, estimated at 0.43 with higher rates in biological than adoptive parents. Rates in monozygotic twins are higher than in dizygotic twins (41). The risk from first-degree relatives is also independent of psychiatry illness (42).

1-2% all suicides are due to contagion or „Copy Cat Suicides“, and sensational media reporting increases this risk especially in youth, given the prominence of peer influences and a need to fit in (43).

PREVENTION PROGRAMS

Given the high rates of suicide, it is appropriate that countries are now focussing on comprehensive integrated efforts to tackle this problem. To date, 28 countries are known to have a national strategy on the prevention of suicide (44), including Ireland (45). The goal of the first ever WHO led global Mental Health Action plan in 2013 was to reduce the rate of suicide by 10% by 2020 (46). Programmes need to be offered at all levels, providing support to the individuals and families, offering education and support for schools and community (47), monitoring and engaging with the media regarding sensitive reporting and providing adequate psycho-education. Health-care services need to incorporate suicide prevention as a core component and be responsive to needs of vulnerable individuals, ensure

on-going training of primary care clinicians to recognise and treat (or refer) individuals with mental health problems, especially depression and substance misuse. Given the high prevalence of DSH and suicidal thinking in our young people, universal programmes seem indicated but need to be balanced with additional targeted approaches to those most at risk, e.g. youth bereaved by family suicide. Restricting access to the means for suicide (fire arms, bulk medication) has been shown to be effective, as, if there is method substitution, it is often non-fatal.

Serious methodological issues exist both in the delivery and evaluation of suicide prevention programmes. The frequency of suicidal ideation and wide prevalence of risk factors make it difficult to target preventative programs effectively and efficiently. In screening programmes, a balance needs to be struck between over-loading a system with a high rate of false positives, thus using much needed resources, and correct identification of at-risk youth who might otherwise have taken their life. Training programmes, while often initially successful, need to be maintained in order to continue to have a beneficial effect (48). School-based screening or curriculum enhancement have shown some positive results, but are not clearly efficacious (49). The episodic nature of suicidal ideation makes identification difficult, as does the fact that many of the most at-risk youth may not be attending school. Optimising the ethos of the school in terms of mental health promotion, developing all school-positive mental health policies and reducing the stigma both of mental illness and treatment seeking, while not specific to suicide reduction, are all admirable general goals (49). Adolescents in general, and those with suicidal ideation, are notoriously difficult to engage, often drop out of therapy or stop taking medication prematurely, and so any programme needs to be adolescent

friendly, preferable designed with input from adolescents (50). Completed suicide is a rare event; therefore evaluating the outcome of community Suicide Prevention Programmes is difficult. The lack of RCT is also a limiting factor (51). A recent large systematic meta-analysis, while applauding prevention initiatives, concluded that no single strategy was clearly more efficacious than the next, and programmes should continue use a combinations of evidence-based strategies both at the individual and population level (51). In the knowledge that improving young peoples' mental health is to be welcomed, the first goal should continue to be „do no harm“, followed by establishing associated improvement in general mental health and ensuring cost-effective delivery of care.

CONCLUSION

Despite some evidence that rates of suicide have decreased in certain countries in the last decade, there is no room for complacency. More effective and reliable data collection, coupled with the growth of research and academic centres in various countries, will facilitate the examination of the many complex factors linked with suicide in men and women of all ages and from all walks of life. Multiple and varied, formal and informal, targeted and universal, individual and organisational efforts towards suicide prevention have evolved but the vast majority remain untested, with no single intervention standing above the others. A combined multifaceted approach at the individual and community level is necessary.

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