

## Editorial

Wien Klin Wochenschr (2006) 118/15–16: 439–441  
DOI 10.1007/s00508-006-0639-5  
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### Suicide by shooting and gun ownership (licenses) in Austria: would gun restriction help?

One of the oldest methods of preventing death is by environmental control. Removing the sword from the defeated soldier in battle, for example, is an environmental act of prevention. Suicide, homicide, and accidental deaths can be so prevented. It has been empirically established across the globe that availability of a potential dangerous lethal means affects the rate of use of the means for death. The greater the availability implies the greater the amounts of death. This is true about suicide, the most predominant form of violence in the world. Controlling the environment is a means of decreasing the incidence of suicide. Guns are the most lethal means, not only for suicides but also for other preventable deaths such as homicides and accidents. Furthermore, it is a scientific fact, not simply opinion, that reducing the availability of guns, such as by way of gun control, will reduce deaths. Of course, one can attempt to control the environment in many more ways than gun control, equally for suicide, as for AIDS, SARS, or, as the father of public health, John Snow, showed, cholera. Indeed, gun control is a golden application of John Snow's public health approach of removing the Broad Street pump in London in 1854 to stop an epidemic of cholera. His work was prototypical.

On one final point of introduction, editorials should have an essayistic character, offering opinion, and/or broader view. They are a Sophist's dream. Yet, although I attempt to offer both opinion and broader view, I will be more factual in this Editorial than common. I will present some studies from Canada and around the world. My main reason for this empirical approach is that opinions on this topic in Austria and elsewhere are often not factual, but mythical. I prefer to let the facts speak for themselves, not rhetoric. I prefer research. The National Rifle Associations (NRA) in the United States and Canada often prefer rhetoric. There is, however, nothing as good as scientific fact to dispel fables (for example the NRA argues: "All gun owners are good. I am a gun owner. Therefore, I'm good, even if I kill myself or you or all of you in the World Trade Centre"). It is the reasoning that is faulty. I do not agree with the lethal first premise. They are Sophists!

Availability of guns is difficult to measure, often only indirect measures are available – the accidental death rate by firearms and the percentage of firearms used for crimes such as murder [1]. There are, however, a few studies on actual firearm ownership, such as measured by gun licenses. In the United States (US) measures of actual firearm

ownership are available in nine regions (but not for the 48 states). Markush and Bartolucci [2] found that in the US the actual ownership was positively associated with suicide rate by shooting and total suicide rate. Lester [3] replicated that ownership was positively associated with the firearm suicide rate. Lester [4] found that ownership of firearms in Australia was positively associated with suicide by shooting. Carrington and Moyer [5] reported that firearm suicide was associated with ownership in Canada. Killias [6] and Lester [7] both found a positive association between the percentage of households with guns and suicide by shooting in 12 nations. Therefore, it is well established that there is a strong positive correlation of firearm suicide to the rate of gun ownership. The study, "Suicide by shooting is correlated to rate of gun licenses in Austrian counties", by world-respected suicidologists, Etzersdorfer, Kapusta and Sonneck adds to the conclusion, based on data from Austria. We can conclude within the laws of science: actual firearm ownership/availability is positively associated to firearm suicide and probably total suicides.

The paper in this issue reports that shooting as a method of suicide has increased in Austria over the last decades. For example, 23.5% of all suicides among men are firearm suicides. The results are alarming. Firearm shooting is the most prevalent method of dying by suicide in the US; whereas in most other nations, it is not. This is highly correlated with the availability of firearms in the US [1]. Australia, on the other hand, shows a decline in suicide by shooting, although hanging (also a lethal method) has increased. Suicide by shooting is low in most European countries; thus, the question raised in the paper: Does the high availability of guns in Austrian counties correlate with the increasing use of firearms for suicide? The authors studied registered suicides in Austria between 1990 and 2000 (including the method) and the amount of gun ownership; i.e. gun licenses in Austrian counties for the same. The authors, in the results, show a striking positive correlation; thus, they replicate the data to date worldwide. The findings, as the authors state, have high political relevance for Austria. They are bound to be controversial. Indeed, the authors argue convincingly, from their results, that gun restriction may well be an important factor in suicide prevention in Austria. This will be even more controversial. They argue for greater gun control or restriction. This raises the important question: Would gun control reduce the rate of suicide by shooting? Would it decrease

the rate of suicide in Austria? Or is the opposite true as the opposition argues: Gun control will increase deaths.

Despite the controversy among politicians and the general public, one area that has a consensus among studies is that a public health approach (e.g. environmental control) can be effective in the reduction of suicide, has been means restriction [8–12]. This is unequivocal. Although countries differ in the most frequent method of suicide, firearms, as noted earlier, are a preferred method in some countries. This is true in the US and Canada – and it appears increasingly so in Austria. To my knowledge, there is no study on gun control in Austria; yet, there is extensive study elsewhere, such as in Canada. A unique opportunity for studying the effects of legislative means restriction, e.g. gun control laws, on their use for suicide is provided by Canada's Criminal Law Amendment Act of 1977 (Bill C-51), enforced since 1978. This Act required acquisition certification for all firearms, restricted the availability of some types of firearms to certain types of individuals, set up procedures for handling and storing firearms, required permits for those selling firearms, and increased the sentences for firearm offenses.

Early commentators on the impact of this Act [13], reported little impact of the Act on suicide by shooting in Canada, but presented only simple charts, with no statistical analysis of the trends. Lester and Leenaars [14, 15] remedied this omission and reported the first comprehensive study on the preventive effect on suicide of the Act in Canada. The results suggested that strict firearm control laws may well have been associated with changes in suicide rates, reduced the use of firearms for suicide, and resulted in no overall switching from firearms to other methods for suicide. Lester and Leenaars' results suggest that Bill C-51 in Canada appeared to have had, at least, one significant positive impact, namely, lowering the rate of suicide by guns.

Subsequently, Leenaars and Lester [16] examined whether the restriction of firearms in Bill C-51 in Canada had a preventive impact for those of all ages or only for some ages. The results showed that the percentage of suicides using firearms decreased only for those aged 15–64, while it increased for those aged 65+. Thus, a general conclusion seems to be that the impact of making the gun control laws stricter in Canada on suicide was not apparent in those over the age of 65, but significantly so in the young.

There is evidence that men and women may respond differently to restricted access to lethal methods for suicide. A study by Leenaars and Lester [17] was designed, therefore, to explore whether the 1977 gun control law in Canada had different effects for men and women in their use of guns for suicide. The results indicated that the passage of C-51 seemed to have had a greater impact on women than men in the use of firearms as a method for suicide, as some men may have switched method; this phenomenon is called displacement. Carrington [18] subsequently, questioned the Leenaars and Lester [17] data, suggesting that significant downward changes in death rates for suicide for both men and women occurred, with no evidence for switching method in both sexes. Research re-evaluated and supported the findings of Leenaars and Lester [19]. Leenaars et al. [19] found that although the intervention had an impact on both men and women, prob-

ably because more men use firearms, but some men, indeed, showed displacement. Thus public health approaches, such as gun control, like any health approach may have limits in interventions, but have impact nonetheless.

Stack [20], in a review of gun control studies, pointed out that rarely do gun control studies take into account other societal factors, which may influence the suicide rate, factors such as divorce, unemployment and the age structure of the population. A study by Leenaars et al. [19] examined this critique of this public health strategy. In order to see whether social changes might have had an impact on suicide rates from guns, birth, marriage and divorce rates as measures of domestic integration [a social variable which Durkheim [21] argued was critical in determining suicide rates], the unemployment rate [22], median family income and the percentage of the males aged 15 to 24 years as a percentage of the total male population (a group with one of Canada's highest suicide rates) were studied. The results showed that the passage of Bill C-51 in Canada in 1977, introducing stricter gun control, appears to have been followed by a significant reduction in the suicide rate by firearms, even after controlling for some social variables. Thus, it appears that even if one controls for other social variables, gun control works.

However, as they will in Austria and elsewhere in Europe, some researchers have disputed the conclusion that gun restriction has prevented suicide in Canada and elsewhere [23–26]. Be that as it may, Carrington and Moyer [5, 27] have replicated the positive findings for gun control in Ontario and showed a similar pattern for most of Canada's provinces and that all provinces had either stable or decreasing rates of firearm suicides, following C-51. There has been a subsequent law in Canada, Bill C-17; it tightened the screening provisions for firearm acquisition (FAC). Bridges [28], following Leenaars and Lester's design, examined the impact of the Bill and showed a significant decrease after passage of Bill C-17 in rate of suicides by shooting and the percentage of suicides by shooting.

More research is needed, however, to strengthen the conclusion that the passage of gun control laws in Canada and in other countries works. There is research, of course, elsewhere. For example, Beautrais, Fergusson and Horwood [29] examined the impact of more restrictive firearm legislation (Amendment to the Arms Act, 1992) in New Zealand on suicides involving firearms. The amendment restricted accessibility, required confidentiality checks of two references, and introduced more strict storage and safety requests. After the legislation, it was shown that firearm-related suicide decreased dramatically, especially in youth. Thus, the New Zealand study not only replicated the Canadian findings on the general impact, but also supported the finding that the tactic was especially useful with young people, a high-risk group for suicide in Austria, Canada, New Zealand, and globally.

In the last 20 years or so, the positive effects of gun control laws have also been studied in the US and Australia; these studies too support the research to date. The research on related phenomena of homicide [30] and accidental deaths [31] hold equal promise. Gun control has reduced not only suicides, but also homicides and accidental deaths. Thus, there are broader implications: gun restriction works to control not only suicide, but also many deaths. Thus, there

is convincing international research [12] to support Etzersdorfer and his colleagues' call for gun control in Austria.

Etzersdorfer and his colleagues (despite forthcoming opposition and censure by the right-wing parties, hunters, short shooter associations and drug companies, much like towards researchers in the U.S. and Canada by the NRA) go further, following John Snow, and state that their findings have high political relevance for Austria. They call for legislative action. John Snow is well known for his environmental call to action. Dr Snow, despite the threat of censure by the medical society in London, went into the field, studied and implemented an effective environmental control to stop cholera. The same can be done to reduce suicides, and also homicides and accidental deaths. This is unequivocal. Public health scientists have frequently studied a phenomenon (death, disease, natural disaster) and called for environmental action. Perhaps the best example is the reduction in toxic coal gas, a lethal agent for death in England till the beginning of the 1960s, to a less toxic gas and the subsequent reduction in deaths [8, 9]. Etzersdorfer and I call also for political action. The removal of lethal agents in the environment will prevent suicides. Indeed, I will go further; environmental control, such as gun control, has been one of the most effective means to reduce suicides, homicides and accidental deaths [12, 32, 33]. Legislation is needed in Austria and elsewhere. Politicians as well as gate-keepers, such as general practitioners, counsellors, crisis workers, and so on, can, thus, reduce suicide and more in Austria by controlling gun availability. Suicide, homicide and accidental death can be prevented. Doctors and their associates (nurses, social workers, psychologists, public health specialists, etc.) can play a major role. Patients and their families can also help; they should not only be forewarned about the dangers of a gun in the home, but also be encouraged to support this public health action [32, 33]. A public health approach is needed. It has been shown to be most effective worldwide [12]. To answer the question: gun restriction (action) will help. It will reduce death!

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**Key words:** Guns, availability, gun control, suicide, Austria.

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