

Suicide in Switzerland: why gun ownership can be deadly

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Summary

There is a great deal of empirical evidence that owning a firearm increases the risk of dying from suicide. Most suicides are impulsive. Nearly 50% of survivors of suicide attempts report that they took less than 10 minutes between the decision to die and their suicide attempt. The great majority of these suicide survivors never make another attempt and die of natural causes. Because nearly 90% of firearm suicide attempts have a deadly outcome, gun owners are unlikely to have such a second chance. These impulsive suicide attempts are typically carried out with the means at hand. Swiss men have much higher firearm suicide rates than men in other European countries and this excess is likely to be due to their easy access to guns, because army conscripts have to keep their guns at home. When the number of conscripts was nearly halved in 2003/4 as a result of the Swiss Army Reform XXI, the number of army-issued firearms was reduced by an estimated 20%. An analysis of suicide rates before and after the reform indicated that male (but not female) suicide rates decreased by 8%, with no evidence of substitution with other means of suicide. If the army would require that the remaining half of conscripts had to keep their weapons at their barracks rather than at home, a further decrease in male suicide rates could be expected.

Introduction

There is a great deal of evidence that having a gun in the house can be dangerous because it increases the suicide risk for all members of that household [1–3]. One of the earliest demonstrations of this association was a case-control study conducted by Kellermann et al. [4] in the USA, comparing suicide victims (cases) with matched controls living in comparable households without guns. Information about the availability of firearms was obtained from the police or friends and relatives of the deceased. Comparison subjects were matched according to sex, race, age range and neighbourhood of residence. Controlling for significant covariates (e.g., alcohol or drug use, hospitalisation due to drinking, prescription of medicine for depression or mental illness), gun availability was associated with a nearly five-fold increase in suicides. Furthermore, guns were chosen in 86% of the suicides in homes with firearms, compared with 6% in homes that lacked firearms. Similar findings were reported from other case-control studies conducted in the USA (e.g., [5–8]).

That household firearm ownership increases the risk of household members dying by suicide has also been confirmed by numerous macro-level studies. Such studies relate gun ownership rates across various countries or US states with suicide rates in these countries or states. A first international comparison conducted by Killias [9] found that gun possession in 18 developed countries was significantly correlated with gun-related suicides. An extended survey of 21 countries replicated this finding [10]. However, most of the macro-level research demonstrating a positive association between gun ownership and suicide rates has been conducted in the USA (e.g., [11–14]).

The most extensive of these studies examined the association of firearm ownership in all 50 US States over a period of 33 years (1981–2013) with the firearm and non-firearm suicide rate in those states [15]. Over these years, the mean estimated percentage of firearm ownership ranged from 12.2% in Hawaii to 72.8% in Wyoming. There was a strong positive association between firearm ownership and firearm suicide rates. Firearm ownership explained 71% of the variance in the firearm suicide rates for males and 49% of the variance for females. Each 10-percentage point increase in firearm ownership increased the male firearm suicide rate by 3.1 per 100,000 and the rate of females by 0.9. Interestingly, firearm ownership was also associated with a decrease in non-firearm suicides, suggesting substitution.

The major weakness of this research is that it is correlational. Although, unlikewith homicide – higher homicide rates might encourage gun ownership – reverse causality is less plausible for the association of gun ownership and suicide rates, third variable explanations are less easily excluded. An even greater problem specific to US macro-level research is that there is no gun registration. In fact, it is illegal for the national or state governments to register guns in a way that ties them to their owners. Although self-reported gun ownership data are available for some years, these studies had to rely mainly on proxy measures of state gun ownership. One such proxy is to use the proportion of suicides in which firearms were used. This proxy correlates 0.80 with survey data of gun ownership. Siegel et al. [16] used an improved proxy that also takes into account the states' hunting license rate. This improved proxy correlated 0.95 with survey gun-ownership data.

Fortunately, recent research on the association of gun ownership and suicide conducted in Switzerland has addressed both of these problems [16, 17]. Switzerland ranks 16th highest in gun ownership rate in the world [18]. Much

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of that gun ownership is due to the militia structure of the Swiss Army, which mandates that soldiers keep their own equipment at home, including all assigned personal weapons. With the Swiss Army Reform XXI, the Swiss Army therefore conducted the equivalent of a natural experiment, when they decreased the discharge age of enlisted troops from 43 to 33 years [16, 17]. As a result, the number of troops was rapidly reduced from 350,000 to roughly 220,000. Although discharged soldiers can buy their army weapons, not everybody makes use of this offer and consequently the number of army-issued firearms decreased abruptly by 20% [16, 17]. Based on an analysis of suicide data between the years of 1995 to 2009, Balestra [16] concluded that this reduction in gun ownership resulted in a 4.9% reduction in gun suicide rates. This effect was *exclusively* due to a 9% reduction in gun-related suicides of men. The effect on women was not statistically significant. Even more important, there was no substitution. The Army reform had no statistically significant impact on non-gun suicide rates. Reisch et al. [17] arrived at the same conclusion when gun suicides were compared with suicides by other means. However, when they analysed all suicide methods separately, Reisch et al. [17] concluded that there might have been a slight increase in railroad suicides.

Why are firearm suicides so deadly?

An analysis of suicide case-mortality rates in the USA for the years 2007–2014, that is the proportion of suicides in a population that resulted in death, reported that although only 8.5% of attempted suicides resulted in death, 89.6% of gun suicides had a deadly outcome [19]. This raises the question, why suicides committed by firearms are so much more likely to result in death than suicides by any other method? After all, guns are only a means to an end. To commit suicide, a person first has to form the intention to do so. However, as interviews with individuals who survived near lethal suicide attempts indicate, the decision to commit suicide is often made impulsively in the throes of some crisis situation such as the break-up of a romantic relationship, the loss of a job or a run-in with the police [20]. Gun ownership enables swift and typically irreversible execution of such a decision

For example, 36% of a sample of 118 patients who had been hospitalised after a recent suicide attempt took only 5 minutes between the decision to die and the actual attempt and 44% took less than 10 minutes [21]. Similarly, 48% of a sample of 82 clinic patients who had been admitted after suicide attempts reported a time span of 10 minutes or less between the first thought of suicide and their attempt [22]. These impulsive suicide attempts are typically carried out with the means at hand [23]. It is therefore unlikely that any of these suicide survivors lived in a gun-owning household, because had they had access to a gun, they would probably not have been around to talk about their attempts.

Such suicidal crises are usually of short duration and will rarely result in further attempts later on, if their fatal outcome is prevented [24]. Although having made a nonlethal suicide attempt is associated with an increased risk of dying of suicide later, the vast majority of people who unsuccessfully attempt to commit suicide are likely to live for many years and ultimately to die of natural causes. Thus, a

Swedish study, which followed up 48,649 individuals who had been admitted to hospital after an attempted suicide for 21 to 31 years, found that only 11.8% later died by suicide [25]. A somewhat lower risk was reported from a study of 11,583 patients, who presented to hospitals in Oxford after an unsuccessful suicide attempt between 1978 and 1997 and were followed until the year 2000 [26]. Three hundred of those patients died by suicide or probable suicide. During the first year following their attempt, the risk increase was 0.7%, after 10 years 2.4% and after 15 years 3.0%. Even though these risk levels are above the suicide risk of normal populations, they still imply that the overwhelming majority of individuals who unsuccessfully tried to commit suicide will survive for a very long time and die of natural causes. Because people who have access to a gun are likely to use it in their suicide attempt, they will be deprived of this second chance.

Limiting or delaying access can save lives

Limiting access to preferred methods of suicide is one of the most effective approaches to suicide prevention [24, 27]. An impressive demonstration of the effectiveness of limiting access to means of suicide was the detoxification of British gas [28]. Between 1955 and 1975, the gas in English homes was changed from toxic charcoal gas to non-toxic natural gas. Following the detoxification of gas, rates of gas suicides fell by 20% for men and 13% for women. Although rates of non-gas suicides increased slightly, there was a substantial drop in overall suicide rates [28].

Given that decisions to commit suicide are frequently made on the spur of the moment and that gun suicides nearly always result in death, any delay in access to their guns might give gun owners time to reconsider and thus save their lives. Impressive evidence comes from a study conducted in Israel with soldiers of the Israeli Defence Force (IDF). The IDF is a conscript army, with 18–21-year-old adolescents having to serve. These conscripts are usually allowed to go home over the weekend and to take their weapons with them. However, in 2006 the IDF changed this rule and weapons had to be left in the base during weekend leaves. This change in rules resulted in a drop in firearm suicides. In the years 2003–2005 there were on average 28 suicides per year, of which 26.3 were firearm suicides [29]. Following the change of rules, the suicide rate decreased by 40% to 16.5 suicides per year from 2007–2008. Most of this decrease was due to a decrease in firearm suicides during the weekend, from an average 10 per year to 3 per year.

Some US states impose a statutory delay on handgun purchases. Whereas in many states, an individual can walk into a shop, buy a handgun and walk out with the gun, many states require a waiting period, which can vary from 48 hours to 14 days. Such waiting periods are important, because studies show that the rate of firearm suicides among handgun purchasers peaks within the first week of the purchase [30, 31]. A study that compared suicide rates in states with delays to those without found that the existence of a purchase delay reduced firearm suicide rates by 2–5%, with no significant increase in suicides by other means [32]. After Wisconsin repealed their 48-hour waiting period on handgun purchase in 2015, firearm-related suicides

increased by 15% for residents living in urban areas [33]. The fact that individuals living in rural areas have a very high rate of gun ownership could have suppressed the effect of the repeal of the waiting period.

Conclusions

With 9.8 suicides per 100,000 inhabitants in 2019, the suicide rate in Switzerland is just below the European average. But Switzerland is unusual with regard to the method of suicide: 33.6% of male suicides in Switzerland are conducted with firearms (as compared with 9.7% in the rest of Europe [34]). The likely reason for this discrepancy is the easy access to guns for Swiss men. Whereas such access is severely restricted in most European countries, this is not the case in Switzerland. In fact, Swiss army recruits have to store their guns at home during their period of service. And after they retire from the military, they can keep their weapons. (This used to be free, but since 2003 their personal weapon has to be purchased, although for an extremely low price). Thus, the government subsidises gun ownership in Switzerland.

A Swiss study of 1112 cases of suicide by firearm between 2000 and 2010 concluded that 435 suicides (39.1%) were carried out with an army weapon [35]. The authors further noted that these army weapons were most commonly used by 20- to 35-year-olds, an age group that was likely to still serve in the army. Given that Balestra [16] found practically no evidence of substitutions in her study of the effects of troop reductions on suicide rates and that men did not use other suicide methods in the absence of guns, it seems likely that most of the 435 suicides committed with army weapons could have been prevented if the Swiss army required that guns had to remain in the army base.

One could argue that such a requirement would have been superfluous, because since 2007, soldiers are no longer allowed to take home ammunition (“Taschenmunition”). Furthermore, they had to return the ammunition they had been given previously. However, this raises the question, how people could kill themselves with an army weapon, if they had no ammunition? Apart from the fact that this ammunition (.225 Remington) can easily be bought in gun shops [36], and that soldiers often take ammunition home during their time of service, it seems that at least by November 2009, 60,000 tins of ammunition previously distributed, each containing 50 cartridges, had not been returned (Jungfrau Zeitung, 29 December 2009). A more intriguing question is the military value of having a gun at home but no ammunition. As an active Swiss staff officer explained to the Jungfrau Zeitung on 29 December 2009: *“For reasons of tradition, state and security policy, it was decided that conscripts should take their personal weapons home. Without ammunition this makes no sense”*.

Potential competing interests

The author has completed and submitted the International Committee of Medical Journal Editors form for disclosure of potential conflicts of interest. No potential conflict of interest was disclosed.

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