

Lethal Means Restriction:
Its Value and Its Problems

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Suicide occurs everywhere in the world, but the rates, means and demographics of suicide vary considerably. A study published in 2001 by Reza, Mercy and Krug¹ examined data from 1990. They found an average global rate of 15.5 per 100,000. The highest overall suicide rate was in China, where the rate among women was uniquely higher than among men. The male to female ratio for suicide globally was 1.5. The highest male to female ratios were in sub-Saharan Africa (4.7), the formerly socialist economies (4.3) and the United States (4.3). Thus in the United States, males have completed suicide in 1990 and in the years since about four times as often as females, although it has been found that women attempt suicide three times as often. This ratio is a direct result of the lethality of the means used.

The use of a gun is the primary method for suicide in the United States. More than half the suicides are completed with guns. Males carry out ninety percent of the gun suicides, which accounts for fifty-five percent of all suicides by males. Males account for 80% of all suicides by all means. Young adult males 20-24 and older adult males 65 and older have the highest rates of suicide and of suicide by gun (CDC)². If gun suicides could be reduced, we maintain that the overall rate of suicide in the United States would also be reduced. There are, of course, many confounding factors. Suicide is a complex problem. This presentation will explore the research on the role of guns in suicide, presenting arguments in favor of better enforcement of existing gun laws as well as new gun laws that could be carried out within the framework of the United States Constitution. We will also address the argument regarding substitution of means. We believe it is vitally important to address lethal means, especially guns, because such a high proportion of suicides is completed with guns. To quote Arlene Metha, writing in 1997, in her study of suicide prevention measures taken up by states:

“There were some obvious gaps in the preventive intervention strategies that were reported by the states. Very few states sponsored public education to restrict access to lethal means of suicide (handguns, drugs, and other common methods of

¹ Reza, A. J.A. Mercy, E. Krug. “Epidemiology of violent deaths in the world” Injury Prevention 2001:7:104-111.

² “Working to Prevent and Control Injury in the United States: Fact Book for the Year 2000. Centers for Disease Control and Prevention; National Center for Injury prevention and Control.

suicide) in spite of the strong evidence that suggests stricter handgun control laws have been associated with lower suicide rates.”³

Drawing on our analysis of suicide in Iowa, we found that one of every two people who committed suicide in Iowa during 2002 (156 of 312) did so with the lethal means of a firearm.⁴ This is a slightly lower percentage than in the preceding six years. However, the suicide rate for all age groups by all means, 10.64 for the six years 1996-2001, was just slightly lower, 10.63 in 2002. The rate by guns dropped from 5.60 in 1996-2001 to 5.55 for 2002. The substitution of method did not occur within age and gender categories, but rather across age and gender categories. That is, people in a particular age and gender groups did not choose different means, but rather more people in other age and gender groups chose to end their lives, some using different means. Specifically, the decline in male teen suicides was made up by an increase in suicides by women in all ages. There were sixteen fewer male teen suicides, matched by 16 more female suicides. Women didn't use guns as frequently, but the decline of 14 fewer gun deaths by male adolescents was offset by an increase of 13 in other gender and age categories – 4 more female gun suicides, 9 more male gun suicides. Frustrating! Puzzling!

Let's look at the history of research on lethal means restriction, especially in regard to guns. Researchers and health policy planners have both theorized and demonstrated for years that restricting lethal means of various kinds contributes to a reduction in the suicide rate. Stengel in 1964 had predicted that restriction of guns might lead to an overall lowering of the suicide rate, although he thought there might be a compensatory rise in suicide by drugs.⁵ Zimring in 1968 argued that increasing restrictions on gun would reduce the use of guns in suicide especially among young people, when the resolve to kill is weak.⁶ Kreitman's 1976 study of lethal means restriction showed a reduction in suicide by changing the nature of oven gas in Britain.⁷ Lester in 1990 showed a decrease in suicide in Switzerland with a detoxification of gas.⁸ Loftin et al demonstrated suicide decreased by 23% in the District of Columbia following restrictive gun registration measures passed in 1976.⁹ Ludwig and Cook showed a reduction in gun suicide rates among those 55 and older associated with the Brady

³ Metha, Arlene, Barbara Weber, and L. Dean Webb. "Youth Suicide Prevention: A Survey and Analysis of Policies and Efforts in the 50 States." 1998; *Suicide and Life-Threatening Behavior*, 28(2): 150-164.

⁴ Iowa Department of Public Health

⁵ Stengel, E. Suicide and Attempted Suicide. 1964. New York, Jason Aronson, 1974. Quote from Rich et al, 1990.

⁶ Zimring FE. Is gun control likely to reduce violent killings? 1968. 35 *University of Chicago Law Review* 721.

⁷ Kreitman, N. The coal gas story: United Kingdom suicide rates 1960-71; *Brit J Prev Soc Med*, 1976; 30: 86-93.

⁸ Lester D. The effect of detoxification of domestic gas in Switzerland on the suicide rate. *Acta Psychiatr Scand* 1990; 82:383-4,

⁹ Loftin C et al. Effects of restrictive licensing of handguns on homicide and suicide in the District of Columbia, 1991; *N Engl J Med* 325 (23): 1615-20.

Handgun Violence Prevention Act of 1994. While the overall suicide rate for this age group did not decline as much as did gun suicide, it did show some reduction, strengthening the argument for restrictive gun laws.¹⁰

Marzuk et al¹¹ in 1992 report on their study of the five boroughs of New York City, in which they examined the relationship between the availability of lethal methods and suicide rates. The rates varied significantly from borough to borough. They concluded that the difference in suicide rates was due primarily to the differential in accessibility of lethal methods of injury. They examined many forms of lethal means, including hanging, laceration, suffocation, burns, falls, overdoses, drowning, and firearms.

A change in Canadian gun laws in 1978 provides an opportunity to examine the effect of that change on suicide. Rich et al in 1990¹² reports on suicide rates before and after changes to the Criminal Code of Canada (The Criminal Law Amendment Act of 1977 - Bill C-51). These changes provided tighter restrictions on the ownership of guns by all citizens. This included an almost complete ban on handguns and restrictions for people with previous conviction or psychiatric histories suggesting potential for violence. Rich et al studied the data from five years before the change (1973-1977) and five years afterward (1979-1983). They found essentially no change in the number of suicides. The number with guns decreased but was replaced by the number who took their lives by leaping. A possible factor in reducing the number of gun suicides was the collection of thousands of guns in Toronto.

However, Carrington and Moyer¹³ conducted a subsequent study using a longer time series (1965-77) and (1979-89). They looked at Ontario as a whole rather than just Toronto. They determined that there had been a slight upward trend prior to the change in the law and a slight downward trend since then. The trends were apparent in both firearm and non-firearm suicides. Whether such trends would have occurred without the firearms law is impossible to say. However, the year of the firearms law marked a distinct change in trend.

A yet later study by Lester (2000)¹⁴ using Federal Data from Canada found that while firearm suicides decreased, suicide by other means increased, so that there was little change in the overall suicide rate. He allowed that other changes in socioeconomic

¹⁰ Ludwig J and Cook PJ. Homicide and Suicide Rates Associated with the Implementation of the Brady Handgun Violence Prevention Act, JAMA, 2000, 284:585.

¹¹ - Marzuk PM, Leon AC, Tardiff K, Morgan EB, Satjic M, Mann JJ. The effect of access to lethal methods of injury on suicide rates. Arch Gen Psychiatry, 1992; 49 (6): 451-458.

¹² Rich CL, Young JG, Fowler RC, Wagner J, and Black NA. "Guns and Suicide: Possible Effects of Some Specific Legislation." Am J Psychiatry 1990; 147:3, 1990.

¹³ Carrington PJ, Moyer S. "Gun Control and suicide in Ontario." Am J Psychiatry 1994; 151:4: 606-608.

¹⁴ Lester D. "Gun Availability and the Use of Guns for Suicide and Homicide in Canada." Revue Canadienne de Santé Publique 2000; 91:3:186-187.

conditions may have affected the results, and that male and female rates might also have varied.

The number of suicides by people of different ages may also vary over the course of years. These studies in Canada paid no attention to the age or gender of the suicide completers. We have looked at these factors in Iowa as I have mentioned, and also in Australia. I will discuss implications of these studies. First, let's consider briefly studies from a few other societies – specifically Great Britain, Turkey and Australia.

A study by Hawton et al in 1998¹⁵ showed a reduction in firearm suicide rates among farmers in Great Britain following national legislation in 1989 on firearm ownership, registration and storage. There was also a reduction in the overall farming suicide rate in their study period from 1981 to 1993. Guns were the means of suicide in 40% of the cases, followed by hanging, 30%. The authors conclude that restriction of the availability of methods would reduce the suicide rate.

Goren¹⁶ reported on a study in Diyarbakir, Turkey of 56 children ages 11-19 who had committed suicide between 1999 and 2001. 87% of these were between 15 and 19. Firearms were the most frequent means (43%), followed by hanging (28%) and jumping (16%). They made no recommendations for reducing suicide, but it is clear that a focus on firearms restriction could make a significant difference in this age group.

Data from Australia¹⁷ for the years 1991-2001 show a decrease in the suicide rate by all means for males from 21.7 to 20.1, and by all means for females from 5.9 to 5.1. The decline in the **number** of suicides by **gun** is dramatic – from 487 in 1991 to 242 in 2001, despite an 11% overall population growth from 17 to 19 million. The Port Arthur Massacre of 1996 in which 35 people were killed and 18 wounded stimulated a nationwide move to implement new gun control laws at both State and Federal levels. The Firearms Act of 1996¹⁸ provided for a buyback, which resulted in more than 643,726 semi-automatic rifles and shotguns, including 250 machine guns, turned in at a cost of \$215 million dollars (U.S).^{19 20} This was estimated to be about 20% of all the long guns in Australia. The Act operates on the principle that firearm possession and use is a privilege conditional on the overriding need to ensure public safety.

With fewer guns and a stricter standard for the acquisition of guns, the percentage of males who used guns to commit suicide dropped from 19.1 in 1996 to 14.4 in 1997 and

¹⁵ Hawton K, Gaff J, Simkin S et al. Methods used for suicide by farmers in England and Wales. The contribution of availability and its relevance to prevention. 1998; *The British Journal of Psychiatry* 173:320-324.

¹⁶ Goren S, Gurkan F, Tirasci Y, Ozen S. "Suicide in children and adolescents at a province in Turkey." *Am J Forensic and Medical Pathology* 2003; 24(2): 214-217.

¹⁷ Briefing paper, Suicides 2001. Australian Bureau of Statistics.

¹⁸ <http://www.jcs.act.gov.au/eLibrary/firearms/issuesPaper.pdf>

¹⁹ <http://www.cnn.com/WORLD/9709/30/britain.aus.gunban/>

²⁰ <http://www.theaustralian.news.com.au>

further to 10.1 in 1998. Armed robberies with guns were reduced from 37% in 1993 to 14% in 2000 and no further mass murders have occurred. The percent using guns to commit suicide had been dropping by 1 or 2% per year before the change in the law, but in the two years following the law the percent of gun suicides as a percent of all suicides dropped more than 4% each year.¹ The numbers are striking – from 369 in 1996 to 309 in 1997 and down to 218 in 1998.

Unfortunately, during these years the number of male suicides went up – by 212 from 1996 to 1997 - with large increases in hanging and poisoning. In subsequent years the numbers of those hanging themselves leveled out and the numbers using poison fell back. Still, with the growth in population, the overall suicide rate has gone down. The suicide rate by all means is down even more significantly for young people, ages 15-24, from 26.7 in 1991 to 20.3 in 2001 for males, and for females from 6.3 to 4.8. The numbers in the 15-24 year old group also declined, for males from 376 to 276, and for females from 86 to 63. The drop in rate for people over age 75 is even more dramatic – from 38.2 to 24.4 for men and 8.1 to 5.6 for women. For males the rate went up in only one age category – 25-34 year olds, and for women also in only one age category – 35-44 year olds. The decline in the number of gun suicides has had a greater effect on the young and the old, where there has been a greater decline and less substitution than among people in the middle years.

As in any society, there are innumerable confounding factors – socio-economic, demographic, quality of medical treatment, divorce rate, substance abuse, level of education, and so forth. But the direction of the suicide death rate in Australia between 1991 and 2001 is down in general for both men and women, and the portion of the suicide attributable to guns is down dramatically. Among male suicides, instead of a quarter in 1991 only an eighth were by gun in 2001.

To summarize all these mind-boggling numbers, the drastic change instituted by the 1996 Gun Law in Australia contributed to a reduction in the suicide rate from 1991 to 2001 for both men and women, most noticeably in young and old men, and in older women. This result coincides with studies of Washington, D.C., the province of Ontario and with Great Britain after changes in gun laws in those places.

Now let's look at the situation in the United States. David Hemenway, Professor of Public Health at Harvard, and others have studied the link between firearm availability and suicide in the United States, focusing particularly on a regional analysis of the US.²¹ Birckmayer and Hemenway²³ suggest that if household firearm ownership rates fell by 10%, the overall suicide rate would fall by 3%. They found that the rate would fall

²¹ Miller M, Hemenway D. "The Relationship between Firearms and Suicide: A Review of the Literature." *Aggression and Violent Behavior* 1999; 4:1:59-75.

²² Hemenway D, Miller M. "Association of rates of household handgun ownership, lifetime major depression, and serious suicidal thoughts with rates of suicide across US census regions." *Injury Prevention* 2002;8:313-316.

²³ Birckmayer J and Hemenway D. Suicide and firearm prevalence: Are youth disproportionately affected? *Suicide and Life-Threatening Behavior* 2001; 31:3:303-10.

more in the 15 to 24 year old group and also the 65-84 year old group. This is consistent with the evidence from Australia.

They followed up on research by Markush and Bartolucci in 1984²⁴ and that by Kaplan and Geling in 1998²⁵. Both of these studies found a significant correlation between suicide rates and firearm ownership in the nine geographical regions of the US. Birkmayer and Hemenway also find an association between suicide and divorce and higher levels of education, without being able to determine causal connections.

Miller and Hemenway²⁶ find that the association between guns in the home and suicide remains high, even when controlling for lifetime depression and suicidal ideation.

In another study, Miller, Azrael and Hemenway²⁷ find evidence that challenges Zimring's 1968 theory that persons with the intent to kill would find other means if guns were restricted. Miller et al find that the strength of intent would not necessarily lead to the use of alternate means. Rather, the presence of the gun in the household is an independent risk factor for suicide. The more homes with guns, the higher the suicide rate, regardless of intent to kill oneself. There may be some substitution, but it is incomplete. The highest rates of association are between firearm availability and suicide, they find again. This is especially true with the youngest and the oldest victims, as we have said, less so with those in midlife between 25-64.

There are other lethal means than guns, and their restriction needs to be taken seriously as well. Let's consider some of the research on these other means.

Annette Beautrais in New Zealand²⁸ studied the effect of the removal of safety barriers on a bridge near a hospital with an acute inpatient psychiatric unit. She found that the number and rate of suicidal jumps increased significantly in the four years following the removal compared with the four years prior. She makes the case that there should be safety barriers at known jumping sites, and such barriers should not be removed.

Another lethal means – Analgesics: Tylenol and aspirin – has come under scrutiny. We don't usually think of Tylenol and aspirin as lethal means, but overdoses are lethal 1-2% of the time. They are much more frequently associated with attempts leading to hospitalization. This is a serious concern. Attempts leading to hospitalization are a significant public health cost, and personal and family crisis. Legislation was introduced in Britain in 1998 to limit the number of pills that may be sold at one time.

²⁴ Markush R.E. and Bartolucci, A. A. Firearms and suicide in the US. *American Journal of Public Health* 1984: 74: 123-127.

²⁵ Kaplan, MS and Geling, O. Firearm suicides and homicides in the US: Regional variations and patterns of gun ownership. 1998: *Social Science Medicine*: 46: 1227-1233.

²⁶ Miller, M, Azrael D and Hemenway D. "Firearm Availability and Unintentional Firearm Deaths, Suicide, and Homicide among 5-14 Year Olds" *Journal of Trauma* 2002: 52:267-275.

²⁷ Miller M, Azrael D and Hemenway D. Household Firearm Ownership and suicide Rates in the United States. 2002: *Epidemiology* 13:5: 517-524.

²⁸ Beautrais, Annette L. "Effectiveness of barriers at suicide jumping sites: a case study." *Australian and New Zealand Journal of Psychiatry* 2001:35:5:557.

Hawton²⁹ found that not only were completed suicides and attempts requiring hospitalization reduced, but also the number of hospital admissions for paracetamol-induced liver damage was down by about 30%, and the number of patients scheduled for liver transplants down by 59%.

In conclusion, the restriction of lethal means is an important component of suicide reduction efforts as well as a contribution to public health in general. All the other measures to reduce suicide need to be taken also – public awareness, community awareness, and training of gatekeepers in the professions, in education and law enforcement. But if the danger of lethal means is ignored, it is as though we are keeping our feet on the accelerator even while we are trying to brake.

The elimination of coal gas in England reduced suicide, fencing bridges reduces suicide, providing smaller packets of analgesics in individually wrapped packages reduces suicide attempts and hospitalizations, and slightly reduces suicide.

A college in Iowa realized that bars used for curtains to separate bedrooms from closets were lethal means in two suicides and one attempt this past spring. They are removing those bars.

Despite attention to gas, analgesics, fences and wooden bars, in the United States more than half the suicides are with guns, particularly in younger and older age groups. Researchers have determined that less availability of guns in the homes would reduce suicide particularly in these age groups. The change in the gun law in Australia in 1996 was followed by significant reductions in the number of gun suicides and all suicides in both younger age groups and those over 75 years.

A step that could be taken that would allow Americans with guns to remove them from their homes during most months of the year would be to arrange for safe storage places outside the home during hunting seasons. Many of the hunting seasons are from November through February or for even shorter periods of time. If gun stores or sheriff's offices or armories could provide safe and secure storage for personal firearms during the spring, summer and early fall, suicides during those months might be reduced significantly.

In our data analysis of Iowa suicides, we found that in the 1996-98 period April was the month with the oldest average age of suicide, June was a month with the 2nd lowest age for suicide (January was the lowest), and August was a high month for total numbers. If older folks didn't have the means in April, younger folks just out of high school or college didn't have the means in June, and those in August didn't have guns, these deaths might be prevented.

²⁹ Hawton, Keith. United Kingdom Legislation on Pack Sizes of Analgesics: Background, Rationale, and Effects on Suicide and Deliberate Self-Harm. 2002: *Suicide and Life-Threatening Behavior* 32 (3): 223-229.

While the key difference in reducing gun suicide and all suicide would be the unavailability of guns in the home, it is also important to reduce the overall environment of gun availability. This is where an organization specifically focused on reducing gun violence in general has an advantage over a state agency.

Iowans for the Prevention of Gun Violence has been working on ways to reduce the flow of guns in the secondary market through stricter application of existing laws and persuasion on business people to change their practices for the sake of improving public health and safety.

An example of the former is alerting auction houses that take possession of guns for sale that they must have a Federal Firearms License and conduct background checks on buyers. Several auction houses in Iowa have stopped selling guns until they are able to obtain such a License. This will make it a bit more difficult for unauthorized people – minors, domestic abusers and felons – to acquire guns.

Another step is to persuade newspapers not to carry classified ads by individuals for guns. Many large newspapers have changed their policy in regard to this. Last April in Florida a man bought a gun from a private seller through a classified ad, and proceeded to shoot his estranged wife with it. That newspaper has changed its policy, as well as a number of other newspapers in the state.

Significant newspapers that have changed their policy include the Chicago Tribune and Philadelphia Inquirer. There are two in Texas – the Houston Chronicle and Dallas Morning News; two in Michigan - Detroit Free Press and Detroit News; and five in Florida - Miami Herald, Sarasota Herald Tribune, Bradenton Herald, Ocala Star Banner, and Northwest Florida Daily News. Only three in this ten state region that have taken this step – the Denver Post and Rocky Mountain News in Colorado, and the Dubuque Herald Tribune in Iowa. This is something you may want to promote in your state. We can help you, especially if you have a gun violence prevention group in your state.

One cannot draw a direct connection between these measures and suicide prevention, but if guns are harder to obtain for those who are prohibited from having guns, it is bound to make a difference across the board. There would be fewer gun crimes, fewer homicides, fewer suicides, fewer unintentional deaths, and fewer legal interventions, otherwise known as suicide by cop.

A more direct level approach is for medical, mental health and social service professionals to incorporate in their intake and counseling practices to guns in the home. The American Association of Pediatricians urges their practitioners to do this. Family physicians have addressed this issue also. Any person can help by urging their pediatrician or family physician to make a question about guns in the home a routine part of their intake practice.

Parents, by asking if the homes of their children's friends have guns, could make a difference not only in their child's safety, but also in the safety of the families of their children's friends.

Reducing suicide by gun and in general is a community responsibility, with attention paid to the means as well as to the other factors. No one solution is perfect or complete. We must use many approaches. Lethal means restriction is an essential component of a total plan.