



Small Arms: A Major Public Health Hazard

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Firearms have been a significant cause of both civilian and combatant deaths in recent times. When weapons remain in circulation following a conflict, death and injury rates remain high as interpersonal violence replaces violence among warring factions. Despite data limitations, rates of firearms death and injury are linked to access to firearms. In many countries, arms-fuelled violence is a major impediment to the provision of basic health care. While strategies to address the problem must respond to local conditions and capacity, there are many opportunities for international cooperation on research and on measures to reduce demand and control supply. [M&GS 2001;7:26-32.]

Violence has been identified as a pandemic by the World Health Organization (WHO). Weapons, particularly firearms, play a significant role in violence not only in countries that are engaged in military conflicts, but also in countries that are considered peaceful. Although the surveillance data is uneven at best, the total mortality from firearms is believed to exceed 500,000 deaths per year worldwide.¹

As Robin Coupland, a surgeon with the International Committee of the Red Cross (ICRC) has written:

Weapons are bad for people's health... Yet health professionals have been slow to recognize that the effects of weapons are, by design, a health issue,

and moreover, constitute a global epidemic mostly affecting civilians.²

This article will focus on exploring the global health effects of firearms including handguns, rifles, shotguns and military weapons. The UN Panel of Governmental Experts on Small Arms has defined firearms as: "Revolvers and self-loading pistols; rifles and carbines; submachine-guns; assault rifles; light machine guns."³ For the purposes of this paper, the term small arms will be considered synonymous with firearms.

Research to Date

Despite the health burden of firearms, there is limited research on the international context of firearms death and injury. International data on firearms-related homicide, suicide, and unintentional injuries are not reported consistently for a host of reasons.[†] Victimization studies are compiled from surveys of populations and reported crimes, as well as from such parameters as firearms ownership. Several studies have collected comparative data. For example, the UN International Study of Firearms Regulation has collected data for more than 60 countries and provides updates on the Internet.⁴ The US Centers for Disease Control and

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Prevention has sponsored two studies—a survey of deaths of children in 24 industrialized countries⁵ and another on deaths in high and middle income countries.⁶ There have been studies of industrialized countries,^{7,8} including some comparative research;⁹ and some efforts to examine the problem in conflict zones¹⁰ and in particular countries.^{6,11,12} Many studies have examined aspects of the licit and illicit international arms trade^{13,14,15} but they tend to define the problem in terms of the proliferation of weapons, (i.e. the number of small arms), rather than the human effects. While some try to draw boundaries between "small arms" in conflict and "firearms" in crime, these distinctions are not always meaningful. In contexts such as Colombia and South Africa for example, crime and conflict are not easily separated. Moreover, from a health perspective, the appropriate focus is the protection of human life within the context of human rights and humanitarian law. Deaths caused by firearms are a significant public health problem regardless of the specific context.

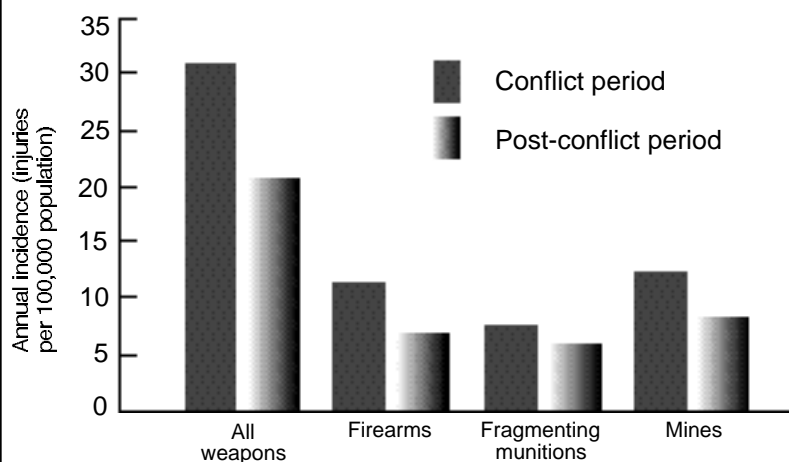
Mortality and Morbidity

An estimated three million people have been killed with small arms in conflict over the past 10 years—about 300,000 per year.¹⁶ Handguns, rifles, shotguns, mortars, and other small arms have been a significant cause of both civilian deaths (conservatively estimated by the ICRC at more than 35%) and combatant deaths.^{17,18} When weapons remain in circulation following a conflict, death and injury rates remain high as interpersonal violence replaces violence among warring factions. One study compared the rate of weapons injury five years before and one and a half years after the region came under uncontested control (Figure 1). Weapons injuries declined only 20-40%. Many working on peacebuilding and disarmament argue that the link between violence levels and access to weapons is self evident.

Another 200,000 per year are killed with firearms in murder, suicide, and "accidents," often in countries that are, at least nominally, at peace. Many of these deaths are preventable. For every death there are additional injuries requiring hospitalization. In Brazil, for example, there are almost 10 times as

† In the US, for example there are approximately four firearm injuries for every firearm death. In Brazil the ratio is 10 to 1 while in Canada the mortality and injury rates are roughly equivalent. This may reflect the "mix" of firearm deaths: In Brazil, most deaths are homicides, in the USA homicide and suicide are roughly equivalent and in Canada there are five times as many firearm suicides as homicides. Lethality rates in homicides are about 93%.

Figure 1. Annual incidence of weapon injuries during conflict and post-conflict periods



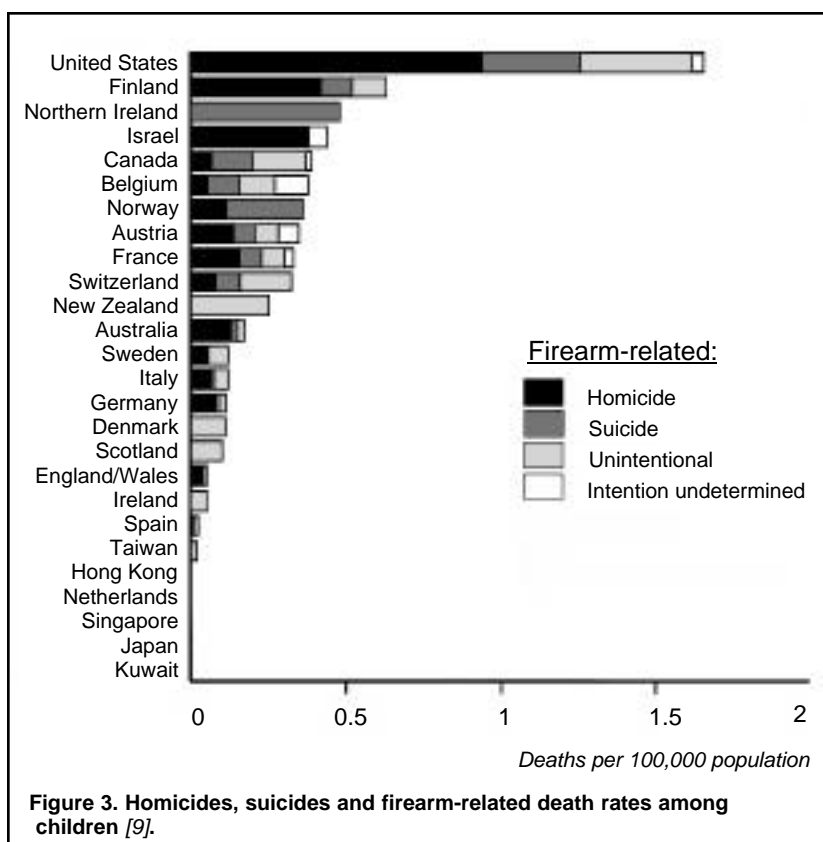
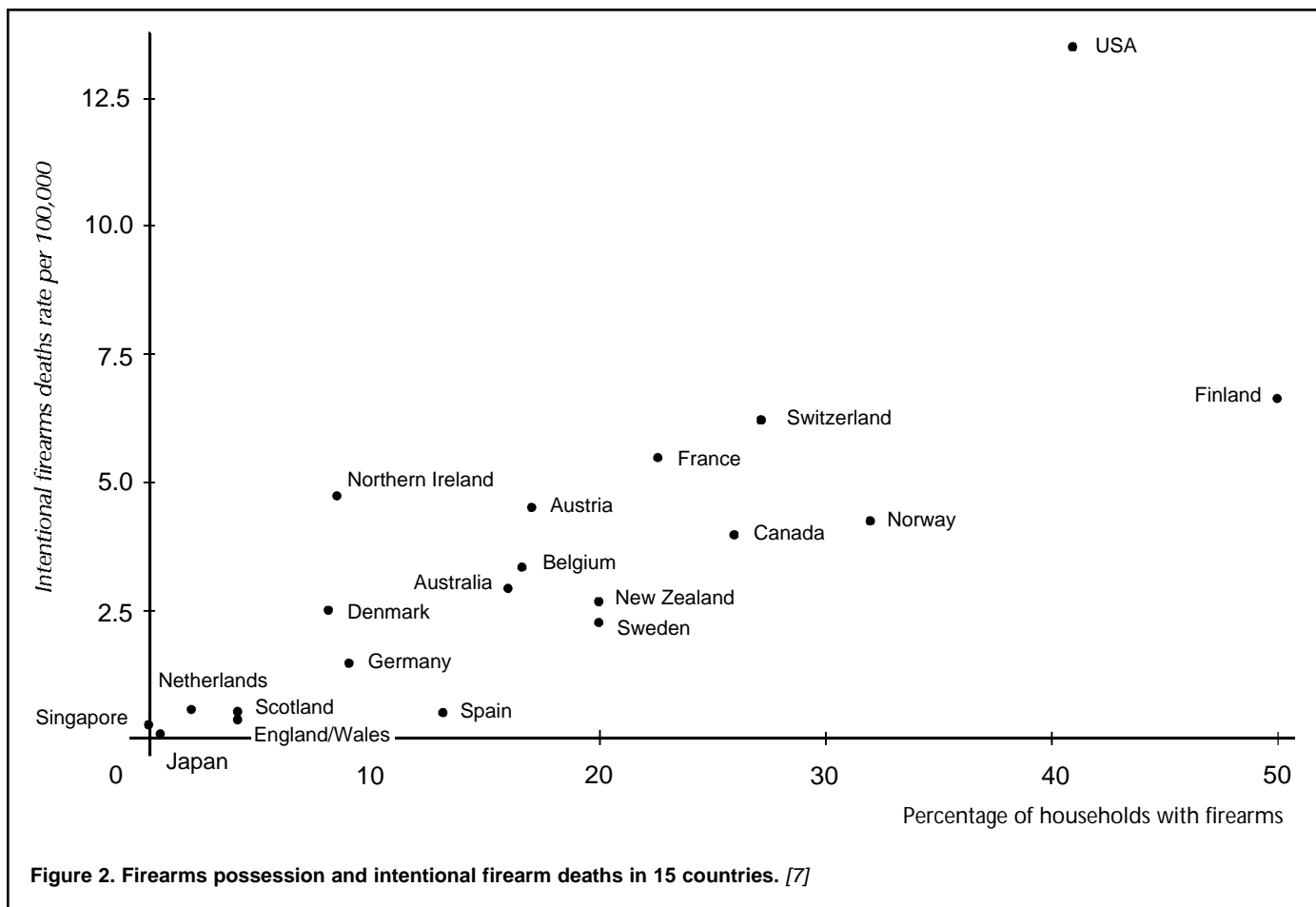
Source: ICRC. Arms availability and situation of civilians in armed conflict. Geneva: ICRC. 1999.

many reported firearm injuries as fatalities, while in Canada and Finland the reported mortality and injury rates are roughly equivalent.⁴ Where other factors remain constant, the level of firearms death tends to vary with levels of firearms ownership in high income and industrialized countries (Figure 2).^{7,8}

Despite the data limitations, a number of studies have explored the relationship between the availability of firearms (measured in many different ways) and firearm death rates.¹⁹ Even considering the complex effects of social, economic, political, cultural, and other factors, a number of researchers have maintained that there is sufficient evidence to conclude that rates of firearms death and injury are linked to access to firearms.^{19,20} In one of the largest studies, based on a standardized survey of victimization in 54 countries, gun ownership was significantly related to both the level of robberies and the level of sexual assaults. There was also evidence that high levels of gun ownership, such as exist in the US, the former Yugoslavia, South Africa, and several Latin American countries, are strongly related to higher levels of violence generally.²¹

Vulnerable Populations

The costs among vulnerable populations are particularly high in both industrialized and developing contexts. Women are seldom users of firearms but are often victims both in the context of war and in domestic violence. Guns figure prominently in the cycle of violence against women and children whether in Canada, Australia, or South Africa.²²⁻²⁴ The patterns of weapons use in domestic violence are remarkably consistent across many cultures. For example, studies in Canada and Australia have shown that firearms play a sig-



nificant role in the cycle of violence. Studies across cultures reveal examples of men shooting pets and threatening to shoot their children during the course of disputes. Readily available firearms are the weapon of choice when men kill their partners. In Canada, for example, on average, 30% of women killed by their husbands are shot. In the US, New Zealand, and Brazil respectively, 55%, 40%, and 46% of domestic homicides involve firearms.²⁵ Consistent with other international studies, research in South Africa suggests that more women are shot at home in domestic violence situations than are shot by strangers on the streets or by intruders.²⁴

In many developed countries, firearms are a leading cause of mortality among children and youth⁵ (Figure 3) and these groups represent a large percentage of the victims of conflict, both as combatants and as casualties.²⁶ A number of studies have revealed that the poor are most likely to become victims of violence.²⁷

Human Rights and Governance

The proliferation of weapons is also an impediment to sustainable peace, long term stability, and reconciliation. The importance of effective domestic regulations in reducing the misuse and proliferation of small arms

has been affirmed by the UN in several different contexts, including Security Council Resolution 1209 (1998); the Report of the Disarmament Commission considered at the General Assembly (1999); and the Report of the UN Commission on Crime Prevention and Criminal Justice (1997). There is no right to bear arms under any international human rights instrument. Even in the US, where advocates of civilian gun ownership have claimed Constitutional rights to bear arms without regulation, courts have repeatedly and unanimously maintained that the Second Amendment to the US Constitution does not impede local, state, or national legislatures from enacting or enforcing gun control laws.[†] While controversy over the interpretation of the Second Amendment is a preoccupation in the US, the notion that an unregulated right to bear arms exists has been dismissed in many other jurisdictions including South Africa, the United Kingdom, New Zealand, and Canada.

Internationally, there is little legal basis for unregulated civilian possession or use of small arms as a right. All human beings have the right to life, liberty, and security of the person under Article 3 of the Universal Declaration of Human Rights, the preamble of which states that freedom from fear is one of the highest aspirations of the common person. Freedom from physical or psychological violence is a prerequisite to the enjoyment of fundamental human rights. War has been defined as a means of violating human rights, while the United Nations Charter provides the foundation for peace as a human right.^{††}

Firearm Violence Impedes Development and Health

Economic harm is among the secondary effects of firearm violence. The economic costs of violence in Latin America, including costs of policing as well as the value of life lost, consume an estimated 14% of GDP. In Brazil, 10% of GDP is consumed by violence, and in Colombia the figure rises to 25%.²⁸ Firearms figure prominently, accounting for more than 70% of homicides in Colombia and 88% of homicides in Brazil.⁴ Even in devel-

oped countries, the economic costs of violence are staggering. In Canada, the costs of firearms death and injury (including murder, suicide, and unintentional injuries) have been estimated at \$6.6 billion per year.⁹

Violence has been identified as a major impediment to the provision of basic health

Small Arms Consequences: Regional Perspectives

In some regions (e.g. Afghanistan, the Horn of Africa), conflict is a priority; in others (e.g. Brazil), crime is the most compelling problem; in still others (e.g. Canada, Finland), suicide and unintentional injury are significant. In many regions where new democratic institutions are colliding with the effects of the transition to a global economy (e.g. South Africa, Colombia, and the former Soviet republics), conflict and crime are inseparable. Some examples:

Afghanistan

- Small arms easily flow between military and civilian populations
- High rates of injury (80 deaths per 100,000) even in peaceful region; 50% of those were firearm related

Brazil

- Approximately 50,000 Brazilians murdered every year, 88% of them with firearms
- Rate of firearm death has increased 320% since 1979
- 59% of youth aged 15-19 who die of external causes are killed with firearms

South Africa

- 25,000 South Africans murdered in 1998, half of them with firearms
- Firearms are one of the leading causes of non-natural death in South Africa
- Vast majority of firearms used to kill in South Africa are pistols and revolvers (57.4%), followed by hunting rifles and shotguns (24.8%)

Colombia

- 19,336 firearm murders in 1998
- Annual homicide rate increased 366% from 1983 to 1993, and 80% of homicides involve firearms

Canada and the United States

- Access to handguns severely restricted in Canada, but an estimated 20% of households have firearms
- Approximately 1,200 people killed with firearms in Canada each year, the majority of them with rifles and shotguns in suicides
- 32,000 people killed each year with firearms in the US

Finland

- Second highest rate of firearms death among children aged 14 and under, according to survey of 26 industrialized countries
- Over 5-year period (1985 to 1989), 1,268 persons required hospital treatment for injuries caused by firearms; 1,295 persons died at the scene of a shooting or during transport to hospital

[†] United States v. Cruikshank 92 US 542 (1875); United States v. Miller 307 US 174 (1939); and Lewis v. United States 445 US 55 (1980) all hold that the Second Amendment of the US Constitution does not guarantee any individual the right to possess firearms.

^{††} The United Nations Declaration on the Right of Peoples to Peace, GA Res. 39/11, 39 GAOR Supp. (No. 51), UN Doc. A/39/51 (1985) states in Article 2 that "...the preservation of the right of peoples to peace and the promotion of its implementation constitute a fundamental obligation of each State."

care; moreover, it diverts resources from other health and social services. Treating firearms injuries absorbs considerable emergency room resources.⁹ Arms-fueled violence also creates problems with blood availability and supply. Emergency responses to large scale violence often do not accommodate careful testing for HIV and result in additional problems. Violence and the prevalence of weapons also create psychological stress that fuels other health problems and creates insecurity. Finally, the proliferation of weapons and the production of those weapons and ammunition have been linked to a wide range of environmental and health impacts.²⁹

Firearms and the Global Culture of Violence

The “culture of violence” is both a cause and an effect of small arms and light weapons availability. A culture of arms possession, created and normalized during the militarization of societies, can contribute to individuals resorting to a gun as their first instrument for resolving problems. The cycle of violence is difficult to break: fear leads to arming, which breeds violence, which leads to insecurity, which leads to further arming. Firearms undermine long term efforts to build a civil society, whether in war zones or inner cities. Much of the demand for guns, particularly military weapons and handguns that serve little practical purpose, may be exacerbated by violent movies and television programs that tend to link heroism with guns and violence. The suggestion that there is a link between values and gun violence was made prophetically by the Rev. Dr. Martin Luther King, Jr., in November 1963:

By our readiness to allow arms to be purchased at will and fired at whim; by allowing our movies and television screens to teach our children that the hero is one who masters the art of shooting and the technique of killing...we have created an atmosphere in which violence and hatred have become popular pastimes.³⁰

A Public Health Perspective: Focus on the Instrument

The public health perspective begins by an analysis of the problem to identify the causal links in the chain of events that lead to an injury, and then proceeds to break them at their weakest point. While a focus on root causes is undeniably important, public health also requires that we focus on the vector/vehicle of injury, in this case the weapon. While it is possible to kill with other means, firearms are a particularly efficient instrument and are more likely to cause death, severe injuries, and

multiple victims. In addition, firearms enable children, who might otherwise lack the strength, to kill themselves and others more readily.

Some people have maintained that there is little evidence to support the link between access to firearms and rates of death, and have disputed studies proposing that stricter controls on firearms reduce gun death and injury.^{31,32} Some have even suggested that increasing access to firearms through arming for self protection saves lives and reduces injury.^{31,33,34} The methodological problems with some of these studies aside, the bulk of the refereed research offers sufficient evidence to conclude that rates of firearms death and injury are linked to access to firearms and that measures to reduce or control access are effective in reducing these rates.^{19,35-40}

Stricter regulatory controls reduce availability and risk by defining who may have weapons and under what circumstances. Safe storage regulations, which create barriers between the user and the instrument, may also be seen as measures limiting availability. Gartner has suggested that there is also an important interaction between laws and values: countries with stricter controls send a signal about the acceptability of violence in the same way that legislation has been observed to have long term effects on other behaviors such as smoking, drunk driving, and drug abuse. For example, Australian states with registration of firearms had significantly lower rates of homicide and suicide with firearms than states without registration.⁴¹

The homicide of a family member has been reported as 2.7 times more likely to occur in a home with a firearm than in a home without guns.⁴⁰ After accounting for several independent risk factors, another study concluded that keeping one or more firearms was associated with a 4.8-fold increased risk of suicide in the home.⁴⁰ The risks increased, particularly for adolescents, where the guns were kept loaded and unlocked.⁴²

Towards a Comprehensive Strategy

There is little doubt that firearms represent a significant burden of mortality and morbidity on an international scale and that globalization has fueled the supply. While strategies to address the problem must respond to local conditions and capacity, there are many opportunities for international cooperation on research and on measures to reduce demand and control supply.

Complex global health problems require multi-layered global solutions and firearms are no exception. The International Action Network on Small Arms (IANSA) paper

"Focusing attention on small arms: opportunities for the UN 2001 Conference on the Illicit Trade in Small Arms and Light Weapons in All Its Aspects," which has been endorsed by more 50 organizations,⁴³ includes the following key recommendations:

- take measures to counter demand;
- improve data collection and information sharing;
- prevent and combat illicit transfers through developing legally binding instruments on marking and brokering;
- control legal transfers between states to reduce the risk that weapons will be used in human rights violations;
- control the availability, use and storage of small arms within states, including strong domestic firearms regulation and a ban on civilian possession of military weapons;
- collect and destroy surplus weapons from both civil society and regions of conflict;
- increase transparency/accountability;
- enhance resources to support effective implementation;
- support research and information sharing; and
- improve coordination between government and civil society at all levels.

Conclusion

Firearms are a major global threat to health. To date, however, international health organizations have had limited involvement in the small arms/firearm issue. Even though the weight of scientific evidence would seem to suggest a link between access and negative health effects, it is a complex issue and many are reluctant to draw conclusions. But as Austin Bradford Hill noted regarding the need to control tobacco products in 1965:

All scientific work is incomplete—whether it be observational or experimental. All scientific work is liable to be upset or modified by advancing knowledge. That does not confer upon us a freedom to ignore the knowledge we already have, or to postpone the action that it appears to demand at a given time.⁴⁴

Some would prefer to avoid the issue because of the strong and vocal forces that oppose any efforts to restrict access to weapons, however modest they may be, and that even encourage the use of firearms as solutions to the problem of violence. There are also efforts to grow the market for guns by promoting the notion that increasing

firearms ownership increases safety. Certainly there have been parallels drawn between gun lobby and the tobacco lobby efforts to shape the research agenda and to block any regulatory efforts. But public health issues—whether poverty, tobacco, AIDS, or the effects of firearms—are never easy. As Virchow said, "Medicine is a social science and politics nothing but medicine on a grand scale."⁴⁵

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