



Armed Violence

Robin M Coupland, FRCS

The effects of armed violence are measurable. The key determinants of the effects of armed violence are the potential of the weapon to cause the effect; the number of potential armed users; the vulnerability of the victim; and the potential for violence. Identifying the determinants of the effects of armed violence and understanding how the determinants interact can predict the results of the design, production, transfer, or use of weapons. Appropriate strategies to prevent and limit these effects then become apparent. [M&GS 2001;7:33-37]

Violence has been defined as “the intentional use of physical force or power, threatened or actual, against oneself, another person, or against a group or community, that either results in or has a likelihood to result in injury, death, psychological harm, maldevelopment or deprivation.”¹ How do weapons play into this definition? The *Oxford English Dictionary* defines a weapon as a “material thing designed or used or usable as an instrument for inflicting bodily harm.”

The link among the definitions of health, violence, and weapons is an expectation that the severity and nature of the effects of violence on health are determined to some extent by which weapon or weapons are used. Certain other facts, however, cannot be overlooked:

- a weapon, in altering or extending “physical force or power, threatened or actual,” gives a person the potential to execute violence in a way he or she could not otherwise do;
- weapons differ considerably both in the way they are used to execute violence and in their potential to do so; and

- the type and number of weapons available influence not only how, when, and why the violent act is committed, but also who the victims are and how they are affected.

Violence and armed violence are not one and the same.

Unravelling the complexity of the relationship between violence and weapons necessitates an epidemiologic analysis of the effects of armed violence on individuals or populations.

The Determinants of the Effects of Armed Violence

The effects of armed violence are measurable (Table 1).²⁻¹⁶

Use of a weapon constitutes an act of armed violence. Before a person can suffer the effects of use of a particular weapon, that weapon must have been transferred into the hands of the user; before that, it had to be produced; before production, it had to be designed and developed.¹⁷ The activities along this self-evident continuum are important potential determinants of the effects of armed violence. For example, the design of a firearm permits its user to inflict physical harm by creating tissue damage, which is caused when a bullet transfers its kinetic energy to the body. The extent of tissue damage is determined by the mass, velocity, construction, and stability in flight of the bullet¹⁶ as well as by the rapidity with which the weapon can fire multiple bullets. These are

*RMC is a surgeon and adviser on the effects of weapons with the ICRC Chief Medical Officer. Address correspondence to Robin M. Coupland, FRCS, 29, Erindale Avenue, Elsternwick, 3185 Victoria, Australia.
E-mail: rmcoupland@hotmail.com*

Table 1. Examples of measurable effects of armed violence

- Number of people in a particular location who are killed or injured [4,11,12,15]
- Mortality from injury [4,8,9]
- Number or proportion of people with a particular injury [5,8]
- Size or number of wounds per person [6,8,16]
- Proportion of people injured in war who are non-combatants [2,5,7,10,13,14,28]
- Number of people who suffer a particular disability or social deprivation [5]

the “design-determined” effects of the weapon.⁸ The potential to use a weapon, however, is influenced by the weapon itself, the user’s perception of the design-determined effect, and the number of other people armed. The user’s perception of the vulnerability of the intended victim or victims also comes into play.⁹

Compare the effects of aerial bombardment to kill a certain number of people with the effects of machetes to kill the same number. Aerial bombardment requires design and production of the technological means; the violence is perpetrated at a distance by a user at the end of a chain of command. By contrast, killing with a machete requires an extraordinary desire to kill on the part of the individual user;^{18,19} killing many people by this means requires that many people to be so armed. In both cases, the number of people killed and the ease with which they can be killed are further influenced by whether the potential victims can find protection from the armed violence.

Whatever the nature of armed violence, the key determinants of the effects (Table 2) are:

- the potential of the weapon to cause the effect (corresponding to design);
- the number of potential armed users (corresponding to production and transfer);
- the vulnerability of the victim (the potential to suffer the effect); and
- the potential for violence (intentional use of physical force).

These determinants interact as long as the potential of each is above zero. Each determinant is a necessary, but not a sufficient, cause of the effects of armed violence. The impact of armed violence is influenced by the user’s perceptions of the other determinants. In brief, the complex relationship between weapons and violence is played out in the psychology of the user or users.¹⁹ In this relationship, the weapons themselves constitute a major determinant of the nature, timing, and extent of armed violence. We are

accustomed to the idea that weapons are often developed with strategic purposes in mind. What has been less obvious is that the strategies available to military forces, to police, to terrorists, and to criminals are, in many ways, tailored to the weapons that are made available.

Identifying the determinants of the effects of armed violence is the first step in preventing or restraining armed violence. Table 2 shows examples of measurable effects of armed violence, their determinants, and appropriate measures to prevent or limit these effects. Although some determinants may weigh more heavily in the interaction than others, no single determinant stands alone; the other three determinants must also be considered.

Armed Violence, War and Civilians

Two important issues relating to the development and use of weapons can be clarified by considering the determinants of the effects of armed violence: civilian injuries from weapons of war and new “non-lethal” weapons.

“Surgical” air-strikes using precision-guided missiles are said to be inherently “discriminate.” By the arguments given above, however, “collateral damage” (an effect) is subject to the same determinants. Several factors lead to a predictable rise in the chances of civilian deaths and injuries:

- the failure rate of precision targeting and the area covered by explosive force;
- the number of such strikes;
- the degree of unpreparedness of the population (lack of warnings, shelters etc.); and
- the selection of targets (military/non-military) in populated areas, in relation to the intent to cause physical harm.

Considering the determinants of “collateral damage” permits its prediction.

An examination of the interactions of determinants reveals that vulnerable civilians may be killed or injured more easily—whether intentionally or unintentionally—as a result of the development, production, transfer, and use of weapons that bring greater military advantage. That this effect is compatible with both greater respect for the Geneva Conventions and better military discipline is an important but little-recognized paradox. These trends mean that those responsible for the continued development, production, and transfer of weapons carry increasingly heavy responsibilities for ensuring training and discipline within the armed

Table 2. Effects of armed violence: determinants and examples of interventions.

Effects	Determinants				Prevention/limiting strategies
	Potential to cause effect:	# potential armed users:	Violence:	Vulnerability of victim(s):	
Number of civilians killed or injured by aerial bombardment	-wide area covered by explosive force	-number of bombs dropped	-intent to hit military objectives near civilians or -intent to kill civilians	-unprepared civilian population -dense population	-limit area covered by explosive force -reduce number of bombs dropped -ensure only military targets are selected with minimal risk to civilians -air raid alarms and shelters -avoid selecting targets in urban areas -avoid placing military installations in urban areas that could become targets -respect 4th Geneva Convention
Number of people killed by machete	-weight and sharpness of blade	-number of people with machetes	-intent to kill	-unarmed victims "herded" into confined space	-any measure to avoid incitement to kill -prevent prior "herding" of victims by threat of use of firearms
Number of people suffering traumatic leg amputation by buried antipersonnel mines	-explosion under foot triggered by foot pressure -mines that remain in the ground for years	-numbers deployed	-where and when mines are laid	-no knowledge of mine location -necessity for risk taking behavior	-respect all measures stipulated in Ottawa Treat of 1997 (Mine Ban) -mine clearance and mine awareness programs
Number of children killed or injured in schools by firearms	-energy carried by bullet -number of bullets that can be fired	-widespread availability of firearms to adolescents	-intent to shoot classmates	-children in classroom unable to escape -children unprotected	-legislation about types of weapons available -legislate availability of weapons to adolescents -prevent students entering schools with weapons -armed guards -eliminate gun culture -limit exposure of children and adolescents to violent images
Number of people killed or injured by military rifles outside armed conflict	-energy carried by bullet -number of bullets that can be fired	-number of such weapons available -ammunition available	-use outside armed conflict	-use in crowded streets -poor training leading to accidents -inability to defend oneself	-eliminate transfer of weapons to undisciplined forces -discarm combatants -improve discipline among armed forces -enforce domestic law
Number of people displaced from their homes by threat of use of rifles and grenades	-fear of design-determined injury by rifles or grenades	-number of potential armed users	-intent to move people from homes	-inability to defend oneself -desire to avoid fighting because of risk to family members	-eliminate transfer of weapons to undisciplined forces -influence the top of the chain of command -promote respect for 4th Geneva Convention among politicians and commanders -improve physical security of the home
Number of people in a city deprived of clean drinking water by air strikes	-explosive force easily disrupting electricity supplies and facilities to pump and clean water	-number of strikes	-intent to deprive a population of electricity and/or water	-dependence on centralized water supply	-avoid such targets -prepare alternative water supply -promote respect for 4th Geneva Convention among politicians and commanders

forces that use these weapons. They must also ensure greater understanding of—and greater respect for—the international legal instruments that protect civilians during armed conflict.

Large numbers of civilian injuries are caused by small arms and light weapons in different countries all over the world. During the Cold War era, small arms were transferred into the hands of many untrained, undisciplined, or non-military users.^{12,14,15,20-22} Compounding the effects of the widespread availability of these weapons is the automaticity of modern military rifles.

“Non-Lethal” Weapons

New weapons developed for police use, peacekeeping, and military uses have been labelled “non-lethal.”²³⁻³³ Proponents of these new weapons consider their “non-lethality” only in terms of the design-determined effects. Rubber bullets and tear gas, however, come under the same label, and both have caused fatalities. The “lethality” of any weapon—that is, the mortality among people affected—is not determined solely by the design. The other determinants—especially vulnerability—must also be considered.⁹ Tear gas used on people in a confined space provides an example.

A number of questions must be answered before “non-lethal” weapons are embraced as a means to reduce death and injury on the battlefield:

- Is a soldier more likely to use a weapon if he or she believes it to be non-lethal?
- Does threat of use of a conventional weapon as a form of posturing—an effective and well-established strategy of armed violence¹⁹—cause fewer deaths than firing a “non-lethal” weapon?
- If “non-lethal” weapons are used in combination with conventional weapons, as dictated by current military strategy,^{23,33} will this elevate the mortality from conventional weapons because of increased vulnerability of the victims?^{9,25}

Considering the effects of armed violence using “non-lethal” weapons in the light of the determinants of these effects will help to answer these questions.³⁴

Conclusions

The examination of the interplay of violence and weapons begs a definition of armed violence. An appropriate definition is:

The intentional use—threatened or

actual—against oneself, another person, or against a group or community of any material thing designed or used or usable as an instrument for inflicting bodily harm that either results in or has a likelihood to result in injury, death, psychological harm, maldevelopment, or deprivation.

A more provocative definition, however, would finish with: “...and the development, production, and transfer of any such material thing.”

Identifying the determinants of the effects of armed violence and understanding how the determinants interact can predict the results of the design, production, transfer, or use of weapons. Appropriate strategies to prevent and limit these effects then become apparent.

The objective of disarmament law is to reduce the chance that armed violence will involve certain types of weapons. The objective of international humanitarian law (the principle elements of which are the 1949 Geneva Conventions and their 1977 Additional Protocols) is to impose limits on how weapons are used in war and prohibitions on the use of certain weapons in war. Both bodies of law have developed through recognition of the effects of the design, production, transfer, and use of weapons. An epidemiological approach to armed violence is an essential component in promoting and strengthening all laws, including international laws, pertaining to weapons and armed violence.

Objective observation, documentation, and publication of the effects of armed violence are the role and responsibility of health professionals. Fulfilling this role also makes health professionals effective advocates for domestic and international laws about weapons and their use.^{17,35,36}

Therefore, those who are not thoroughly aware of the disadvantages in the use of arms cannot be thoroughly aware of the advantages in the use of arms.

—Sun Tzu³⁷

References

1. **Koplan JP, Rosenberg M, Krug E.** Violence prevention: A public health policy. Atlanta: Centers for Disease Control and Prevention. 1998.
2. **Aboutanous MB, Baker SP.** Wartime civilian injuries: Epidemiology and intervention strategies. *J Trauma* 1997;43:719-726.
3. **Bellamy RF.** The medical effects of conventional weapons. *World J Surg* 1992;16:888-892.
4. **Coupland RM.** Epidemiological approach to the surgical management of the casualties of

war. *Br Med J* 1994;308:1693-1697.

5. **Coupland RM, Korver A.** Injuries from antipersonnel mines: The experience of the International Committee of the Red Cross. *Br Med J* 1991;303:1509-12.
6. **Coupland RM.** Hand grenade injuries among civilians. *JAMA* 1993;270:624-626.
7. **Coupland RM, Samnegaard HO.** Effect of type and transfer of conventional weapons on civilian injuries: Retrospective analysis of prospective data from Red Cross hospitals. *Br Med J* 1999;319:410-412.
8. **Coupland RM (ed).** The SirUS project: Towards a determination of which weapons cause "superfluous injury or unnecessary suffering." Geneva: International Committee of the Red Cross. 1997.
9. **Coupland RM, Meddings DR.** Mortality associated with use of weapons in armed conflict, wartime atrocities, and civilian mass shootings: literature review. *Br Med J* 1999;319:407-410.
10. **Jeffrey S.** Anti-personnel mines: Who are the victims? *J Accid Emerg Med* 1996;13:343-346.
11. **Kellerman AL, Reay DT.** Protection or peril? An analysis of firearm-related deaths in the home. *N Engl J Med* 1986;314:1557-1560.
12. **Meddings DR.** Weapons injuries during and after periods of conflict: Retrospective analysis. *Br Med J* 1997;315:1417-1420.
13. **Meddings DR.** Are most casualties non-combatants? *Br Med J* 1998;317:1249-1250.
14. **Meddings DR, O'Connor SM.** Circumstances around weapon injury in Cambodia after departure of a peacekeeping force: Prospective cohort study. *Br Med J* 1999;319:412-415.
15. **Michael M, Meddings DR, Ramez S, Gutiérrez-Fisac JL.** Incidence of weapon injuries not related to interfactional combat in Afghanistan in 1996: Prospective cohort study. *Br Med J* 1999;319:415-417.
16. **Sellier KG, Kneubuehl BP.** Wound ballistics. Amsterdam: Elsevier 1994.
17. **Coupland RM.** The effects of weapons on health. *Lancet* 1996;347:450-451.
18. **Dallaire RA.** The end of innocence: Rwanda 1994. In: Moore J. (ed) *Hard choices: Moral dilemmas in humanitarian intervention.* Lanham: Rowman and Littlefield. 1998.
19. **Grossman D.** On killing: The psychological cost of learning to kill in war and society. Boston: Little, Brown. 1995.
20. **Boutwell J, Klare MT, Reed LW (eds).** *Lethal commerce: The global trade in small arms and light weapons.* Cambridge, Massachusetts: Committee on International Security Studies American Academy of Arts and Sciences. 1995.
21. **Gamba V.** Introduction. In Gamba V (ed). *Society under siege: Crime, violence and illegal weapons.* Halfway House: Institute for Security Studies. 1997.
22. **International Committee of the Red Cross.** *Arms availability and the situation of civilians in armed conflict.* Geneva: ICRC. 1999.
23. **Institute for Foreign Policy Analysis.** *Non-lethal weapons: Emerging requirements for security strategy.* Washington DC: Institute for Foreign Policy Analysis. 1996.
24. **Arkin WM.** Acoustic anti-personnel weapons: An inhumane future? *Medicine, Conflict and Survival*. 1997;14:314-326.
25. **Coupland RM.** "Non-lethal" weapons: Precipitating a new arms race. *Br Med J* 1997;315:72.
26. **Dando M.** A new form of warfare: The rise of non-lethal weapons. London: Brassey's. 1996.
27. **Klaaren JW, Mitchell RS.** Nonlethal technology and airpower. *Airpower Journal Special Issue* 1995:42-51.
28. **Lewer N, Schofield S.** Non-lethal weapons: A fatal attraction? London: Zed Books. 1997.
29. **Doswald Beck L (ed).** *Blinding weapons.* Geneva: ICRC. 1993.
30. Editorial. Weapons intended to blind. *Lancet* 1994;344:1649-1650.
31. **Gillow JT.** Another weapon too far: The antipersonnel laser. *JR Soc Med* 1995;88:347P-349P.
32. **Marshall J.** Blinding laser weapons. *Br Med J* 1997;315:1392.
33. **NATO.** NATO policy on non-lethal weapons. (Press statement). Brussels: NATO. 13 Oct. 1999.
34. **Fidler DP.** The international legal implications of "non-lethal" weapons. *Michigan Journal of International Law* 1999;21:51-100.
35. **International Committee of the Red Cross.** *The medical profession and the effects of weapons (Symposium).* Geneva: ICRC. 1996.
36. **World Medical Association.** Statement on weapons and their relation to life and health. 48th General Assembly of the World Medical Association. Somerset West, Republic of South Africa: WMA. October 1996.
37. **Sun Tzu.** *The art of war.* Boston: Shambala. 1988.