

Armed conflict and child health

Michael Rieder,¹ Imti Choonara²

¹University of Western Ontario, London, Canada
²Academic Division of Child Health, University of Nottingham, Derbyshire Children's Hospital, Derby, UK

Correspondence to

Imti Choonara, Academic Division of Child Health, University of Nottingham, Derbyshire Children's Hospital, The Medical School, Clinical Sciences Wing, Uttoxeter Road, Derby DE22 3DT, UK; imti.choonara@nottingham.ac.uk

Accepted 2 February 2011
 Published Online First
 9 March 2011

SUMMARY

Armed conflict has a major impact on child health throughout the world. One in six children worldwide lives in an area of armed conflict and civilians are more likely to die than soldiers as a result of the conflict. In stark contrast to the effect on children, the international arms trade results in huge profits for the large corporations involved in producing arms, weapons and munitions. Armed conflict is not inevitable but is an important health issue that should be prevented.

INTRODUCTION

Unfortunately, over the last 500 years we have experienced more years of war than of peace in Europe, Africa and Asia.¹ In the last decade there have been between 14 and 21 major armed conflicts each year.² Although this may seem a relatively small number in comparison with the number of countries, the impact of war/conflict on child health is staggering. It has been estimated that more than 1 billion children were living in areas in conflict or emerging from war in 2006.³ Three hundred million of these children were under the age of 5 years. It is ironic that as weapons become more sophisticated and more legislation is passed to try and control war, the proportion of civilians involved as casualties has steadily increased (table 1). It is troubling to note that over the last century the ratio of civilian to military deaths has risen progressively. In part, this relates to the increasing range and lethality of military ordnance; in 1902 lethal fire was largely limited to line of sight, while contemporary military units can produce lethal injury for a radius of many kilometres. Additionally, urbanisation and a shift in the focus and pace of combat operations have moved military action into closer and closer proximity to civilians, with predictable results. Regrettably, the 'empty battlefield' described in military texts is often not empty of non-combatants.

Terrorist attacks on civilians have resulted in significant numbers of children being killed or injured. Internal conflicts are usually associated with even higher ratios of civilian to military casualties than the conflicts between nation states illustrated in table 1. The so-called 'war on terror' has also significantly affected children. More than 1500 children are being held in detention in Iraq.³ Palestinian children as young as 12 years of age are being held in Israeli prisons and the transfer of Palestinian child prisoners outside the occupied Palestinian territory into Israel has been noted to be in direct violation of the Fourth Geneva Convention.⁴ It is important to recognise that a cessation of violence does not necessarily result in a cessation of effects on child

health. Psychological trauma following conflict is a significant problem in children and additionally landmines cause both death and injury for many years after conflict. This article aims to explore links between different aspects of armed conflict and child health.

WHO PROFITS FROM WAR?

Civilians and children in particular who are caught up in a conflict, be it internal or between different states, invariably want to return to a peaceful life as soon as possible. The UK saw the largest ever demonstration in its history where an estimated 2 million people (almost 4% of the population) marched through London on an antiwar protest prior to the invasion of Iraq. In contrast to innocent civilians who wish to lead a peaceful life, one has to recognise that the international arms market results in enormous profits for key companies involved in the development, manufacture and export of weapons and munitions.

The total global military expenditure in 2008 is estimated to be US\$1464 billion.² Over 40% of this spending occurred in a single country, the USA, the defence expenditure of which is equivalent to that of the next 14 countries combined. The six largest arms-producing companies in the world consist of five American companies and BAE from the UK. Each of these six companies made more than US\$1 billion in profit in 2007.² Boeing alone made US\$4 billion profit. The political influence of these major companies is considerable.

The evolution of the major companies involved in arms sales occurred during the Cold War and issues about government–industry relations are not new. Concern about the influence of the 'military industrial complex' was first raised by Dwight Eisenhower, the former US President, in 1961 when he stated "In the councils of government, we must guard against the acquisition of unwarranted influence, whether sought or unsought, by the military industrial complex. The potential for the disastrous rise of misplaced power exists and will persist."⁵ The arms business is not a uniquely Western domain. Russia is the world's second largest exporter of arms and in the last decade, China has doubled the number of weapons and munitions exported.

High military expenditure in high-income countries has an adverse effect on child health in those countries. The USA has been discussing whether it can afford a universal health insurance scheme and yet does not question spending over US\$600 billion per annum on weapons. Within the UK, despite a huge deficit in the budget and the need for major cuts in public expenditure, the two main political parties are committed to spending between £20 billion and £95 billion on



This paper is freely available online under the BMJ Journals unlocked scheme, see <http://adc.bmj.com/info/unlocked.dtl>

new nuclear weapons.⁶ It is noteworthy that the UK, which has been involved in 17 different wars since World War II, has twice the under 5 mortality of Sweden, which has not been involved in a war for almost 200 years.^{7 8}

There is a marked contrast between the amount of money spent on weapons and munitions versus the costs of attaining the millennium development goals (MDGs). It has been estimated that the cost of halving the proportion of people without sustainable access to safe drinking water and basic sanitation (MDG7) could be achieved by spending US\$18 billion each year over the next decade⁹ (table 2).

SMALL ARMS

Prior to the Iraq war much was made of the phrase 'weapons of mass destruction'. Unfortunately for children the 'weapons of mass destruction' are usually small arms which are weapons that can be carried and used by an individual. In many poor countries where internal conflict is widespread, small arms are readily available and incredibly cheap. Small arms and light weapons are thought to be responsible for the deaths of at least 1000 people each day.¹⁰ They are thought to be responsible for up to 90% of the direct conflict deaths each year.¹⁰ The most widespread military weapons in the world are variants of the Kalashnikov assault rifle (AK-47 and AK-74). It is estimated that there are between 50 and 70 million AK-47s worldwide and they can be purchased in some countries for \$12.¹⁰

Each year 8 million guns are manufactured worldwide and in the same year less than 1 million guns are destroyed by authorities.¹⁰ The number of small arms is therefore rapidly increasing. In addition, with cleaning and maintenance, small arms are incredibly durable; as an example, there are still models of the Austrian Roth-Steyr pistol in use in Eastern Europe—this pistol was manufactured for the cavalry of the Austro-Hungarian Empire in 1907. Guns can remain in society for a long period after conflict and this is illustrated by the experience in Guatemala where a civil war ended in 1996. Despite the end of the civil war, the rates of gun violence have increased since the end of the war and each day 25 people are killed or seriously injured by gun shots.¹⁰ The International Action Network on Small Arms has been working to try and highlight the problem associated with the proliferation in misuse of small arms worldwide.

LANDMINES

It is estimated that there are more than 80 million landmines still in the ground worldwide.¹¹ These landmines result in between 15 000 and 20 000 new casualties each year. Landmines remain a problem following the end of the conflict and more than 90% of landmine victims today are civilians, with one in four of these victims a child. Recognition

Table 1 Ratio of military to civilian casualties: selected major conflicts of the 20th and 21st centuries*

Conflict	Civilian/military deaths
Russo-Japanese War (1904–1905)	0.16
World War I (1914–1918)	0.72
World War II (1939–1945)	1.71
Korean War (1950–1953)	3.09
Vietnam War (1964–1973)	2.17
Invasion/occupation of Iraq (2003–)	7.78

*Total military deaths in selected conflicts 39 961 000; total civilian deaths in selected conflicts 56 728 000.

that landmines affected civilians more than military personnel resulted in a widespread movement that led, in 1997, to the so-called Mine Ban Treaty. The Mine Ban Treaty has been a major step forward but it is important to recognise that not all countries have ratified the agreement. It is estimated that there are more than 10 million landmines in both Afghanistan and Angola.^{12 13} Clearance of land mines is dangerous, demanding and costly. As well as causing direct casualties, the extensive landmines have a major negative impact on farming and the economy.

CLUSTER BOMBS

Cluster bombs are weapons that can be dropped from the air or fired from the ground and release dozens or hundreds of submunitions, which are in effect smaller bombs. They effectively scatter devices that will detonate over a wide area and hence have difficulty distinguishing between military targets and civilians. Many cluster bombs fail to detonate on impact and therefore become the equivalent of landmines. They were responsible for more civilian casualties in Iraq in 2003 and Kosovo in 1999 than any other type of weapon. Following the successful 1997 Mine Ban Treaty, many civil society organisations have worked together to ban cluster bombs.¹⁴ Over 100 countries have signed the Convention on Cluster Munitions but unfortunately several key countries have so far neither signed nor ratified the treaty.

CHILD SOLDIERS

Children are actively being recruited or abducted and forced to fight in wars, a problem that is made worse by the greater availability of small arms. It is estimated that there are more than 300 000 child soldiers worldwide.¹⁵ Small arms are not only durable, but the care and use of modern small arms is simple enough that most school age children can use and maintain them. As an example, in Uganda, 90% of the soldiers in the Lord's Resistance army consisted of children.¹³ Children as young as 4 years of age were abducted and forced to be involved in military action. Children are forced to take part by a combination of direct physical abuse, threats and drugs.¹³ Children who do manage to escape from these armed military groups often have long-term psychological problems.¹⁵

DEATH AND DISABILITY

Children may die during a war from direct trauma but it is thought that more die from starvation, illness such as infections or a combination of factors involving the loss of their parents in the aftermath of war.¹⁶ More than 1.5 million children are estimated to have died as a direct result of violence in just over a decade.¹⁶ The children involved in violent conflicts are usually in low-income countries or in disadvantaged communities within lower-income to middle-income countries. It is usually impossible to get accurate numbers of children killed in military conflicts because those responsible, whether they

Table 2 Military expenditure in 2008

Annual estimates	Billion US\$	Reference
Military expenditure, USA	607	2
Military expenditure, UK	65	2
Profit from arms sales (BAE Systems)	1.8	2
Cost of achieving MDG7 (safe drinking water and sanitation)	18	7

be government armies or military groups, invariably will try and ensure that the media is not accurately informed or that the other side is blamed.¹⁷

The effect of the war in Croatia (an upper middle income country) on a small community, however, has been described in detail.¹⁸ The community involved consisted of 28 500 children under the age of 18 years. In a 13-month period, 215 children were wounded and 46 killed. Over two-thirds of the children killed and wounded were boys. Children (both boys and girls) over the age of 10 years were more likely to be killed or wounded than younger children. Most of the children died or were injured as a result of machine gun fire, rockets or bombs, including cluster bombs dropped from aircraft. A study of 94 children treated at one Croatian hospital following war-related injuries found that the majority were wounded during shelling or bombing or leftover explosive devices.¹⁹ Almost 40% of the children had a permanent disability. The long-term effects on the health of children (both physical and mental) are described in the following sections.

DISPLACEMENT AND DISEASES

Civilians will try and escape conflict areas. Twelve million children have been made homeless by armed conflict and direct conflict is the single most important factor in the creation of refugees.²⁰ The highest mortality in groups of refugees are in children under the age of 5 years.²¹ The most common causes of death include diarrhoeal diseases, acute respiratory infections, measles, malaria and severe malnutrition.²¹ Simple measures, such as provision of soap and avoiding contamination of water, can have a major impact on reducing mortality.²¹

A combination of factors including displacement, infectious diseases, increased poverty and decrease in food production result in increasing levels of malnutrition in children during armed conflict. The armed conflict in Mozambique in the 1980s resulted in a documented increase in child malnutrition.²² The number of cases of malnutrition admitted to hospital in the capital increased dramatically over a period of 2 years and by 1990 malnutrition was the leading cause of child mortality in hospital.²² Sixteen per cent of the children admitted with malnutrition were from families displaced by war. A survey of rural areas at this time found that 53% of children under the age of 5 years had stunted growth and 7% were wasted. There were outbreaks of both cholera and measles, especially in overcrowded, displaced populations.

ACCESS TO HEALTHCARE AND EDUCATION

Direct conflict often results in difficulties for the civilian population to access basic services such as healthcare and education. It is important to recognise that in many conflicts, the aim is not to win the war but simply to de-stabilise the country. This strategy was used by the USA in Nicaragua²³ and South Africa in Mozambique in the 1980s.²² In both cases, military groups that were supported by foreign governments hostile to the government in power in the host country, targeted schools and health centres. The Mozambican National Resistance destroyed or looted almost half of the primary healthcare centres in Mozambique. They also targeted primary schools and 45% of the primary schools closed and half a million children lost access to education.²² A similar strategy was used in Nicaragua where 106 of the 450 health units in the country became inoperable by the contras stealing medicines or placing landmines under the clinic walls.²³ These tactics have unfortunately become increasingly popular with many different groups worldwide.

An illustration is the situation in Afghanistan. Attacks on schools and healthcare facilities have increased dramatically in recent years and in a 12-month period in Afghanistan there were 133 incidents of attacks on schools.³ Some of the attacks deliberately targeted female students and teachers. In a similar time period in Thailand, more than 100 schools were deliberately burnt down.³ In 2006, five staff members of Médecins Sans Frontières were deliberately murdered resulting in the withdrawal of Médecins Sans Frontières from Afghanistan. Armed groups that wish to de-stabilise a country are extremely unlikely to abide by legal conventions and it is essential that the arms trade is more tightly controlled and monitored to prevent these groups obtaining weapons.

PSYCHOLOGICAL PROBLEMS

Children who are either involved in or are witnesses of armed conflict are likely to experience a variety of psychological problems ranging from anxiety and depression to post-traumatic stress disorder (PTSD). The prevalence of PTSD will clearly vary depending upon the nature of the armed conflict and what the child has observed. The prevalence of moderate to severe PTSD in one study of 234 children aged 7–12 years was just over 40%.²⁴ One year after the conflict the prevalence had fallen to 10%.²⁴ The Rwandan genocide was one of the most violent conflicts in modern history. Over half a million civilians were murdered in a few months. A study of over 1500 Rwandan children and adolescents, 1 year after the killings, found that the levels of probable PTSD ranged from 54% to 62%.²⁵ Ninety-five per cent of the sample were still re-experiencing symptoms. The authors felt that the extreme degree of violence witnessed (over 90% witnessed killings and had their lives threatened, 30% witnessed rape or sexual mutilation and 15% hid under corpses) suggests that psychological resilience may be extinguished and that the prevalence of PTSD may not decrease. Children who are exposed to military violence for prolonged periods may develop aggressive behaviour themselves and it is ironic that children in this situation may therefore see armed conflict as a solution to the problems, thus perpetuating the violence.²⁶

WHAT CAN HEALTH PROFESSIONALS DO?

The fact that one in six children worldwide lives in an area of armed conflict should be of concern to all health professionals.^{3 27} The impact of armed conflict on child health is dramatic in that as well as deaths from direct violence, deaths from infectious diseases and malnutrition increase dramatically.²¹ Health professionals need to be aware that politicians who are prepared to describe the death of innocent children as 'collateral damage' are unlikely to divert funding from military expenditure to either health or education. Health professionals unfortunately will need to constantly challenge the so-called wisdom of subsidising expenditure on weapons while cutting back expenditure on health and education.

Health professionals can make contributions as individuals by writing to local papers. Individually, they can also support key organisations in reducing armed conflict, such as the International Physicians for the Prevention of Nuclear War.²⁸ The International Physicians for the Prevention of Nuclear War have, as one of their main campaigns, reducing mortality and morbidity from small arms, which unfortunately are a major problem worldwide. Health professionals can have a far greater impact when they work collectively, especially by the involvement of professional organisations which have a responsibility to make representations to politicians on

behalf of disadvantaged children throughout the world. This approach has been highly successful in relation to landmines and cluster bombs.^{11–14} A recent successful initiative in the UK was a national meeting organised by the International Child Health Group, which is associated with the Royal College of Paediatrics and Child Health, on armed conflict and its effect on mothers and children.²⁹

The education of both health professionals and the public on the impact of armed conflict on child health is essential. The decision by three international medical journals to each produce a special issue on the theme of conflict, violence and health is to be welcomed.³⁰ It is also a topic that should be included within the undergraduate curriculum of all health professionals.

An informed and candid debate on the nature of armed conflict—and on how to prevent and avoid these conflicts—is essential if the international community is to make any impact on the many problems produced by the effects of armed conflict on women and children. Armed conflict is not inevitable and is an important public health issue which has a major adverse impact on children worldwide.

Acknowledgements Dr Rieder holds the CIHR-GSK Chair in Paediatric Clinical Pharmacology at the University of Western Ontario.

Provenance and peer review Commissioned; externally peer reviewed.

REFERENCES

1. **Pearn J.** Children and war. *J Paediatr Child Health* 2003;**39**:166–72.
2. Stockholm International Peace Research Institute. *Sipri yearbook 2009: armaments, disarmament and international security*. Oxford: Oxford University Press 2009.
3. UNICEF. *Machel study 10-year strategic review. Children and conflict in a changing world*. UNICEF, New York, USA, 2009.
4. United Nations. Children and armed conflict: Report of the Secretary-General. UN Document A/62/609-S/2007/757. New York, 21 December 2007, paragraph 86.
5. **Eisenhower DD.** Military-industrial complex speech, 1961. <http://coursesa.matrix.msu.edu/~hst306/documents/indust.html> (accessed 16 Jun 2010).
6. Ekklesia. Trident will cost nearly five times predicted price, 2009. www.ekklesia.co.uk/node/10245 (accessed 25 Aug 2010).
7. Wikipedia. List of wars involving Great Britain, 2010. http://en.wikipedia.org/wiki/List_of_wars_involving_Great_Britain (accessed 27 Sep 2010).
8. UNICEF. *The state of the world's children 2009. Maternal and newborn health, 2008*. UNICEF, 2009.
9. **Hutton G,** Bartram J. Global costs of attaining the Millennium Development Goal for water supply and sanitation. *Bull World Health Organ* 2008;**86**:13–19.
10. International Action Network on Small Arms (IANSA). Gun violence: the global crisis, 2008. www.iansa.org (accessed 10 Jan 2011).
11. **Sirkin S,** Cobey JC, Stover E. Landmines. In: Levy BS, Sidel VW, eds. *War and public health*. Second edition. Oxford: Oxford University Press 2008:102–16.
12. International Campaign to Ban Landmines. Afghanistan landmine fact sheet, 2010. www.afghan-network.net/Landmines/ (accessed 13 Sep 2010).
13. **Albertyn R,** Bickler SW, van As AB, et al. The effects of war on children in Africa. *Pediatr Surg Int* 2003;**19**:227–32.
14. Anonymous. Cluster munitions coalition. The problem, 2010. www.stopclustermunitions.org/the-problem (accessed 31 Aug 2010).
15. **Barbara JS.** The impact of war on children. In: Levy BS, Sidel VW, eds. *War and public health*. Second edition. Oxford: Oxford University Press 2008:179–92.
16. **Wexler ID,** Branski D, Kerem E. War and children. *JAMA* 2006;**296**:579–81.
17. Wikileaks. Afghan war diary, 2010. http://www.wikileaks.org/wiki/Afghan_War_Diary_2004-2010 (accessed 20 Sep 2010).
18. **Jelic A.** Child casualties in a Croatian community during the 1991–2 war. *Arch Dis Child* 1994;**71**:540–2.
19. **Terzic J,** Mestrovic J, Dogas Z, et al. Children war casualties during the 1991–1995 wars in Croatia and Bosnia and Herzegovina. *Croat Med J* 2001;**42**:156–60.
20. **Plunkett MC,** Southall DP. War and children. *Arch Dis Child* 1998;**78**:72–7.
21. **Moss WJ,** Ramakrishnan M, Storms D, et al. Child health in complex emergencies. *Bull World Health Organ* 2006;**84**:58–64.
22. **Cliff J,** Noormahomed AR. The impact of war on children's health in Mozambique. *Soc Sci Med* 1993;**36**:843–8.
23. **Garfield RM.** War-related changes in health and health services in Nicaragua. *Soc Sci Med* 1989;**28**:669–76.
24. **Thabet AA,** Vostanis P. Post traumatic stress disorder reactions in children of war: a longitudinal study. *Child Abuse Negl* 2000;**24**:291–8.
25. **Neugebauer R,** Fisher PW, Turner JB, et al. Post-traumatic stress reactions among Rwandan children and adolescents in the early aftermath of genocide. *Int J Epidemiol* 2009;**38**:1033–45.
26. **Gouta S,** Punamäki R-L, Miller T, et al. Does war beget child aggression? Military violence, gender, age and aggressive behaviour in two Palestinian samples. *Aggressive Behav* 2008;**34**:231–44.
27. **Waterston T.** Paediatricians' role in war prevention. *J Trop Pediatr* 2005;**51**:128–9.
28. International Physicians for the Prevention of Nuclear War. Home Page, 2010. <http://www.ippnw.org> (accessed 14 Jan 2011).
29. International Child Health Group. Home Page, 2010. <http://www.ichg.org.uk> (accessed 10 Jan 2011).
30. **Panter-Brick C.** Conflict, violence, and health: setting a new interdisciplinary agenda. *Soc Sci Med* 2010;**70**:1–6.