

# Landmines: the human cost

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Landmines are the things for defence in the future. We have covered the works with them, and they have deterred all attack, and done much execution.

— General Gordon 1884

It is a day [following the ratification of the Ottawa Treaty] whose arrival few could have predicted, and whose import to the millions whose lives or limbs may be saved from these barbarous weapons cannot be overestimated. The battle ahead is to make this Treaty fully effective, not just in law, but also in implementation, not just in the capital of the signatories but also in the fields and forests where mines exist.

— Kofi Annan, United Nations Secretary-General, 1999

THE INVENTION OF GUNPOWDER fostered the military mining of fortresses and strongholds in medieval Europe. In the American War of Secession, wooden boxes filled with gunpowder were used and detonated by mechanical and electromechanical fuses. The Germans were the first to detonate mines under their opponent's trenches in the First World War, and then in 1915, the British used the Royal Engineers to start mining the German positions. By June 1916, no less than 25000 men from Canada, Australia and the United Kingdom were involved in this form of mine warfare.<sup>1</sup>

Antitank mines were developed with the arrival of tanks in 1916. These were further developed in the Second World War, and various types of mines have been used in virtually every major conflict since.<sup>1</sup>

Although there are clear guidelines for the use of mines in warfare which delimit their use to defined zones, these "rules" have been totally ignored in many recent military conflicts.



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## Synopsis

- ◆ Each week an estimated 500 people are killed or maimed by landmines, most of them civilians, many of them children.
- ◆ Landmines have been laid indiscriminately in many recent conflicts. Plastic mines are common and difficult to detect. Over a hundred million mines are estimated to be planted around the world, almost all in developing nations.
- ◆ The deleterious economic effects of landmines are the loss of accessible and arable land, strains on the health system, loss of productive labour, inhibition of the repatriation of refugees, and obstruction of economic development.
- ◆ Despite the difficulties involved, landmine clearance programs are viable and necessary.
- ◆ The Ottawa Treaty, ratified in 1998, bans the production, use, stockpiling or transfer of mines, and calls on signatory nations to clear minefields within 10 years. Unfortunately, the USA, Russia and China are not signatories.
- ◆ Australia is an active contributor to international efforts to eliminate the scourge of landmines in the developing world.

*ADF Health 2000; 1: 93-98*

There are currently more than 60 types of landmines used in conflict zones. Many of these are made of plastic, and so are difficult to detect. They may float away in flood water, moving many kilometres from their original site of deposition, and may therefore pose a distant threat. One nasty offshoot has been the development of plastic butterfly shaped "baby killer" mines dispersed from aircraft, which are treated as toys by unsuspecting innocent children.<sup>1,2</sup>

For the citizens of the war-torn countries of the world, landmines are an ever present danger which kill and maim members of their families, friends and neighbours, disrupt their means of livelihood, restrict commerce and ultimately limit their personal freedom. The injuries and deaths caused by landmines often occur years after the mines have been laid and the conflict has ended.

Landmines kill and maim children and adults at an alarming rate and there is a tremendous human cost as a result. The magnitude of the landmine scourge is not generally appreciated or considered by those living in countries like Australia, which are unaffected directly by war.

## The scope of the landmine problem<sup>3-5</sup>

- Each week an estimated 500 people are killed or maimed by landmines (one person every 22 minutes).
- More than 100 million antipersonnel landmines are active in some of the poorest countries of the world. Another 100 million landmines are held in stockpiles (International Committee of the Red Cross 1996, UN mining database) .
- 80%–90% of landmine victims are civilians. About 85% of child victims of landmines die before reaching hospital.
- An estimated 400 million mines have been deployed since they were widely used in World War II, and the use of mines has increased over the last 20 years.
- At least 26 of the 200 nations of the world have landmines seeded over their surface.
- One quarter to one third of countries have a significant landmine problem.
- Early in 1997, landmines were being sown in Yugoslavia at the rate of 50 000 per week.
- Angola and Cambodia have more than one mine for every member of the population.
- In Cambodia there are about 35 000 amputees as a result of landmine injuries, or one amputee for every 236 members of the population.
- There are currently 100 000 amputees in Angola.
- The current estimate of the child death rate due to landmines is 800 per month, with another 1 000 to 2 000 children surviving each month with blast injuries and consequent disability.
- Of the preventable causes of child death, landmines rank sixth, after pneumonia, gastroenteritis, malaria, measles and HIV.
- UNICEF estimates that there is about one mine for every 20 of the world's children. In many countries this exceeds the ratio of toys and school books to children.
- The pattern of landmine injuries includes blast injury to the lower limbs, blast injury to the upper limbs, shrapnel injuries, genital/perineal injury, eye injuries including blindness, and deafness due to the blast.
- Up to half the victims who detonate a mine die within minutes of the blast, others die before they reach medical facilities, which are often remote and/or deficient in equipment or expertise.
- Almost 30% of mine casualties recorded in the ICRC database required an amputation. Of these, 17% had one below-knee amputation, 10% had one above-knee amputation, and 3% had both legs amputated.
- The direct costs of a surviving landmine victim are: surgery US\$ 5000, prosthetic care per victim US\$3000.

### Landmine hot spots<sup>5</sup>

Country	Estimated no. of landmines
Afghanistan	10 000 000
Angola	10 000 000
Bosnia	6 000 000
Croatia	3 000 000
Cambodia	4 000 000
China	10 000 000
Egypt	23 000 000
Eritrea	1 000 000
Ecuador	60 000
Honduras	30 000
Iran	16 000 000
Iraq	10 000 000
Mozambique	3 000 000
Nicaragua	108 000
Somalia	1 000 000
Sudan	1 000 000
Ukraine	1 000 000
Vietnam	3 500 000
Zimbabwe	2 000 000

- Clearing a landmine costs US\$200–\$1 000.
- Many child amputees require at least one reamputation in the following years because of differential growth rates of overlying tissues and the bone.



*The magnitude of the physical damage caused by a land mine explosion.*

## Rebuilding the lives of mine injury survivors

The rehabilitation process must teach the victims to walk or use their arm with their new prosthesis. The adult victims, most of whom are farm labourers, require retraining for employment in such fields as education, manufacturing or mine clearance. The many child victims require a great deal of support, with rehabilitation and education.

Prostheses must be manufactured. Charities such as Handicap International (supported by World Vision and Austcare) are able to set up a limb-making factory and train the local people in how to make simple but effective prostheses from local materials. This promotes self-sufficiency and independence, and builds a sense of pride in their community.

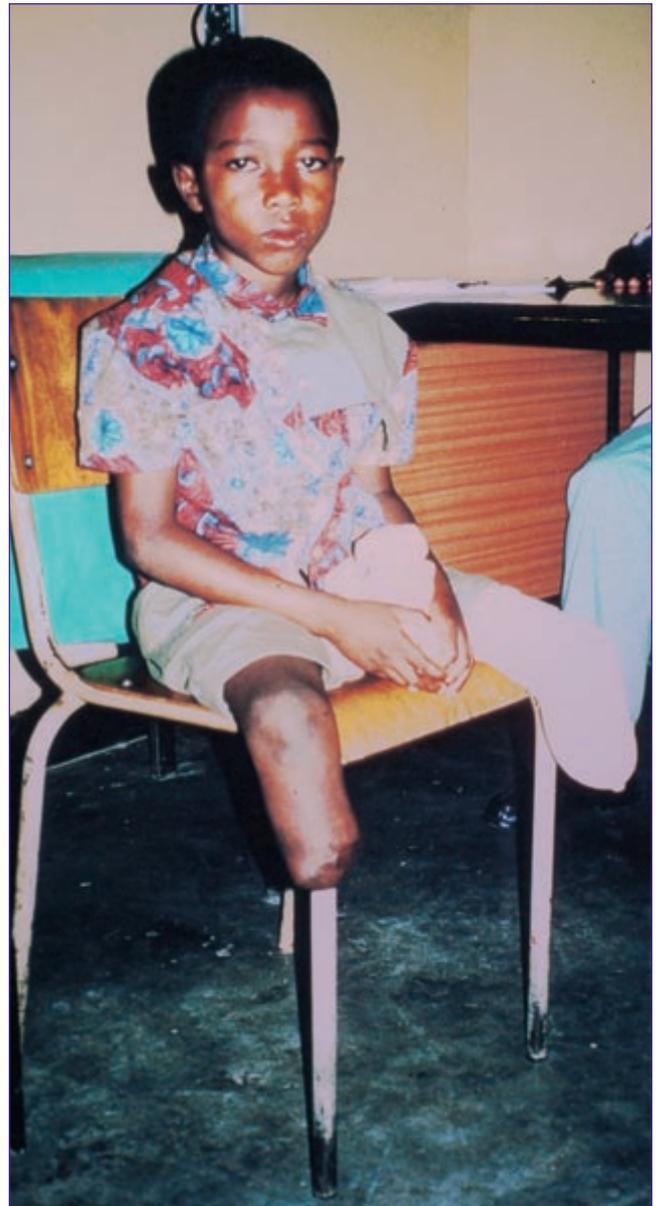
Mine survivors usually face profound psychological difficulties as well. Their injuries disturb body image, productivity and sexual relations. Post-traumatic stress disorder is common, but it is an under-recognised condition in the developing world, perhaps partially due to language barriers, and lack of psychological and psychiatric services for the victims. Often the victim is socially stigmatised and ostracised. Survivors become dependent members of their family and society. Often the family is uprooted in order to look after the victim in hospital and during rehabilitation. The survivor's dependence contributes to a loss of self-esteem. Depressive illness is a common sequel.

Psychological counselling is an essential part of rehabilitation, with the aim of returning a sense of dignity to the victim, and rebuilding their self-esteem and confidence so that they feel they are still useful people.

In the developing world, a high level of amputation is often required because of the prolonged journey from the place of injury to the hospital, a delay which increases the tissue injury in the affected limb(s). There may also be improper or inadequate treatment. The surgeon may have had no training in the correct techniques for the amputation and the instruments, disposables and facilities are often deficient. Anaesthesia may be poor, incomplete or non-existent. The stump may thus be poorly shaped, which makes fitting the prosthesis difficult, and walking then becomes problematic. It is difficult to fit a prosthesis to an upper limb amputation, with a high rate of rejection, a lengthy training period required to use the prosthesis, and rather poor cosmetic appearance. The ratio of lower limb to upper limb amputations is 16 to 1.

Children are more affected than adults, in terms of physical and mental disability. The disability from mine injuries is lifelong. The aim is for the successful rehabilitation of the young amputee, but above-knee amputees are harder to rehabilitate than below-knee amputees. Chronic arthritis often develops in the good limb because of over-use and over-stress. Low back pain also may develop with an ill-fitted prosthesis, and phantom limb pain is an underestimated problem in the amputees, again because of the lack of pain management expertise amongst caregivers. Treating chronic phantom limb pain is problematic. It may require local surgery to the neuromas of the stump, but more often requires spinal cord stim-

### The tragedy of the landmine victim



*A tragic young Rwandan orphan with bilateral below knee amputations as a result of a landmine explosion. He has a forlorn look of total devastation indicating a profound injury to his soul as well as his legs. Tremendous support will be required to return him to mental and physical health and help him to become an active member of his society.*

ulation, which is the most effective procedure available. The more complex procedures are not available in the developing world, and spinal cord stimulation is very expensive.

Looking after the mine survivor places an economic burden on the family. If the victim was a breadwinner or wage-earner for the family, this source of income is severed, which can have devastating consequences for the organisation and viability of the family. Prostheses will eventually need replace-

ment, rehabilitation is required for other injuries which are frequent; physiotherapy is essential in order to train and assist the victim to walk. Psychological counselling is necessary, particularly to give the victim hope and prevent ongoing depression. Vocational training in metalwork, woodwork, or fabric crafts is a valuable function of the rehabilitation centre.

The creation of indigenous services for the victims is well worthwhile, and education of the society on the needs of the disabled is also helpful in preventing rejection of the victims, and allowing them to reintegrate into society. The preservation of family units must be a priority of any rehabilitation service.

### Economic and environmental effects

Mines are arguably the most toxic and widespread pollution facing mankind. The deleterious economic effects of landmines are the loss of accessible and arable land, inaccessible water supplies, strains on the health system, loss of productive labour, inhibition of the repatriation of refugees, and obstruction of economic development. The effect of landmines on the land may

*Two Rwandan landmine victims wearing their new prostheses and learning to walk. Note the relative shortening of the lower limb length in the child who is standing.*



*Prosthesis factory set up in Kigali, Rwanda by Handicap International. Local workers are trained to produce the prostheses using local materials.*

last more than 100 years, particularly because of the fear of the population entering areas known to contain landmines. For example, it is estimated that agricultural production in Cambodia and Afghanistan could be doubled if all the landmines were removed from those countries.

### Mine clearance<sup>5</sup>

The most important solution to the landmine problem is mine clearance, with the development of training programs for indigenous minefield clearance workers. The clearance results in the return of productive land and roads. At the moment, mine clearance is an uphill battle. Twenty landmines are laid for every landmine that is cleared. It costs between US\$3 and US\$30 to manufacture a mine, and between US\$200 and US\$1000 to clear it. It has often been said that landmine clearance is impossible, but the UN estimates of the total of 130 million mines to clear at a cost of \$33 billion<sup>5</sup> is probably an overestimate. Bill Van Ree, a mine clearance expert from Austcare, believes that landmine

clearance is a realistic goal for the world community at large (personal communication).

Clearing mines is a hazardous occupation with one de-miner killed and two injured for every 5000 mines cleared. Trained de-miners work in teams, wear protective clothing and usually have medical care close at hand. However, most of the mine clearance is done by local de-miners with limited training and protection. Some are the poor villagers who have to try and clear the land of mines in order to survive. One de-miner can only clear about 50 square meters a day, or less if conditions are unfavourable.

Landmine clearance technology involves ground penetrating radar, biosensors which detect nitrogen levels, armoured vehicles and protective clothing, but any new technology must be able to penetrate to a depth of 30 cm, with a 99.9% detection rate, and clear more than 100 000 square metres per month at a cost below 30 cents per square metre to be effective in comparison with current best available technology. Probably dogs are the best clearance “technology”. They assist the de-miners rather than replace them. Two trainers usually work with four dogs. The dogs can clear 120 000 square metres per month, at a cost of 20 cents per square metre, but training is time consuming. World Vision has trained 150 dogs in Afghanistan, for instance. There is also a continual loss of dogs due to accidental detonation of mines.

The *Adopt a Minefield Program* is a charity in which communities get together to donate funds to clear specified landmine fields in developing countries. The Melbourne City Council was the first organisation outside the USA to become involved in this program; it raised \$23 000 for the clearance of a landmine field in Cambodia following one fundraising dinner in 1999.

### Mine awareness through preventive education programs

The local population must be taught the appearance of mines; minefields must be clearly demarcated using signs or rocks;

the support of the community leaders must be garnered. The use of theatre to disseminate the message is very useful, particularly in a largely illiterate society. Education programs in the schools are also very useful, particularly to discourage children from playing with what they think are toys, but in fact are deadly mines. Building self-sufficiency in these education programs is very valuable. The cooperation of non-government organisations in mine awareness programs is also useful. Education of the community about the capabilities of the victims helps to prevent their rejection, and helps to build a local capacity to manage education and rehabilitation programs.

### Restricting access to and use of landmines

**The Ottawa Treaty:** Nations that sign the Ottawa Treaty agree not to use, produce, stockpile or transfer landmines, or assist other nations who do not comply. The Treaty requires signatories to destroy all stockpiles within four years and remove mines from the ground within 10 years. It binds governments to compensate victims.

The Treaty was opened for signature in December 1997. The West African state of Burkina Faso was the 40th nation to ratify the Ottawa Treaty on 18 September 1998. This achieved the trigger number of signatories that would make the Treaty binding. This has been the fastest ratification of any international treaty in history. At the time of ratification, 130 countries had signed it, but only 40 had ratified it. The Convention “The 1997 Mine Ban Treaty” entered into force as international law on 2 March 1999, six months after the 40th country had ratified the international ban. At this time 130 governments had signed it and 65 had ratified it. Australia signed the treaty on 3 December 1998. The USA, China and Russia have not signed the treaty.

**The International Campaign to Ban Landmines (ICBL)** organization was a prime mover in developing the Ottawa treaty. The ICBL was awarded the Nobel Peace Prize in 1997 for this work. The ICBL network in Australia is coordinated



Signs in Iraq, warning of the perils of landmines. Photographs by courtesy of Lieutenant Mark Bolt, RAN, who served as an observer with the United Nations Special Commission (UNSCOM) in Iraq.



by Sister Patricia Pak Poy, OAM, RSM. The ICBL network goals are: mine clearance, assistance for victims, monitoring implementation of the treaty, lobbying for the universalisation of the treaty and working with non-state actors (rebel movements, anti-government forces, guerilla groups, extra-parliamentary oppositions, and even the corporations who manufacture the landmines) to cease the manufacture, distribution and use of the landmines.

How can cooperation with the Ottawa Treaty be increased? Most landmines being planted are the result of war between government and anti-government forces. Rebel groups will not be bound by treaties. The first method of increasing compliance is thus coercive. A rebel force may overthrow a government by force and cease using landmines. Secondly, a government may introduce criminal legislation prohibiting the production or export of landmines, or enforce the UN protocols on inhumane weapons. Thirdly, the international court may prosecute perpetrators using the Crimes Against Humanity legislation. The **Geneva Convention Additional Protocol 1** regulates the use of landmines, banning the indiscriminate use of landmines, and mandating demarcation of minefields. (It also regulates the use of blinding lasers in war, and incendiary devices, such as napalm.) When the Geneva Convention Additional Protocol 1 is activated, court actions can be taken against corporations who manufacture landmines for negligence or causing harm, or finally, the military solution can be used to destroy the forces laying the landmines.

The non-coercive or “gentle” method of increasing cooperation with the Ottawa Treaty is to promote dialogue, education, unilateral declarations, bilateral or multilateral agreements such as a “deed of renunciation”, a rebel code of conduct, developing peace zones, and mine-free zones, and longterm peace building. The United Nations Conference on Disarmament is developing a treaty to ban the transfer of landmines.

The **Global Landmine Monitor** was established in Dublin in September 1998. Its purpose is to define the landmine industry apparatus, to find the victims and their injuries, to determine the resources required to deal with the problem and monitor the results of interventions.

## Australia’s commitment

Australians are fortunate to live in a peaceful environment and do not generally appreciate the scourge of landmines in other parts of the world. However, Australia is a signatory to the Ottawa Treaty. It is also a stated priority of Australia’s foreign policy to help build a solution to the global landmine problem. One practical example of this is the agreement signed by the Australian government with the UN development program in Mozambique to provide \$2.5 million to the accelerated de-mining program. Australian soldiers have made a valuable contribution to this mine clearance program in Mozambique.<sup>6</sup> Australia’s Special Representative on De-mining has been appointed.

## Countries that manufacture landmines

Argentina	India	South Korea
Brazil	Iraq	Spain
Canada	Italy	Sweden
Chile	Japan	Switzerland
China	Netherlands	Turkey
Denmark	North Korea	UK
France	Pakistan	USA
Germany	Poland	Vietnam
Greece	Romania	Yugoslavia
Hungary	Singapore	

The Australian Defence Force provides specialist personnel to international mine clearance efforts and has done so for many years. Australia will allocate \$100 million for de-mining and related programs by 2005, and Australia participates in the UN Conference on Disarmament.<sup>7</sup> Clearly, with these initiatives and actions, Australia is making a significant commitment to reducing the global landmine problem.

## A world problem

Stronger preventive strategies are required to reduce the numbers of mine victims. Improved treatment and rehabilitation facilities in countries affected by land mines are a priority, but require diversion of charitable and foreign aid funding. Mine clearance programs require further development and expansion, and landmine clearance is a realistic goal in many countries. The banning of landmines through the Ottawa Treaty must continue and many more nations should ratify it. Shattered lives, families, societies and economies must be gradually rebuilt, but the unaffected industrialised nations must seriously contribute to the charitable endeavours required to do this work, through the United Nations and non-government organisations with expertise in landmine matters. The industrialised nations should also continue to assist war-torn nations with peace-making and peace-keeping activities under the auspices of the United Nations.

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