

This evidence based report analyses from a public health perspective the health and environmental costs of the war on Iraq 2003. It builds on Medact's report of a year ago, *Collateral Damage: the health and environmental costs of war on Iraq*.

This report shows that the war had and will continue to have a major impact on the physical and mental health of civilians and combatants, and on the environment and physical infrastructure of Iraq.

The report is by Medact, an organisation of health professionals that exists to highlight and take action on the health consequences of war, poverty and environmental degradation and other major threats to global health. For many years the organisation has highlighted the impacts of violent conflict and weapons of mass destruction and worked to improve the health of survivors of conflict such as refugees.

This report, and annexes to individual sections, can also be found on the Medact website www.medact.org and on the website of IPPNW www.ippnw.org.

Photographs both by Kael Alford/Panos Pictures

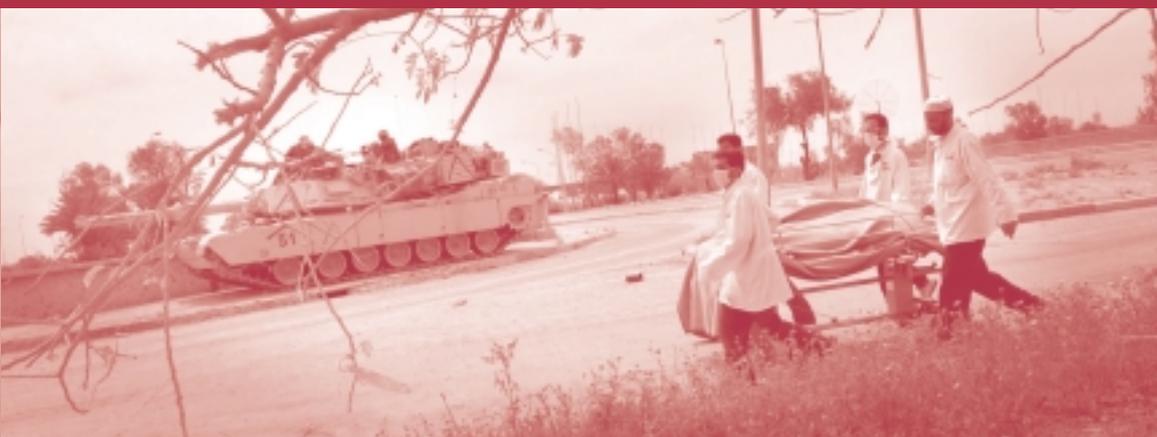
left: A volunteer medical team removes the last of the dead Iraqi fighters under the watch of US marines in Baghdad, 12.4.03.

below: A woman waits for treatment with her husband, whose wounds have become badly infected, on the floor of the lobby at Saddam Medical City Hospital, Baghdad, 14.4.03.



continuing collateral damage

the **health** and **environmental costs** of war on Iraq 2003



This report assesses the impact of the 2003 war on the environment and on the physical and mental health of civilians and combatants. It describes the war and some of the weapons used; its impact on health and the environment; and health-related issues in postwar reconstruction. The health of civilians and combatants has suffered greatly and continues to suffer. Its conclusions may help to determine whether waging war on Iraq was more or less damaging than alternative courses of action; how best to conduct postwar affairs to minimise further loss of life and maximise health gain; and how to approach such issues in debates about other conflicts. The report ends with recommendations relating both to Iraq and prevention of war.

Keywords: conflict, environment, health, international development, Iraq

This report and an executive summary are available in English, Arabic and Italian, from Medact and on the website – www.medact.org. Annexes to sections are also available on the website



challenging barriers to health

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Introduction

The health consequences of the 2003 war on Iraq will be felt by the Iraqi people for years, even generations.

This report assesses the impact of the war on the environment and on the mental and physical health of civilians and combatants. Its conclusions may help to determine whether waging war on Iraq was more or less damaging than alternative courses of action; how best to conduct postwar affairs to minimise further loss of life and maximise health gain; and how to approach such issues in debates about other conflicts.

It builds on Medact's 2002 report, *Collateral Damage: the health and environmental costs of war on Iraq*, which concluded that the health of the Iraqi people had deteriorated alarmingly since the 1990-91 Gulf War and predicted that further conflict could have calamitous effects. We launched the Iraq Health Monitoring Project in spring 2003, aiming to research, document, analyse and disseminate information about the health consequences of the war. A second goal was to develop a model for measuring the core health impacts of war; none currently exists despite the continuing massive impact on health of conflicts worldwide.

The project has collated information on a range of health indicators from sources in the public domain and discussions with a variety of organisations and individual experts active in Iraq, both external and Iraqi. The already complex task was hampered by lack of valid and reliable data. Much of the information needed to paint a complete picture is not available, not collected and/or not published. There is also a danger of bias in different sources in the polarised situation produced by a conflict.

The report begins with a brief description of the war and the impact of the weapons used, particularly weapons of disputed legality. The impact of the war on health and the environment is then assessed, including its direct and indirect effects on mental and physical health in the short and longer term. War affects health at an individual and societal level through multiple direct and indirect pathways, and its impact on aspects of the physical and social infrastructure that predispose to ill health is examined, ending with an overview of the current state of Iraqi health. The impact of postwar reconstruction on health and the health system is explored. The report ends with a series of recommendations which ought to be addressed immediately to halt further health decline.

The best available evidence and expert opinion was utilised, but as the months go by it remains impossible to calculate the precise impact of the war on health in the past, present or future. What is certain is that the health of civilians and combatants has suffered greatly and continues to suffer. In addition to the fatalities there is a huge burden of mental and physical disability and disease, and long-term implications for the development of individuals, communities and Iraqi society as a whole.

Our 2002 report suggested that the total of possible deaths on all sides during a conventional conflict and the next three months could range from 49,000 to 261,000. Tentative estimates now suggest an actual range from 22,000-55,000. These figures are 'low' because the Iraqi military resistance collapsed faster than anyone foresaw and there were no exchanges of weapons of mass destruction. Meanwhile the current situation continues to damage health and the environment in Iraq. We cannot make an assessment of the health impact this disruption has caused but the evidence presented in this report suggests it may be considerable. The Geneva Convention enjoins occupying powers to protect people's health, yet the death toll continues to rise. We begin by examining the health impact of some of the weapons used during the war.

Iraq: the background

Population 25 million (50% under 18), including 5 million in the capital Baghdad

Other major cities Arbil, Basra, Diyala, Kirkuk, Mosul

Area 438,317 sq km, bordered by Iran, Saudi Arabia, Kuwait, Jordan, Syria, Turkey

Geography Desert, fertile plains in the centre between the Tigris and Euphrates rivers, and mountains in the north

Main languages Arabic (official and predominant) and Kurdish

Ethnic groups Predominantly Arab (75-80%), Kurdish (15-20%), other 5%

Religion Islam (97%). Most of the Shiite Muslims (60-65%) live in the south, and Sunni Muslims (32-37%) mostly in the centre and north. Christian and other 3%

Economy Owns 10% of the world's oil reserves. Population mainly urban but there is substantial agricultural production

Human development 126th out of 174 nations in the UN Human Development Index that compares countries' overall development level. In 1990 50th out of 130, and in 1995 106th out of 174 (Unicef 2002; *The World Guide 2001/2002*).

The war and the weapons

Iraq was attacked on 20 March 2003 by a coalition comprising the US, the UK, Australia and Poland (ground forces), and Denmark and Spain (naval forces). The ‘fall of Baghdad’ came less than three weeks later and the US announced the end of the war on 1 May 2003. Combat operations had mostly been ‘conventional’ (air strikes and missile attacks) and all weapons used were conventional – that is, not chemical, biological or nuclear. Armed forces consisted mainly of aircraft, heavy artillery and light weaponry.

However, some of the weapons used during the conflict have indiscriminate effects, i.e. they impact on combatants and civilians alike: not only are cluster weapons, landmines and depleted uranium weapons likely to create civilian casualties during combat operations, but they also remain a potential health hazard for local populations years after the conflict. Considering that Protocol I of the Geneva Conventions prohibits indiscriminate attacks (Art. 51.4) and prescribes the protection of civilians (Art. 51.1), the use of such indiscriminate weapons, especially in built-up areas (see table 1) can be regarded as controversial, or of dubious legality.

This section looks at these contentious weapons, their destructive potential and subsequent health effects. Table 1 gives quantities and descriptions for each weapon as well as a small representative selection of incidents. It is based on publicly available information and is by no means exhaustive, owing to governmental secrecy and unreliable data. When available, official quantities are figures presented as total quantities by governments or military personnel – they may not represent the entire truth.

Cluster weapons contain submunitions called ‘bomblets’ – explosive projectiles designed to separate and spread when released. When they explode, fragments of munitions penetrate the body, maiming or provoking lethal internal bleeding. This ‘fragmentation effect’ is an intended design objective. About 30% of victims die even with good life support (Husum et al 2000). Bomblets are designed to explode on impact, but many fail to explode and become de facto landmines. The new L20 used by British forces is designed to self-destruct when it fails to explode, but its failure rate is 2%. However, the old BL-755 has no self-destructing device and a high failure rate (~10%). The US used its new precision-guided CBU-105 bomb but did not acknowledge use of older types of cluster bombs, which are probably responsible for the Basra and al-Hillah atrocities

among others. It also refused to provide figures for ground-launched cluster munitions, used in far greater quantities, but Human Rights Watch has identified the use of the Multiple Launch Rocket System (which fires cluster munitions), with a failure rate of 16% (1.4.03).

Depleted uranium (DU) is used in anti-tank ammunition because it is dense and heavy, and penetrates heavy armour. After explosion, it leaves a chemically toxic dust, but only people inhaling significant amounts of dust are susceptible to DU poisoning. DU is also weakly radioactive but serious risks of cancer could only arise from internal radiation, i.e. from inhaled dust embedded in the lungs (Royal Society 2001). No comprehensive scientific study has ever been carried out to prove whether DU played a part in reported increases in Iraqi cancers and birth defects or in Gulf War Syndrome after the 1990–91 war. However, a 2003 UN Environmental Programme study found proof of groundwater contamination seven years after the conflict in Bosnia and Herzegovina, and recommended the use of alternative water sources (Unep 2003b). Despite this, the US said it had no intention of cleaning up residues from DU weapons (BBC News Online 14.4.03), and it has not given any figures for DU munitions fired from battle tanks. Experts estimate that between 1,100 and 2,200 tonnes of DU were used during the conflict, compared with 350 tonnes in 1991 (*The Guardian* 25.4.03).

Landmines used by Iraq included anti-personnel (AP) fragmentation mines and blast mines. These cause leg and groin injuries and secondary infections which often lead to amputations, extensive hospital stays and rehabilitation (ICBL 1999). Stockpiles of Iraqi landmines were found around the country including in civilian buildings and a mosque, and hundreds were laid in water tanks, in and around towns, on roads and bridges and in oilfields (Landmine Action 2003). The 1997 Ottawa Treaty bans landmines, but Iraq has not signed it and used many different types of landmines which continue to pose a major threat to life and health in Iraq.

Explosive remnants of war (ERWs) are live munitions left after conflict. From figures published in *Hansard* (table 1), it is possible to calculate that British cluster weapons alone left between 2,000 and 3,000 ERWs – US ERWs are impossible to estimate owing to incomplete data. Fleeing Iraqi soldiers abandoned large quantities of ammunition, often in easily accessible locations, including 100 Iraqi surface-to-air

TABLE 1 Weapons of disputed legality: quantities, incidents and immediate effects

Army	Type of weapon	Official quantities	Description of weapon	Targets and specific incidents (deaths and damage caused, when known)
UK	Cluster weapons	66 air-dropped BL-755 cluster bombs (Hansard 16.6.03)	Each bomb contains 147 submunitions (anti-tank and fragmentation bomblets) Claimed failure rate ~5-6% Estimated failure rate ~10%	No specific report – many attacks consisted of a mix of US and UK bombs. Adam Ingram, UK armed forces minister, admits cluster bombs dropped in built-up areas (BBC Radio 4 29.05.03)
		2,098 ground-launched L20 munitions (Hansard 16.6.03)	Each bomb contains 49 bomblets. Claimed failure rate ~ 2%	No specific report
	DU	1.9 tonnes (t) (Hansard 4.4.03)	Fired by Challenger II tanks	No specific report
US	Cluster bombs	1500 air-dropped cluster bombs (US Department of Defence 25.4.03) Including 6 CBU-105 (BBC News Online 2.4.03)	CBU-105 is precision-guided. It contains 10 armour-destroying bomblets. Failure rate ~ 5%	<i>March 22:</i> F-16 fighter planes drop cluster bombs on the outskirts of Basra: 40-80 civilian deaths (<i>The Guardian</i> 24.3.03) <i>March 30:</i> Cluster bombs dropped near al-Hillah: at least 61 dead and 200 wounded (80% civilians) registered by local hospital (<i>The Independent</i> 3.4.03)
	DU	300,000 DU bullets ~75t (<i>Christian Science Monitor</i> 15.5.03) US Colonel says 500t (Coalition for Free Thought in the Media 5.5.03)	Fired by A-10 Warthog aircraft GBU-28 BLU-113 bunker buster contains DU in the warhead It penetrates 6m concrete or 30m earth	<i>March 28:</i> A-10 tankbuster plane fires DU shell, killing a British soldier and injuring 3 in 'friendly fire' (<i>Sunday Herald</i> 30.3.03) <i>March 28:</i> US officials say 2 GBU-28 bunker-buster bombs used in Baghdad, targeting a communications tower in the centre (BBC News Online 7.4.03) <i>April 8:</i> A-10s fire DU shells at a government ministry building (<i>The Independent</i> 9.4.03)
	Napalm bombs	US Colonel says 30 canisters of napalm used in 30 days of war (Monitor-TV 7.8.03)	Mark 77 Firebombs use kerosene instead of petrol; thus Pentagon denies the use of napalm. But MK77 and napalm have exactly the same impact (James Snyder in Monitor-TV 7.8.03)	<i>Unknown date:</i> 'Dozens' of bombs dropped on bridges over the Saddam Canal and Tigris River south of Baghdad (<i>The Independent</i> 10.8.03) <i>March 21:</i> Napalm attack on Iraqi observation post at Safwan Hill near Kuwait border (<i>The Independent</i> 10.8.03)
Iraq	Landmines	No official quantity	– Valmara 69 anti-personnel fragmentation mines – PMN AP blast mines – VS 1.6 anti-vehicle mines (Landmine Action 2003)	<i>April 2:</i> Four journalists enter Iraqi AT minefield at Kifri. Freelance Iranian cameraman Kaveh Golestan dies, BBC producer Stuart Hughes loses right foot (BBC News Online 5.4.03)

missiles around Baghdad (Unicef 2003). By May, the Humanitarian Operations Centre in Baghdad identified 317 minefields and 1,102 Coalition cluster munitions strike sites (Landmine Action 2003). A Unicef briefing points out that, since the end of the war, over 1,000 children have been injured by ERWs, especially cluster bomblets which are colourful or shiny, and 'come in interesting shapes that are attractive to children' (2003). Clearance is slow, painstaking and dangerous so the problem will persist for years.

Before and during the war, UK and US leaders made much of the ability of precision bombing to minimise civilian casualties. However, the war showed that deployment of laser/satellite-guided does not necessarily reduce 'collateral damage',

because Coalition troops also used older types of weapons or used precision weapons in built-up areas. Civilian facilities hit by the Coalition include numerous homes, markets and farms (Herold 2003), three hospitals, several communications facilities, and the Palestine hotel where foreign journalists were staying. In addition, some of the weapons used in or near built-up areas were indiscriminate; for example, US officials admitted that 26 of the 1,500 US cluster bombs were dropped within 500m of civilian areas (US Department of Defence 25.4.03). Landmines and DU weapons were also used in and around towns (see table 1). All these weapons are likely to pose significant long-term health risks for civilian populations, strain health services, and slow down the reconstruction process.

Health and environment – impact assessment

The direct effects of war

The impact of war on combatants and civilians arises both from the direct effects of combat, namely battle deaths and injuries, and from the indirect consequences of war that continue to be felt years after conflict ends (Ghobarah et al 2002). It includes both physical and mental trauma, though the latter is less often acknowledged or quantified in war statistics.

Making an accurate body count in wartime is an act of responsibility and a historical record. The difficulties of making a count are obvious – death certification ceases, and bodies are blown to pieces, buried under rubble, burned beyond recognition or buried quickly, in accordance with Islamic custom. This is compounded by the US government’s reluctance to collect statistics of Iraqi casualties. Victors in modern wars may underestimate the number of dead and the vanquished overestimate them, so truth also becomes a casualty.

Civilian deaths and injuries

The number of civilians killed since the beginning of the war and October 20, 2003 is independently estimated to be in the range of 7,757–9,565 (Iraq Body Count) (see Table 2). These figures are currently being corroborated by researchers in house-to-house surveys checking each death against different sources and visiting hospitals, mortuaries and cemeteries (CIVIC).

Reliable numbers of civilians injured during conflict are difficult to obtain. Health professionals have no time to keep records and under-reporting is likely due to rapid removal of the injured from the scene of the incident. One assessment using reports from the

media and non-governmental organisations estimates at least 20,000 civilian injuries by July – three times the number of deaths (Iraq Body Count). Of these 8,000 were in the Baghdad area alone; there is no full countrywide picture. Deaths and injuries from unexploded ordnance continue and are likely to be under-reported, according to the Mines Advisory Group.

Combatant deaths and injuries

The number of Iraqi military deaths is unknown, the estimates ranging between 13,500– 45,000. This is based on extrapolating from death rates of between 3–10% found in the units around Baghdad, although it is believed the overall casualty rate may lie closer to the lower figure (*The Guardian* 28.05.03). The US military estimates 2,320 Iraqi military deaths from fighting in and around Baghdad alone (Reuters). The Iraqi Red Crescent is exhuming mass graves to identify Iraqi war dead, including at the airport where the most intensive fighting took place (*The Guardian* 19.08.03).

The official number of American and British combatants killed during the war was 172. The postwar phase saw more US casualties in the next five months than during the war. By October 20 a further 200 American, 18 British and 4 other service personnel had died, many to hostile action (Iraq Coalition Casualty Count) but the total number of deaths due to all causes is much higher due to accidents, illness and suicide (*The Guardian* 4.8.03).

The number of Americans wounded in Iraq between March 20 and October 19 is officially reported as 1,927, half of them postwar, though unofficial figures are much higher (Coalition Casualty Count, *The Guardian* 4.8.03). Over 6,000 US personnel are believed to have been evacuated owing to physical or mental illness (*Washington Post* 2.9.03). Little is known about them but there is public concern about long-term and potentially fatal health problems resulting from exposure to DU or obligatory anthrax vaccinations, both believed to be among the triggers of Gulf War Syndrome.

Unlike US and UK combatants, very few Iraqi combatants have access to adequate health or social care or long-term rehabilitation services. There are no reliable figures but the number of wounded is generally calculated as three times the number of deaths, which gives a range of 40,500 – 135,000 injured Iraqi combatants.

TABLE 2 Deaths directly attributable to the war

Iraqi military deaths	13,500-45,000
Iraqi civilians killed during the war (20 March – May 1, 2003)	5,708-7,356
Iraqi civilians killed post-conflict (May 2 – October 20, 2003)	2,049- 2,209
US and UK combatants killed during the war (20 March – May 1, 2003)	172
US and UK combatants killed post-conflict (May 2 – October 20, 2003)	222
TOTAL	21,700-55,000

(Iraq Body Count and Iraq Coalition Casualty Count, *The Guardian* 28.5.03)

A country in ruins

The condition of a country's environment and physical infrastructure has a significant direct and indirect impact on its people's health. Already seriously damaged by earlier wars and sanctions, the physical infrastructure suffered further degradation in the 2003 war. Less tangible but equally important is the social infrastructure, battered by oppression and war. Violence, poverty, unemployment and family/community relationships all influence health and the prospects for individual and community development.

The environment and physical infrastructure

Environment

The conflict added to the chronic environmental stresses that have accumulated in Iraq over the past 20 years (Unep 2003a). Major threats include environmental degradation and the destruction of water and sanitation systems. Power cuts and shortages stop the pumps that remove sewage and circulate fresh water, leading to contamination and health risks, and also affect the pumps that remove saline water from irrigated lands, leading to further waterlogging and salinisation.

Smoke from oil well fires and burning trenches caused air pollution and soil contamination. Heavy bombing and the movement of large numbers of vehicles and troops further degraded natural and agricultural ecosystems. Large quantities of military debris, including unexploded ordnance, litter the environment. Depleted uranium used in weapons and armour is known to be an environmental contaminant. The looting of nuclear power plant sites caused dispersal of radioactive materials and contamination of the environment, in addition to the possibility of radioactive materials falling into the wrong hands (see box).

Water and sanitation

Clean water and good sanitation are prerequisites to health; in their absence, infectious diseases flourish and kill vulnerable people, especially babies. Iraq's water and sanitation systems were severely disrupted in the 1990-91 Gulf War and not repaired to former standards. The water system was further affected by the recent conflict: in Baghdad, around 40% of the network was damaged, leading to loss or contamination of piped water. Shortly after the war began 40% of the people of Basra had little or no water and drank directly from the polluted river. Sabotage, and breaking pipes open to use the supply even when contaminated, was common. UN tankers are supplying

many areas while 80% of prewar capacity has now been restored in Baghdad (*The Guardian* 16.8.03).

In 2000, more than 4.8 million people did not have access to any type of sanitation (WHO and Unicef) and the system is now even worse (Care International 22.5.03). Sewage treatment plants were stripped bare during the looting and sewage is flowing back into the rivers; it may take up to a year to rectify. Meanwhile people are unaware of basic preventive measures and there are few health workers to teach them.

Nutrition and food security

Malnutrition, which results from low food intake or an unbalanced diet or both, is a major determinant of poor health in Iraq. Before the invasion of Kuwait in 1990 and the imposition of UN sanctions, Iraq was one of the best-fed countries in the Middle East and imported two-thirds of its needs. From 1997 until the 2003 war, the nutritional status of three in five Iraqi people depended on food rations distributed under the Oil-for-Food programme (Off), but these did not provide a nutritionally adequate and varied diet (FAO 2000). The food basket rarely lasted the month and lacked important nutrients such as vitamins A and C, riboflavin, folate and iron. Some families supplemented the rations with food from local markets, but many families could not afford to buy extra and were particularly vulnerable to malnutrition.

In preparation for war, the Iraqi government supplied double and triple rations and people stored what they could. In the event food shortages were avoided due to stockpiling and the relatively short interruption to Off, which has been extended until February 2004. Viable plans are needed to meet future nutrition needs, widespread unemployment and poverty have eroded domestic purchasing power, and few families will be self-sufficient. Some households sell part of

Radioactive hazards

During the looting of Tuwaitha nuclear power plant, people tipped uranium on the ground so they could use its containers to store food and water. Some 150 of the 500 containers are still unaccounted for and aid workers uncovered a mixing canister containing several kg of uranium. Radioactivity levels in houses including one source are 10,000 times above normal. Local reports describe people suffering from nose-bleeds, vomiting, breathing difficulties and skin problems.

Occupying forces have refused unlimited access to the International Atomic Energy Agency (IAEA). However, a limited inventory of one location estimates that 10 kg of uranium compound could have been dispersed and demands a concerted effort to recover it. It is essential the IAEA be given a full mandate to search survey and decontaminate towns and villages around Tuwaitha and carry out a full assessment of the situation at all nuclear sites in Iraq.

(Greenpeace, BBC News Online 6.6.03; IAEA)

CASUALTIES (P4)

Coalition combatant total: 394; Iraqi civilians total: 7,757-9,565; Iraqi combatants estimates range from 13,500-45,000. This brings the death toll between March 20-October 20, 2003 to between 21,700 and 55,000

The 2003 war on Iraq and its aftermath is having a devastating impact on the lives and health of Iraqi civilians, combatants on both sides, and on the environment. See report pages referenced for details

THE WEAPONS (PP2-3)

The coalition used many new and refined weapons of all kinds, such as earth-penetrating bombs known as 'bunker busters', precision-guided bombs and missiles and area-impact munitions

Some of the weapons used are of doubtful legality, or were used in illegal ways because they were indiscriminate and/or were used in built-up areas

Children continue to be killed or injured by landmines and explosive remnants of war – 20 incidents a day in one city alone

Iraq used no weapons of mass destruction and none have been located to date

HEALTH OF IRAQIS (P10)

The mental and physical health of already weakened and unhealthy people is being damaged further

People suffering from the immediate impact of war are more susceptible to further health hazards and less able to mobilise their own resources for survival and reconstruction

Shortages of clean water, adequate food, and power lead to an increase in certain diseases that is likely to result in more deaths than those caused directly by the conflict

Short and long-term physical health effects include disability, infectious diseases, stillbirths, underweight newborns, diseases of malnutrition, possibly more cancers

Short and long-term mental health effects include post-traumatic stress reaction, psychiatric illness, behavioural disturbance and developmental delays in children

With the economy shattered and unemployment running at above 60%, the vicious circle of ill-health and poverty is reinforced

Health services, already running well below capacity, cannot cope well with immediate demands or offer longer-term rehabilitation or preventive health care

SIX MONTHS ON FROM WAR

Governance Iraq ruled by US proconsul Paul Bremer as head of Coalition Provisional Authority. There are now 70 political parties. The US-appointed, 25-strong Iraq Governing Council lacks teeth. US says it will take six months to draw up a constitution, leading to elections and an Iraqi government in 2004

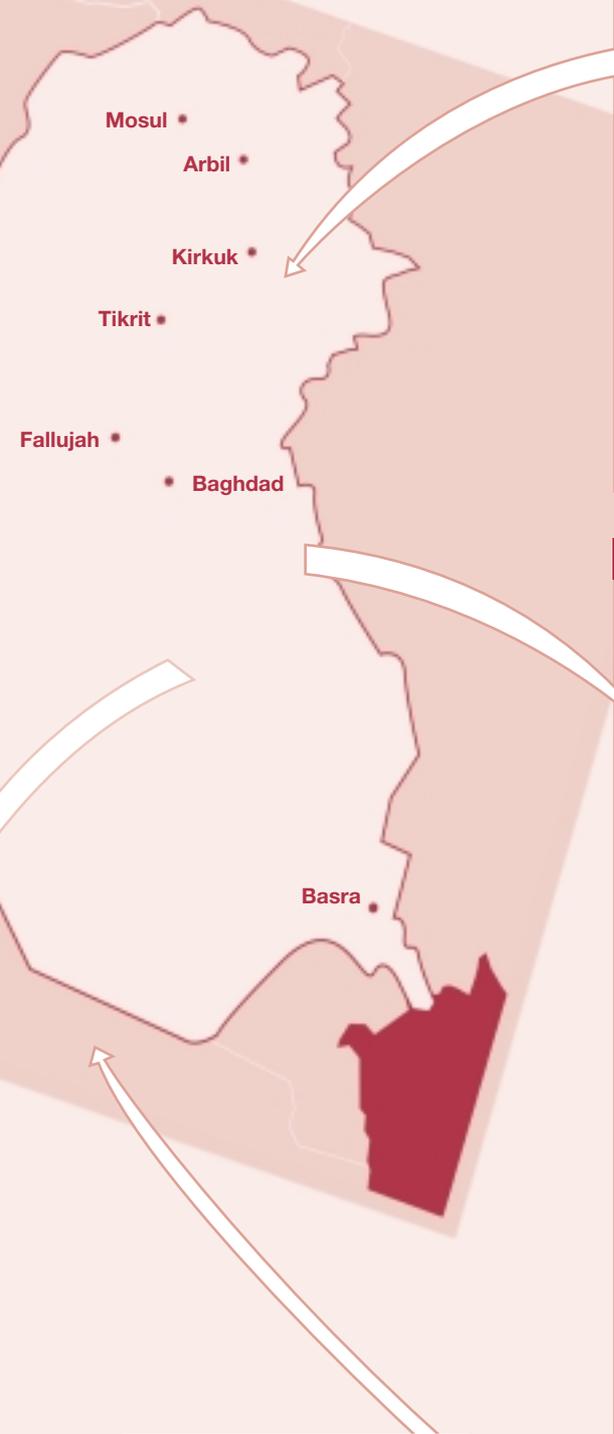
Threats to security These hamper reconstruction, activities of relief/development agencies and daily functioning of education, health and welfare services. There are a reported 15-20 daily attacks on coalition forces and 15-25 civilians shot dead in Baghdad every day. Since the end of the war the Baghdad morgue reports 500 excess deaths per month

Media 189 newspapers and magazines now published, compared with 39 under Saddam which were tightly controlled and censored

Opinion Most Iraqis approve of the removal of Saddam. In a Gallup poll, 62% of Baghdad residents thought their suffering was worth it and 67% thought their lives would be better five years on

(*The Independent* 10.10.03)

cost



A COUNTRY IN RUINS (PP 5,8-9)

Iraq's physical infrastructure, already seriously damaged by the 1990-1991 Gulf War and much of it not repaired, has suffered further enormous damage in air attacks and urban conflict

Destruction of roads, railways, homes, hospitals, factories and sewage plants has created conditions in which the environment is degraded and health threatened

Extensive damage to the environment of Iraq and possibly neighbouring countries: radioactive materials dispersed into the environment, oil wells fired creating oil spills and toxic smoke; troop movements destroy fragile desert ecology; explosive remnants of war and land mines kill, maim and pollute; bombardment destroys buildings, topsoil, and arable/grazing land; pollution of land, sea, rivers, and atmosphere

RECONSTRUCTION (P 11)

Total cost of the war \$79 billion to date including occupation cost of \$3.9 billion a month (double prewar Pentagon estimates)

World Bank estimates over \$55 billion required over 4 years to restore public services including \$1.6 billion for health, \$6.8 billion for water and sanitation and \$12 billion for electricity. US government spokesman says the price of reconstruction is 'almost impossible to exaggerate'

UK has pledged £544 million for the rebuilding of Iraq, and is spending £5 million a month to keep 11,000 troops in the Gulf

No process initiated to heal the deep emotional and psychological trauma of war and oppression, or to resolve tensions peacefully

Ongoing violence, insecurity, lawlessness and social decay resulting in crime, substance abuse, poor school attendance, child abductions, prostitution and mental ill health continue to present obstacles to reconstruction.

Iraqi entrepreneurs are 'queuing up' for franchises to open McDonald's hamburger outlets in Baghdad. 'The Iraqi people would love a Big Mac and fries as much as the rest of the world,' says US Defense Department

All information from references cited in *Continuing Collateral Damage: the health and environmental costs of war on Iraq 2003*, Medact, London, 2003.


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GLOBAL IMPACT

All sides pay a heavy financial cost: arms spending, occupation, relief and reconstruction. Funds being diverted from other lower-profile crises in Afghanistan and Africa

Weakening of authority of the United Nations and of multilateralism; destabilisation of governance at global level

their rations to buy essential clothing and medicine, while a quarter of families interviewed in the poor district of Shu'la in Baghdad had no income at all (Save the Children 2003).

These heavily subsidised rations should be replaced by supplies targeted at vulnerable people as defined by nutritional needs assessment. Domestic food production must be re-established to reduce the reliance on external aid and food imports. However, conflict, sanctions and drought, and the regime's despoliation of fertile lands in the Kurdish north and Shia south, have wrecked agriculture and the rural economy (FAO), while US troops have destroyed orchards of oranges, lemons and date palms (*The Independent*, 11.10.03). Farmers lack seeds, fertilizers, pesticides, machinery, fuel, spare parts and other tools, animal feed, and vaccines and medicine for livestock. The lack of veterinary services and quarantine controls could result in the spread of animal disease, with serious implications for the entire region (FAO).

Power

Iraq's prewar electricity supply was erratic and weak, with homes, public services and industries often forced to rely on their own generators for long periods. The war caused temporary deterioration of power supplies in many areas. Restricted electricity means ineffective water pumping, no cold storage for essential vaccines and drugs, more accidents and lack of air conditioning, thus making it difficult for hospitals and health centres to function.

The picture varies nationally. Baghdad slums lack electricity most of the time, while in the north supplies are near normal for the first time in years. Around 500 pylons in the Basra region were toppled by saboteurs, including utility workers anxious to keep power supplies for themselves rather than Baghdad (*The Guardian* 4.10.03). Elsewhere copper was stolen from power lines. Restoration will require \$10 billion and may take as long as three years (*The Guardian* 17.9.03).

Despite abundant oil production, problems with the electricity grid and the dilapidated refineries are causing shortages in the supply of fuel for cars and domestic or commercial use, with long queues and higher prices. Fuel riots broke out in Basra in August, while UN officials predict winter shortages of kerosene, used for heating homes in the north (*New York Times* 11.08.03).

Housing

Aerial bombardment and ground combat in urban areas destroyed or damaged many buildings including

schools and factories, but no information is available on the number, or on people rendered homeless and now living in overcrowded conditions with relatives or neighbours. These upheavals and living conditions are hazardous to mental and physical health. Population movements and crowding in temporary shelters increase the risk of waterborne and airborne diseases such as cholera, typhoid, tuberculosis and dysentery. The war caused no mass movement of refugees, but thousands were temporarily displaced. Some minority groups once protected by the Iraqi government left for fear of persecution (UNHCR).

Health services

Prior to 1990, the Iraqi health system was considered to be one of the best in the Middle East and the health status of the Iraqi people was comparable to that of other middle-income countries. The health system was financed by central government and provided free healthcare to all Iraqis irrespective of income.

The 1991 Gulf war and over a decade of sanctions caused a drastic decline in the public health system and preventative programmes suffered a significant deterioration. Problems with maintaining essential medical equipment affected the functioning of health facilities. In 1997 the Iraqi government was able to meet 10-15% of the country's medicine needs and only a quarter of medical equipment was considered operational. Laboratory services were seriously impaired and an intellectual embargo had serious consequences for medical training with no textbooks or medical journals being allowed into the country during the 1990's.

The already dilapidated health system was further damaged by ground combat, aerial bombardment and looting during the recent war. Around 7% of hospitals were damaged during combat with at least three hospitals being directly hit (Associated Press 31.3.03; 11.4.03) and about 12% being looted. Security remains the country's main health issue: both as an underlying reason for seeking medical care and in limiting access to services (*The Lancet* 18.10.03).

The conflict caused a breakdown of the cold chain system used for storing vaccines, which meant some 210,000 newborns had no immunisations and risk preventable diseases such as measles (Unicef). Political and/or religious groups, many with armed guards, now run half the public health clinics in Baghdad and in the absence of a government there are concerns for a health system heading towards de-regulation and privatisation (Colombo 2003). There are continuing shortages of staff, specialised drugs

(for cardiovascular diseases, diabetes and cancer) and equipment and staff are severely stretched as wards overflow with victims of lawlessness.

Psychological and social impact

Studies of the health impact of war tend to overlook less visible effects such as disruption of individual and societal development (Ugalde et al 2000).

The psychological impact on civilians

The initial 'shock and awe' bombing campaign undoubtedly generated acute anxiety among Iraqi civilians and combatants that will trigger a significant increase in common mental disorders of anxiety and mood disturbance (Dyer 2003). The prevalence of common mental disorders is likely to be similar to destabilised conflict areas and much greater than in stable countries (de Jong, Comproe and Ommeren 2003). Long-term morbidity will include more suicides, greater disability, increased drug and alcohol abuse and more social and domestic violence - major obstacles to the restoration of a stable society.

Iraq's only long-stay mental hospital, Al-Rashid in Baghdad, was looted and its 1,200 inpatients allowed to leave. Around 600 have not returned and their fate is unknown.

The incidence of behavioural and emotional disorders is likely to be high among children and adolescents, interacting with broader social issues of moral breakdown, violence and educational failures. Cognitive developmental disorders are likely to be increased through association with malnutrition and poor general health.

Combatants' mental health

Recognition is growing of the psychological distress experienced by combatants and its long-term consequences (Stuart and Halverson 1997), but there is no hard data on combatants in this war. Mental wellbeing in conflict is generally protected by a sense of attachment to the purpose of the conflict, but many Iraqis were conscripts with little loyalty to the regime.

Coalition forces have far more psychological support available although there is controversy over the adequacy of such support. The postwar situation where service personnel remain targets for violence is highly stressful, judging by evidence from the former Yugoslavia (Hotopf et al 2003).

Social impact

Since the war robbery, burglary, kidnapping and violence have been widespread and the authorities

are struggling to establish law and order. The US army has too few soldiers to keep the peace effectively and only 150 of the 400 law courts are believed to be in operation (*The Independent* 9.8.03). The removal of the regime and dismissal of the top four layers of management created a power vacuum. Newly promoted officials lack experience in top-level leadership, policy and management posts.

The decision to disband the military and purge most Ba'ath Party members from government posts with no reintegration or job creation has driven unemployment up from 50% before the war to more than 60% (BBC News Online 7.7.03). Mass unemployment reinforces the deprivation cycle of joblessness, poverty and ill health. Iraqis who do have jobs suffer from dangerous levels of occupational ill health, including accidents and illness. Most now work in the informal economy with few safeguards. Dangerous occupations such as sex work and smuggling have expanded, while social welfare has diminished.

The crisis of law and order threatens vulnerable people, with reports of rape and abduction of women and children, and organised networks in human trafficking (CARE Intl 22.5.03). More children live on the streets; many family and community networks that protect them are not functioning and exploitation for sex or slavery is likely (Unicef). For every Ali Abbas, the severely injured boy who lost 16 relatives and is now being cared for in the UK, there are thousands of children receiving no expert help.

School attendance rates after the war fell to an average of 65% and even lower for girls (Unicef). Although new textbooks and renovated premises have been provided, many parents are keeping their children at home because of security fears. Poor literacy, especially among females, has a negative impact on health, while a good primary education system provides protection against exploitation and injury, and allows children to regain a sense of normality as well as develop skills for the future.

The security situation, and the emergence of brands of religious conservatism that restrict women's choices, has a particularly negative impact on women. Before 1990 Iraq was in the forefront of Arab countries promoting education and employment for women, but this has reversed. Widowhood through war, deprofessionalisation, rising unemployment and widening education differentials all damage their status and prospects. The decline is particularly acute in rural areas. All these factors may contribute to a worse state of health for women and a rise in infant mortality and morbidity.

Iraq's state of health

The state of people's health in Iraq was already poor when the war started, as illustrated by the most recent reliable figures from 2001 (WHO, Unicef):

- Life expectancy at birth: 59 for men and 63 for women.
- Deaths of children under five: 133 per 1,000, or one in 8.
- Maternal mortality: 294 deaths for every 100,000 births.
- One in four children under five chronically malnourished.
- A quarter of all children born underweight.

This is the cumulative result of the effects of war in 1990-91; living under Saddam Hussein's regime; economic under-development, accentuated by the period of sanctions; increasing levels of poverty and malnutrition; and a steady deterioration in the quality and availability of health services. The impact of the 2003 war compounded this already poor state of health, afflicting people who were already weakened and whose ability to withstand further trauma, let alone create a new society, was thus severely compromised.

The impact of war on health is usually assessed only in terms of its most direct and visible effects - death and injuries through conflict. Even then much goes unrecorded. Yet as indicated throughout this report, the full effects of war on health are felt through many other less direct but potentially equally or more deadly pathways. Lack of access to clean water and the undermining of household food security, for example, are both known to increase child mortality.

The diagram below illustrates the multiple direct and indirect pathways through which war affects health at the individual and societal level in Iraq. By their very nature it can be inferred that precise measurement of the true impact of war is methodologically complicated. Counting injuries and deaths is difficult enough in wartime, but estimating the impact on other indicators such as child mortality, access to clean water and mental health is extremely problematic.

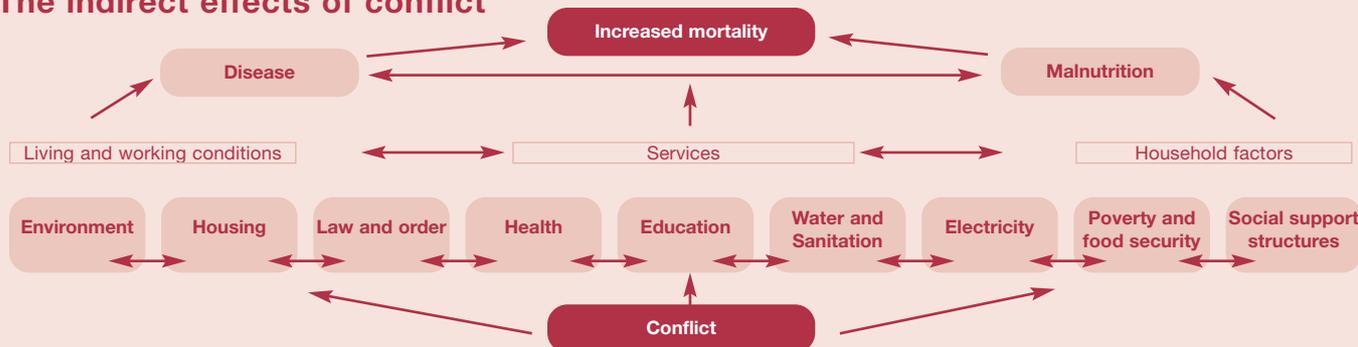
In spite of the need to acknowledge and attempt to measure these complex and multiple pathways, there is a lack of accurate and reliable data in many postwar situations, including Iraq. Poor mortality and morbidity data are a consequence of the Coalition authority's failure so far to collect and record data, as well as the collapse of routine health information systems. So little reliable data on the health of the population is available (Colombo 2003) that it is impossible to present any population-based health indicators that allow a comparison of health status before and after the 2003 war.

The information in this report nevertheless suggests that in addition to the direct effects of war on injuries and death, there has been deterioration in all the intermediate determinants of health affected by war shown in the table. It can therefore be concluded that the rates of the prewar indicators above have deteriorated, in other words that people's health is generally even worse.

This conclusion is reinforced by the state of collapse of many basic services as well as prevailing violence and insecurity, and further substantiated by recent small-scale surveys. For example, there has been a dramatic increase in waterborne diseases such as gastrointestinal diseases, typhoid and cholera. A postwar nutritional assessment in Baghdad found that acute malnutrition or wasting had nearly doubled from 4% in 2002 to almost 8%, and that 7 out of 10 children had suffered from diarrhoea (Unicef). The main health hazards continue to be communicable diseases, nutritional deficiencies, unattended childbirth (48% home deliveries), and noncommunicable and chronic mental and physical conditions.

The full impact of the war on health will not be known for years, if ever. Good health and social information systems will be necessary to monitor disease incidence and new disease patterns, including conditions that have been previously controlled, and mental as well as physical health. If insufficient progress is made on the multiple determinants identified here, which will be affected by the state of security and stability, there could be tens of thousands of additional deaths in the next few years.

The indirect effects of conflict



Reconstruction

Insecurity, lawlessness and conflict beset postwar Iraq, while the state of collapse of many public services prolongs hardship and suffering. The nature of the political, economic and social reconstruction will be crucial – and not only in the short term; decisions being taken at this moment will have profound and long-lasting effects on Iraq's social, cultural and economic prosperity.

Postwar administration has been directed by the occupying powers through the US-led Coalition Provisional Authority (CPA). Progress towards Iraqi self-governance and representative democracy has been slow and unsatisfactory. The role of the UN and neutral and independent humanitarian agencies is marginal. The attacks on UN headquarters in Baghdad and the state of insecurity have led many agencies to withdraw or reduce their activities. All this compounds the habitual difficulty of inter-agency co-ordination and reduces their effectiveness.

Private and for-profit companies, many from the US, have been awarded contracts to provide services and technical assistance in many sectors. For example, in the health sector, the large for-profit US company Abt Associates has been awarded a US \$40m contract to strengthen the Iraqi health system. Iraq's relative wealth and the large amounts of public money being invested in reconstruction provide profitable opportunities, but the unashamed commercialisation of postwar relief, humanitarian and development efforts raises questions about the ethics of profiteering from war.

Lessons should be learned from the successful postwar reconstruction of Europe and Japan, including the importance of a strong central government directing resource allocation towards meeting the needs of the country as a whole. Both examples highlight the importance of public investment. It will also be important to find ways to cancel or substantially reduce Iraq's sovereign debt of about \$260 billion (Oxfam 2003) by recovering assets frozen overseas. High levels of debt have a negative impact on private and public investment and therefore future growth prospects.

There has been very little talk of the need to pursue similar processes of 'social healing' to those that occurred in South Africa and Chile. The Iraqi people currently lack any meaningful path to 'social reconstruction', essential to repair the deep wounds and widespread trauma inflicted by the war and by the old regime, and to find ways of resolving conflict and living with diversity in peaceful, respectful ways.

The health system

The postwar reconstruction of Iraq's health services exemplifies the difficulties outlined above. Some commendable efforts are being made by the Coalition administration and other agencies to deliver humanitarian aid and provide essential health services, but this is proceeding in an uncoordinated and fragmented way. Some interventions are attempting to develop participative processes that put Iraqis themselves in control of reform, but there is no overall agreement on the values and principles that should drive the reconstruction process, and no strategic planning.

Postwar health sector rehabilitation interventions elsewhere have tended to concentrate on rebuilding the infrastructure and supplying free medicine, while issues like human resources are neglected.

There is also a reported policy intention (*The Guardian* 15.10.03) to model the future health system on the American model of commercialised and market-oriented health care, and little commitment to exploring the various options of rebuilding and restructuring the health system through an Iraqi-led process. The postwar situation provides a unique opportunity to review the functions and distribution of health facilities and to rationalise and make more equitable the distribution of resources. On the basis of international evidence commercialisation of health care should be avoided.

Reconstruction of the health system should be carried out on the basis of a transparent and participatory debate about the desired configuration, governance and financing of the health system, and should be guided by an explicit set of strategic aims and principles. While immediate and short-term interventions are vital to meet emergency and humanitarian needs, they should not deflect from longer-term planning. A clear vision of the future health system should be established now so that all policy decisions work towards its achievement. For example, building or re-equipping hospitals is seen as a priority in postwar situations, but may not be the best way to achieve better health for people whose needs are better met by good primary health care. Health service development also needs to move in step with the redevelopment of other sectors such as finance, education, housing, transport and the environment that have a profound impact on health.

Finally, the reconstruction of the health system and the promotion of good health for all should be viewed as an important nation-building exercise. Health care has an important symbolic role in promoting healthy inter-community relationships and health is a potential 'bridge to peace'.

Conclusions and recommendations

At this stage it is impossible to assess the precise impact of this latest war on the health of the Iraqi people. The absence of reliable data, the failure of the occupying forces to provide full information, and the deteriorated security situation which caused most UN staff and many non-government organisations to leave the country, have led to an information black hole of unique proportions.

What is certain is that the war has led to the death and injury of thousands of Iraqi civilians and of combatants on all sides. It has caused a further deterioration in the health of the Iraqi people and contributed to the chronic stress on the environment.

Iraq is an increasingly violent and unstable place with particular risks for vulnerable groups such as women and children, the sick, disabled and the elderly. In addition to the direct casualties of war, problems in the essential infrastructure such as water/sanitation, power, housing and food availability have contributed to further suffering in the short to medium term. There are also concerns about high unemployment and its implications for poverty and social unrest.

What happens to health in the long term is dependent on restoration of security and public services, and regeneration of the health care system.

Recommendations relating to Iraq

1. Health

- Establish an Iraqi health sector based on the principle that health and health care are basic social rights. In a country as diverse as Iraq equity should also be a central concern. The health sector goal must be to ensure a strong, coherent and integrated public health system providing primary, secondary and tertiary care with financing based on progressive taxation.
- Establish health information systems to monitor disease incidence and examine disease patterns in order to plan effective public health interventions.
- Carry out an assessment of the country's chemical risks and levels of contamination in addition to surveillance of health effects of environmental risk factors including depleted uranium.
- Fund and rapidly implement the clear-up of all unexploded ordnance.
- Study long-term effects of the war on mental health and trends in domestic and criminal violence, and develop effective health care and social policy interventions.

- Fund independent academic institutions or UN agencies to continue monitoring the health effects of war.

2. Social reform

- Give social and political reconstruction the same prominence as economic reconstruction.
- Explore processes of 'social healing' similar to those which occurred in South Africa and Chile in order to secure long term peace and avoid revenge attacks or internal conflict.

3. Political reform

- The democratisation process must be speeded up with a clear timetable for handing over authority to a legitimate interim Iraqi administration under the auspices of and accountable to the UN.
- The occupying powers must allow the UN to play the central role in peacekeeping and in the humanitarian and reconstruction process.

4. Reconstruction and economic reform

- Economic reconstruction should not be tied to the economic and commercial interests of the occupying powers. The pace at which sectors are liberalised and public assets privatised also needs careful consideration by the Iraqis.
- Proposed economic, social and political reforms should be debated widely. Care should be taken that economic liberalisation does not result in the creation of monopolies and vested interest.
- Cancel or substantially reduce Iraq's sovereign debt of \$260 billion. Successful reconstruction will not be possible if this is left to hang like a millstone around the neck of a new democratic government.

Recommendations relating to prevention of war

- Support steps to reduce the global arms trade (in the UK, for example, the arms trade is the second biggest export earner – BMA 2001) and the development and stockpiling of weapons by all countries.
- Work through the UN to tackle the roots of Middle Eastern problems, including a just and fully enforced Israeli-Palestinian settlement.
- Increase funding for effective interventions for physical, political and psychological security that break the cycle of violence (these currently receive less than 1% of the funds available for military intervention (Elworthy and Rogers 2002)).
- Maximise ability of health professionals to be involved in building 'health bridges for peace'.

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