# Chapter Two The Many Victims of War: Indirect Conflict Deaths

The lethal impact of modern war extends far beyond the number of soldiers and civilians who die violently in armed combat or clashes.[1] As some analysts have pointed out, 'the number of battle deaths . . . does not provide a remotely adequate account of the true human costs of conflict. War kills people in less direct (but highly predictable) ways' (Lacina and Gleditsch, 2005, p. 148; Garfield and Neugut, 1991).

Armed conflict generates a series of lethal but *indirect* impacts on communities beyond the number of people killed in battle or combat. In the short term, indirect victims of armed conflict die from a variety of specific causes, usually from easily preventable diseases such as dysentery or measles, or from hunger and malnutrition. These deaths are a result of the loss of access to basic health care, adequate food and shelter, clean water, or other necessities of life. In the long run, armed conflict affects mortality by its destructive impact on the national economy and infrastructure (including health facilities), on social cohesion, and on psychological health and well-being (Li and Wen, 2005, pp. 473–75; Murray et al., 2002; Ghobarah, Huth, and Russett, 2003). All of these factors can negatively affect the prospects for post-conflict peace-building.

These indirect victims of war do not die violently. But, from a human, moral, and political point of view, the distinction between a violent and non-violent death is irrelevant. All that matters is that a number of people died who would otherwise have lived if armed violence had not ravaged their communities. An adequate account of the direct and indirect impact of armed conflict is also important for assessing whether international humanitarian law and human rights law have been violated, and whether groups in combat are preying on civilian populations (Daponte, 2008).

In almost all contemporary conflicts, the number of indirect victims of armed violence is many times larger than the number of battle deaths. For example, the International Rescue Committee's series of mortality surveys in the Democratic Republic of the Congo (DRC) found that 5.4 million excess deaths occurred between August 1998 and April 2007, with 2.1 million occurring since the formal end of war in 2002 (Coghlan et al., 2008). Of these 5.4 million excess deaths since 1998, fewer than ten per cent died 'directly' or violently. Nearly all deaths (90 per cent)—*approximately 4.8 million people*—were indirect and caused mainly by preventable infectious diseases, malnutrition, and neonatal- and pregnancy-related conditions that emerged in the resource-poor post-conflict environment. The number of battle deaths estimated in the preceding chapter for the DRC in the period 2004–07 is about 9,300 (DIRECT CONFLICT DEATH).[2]

While the DRC may be an extreme case, since the end of the cold war the overwhelming majority of conflicts (95 per cent) are now fought within national borders in poor countries, often reflecting communal and political disputes that trap civilians in insecure situations (Harbom, 2007; HSC, 2005).

**Photo** ▲ A mother holds up her severely malnourished baby in the refugee camp of Xjosa Sabz Poosh, Afghanistan. © Tim Dirven/Panos Pictures

Most conflicts are either low-intensity civil wars that involve poorly trained armies who target civilians, or asymmetric wars that pit a well-equipped army against a militarily weaker opponent (Harbom, 2007). Both scenarios inflict violent ('direct') and non-violent ('indirect') deaths on civilians. Contemporary armed conflicts involve organized and disorganized armed forces inflicting violence on both soldiers and civilians, with widespread consequences for the health and economic infrastructures of whole countries. While violent death is an indicator of armed conflict, disease and malnutrition have been the main causes of death among civilians in most major conflicts since the late 1980s (Guha-Sapir and Degomme, 2005a).

This chapter discusses what we know about 'excess mortality' and 'indirect deaths' in armed conflict. It first overviews the epidemiological and demographic methods for estimating excess mortality, current knowledge gaps, and the scientific challenges. The second section summarizes data from a variety of cases to arrive at some benchmarks to evaluate the level of indirect victimization in contemporary conflicts. The chapter closes with three brief case studies estimating indirect deaths in South Sudan, Sierra Leone, and Iraq.

The main findings of the chapter are the following:

- In the majority of conflicts since the early 1990s for which good data is available, the burden of indirect deaths was between three and 15 times the number of direct deaths.
- Variation in the ratio of direct to indirect deaths depends on the pre-conflict level of development of the country, the duration of the fighting, the intensity of combat, access to basic care and services, and humanitarian relief efforts.
- The lethal burden of armed conflict in 2004–07 was many times greater than the number of direct conflict deaths. A reasonable average estimate would be a ratio of four indirect deaths to one direct death in contemporary conflicts, which would represent *at least 200,000* indirect conflict deaths per year, and possibly many more.[3] There may have been up to 400,000 indirect conflict deaths per year in the DRC alone since 2002.
- Appropriate methods exist to arrive at a more accurate account of the number of indirect deaths in conflict zones; these should be applied systematically wherever possible to individual conflicts.

- Sexual violence in armed conflict accounts for a sizable, albeit hidden, proportion of indirect conflict deaths with the majority of victims being women and girls.

## What is excess mortality?

Epidemiologists use mortality rates to assess the severity of the impact of conflict on civilian populations affected by complex humanitarian emergencies (Toole and Waldman, 1997; Guha-Sapir et al., 2005; Checchi and Roberts, 2005). Standardized mortality calculations make possible comparisons between populations and judgements on the severity of a crisis.

*Excess mortality* captures the difference between the death rates ('crude mortality') in a non-conflict situation and in a conflict or crisis situation. It includes those dying both from the direct and the indirect consequences of armed conflict. However, its accuracy depends on the reliability of baseline mortality data. In many protracted conflict areas the establishment of this baseline is complicated by the absence of reliable data.

The crude mortality rate (CMR) is informative only when compared with a national or regional *baseline CMR* (the 'expected' mortality in a country in a normal situation) or with alert level thresholds which signify a crisis situation[4]. The numerical difference between the 'crisis CMR' and the 'baseline CMR' is termed the 'excess mortality'. This value represents the mortality that can be attributed to the crisis and is used to estimate the magnitude of the emergency and to monitor the humanitarian response. Excess mortality is traditionally broken down into two types of death—direct and indirect—according to whether or not the cause of death was violence (see Figure 2.1).

*Direct deaths* are caused by war-related injuries and attacks (such as those inflicted by a bullet, bomb, mine, machete, or assault) (SMART, 2005, p. 81).[5] *Indirect deaths* are caused by the worsening of social, economic, and health conditions in the conflict-affected area. They can result from a variety of different factors including (but not limited to) inability to access health care, damage to health systems and public health infrastructure, changes in behaviour that increase the incidence of diseases, malnutrition, unsanitary living conditions, food insecurity, and loss of livelihood and agricultural land (Guha-Sapir and van Panhuis, 2002; Gayer et al., 2007).

**Figure 2.1** Typology of conflict mortality


**Source:** Ratnayake et al. (2008)

The magnitude of indirect deaths is difficult to quantify and verify; however, its assessment—in addition to direct deaths—is essential to understanding the true human impact of a conflict or crisis.

Although the concept of indirect death is relatively new, it is also possible that quantifying indirect deaths may contribute to holding legally accountable political and military leaders who are ultimately responsible for these deaths (Thoms and Ron, 2007). Estimates of indirect deaths have been neglected by human rights organizations, which have traditionally aimed to document the direct deaths due to violence. But improved collaboration between epidemiologists, statisticians, and human rights organizations has been encouraged in order to address the larger picture of the indirect costs of conflict (Thoms and Ron, 2007; Asher, Banks, and Scheuren, 2008).

From a public health perspective, the concept of indirect deaths is useful because it captures deaths that might have been preventable through a bolstering of the public health system. Such figures provide strong evidence for prioritizing basic public health interventions (such as infectious disease surveillance, immunization, disease control programmes, and water and sanitation projects) in conflict and post-conflict situations.

## Challenges to collecting and using data on indirect deaths

Indirect deaths are inherently difficult to quantify and attribute to conflict-related causes. There are three reasons for this:

- ongoing data collection is weak and specially-targeted methods must be used;
- the attribution of indirect deaths to the conflict is difficult; and
- it is difficult to determine baseline mortality rates in endemic conflict zones.

In conflict situations the ongoing collection of health information is difficult due to the breakdown of information systems, the loss of human resources, and restricted freedom of movement. Health information systems (HIS), which encompass vital registration, epidemiological surveillance, and health service data systems, traditionally aggregate data to provide key information on morbidity, mortality, and early warning and response. However, as health systems break down during conflicts, information systems similarly deteriorate (Working Group for Mortality Estimation in Emergencies, 2007). Even before a conflict becomes violent, information systems may already be underresourced and underdeveloped.

There are numerous examples of the consequences of poor information gathering during conflicts. In South Sudan in 1998, a relapsing fever outbreak

**Box 2.1** Crude mortality rates

Crude mortality rates (CMRs) can be expressed in different ways which are useful for various purposes. Demographers and researchers for the UN's annual statistical yearbooks often use deaths per 1,000 persons per year, as annual rates are most useful in this context. In conflicts and other complex emergencies, *deaths per 10,000 persons per day* is the standard unit since it is most practical for monitoring a humanitarian situation over a short period of time. A humanitarian emergency is considered to be any situation where the CMR is double the baseline rate (Sphere, 2004, p. 261). Various organizations place the emergency threshold at a CMR of 1.0 deaths/10,000/day. This is roughly in line with the Sphere approach for sub-Saharan Africa, which is 0.9 deaths/10,000/day.

The units for CMRs can easily be converted using basic equations:

1 death/10,000/day = 3.04 deaths/1,000/month
= 36.5 deaths/1,000/year

**Note:** For comparison purposes in this report, most figures in this report have been expressed in deaths per 100,000 per year.

**Source:** Guha-Sapir, Degomme, and Altare (2007)

continued for six months due to the lack of an effective early warning system (Gayer et al., 2007). A similar lapse occurred in Angola in 2005, where health authorities were unable to identify a large, deadly outbreak of Marburg haemorrhagic fever in its early stages due to the reduced ability to detect the disease (Ndayimirije and Kindhauser, 2005; Guha-Sapir and Le Polain de Waroux, n.d.).

Without working information systems, standard practices for verifying causes of death are useless. Objective indicators that are normally used (including death certificates and hospital records) are frequently missing or inaccessible (Checchi and Roberts, 2005).

One means of validating non-violent causes of death during conflicts would be verbal autopsy techniques. These interview-based protocols have been developed for community workers in low-resource contexts to obtain information about a single cause of death (Setel et al., 2006). However, the length of time required for interviews and the intensiveness of training impede their use in conflict situations, and greater research into their use in conflict settings is needed (Utzinger and Weiss, 2007; Working Group for Mortality Estimation in Emergencies, 2007).

Second, attributing indirect deaths to the impacts of conflict remains difficult (Checchi and Roberts, 2005). Loss of livelihood, poor diets, lack of food, displacement, poor sanitation, and countless other factors are often treated as the underlying determinants of mortality within a conflict. However, some of these deaths would 'normally' occur under the adverse environmental and economic conditions, such as drought and poor diet, that prevail in most developing countries where armed conflicts occur. While seemingly distant conflict factors may still have an impact on deaths due to disease and malnutrition, attributing these conditions to the conflict remains difficult.

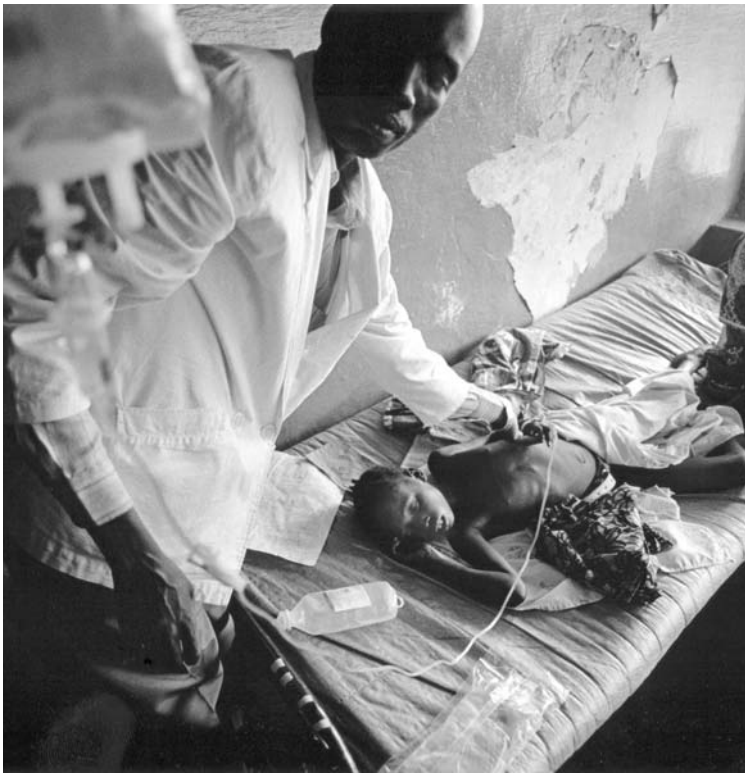


**Photo ▲** A child is treated at hospital during an outbreak of cholera, which is believed to be present in the Yei River, Sudan. © Sean Sutton/MAG/ Panos Pictures

Third, and perhaps even more daunting, there is no straightforward method for determining baseline mortality rates in order to assess the severity of a conflict (and calculate excess mortality) in areas where for decades there have been no public services and little accurate data collection (Guha-Sapir and van Panhuis, 2004; Utzinger and Weiss, 2007). Currently, there is no consensus among researchers on how to derive and compare baseline mortality rates.

In several conflict areas, such as the DRC and Sierra Leone, there has been poor coverage by vital registration for decades. There is therefore little accurate data that can be used to estimate the demographic profile of a population. In addition, it is difficult to designate a point in time at which

to compare countries that exist in a cycle of chronic conflict and/or emergency. For example, as Somalia has been war-torn since the early 1980s, it may not be useful to compare current mortality rates with the out-of-date mortality baseline statistics for the country, which are affected by normal demographic factors. There are, however, currently initiatives to collect routine demographic and mortality data in some areas affected by conflict (e.g. the Bandim Health Project in Guinea-Bissau) (Nielsen et al., 2006).

Notwithstanding the data collection challenges, the most widely used datasets that include baseline statistics for most countries are collected by the United Nations Population Division and often referenced in UNICEF's annual *State of the World's Children* report. This data is derived from the last census and is therefore limited by the quality of data collection and time of collection. Mortality rates are also compared with UNICEF's regional baseline rates rather than those of single countries. This approach is useful where no country-level or sub-national-level baseline data exists, and has been recommended by the Sphere Project (Sphere Project, 2004).

An important conclusion is that in some places the 'normal' peacetime baseline mortality rate may be extremely high. The baseline mortality rate may thus not be an ideal or acceptable benchmark for the health of the population of concern (Guha-Sapir and van Panhuis, 2004).

**Photo ▼** These young children live in a wrecked armoured personnel carrier left over from the civil war, Somalia, 1992. © Paul Lowe/Panos Pictures

## Methods for quantifying indirect conflict deaths

There are three main approaches to quantifying indirect deaths: retrospective mortality surveys, prospective surveillance, and the analysis of multiple data sources.[6] These methods are best used together as 'building blocks' to derive the best estimates of mortality in a conflict situation (see Table 2.1).

A retrospective mortality survey (RMS) is used to determine past mortality rates in situations where the direct collection of mortality data was or is not possible. An RMS collects mortality information for a previous period from a representative sample of a population. Surveyors administer a standard questionnaire to households to collect information on deaths. The advantage of an RMS is the rapid assessment of mortality in areas where prospective surveillance does not exist. However, RMSs are problematic in capturing the true medical causes of death because the information collected cannot be independently verified. It is also difficult to establish whether deaths occurred due to violent or non-violent causes. Logistical problems or security risks make RMSs challenging to implement, especially since the data generated is politically sensitive. Nevertheless, RMSs remain a useful tool in conflict situations with little or no previous mortality information, and

**TABLE 2.1** Comparison of methods for measuring excess mortality

| Method | Appropriate setting | Advantage | Disadvantage |
|---|---|---|---|
| Retrospective mortality survey | ■ During conflict<br>■ Post-conflict | ■ Useful for rapid assessment where prospective surveillance is not in place<br>■ Does not require population denominator<br>■ Practical for use in disorganized settlements | ■ May be difficult to carry out due to logistical needs and insecurity<br>■ Recall bias, response bias, survivor bias<br>■ Measures past death, so not in real time<br>■ Statistical analysis is relatively complicated |
| Prospective surveillance | ■ During conflict<br>■ Post-conflict | ■ Occurs in real time and has strong operational usage<br>■ Relatively simple analytical procedures involved | ■ National information systems to track health and mortality are usually weak in conflict settings so an ad hoc system is required<br>■ Requires regular updating of data and population size to be useful<br>■ Possible only in camps and stable populations |
| Analysis of multiple data sources | ■ Mainly post-conflict (as it is dependent on other primary data sources) | ■ Used to assess the quality and strengths of multiple sources of data<br>■ Statistical techniques are available to employ the best aspects of data sources (i.e. Multiple Systems Estimation) | ■ Dependent on the quality and type of primary data sources (i.e. data source such as a graveyard database may not have clear information on type of death)<br>■ Dependent on the availability and timeliness of primary data sources |

**SOURCES:** Checchi and Roberts (2005); Guha-Sapir, Degomme, and Altare (2007)

RMS methods have been standardized through an inter-agency humanitarian initiative (Working Group for Mortality Estimation in Emergencies, 2007).

The prospective surveillance of mortality through a health information system (HIS) is a better method to document and verify mortality in stable environments. By targeting health facilities and death registries, these systems can provide accurate and timely mortality data. However, HISs are almost universally weak in conflict-affected areas, and between two-thirds and three-quarters of the world's population are not covered by any type of health surveillance (Fottrell, 2008, p. 4). But mortality detection can be integrated through ad hoc surveillance within humanitarian operations and in refugee camps even though it may be prone to under-reporting due to the lack of accurate demographic information (Thieren, 2005; CRED, 2006). The problem of verification and reporting of death in conflict situations is symptomatic of the general lack of standard sources on the causes of deaths.

The analysis of multiple data sources permits the reconstruction of mortality profiles using sources

**Photo ▲** A 13-year-old and her three-month-old baby, born as a result of her rape, in hospital in Goma, DRC.


'Sometimes, when they said that you were the most beautiful woman, it was a disaster! They put you in the middle of everyone, on a cross, with your head down and your legs spread and they raped you in that position. And the others had to cheer them on and dance around you [. . .] I was everybody's woman and nobody's woman. Whoever wanted to satisfy his sexual needs came on us. Sometimes they would shout "Food! Food!" We thought maybe they were bringing us food. But unfortunately, it was not food. It was us, the women, who were their "food".'

— Onarata Kazende, 55 years old, DRC (BBC, 2008)

## **Box 2.2** Sexual violence in armed conflict

During armed conflict, women and girls are specifically targeted by sexual violence that occurs in homes, detention places, military sites, and camps for refugees and displaced persons. Brutal rapes, sexual assaults, sexual slavery, and mutilation are systematically used in many armed conflicts. Survivors suffer grave psychological trauma, permanent physical injury, unwanted pregnancy, and long-term health risks including HIV/AIDS and serious complications in reproductive health.

Data on the scope and magnitude of sexual violence, especially rape, in armed conflicts worldwide is scarce, making it impossible to estimate its extent. In addition to the usual obstacles to data collection, sexual violence is surrounded by social taboos and stigmatization, resulting in a lack of (and under-) reporting even in peacetime. Table 2.2 illustrates the wide range and imprecision of estimated incidents of rape in selected armed conflicts.

A clear example of widespread sexual violence is in the DRC. Victims report that all armed groups, including state security forces, are responsible for rapes and high levels of sexual violence. The majority of the perpetrators remain unpunished, however, especially when belonging to the state security forces.

Rape is becoming more violent and more common in the DRC. It seems that male relatives are forced at gunpoint by militias or paid security forces to rape their mothers, sisters, or daughters. Often women are shot or stabbed in their genital organs after being raped (Wakabi, 2008). According to the UN special rapporteur on violence against women, 31,500 rapes were recorded in South Kivu province between 2005 and the first half of 2007, with probably many more going unreported. The Provincial Synergy for South Kivu estimates that 22 per cent of rape victims are HIV-positive due to the incidents (HRC, 2008).

Civil society organizations (CSOs) have expressed widespread concern for the pervasive nature ▸▸

of sexual violence in the country.[7] The International Rescue Committee reported assistance to more than 40,000 rape survivors in DRC since 2003. A United Nations Populations Fund survey among half of the health centres in the country showed that 50,000 rape cases were reported in 2007 (Wakabi, 2008). The ceasefire of January 2008 did not stop the incidence of sexual violence. In North Kivu province, 880 cases of rape were documented by NGOs and UN agencies in April 2008 alone.[8]

Findings from surveys in different countries and among refugee and internally displaced persons (IDPs) camps show varying prevalence of sexual violence. While in some camps women and girls are especially at risk when they leave the camp to collect wood and fetch water, in others the majority of assaults happen within the camp. A 2006 UNHCR report on sexual and gender-based violence notes than more than 20 of 104 camps that supplied data reported rates of sexual and gender-based violence of between 250 and 500 per 100,000 persons, with approximately ten camps reporting rates of between 500 and 1,000 per 100,000, and 20 camps reporting rates greater than 1,000 per 100,000 (UNHCR, 2007, p. 65). This means that 50 per cent of camps reporting data had rates of sexual and gender-based violence greater than 250 per 100,000.

The 2008 United Nations Security Council (UNSC) Resolution 1820 on sexual violence, adopted unanimously on 19 June, classifies rape and other forms of sexual violence as a weapon of war. It can constitute a war crime, a crime against humanity, or a constitutive act with respect to genocide. Resolution 1820 stresses that perpetrators of crimes of sexual violence should be excluded from amnesty provisions and should be prosecuted (UNSC, 2008). The responsibility for perpetrators of sexual violence is now collective. Some NGOs are concerned that the new resolution on sexual violence does not strengthen the provisions of UNSC Resolution 1325 on Women, Peace and Security and that it does not offer clear measures to end impunity for acts of sexual violence.

**TABLE 2.2** Estimated incidents of rape in selected armed conflicts

| Armed conflict | Estimated number of incidents |
|---|---|
| Sierra Leone (1991–2001) | More than 215,000 |
| Rwanda (1994) | 250,000–500,000 |
| Bosnia and Herzegovina (1992–95) | 14,000–50,000 |
| Liberia (1989–2003) | Approximately 500,000[9] |
| Kosovo (1998–99) | 23,200–45,600[10] |

**SOURCES:** UNICEF (2005, p. 4); UNECOSOC, Commission on Human Rights (1996, §16); OCHA/IRIN (2005, p. 178); Refugees International (2004); AI (2004, p.10); Hynes and Cardozo (2000)

of mortality statistics collected before, during, and after conflict. Demographers and statisticians offer several approaches based on the availability of data sources and the derivation of the best estimates. Multiple systems estimation (MSE) techniques can, for example, assess databases of human rights violations, a census of public graves, and an RMS to estimate mortality. The clear advantage of such an analysis is the assessment of quality among different data sources to derive a best estimate. However, the approach could also aggregate potentially flawed sources of secondary data, which may result in inaccurate results.

## Direct versus indirect deaths in recent conflicts

Given the challenges to arriving at an assessment of the burden of indirect deaths in armed conflict, it is difficult to provide a precise assessment of the annual burden of indirect conflict deaths. Based on the figure of 208,300 conflict deaths between 2004 and 2007 (an average of around 52,000 per year) presented in the chapter on conflict deaths, it is possible to provide some indication of the likely indirect burden in recent years.

The first step is to examine the available evidence on indirect versus direct deaths in recent conflicts. Table 2.3 below does this for 13 conflicts, from different continents and covering different time periods. Several points should be noted from this table. First, in all but one case (Kosovo, 1998–99), indirect deaths were greater than direct deaths, and usually by a wide margin. The Kosovo case

**Table 2.3** Direct vs. indirect deaths in several recent armed conflicts

| | Indirect deaths as percentage of total excess deaths | Ratio of indirect to direct deaths | Conflict mortality rate (per 100,000 per year, average) | Total conflict deaths (direct and indirect) |
|---|---|---|---|---|
| Kosovo, 1998–99[a] | 0[11] | – | 334 | 12,000 |
| Iraq, 2003–07[b] | 63 | 3.0 | 246 | 347,000 |
| Northern Uganda, 2005[c] | 85 | 5.6 | 476 | 26,000 |
| Democratic Republic of the Congo, 1998–2002[d] | 90+ | 9.0 | 1,316 | 3,300,000 |
| Congo-Brazzaville, Pool Region, 2003[e] | 83 | 4.8 | n/a | n/a |
| Burundi, 1993–2003[f] | 78 | 3.5 | 500 | 300,000 |
| Sierra Leone, 1991–2002[g] | 94 | 15.7 | 1,101 | 462,000 |
| Darfur, Sudan, 2003–05[h] | 69 | 2.3 | 730 | 142,000 |
| South Sudan, 1999–2005[i] | 90+ | 9.0 | 1,178 | 427,000 |
| Angola, 1975–2002[j] | 89 | 8.1 | 676 | 1,500,000 |
| Liberia, 1989–96[k] | 86 | 6.1 | 889 | 175,000 |
| East Timor, 1974–99[l] | 82 | 4.6 | 638 | 103,000 |
| Iraq, 1991 war[m] | 77 | 3.3 | 784 | 144,500 |

**Sources:**

[a] Based on Spiegel and Salama (2000, p. 2204). Detailed calculation in Small Arms Survey (2005, p. 259).

[b] There is considerably uncertainty around both direct and indirect conflict deaths in Iraq. Figures used here (87,185 direct and 259,000 indirect conflict deaths) should be considered conservative; it is possible that up to 150,000 direct deaths and as many as 326,000 indirect deaths have occurred. This would yield a total of 476,000 conflict deaths, a conflict mortality rate of 337 per 100,000. Based on data in Box 2.5.

[c] Based on WHO (2005). Total deaths is + or - 4,000; UBOS (2006).

[d] Based on IRC (2000, pp. 1, 3); IRC (2003b, pp. 5–6); IRC (2001a. pp. 6, 8–11); IRC (2004a, pp. 11, 13, and 17); Coghlan et al. (2008), p. 13. Total death figure from Coghlan et al. (2006).

[e] Based on a survey in the Pool region (IRC, 2004b, p. 7). Details in Small Arms Survey (2005, p. 259).

[f] Indirect death ratios for 2002–03, based on IRC (2002a; 2002b; 2002c; 2003a). Details in Small Arms Survey (2005, pp. 258–59). Total deaths are for the entire conflict (1993–2003) from IRC (n.d).

[g] See Box 2.4.

[h] Based on Guha-Sapir and Degomme (2005a; 2005b). This is a meta-analysis of more than 24 different surveys in the region.

[i] See Box 2.3.

[j] Based on Lacina and Gleditsch (2005, p. 159). The 11 per cent 'battle deaths' estimate appears to include both civilian and combatant violent deaths.

[k] Based on Lacina and Gleditsch (2005, p. 159). The 12–16 per cent 'battle deaths' estimate appears to include both civilian and combatant violent deaths. Total deaths are + or - 25,000.

[l] Based on Silva and Ball (2006). Death total is + or - 12,000.

[m] Based on Daponte (2008, p. 59).

can be explained by the relatively well-developed pre-war basic health and service infrastructure, the rapid and effective humanitarian response to the population displacement that occurred during the fighting, and the relatively short and intense nature of the armed conflict.

Second, the conflict mortality rates that these figures suggest are very high, ranging from 334 to 1,316 per 100,000 per year. These are considerably greater than the highest direct conflict and non-conflict death rate, underlining that the risk of dying in warfare can be much higher if accounting for indirect conflict deaths.

Although there is a wide variation in the relationship, in only two cases other than Kosovo did the ratio fall below three indirect deaths for every direct death. Both the Iraq 2003–07 and Darfur, Sudan, 2003–05 cases have been the subject of numerous analyses. The low ratio in the Iraqi case is partly due to the intensity of the violence and the relatively well-developed infrastructure (compared to other conflict zones), and is discussed in Box 2.5. The lower ratio for Darfur is partly due to the fact that studies focused on conflict-affected populations, groups among which the violent deaths were concentrated. It is based on an estimated 142,000 total deaths in 2003–05, of which 43,935 are estimated to be violence-related (Guha-Sapir and Degomme, 2005a; 2005b). Whatever the ratios, the conflicts in Iraq and Darfur exacted a huge human toll.

Three main factors explain the differences in proportion between direct and indirect conflict deaths: the quality of pre-existing health care systems and patterns of disease; the speed and extent of the humanitarian response; and the intensity and duration of battle. Relatively healthy populations with prior access to good health care are much less vulnerable to rapid increases in mortality, whereas vulnerable and weak populations quickly fall victim.

**Photo ▲** A line forms outside an information tent in Stenkovec 2 camp, Macedonia, for refugees fleeing Kosovo.
© Andy Johnstone/ Panos Pictures

A vigorous humanitarian response—food, water, protection, shelter, and basic health care—and good access to affected or displaced populations can also reduce mortality. Conventional battles between regular armed forces in limited areas—which characterizes few contemporary wars—also reduces the burden of indirect deaths on the civilian population, and can (if fighting is intense) also increase the proportion of battle deaths. These three factors taken together can help explain the relatively low ratio for the 1991 Iraq war, compared with the conflicts in Africa.

The persistence of high levels of indirect conflict death after the end of the violent phase of a conflict is an important problem for policy-makers concerned with humanitarian aid and reconstruction. It is often far more time-consuming to restore health infrastructure, services, and security than to negotiate a ceasefire, or even demobilize combatants. States that have been weakened by long-term violent conflicts generally lack the resources and capacity to address these challenges, and

progress is not made until long after a conflict has ended. The disruption and increased mortality that persist at the end of a violent conflict need to be taken seriously into account in the planning of long-term reconstruction and development programmes.

Without detailed data on mortality for all the contemporary conflicts discussed in the preceding chapter (DIRECT CONFLICT DEATH), it is not possible to give a precise estimate of the indirect burden of armed violence. But an order of magnitude can be offered for the purposes of comparison with other aspects of the global burden of armed violence, based on the following data and assumptions:

- The direct death burden in conflicts for 2004–07 from incident reporting was 208,300, or about 52,000 per year.[12] These reported deaths clearly undercount the actual total of direct conflict deaths, although the degree of undercounting varies by conflict.
- A previous study of undercounting in specific conflicts demonstrated that it could be between two and four times the level captured in incident reports (Obermeyer et al., 2008; Small Arms Survey, 2005, p. 230). In the DRC alone, an estimated average of 51,000 people have died violently per year since 1998, although the annual totals have been lower since 2002.
- A conservative ratio of 4:1 indirect to direct deaths would mean that the burden of indirect deaths for an average year between 2004 and 2007 would be at least 200,000 and probably higher.[13]

The total number of indirect deaths would vary considerably from year to year, depending on the number and intensity of conflicts, the nature of the fighting, the provision of humanitarian assistance, and the condition of the affected population. In order to avoid the impression of excessive precision in what is simply an order of magnitude, this report concludes that *on average, at least 200,000 persons have died each year as an indirect result of conflict since 2004*.

The pages following the end of this chapter provide detailed discussions of three long wars—in Iraq, Sierra Leone, and South Sudan—to provide concrete illustrations of how field-based surveys can provide a more adequate picture of the burden of violence in armed conflicts.

## Conclusion

Quantifying excess mortality and indirect deaths is a difficult task. But the expert consensus is that in almost all contemporary armed conflicts, indirect deaths are often more numerous than mortality arising from violence. Non-violent deaths that can be directly linked to conflict should count as part of the burden of armed violence, since from a human perspective it matters little if a parent or child dies from a bullet or from dysentery soon after an armed clash.

Several scientifically rigorous methods have been developed and improved in recent years, by epidemiologists, demographers, and statisticians, to provide reliable estimates. These methods continue to be refined and standardized, as evidenced by the SMART (Standarized Monitoring and Assessment of Relief and Transitions) initiative and the general increase in the quality of data collection and analysis in humanitarian research.

Continued innovation in measuring indirect mortality in conflicts will be crucial to understand the true human impact of mortality in conflicts, to help set priority public health goals for the prevention of disease and malnutrition, and to provide the evidence base to hold perpetrators of violent acts against innocent populations legally accountable.

**Box 2.3** A very dark number: direct and indirect mortality in southern Sudan, 1999–2005

Since Sudanese independence in 1956, civil wars have raged in the south, with a lull between 1972 and 1983. The period 1983–2005 was the longest and, in all likelihood, the deadliest spell. In January 2005 the Comprehensive Peace Agreement formally ended the fighting, and relative calm has since returned.

Large-scale human rights violations were committed during the 1983–2005 civil war, in particular against the civilian population of southern Sudan. Massive population movements took place; famines were chronic. Food aid to the affected population was in numerous instances denied or purposely obstructed.

An estimated 427,337 people died (excess mortality) during the second phase of the armed civil conflict in the period 1999–2005 in the three states of southern Sudan: 339,342 in Upper Nile, 58,663 in Bahr el Ghazal, and 29,332 in Equatoria (these three regions have become the ten states of South Sudan).

Of these excess deaths, the percentage of direct (violent) deaths is only 0.3, although it appears there was relatively higher direct mortality in Bahr el Ghazal (one per cent) during this period. The total number of direct deaths in southern Sudan between 1999 and 2005 was 1,381 (594 in Bahr el Ghazal, 520 in Upper Nile, and 167 in Equatoria). This is in addition to the previously estimated *1.7 million* victims between 1983 and 1998 (Burr, 1993; 1998).

How are these figures arrived at? Direct mortality is estimated from data on killings in all documents that could be found on the Internet, through fellow researchers, and in libraries. Documents were selected if they provided independent information on mortality during the conflict. Incidents and casualties were collected in one file, and identified by location and date, to prevent double counting. Verbal descriptions ('many', 'numerous', 'few') were quantified (see Bijleveld, Degomme, and Mehlbaum, 2008).

To estimate total excess mortality, the crude (CMR) and under-five (U5MR) mortality rates in all the surveys in the CE-DAT database have been plotted against the years studied and the trends in mortality have been investigated (CRED, 2008).[14] Any outliers are removed in order to arrive at a conservative estimate, and mortality rates are applied to time frames and regions to develop a differentiated estimate.

For estimating total mortality, 78 surveys that gave either a CMR or U5MR were found. Only 37 of these gave a recall period, but as the largest recall period was three months, and as population estimates for southern Sudan are fairly coarse anyway, all surveys were used, whether or not they reported a recall period, and to peg the mortality rate to the time that the survey was administered. Most surveys were conducted by NGOs active in southern Sudan, both in towns like Aweil and Bentiu and in the rural areas. No surveys were found for 1999. One outlier with an U5MR of 33 was removed (Ratnayake et al., 2008, p. 16).

Virtually all surveys that reported CMRs and U5MRs above emergency level were conducted between June 2001 and August 2003 in the Upper Nile and Jonglei states. These rates are problematic, however, as they are excessively high and would have to have been reflected in massive starvation, which was not reported during those years. In addition, the surveys were methodologically different from subsequent measurements. The median of the CMR from the surveys (2.1) was used as a more conservative estimate. With these elevated rates excluded, the average CMR was 0.58.

For the Bahr el Ghazal and Equatoria regions the average non-elevated CMR of 0.58 was used for the entire period. For 1999, the 2000 mortality rates were assumed to hold. For the Upper Nile region the 0.58 CMR was used for 1999, 2000, and 2004. As the surveys show elevated mortality for Upper Nile and Jonglei from only mid-2001 and onwards, 2.1 was used for 2002 and 2003 for the entire Upper Nile region.

To determine excess mortality, expected mortality was subtracted and set conservatively at 0.5. Applying these mortality rates to estimated population sizes, the total excess mortality is 427,337 (339,342 for Upper Nile, 58,663 for Bahr el Ghazal, and 29,332 for Equatoria).

These estimates are dependent on assumptions, and, in the case of direct deaths, in part on a quantification of verbal statements that may be inaccurate. However, even if 90 per cent of all direct mortality was missed, or if total excess mortality were only 50 per cent of what is estimated here, almost all excess mortality would still be indirect, and only a fraction (less than five per cent) the immediate consequence of violence.

By far the largest contribution to mortality in southern Sudan in 1999–2005 was indirect deaths. On a more general note, our calculations are on the edge of feasibility, since they have been made from scarce data and should be used with caution.

## Box 2.4 Direct and indirect mortality in Sierra Leone, 1991–2002

Massive human rights violations took place during the civil war in Sierra Leone from 1991 to 2002. During almost 11 years of conflict, many thousands of people were displaced from their homes or fled the country. As the conflict moved across the country, population moved in its wake.

With infrastructure destroyed and/or facilities looted in most conflict zones, parts of the population were unable to plant their crops, and had severely reduced access to health care. In addition to being caught up in the fighting, the civilian population was also actively targeted. Among the crimes committed were widespread and systematic sexual violence, sexual slavery, abduction, use of child soldiers, murder, robbery, destruction, amputations, displacement of people, and starvation (PHR, 2002).

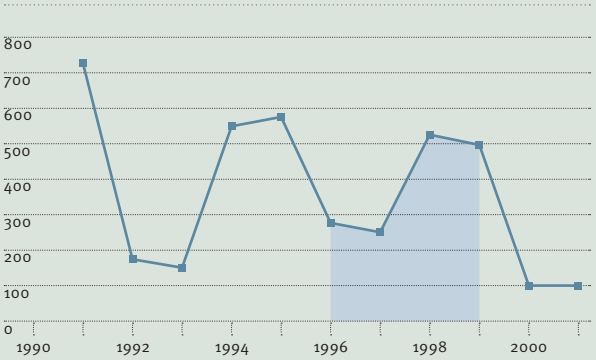
### War-related sexual violence in Sierra Leone

During more than a decade of armed conflict in Sierra Leone sexual violence and associated abuse against women and girls was characterized by extreme brutality. As many as 215,000–257,000 women and girls were affected by sexual violence (PHR, 2002, p. 4). According to the Truth and Reconciliation Commission (TRC) all armed factions, in particular the Revolutionary United Front (RUF) and the Armed Forces Revolutionary Council (AFRC), systematically and deliberately raped women and girls (TRC, 2005, p. 162).

In addition to rape, other human rights violations, such as abductions, beatings, killings, torture, forced labour, firearms and other injuries, and amputations were committed on a regular basis. One survey found that 94 per cent of 991 randomly surveyed households reported at least one of the above listed abuses during the course of the war. Of those who experienced sexual violence, 89 per cent were raped, 33 per cent were gang raped, 33 per cent were abducted, 14 per cent were molested, 15 per cent experienced sexual slavery, and 9 per cent were forced into marriage. The majority of incidents occurred between 1997 and 1999 (PHR, 2002, pp. 2–4).

Violence against the civilian population and especially against women and girls perpetrated by combatants in Sierra Leone was widespread, representing a significant long-term health burden.

**Figure 2.2** Distribution of killings in Sierra Leone, 1991–2001




**Source:** Benetech report to the TRC (Conibere et al., 2004)

Different estimates of civilian deaths from these gross human rights violations do exist, ranging from 35,000 to 200,000 deaths (cf. Bijleveld and Hoex, 2008). These estimates are, however, barely substantiated. Also, it is unclear what part of mortality is direct (violent) and what part is indirect (consequence of disease, starvation, exhaustion, injuries, etc.).

To estimate direct mortality, the distribution of direct deaths as reported by the Sierra Leonean Truth and Reconciliation Commission (TRC) is used. Next we assume that all killings in Sierra Leone in the period under investigation did follow the trend as given by the TRC report. Finally, the level of this trend curve was set to match the available data (mainly from UN and Amnesty International sources) on direct killings from 1996–99.

Figure 2.2 describes the distribution over time of the total estimated direct mortality of 26,704.

This number should be regarded as conservative when compared with other sources. TRC data is an underestimate: for instance, in January 1999 around 5,000 persons were killed in Freetown, while the total TRC number adds up to approximately 4,500.

Similarly, the Amnesty International deaths are also an underestimate, since they cover only six months in 1996, only five months in 1997, and eight months in 1998; as well, not all districts were covered and some periods and areas were too dangerous to survey. ▸▸

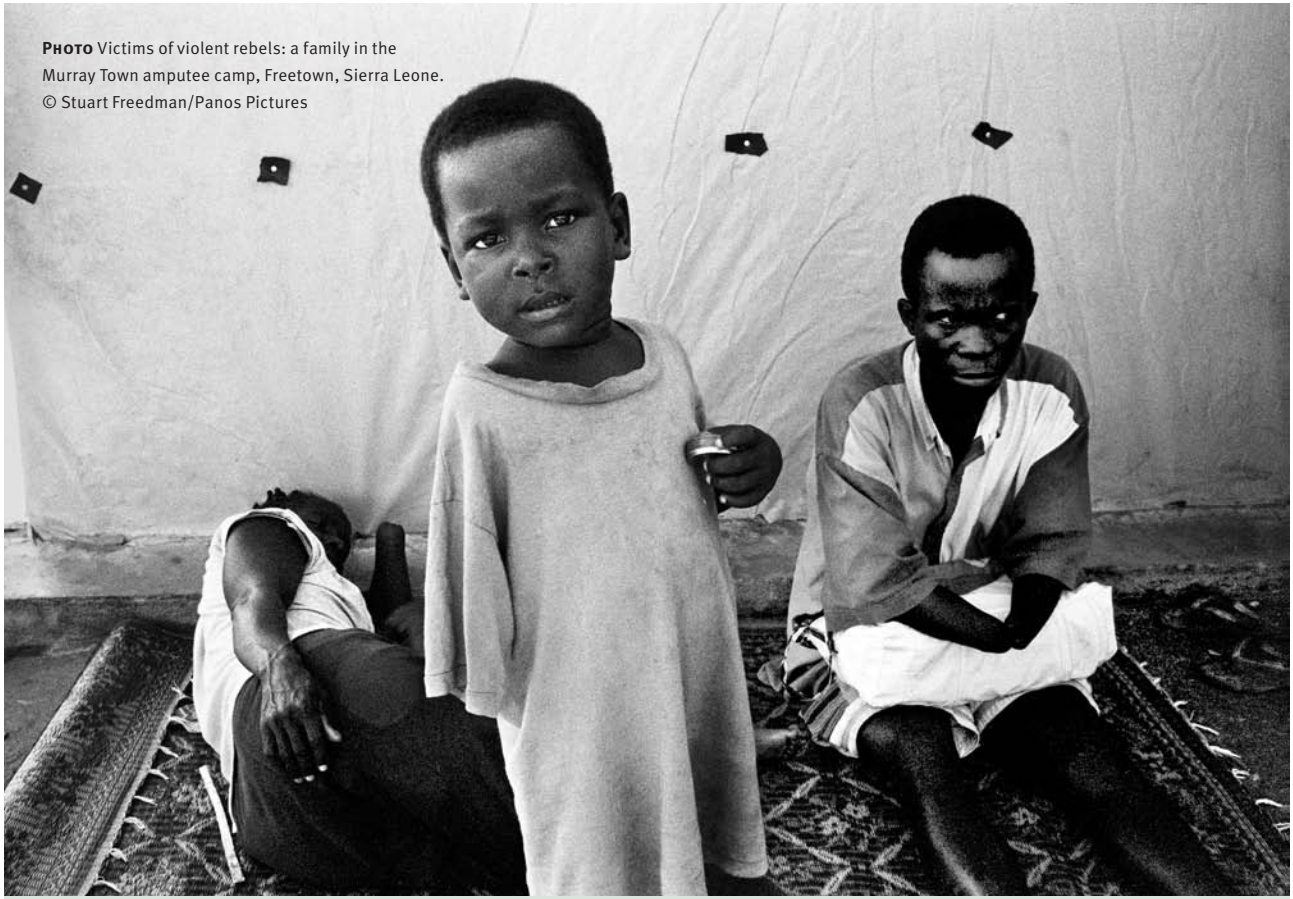


**Photo** Victims of violent rebels: a family in the Murray Town amputee camp, Freetown, Sierra Leone.
© Stuart Freedman/Panos Pictures

Total excess mortality was calculated using a hypothetical population size for 2002 and assuming uninterrupted non-conflict population growth from the 1990 population for Sierra Leone of 4,087,000. Using a conservative growth rate of 1.96 and correcting for migration leads to a hypothetical population size by 2002 of 4,979,321.

The actual population size in 2002 was estimated by calculating back from the 2004 census, and again correcting for migration, to estimate actual Sierra Leonean population size in early 2002 at approximately 4,517,330.

Total war-related mortality, estimated as the difference between the hypothesized and the actual population, is then approximately 461,990—meaning that an estimated 460,000 Sierra Leoneans lost their lives as a result of the conflict between 1991 and 2002.[15] Approximately 26,704 of these deaths—or six per cent—were most probably directly due to violence. Roughly 94 per cent of the total excess mortality was thus indirect, mostly attributable to causes other than violence.

These estimates all depend on assumptions. It may have been that the Sierra Leonean population would, without the conflict, not have grown at the assumed rate, but at a much slower rate. In that case, the percentage of direct deaths becomes higher. However, even if the growth rate were set at the lowest rate ever measured (1.4 per cent, which is unrealistic and too low), still around a quarter of total excess mortality is direct, and three-quarters is indirect. By far the greater part of the mortality in the Sierra Leone war was indirect.

## Box 2.5 Armed violence in Iraq: what's in a number?

Estimates of violent deaths (both direct and indirect) in Iraq since 2003 have generated extreme controversy, in part because of the wide variation in the number of deaths, in part because of lack of clarity regarding what different techniques measure or count. Sources may focus on combatants (battle deaths), civilians who die violently, or on changes in overall mortality rates since 2003.[16] But as shown below, it is reasonable to conclude that armed violence has claimed more than 200,000—and perhaps up to 400,000—lives since 2003.

The situation in Iraq also shows how difficult it is to draw a line between 'conflict' and 'post-conflict' violence, or between conflict and 'non-conflict' or criminal violence. In many cases, the identity or motive of the perpetrator of violence is unknown, making it difficult to establish why particular killings occur. Furthermore, the ebb and flow of armed violence since 2003 call into question the very notion that violent deaths decrease after a conflict has been declared over. ▸▸

**Table 2.4** Violent deaths reported in Iraq, 2003–07

| Database | 2003 | 2004 | 2005 | 2006 | 2007 | Total* |
|---|---|---|---|---|---|---|
| Cross-country databases | | | | | | |
| IISS | 10,000 | 15,000 | 12,900 | 23,000 | 31,560 | 92,460 |
| Ploughshares | 12,500 | 6,500 | 10,500 | 35,000 | n/a | 64,500 |
| PITF | 100–1,000 | 1,000–5,000 | 10,000+ | 10,000+ | n/a | 23,500** |
| PRIO | 10,000 | 9,500 | 8,100 | n/a | n/a | 27,600 |
| SIPRI | 18,600 | n/a | 5,500 | n/a | n/a | 24,100 |
| UCDP state | 8,313 | 1,987 | 2,299 | 3,537 | n/a | 16,136 |
| UCDP state and non-state | 8,494 | 2,304 | 3,418 | 3,537 | n/a | 17,753 |
| National databases | | | | | | |
| Iraq Body Count | 11,672 | 9,843 | 13,816 | 26,659 | 23,427 | 85,417 |
| Iraq Coalition Casualty Count | 598 | 1,093 | 3,542 | 3,042 | 2,833 | 11,108 |
| **GBAV estimate** | **10,919** | **9,803** | **15,788** | **26,910** | **23,765** | **87,185** |

* For available years only.

** This includes averages for the ranges for 2003 and 2004 and the lowest figures for 2005 and 2006.

**Source from this chapter:** Iraq Coalition Casualty Count (2008).

**Sources from Chapter 1 (DIRECT CONFLICT DEATH):** IISS (2008); Iraq Body Count (2008); PITF (2006); PRIO (2008); Project Ploughshares (2007); SIPRI (2007); UCDP (2006a)

### Violent (direct) deaths

Two main techniques have been used to collect data and estimate levels of violent deaths: incident reporting and mortality data from surveys. The Iraq case is one of the few in which a comparison between different methods can be made.

Table 2.4 shows data from incident-based databases, both from cross-country databases and country-based studies for Iraq. The differences are mostly due to different techniques and (more importantly) different rules for counting. The UCDP dataset, for example, measures only battle-related deaths; Iraqi Body Count measures civilian casualties including morgue reports; and the Iraqi Coalition Casualty Count measures casualties among combatants and civilian contractors.

The last row in Table 2.4 provides the consolidated estimate for 2003–07 used in this report. It is based on combining figures for country-based studies and accounting for the different counting methodologies used. This report thus estimates that since the start of the war *at least* 87,000 direct conflict deaths have occurred, of which only 15 per cent are identified as state or coalition combatants. Translated into mortality rates, this would equal approximately 65 violent deaths per 100,000 people per year—a high rate. All the sources used note that undercounting of the real burden is likely because of difficulties encountered in gathering reliable information on all violent deaths.

The GBAV estimate is calculated by pooling a variety of incident-based datasets. In order to control for overlap across sources, this technique includes civilian data from Iraq Body Count after discounting morgue data, which cannot be tied to conflict actions with any certainty. While it also excludes accidents and civilian data, the estimate includes figures for military and contractor casualties as well as Iraqi armed forces generated by the Iraq Coalition Casualties Count. The GBAV estimates track the perceived intensity of the war over time and are similar to the trends documented in most other data sources.[17] ▸▸

**Table 2.5** Violent death estimates from three mortality surveys

| | Period covered | Violent deaths |
|---|---|---|
| Roberts et al. (2004) | March 2003–Sept. 2004 (18 months) | 14,700–49,980* |
| Burnham et al. (2006) | March 2003–July 2006 (40 months) | 601,027 (426,369–793,663) |
| Alkhuzai et al. (2008) | March 2003–June 2006 (40 months) | 151,000 (104,000–223,000) |

* This estimate is based on the percentage of the recorded deaths that were violent deaths (15 per cent if the deaths from Falluja are excluded; 51 per cent if they are included), multiplied by the mid-point estimate of 98,000 excess deaths. It should be noted that there is a wide confidence interval for the estimate of 98,000 deaths, so these figures should be taken as indicative only.

**Table 2.6** Overview of indirect death estimates from three mortality surveys

| | Period covered | Excess deaths estimate |
|---|---|---|
| Roberts et al. (2004) | March 2003–Sept. 2004 (18 months) | 83,300* |
| Burnham et al. (2006) | March 2003–July 2006 (40 months) | 53,938** |
| Alkhuzai et al. (2008) | March 2003–June 2006 (40 months) | 259,000*** |

* The figure is the total of 98,000 excess deaths minus the violent deaths (14,700), excluding violent deaths recorded in the Falluja cluster, which was itself excluded from the estimates given for excess deaths.

** The figure is low because of the very high rate of violent deaths reported (see Table 2.5).

*** The range for this estimate is 213,000–327,000. Figure based on WHO calculations from the original dataset. Mills and Burkle (2008) suggest a higher figure of 282,000 non-violent indirect deaths.

Several recent epidemiological studies provide further information on the scale and scope of direct and indirect conflict deaths. Two studies were published in the medical journal *The Lancet* in 2004 and 2006 (Roberts et al., 2004; Burnham et al., 2006) and a third in the *New England Journal of Medicine* in 2008 (Alkhuzai, 2008), all based on sampling survey techniques used to calculate an estimate for the entire population. At least one of these estimates stirred a controversy by revealing an extremely high level of violent deaths (conflict and non-conflict), much larger than the one estimated by incident reporting or other studies. The results of all three epidemiological studies for violent deaths are summarized in Table 2.5.

At first glance, such a wide range seems to imply that the exact number of deaths due to violence remains unknown. But the quality and reliability of these surveys is not equal. The most recent study (2008) surveyed 9,345 households, and was conducted under the auspices of the World Health Organization. The previous two studies, both conducted under difficult circumstances and with limited resources, surveyed 990 (2004) and 1,849 (2006) households. The gain in precision with greater numbers of households surveyed in the 2008 study is obvious, and some concerns have been raised about the accuracy of the estimates in the 2006 study.

The estimate of 151,000 violent deaths for the 40-month period from March 2003 to June 2006—an average of 45,300 deaths per year (Alkhuzai, 2008)—is approximately three times higher than the equivalent period in the incident reporting data. The figure can in part be explained by the under-reporting that characterizes all incident reporting systems, especially where media coverage is patchy and conflict is intense. It also underscores the main message of the conflict deaths chapter—that the figures of 52,000 conflict deaths per year *for all conflicts* in recent years, based on incident reporting, is certainly an undercount of the burden of direct deaths (CONFLICT DEATHS).

### Indirect deaths

The Iraqi conflict also potentially produced *indirect deaths*—persons who have died from such preventable causes as disease and malnutrition, due to loss of access to basic health care, water and sanitation, or other basic services. The three mortality surveys discussed above estimate both violent and non-violent mortality; consequently, they can also estimate the burden of indirect conflict deaths in Iraq. Table 2.6 presents an overview of the results of the non-violent mortality rates.

The figures in Table 2.6 provide a very wide range of estimates: between 1,348 and 3,900 per month. Nevertheless, based on these figures, which calculate the difference between the post-invasion and pre-invasion mortality rates in Iraq, one can arrive at an estimate of indirect deaths from March 2003 to March 2008 (five years) for the Iraq conflict: more than 150,000 indirect deaths, with a wide possible range between 80,000 and 234,000. These figures illustrate that the estimate for excess indirect mortality in Iraq remains as imprecise as the estimate for direct deaths.

Regardless of the final figure, the total number of direct and indirect victims of the Iraq war since 2003 is very large, almost certainly exceeding 200,000 and perhaps as high as 400,000.

## Abbreviations

| | |
|---|---|
| **AFRC** | Armed Forces Revolutionary Council |
| **CE-DAT** | Complex Emergency Database |
| **CMR** | Crude mortality rate |
| **CSO** | Civil society organization |
| **DRC** | Democratic Republic of the Congo |
| **HIS** | Health information system |
| **IDP** | Internally displaced person |
| **MSE** | Multiple systems estimation |
| **RMS** | Retrospective mortality survey |
| **RUF** | Revolutionary United Front |
| **TRC** | Truth and Reconciliation Commission |
| **UNSC** | United Nations Security Council |
| **U5DR** | Under-5 death rate |
| **U5MR** | Under-5 mortality rate |

## Endnotes

1 This chapter draws extensively upon Ratnayake et al. (2008), which was commissioned for the *Global Burden of Armed Violence* report.

2 Of the 2.1 million reported indirect deaths since 2004, only 0.4 per cent—or 8,400—were calculated as violent deaths, a figure that accords well with the direct conflict death estimates for the same four years (Coghlan et al., 2008).

3 This 'reasonable estimate' is based on the assumed undercounting of combat deaths, and conservative assumptions about indirect deaths. The figure is explained in more detail below.

4 The use of alert thresholds is explained further in Checchi and Roberts (2005, p. 7).

5 Accidents are sometimes grouped under direct deaths as they specify a grey area where deaths may have indeed been due to violence.

6 For a more detailed account of the methods of quantifying indirect deaths, see Ratnayake et al. (2008, pp. 6–12) which was commissioned for the *Global Burden of Armed Violence* report.

7 Letter to the UNSC from 71 Congolese organizations representing the women of DRC. 12 June 2008.

8 Letter to the UNSC from 71 Congolese organizations representing the women of DRC. 12 June 2008.

9 Estimated 40 per cent of the female population, averaged over 15 years.

10 Population-based survey of 1,358 Kosovo Albanians (who had been internally displaced or who had recently returned to Kosovo) conducted in August and September 1999 by the Centres for Disease Control and Prevention (CDC). Extrapolation to an estimated 800,000 Kosovo Albanian women over 15 years of age (Hynes and Cardozo, 2000).

11 In Kosovo the number of violent deaths recorded in the sample population actually exceeded the number of calculated excess deaths (both direct and indirect) in the conflict. This may be a statistical artefact due to the small numbers used to calculate ratios, but it also reflects the fact that intentional injury was a cause of death in Kosovo even before the most intense phase of the conflict. Some direct deaths may therefore have been included in the number of expected deaths for the population.

12 This figure includes civilian victims of violence in conflict; the number of combatant deaths is lower.

13 A qualitative assessment of the most important ongoing conflicts would support this assumption of a 4:1 indirect to direct death ratio as a minimum average.

14 The Complex Emergency Database (CE-DAT) is an online, publicly accessible, searchable database of global humanitarian emergencies. It contains more than 1,800 surveys previously collected in complex emergencies occurring since the year 2000. ‹http://www.cedat.be›

15 It should be stressed that these are a conservative estimates; Bijleveld and Hoex (2008) give a range.

16 It is impossible to summarize all the relevant contributions to these debates. For some examples, see Dobbs (2007); Fischer (2007); Ahuja (2007); and Tapp et al. (2008).

17 See the online annexe at www.genevadeclaration.org for a detailed explanation of the methodology.