CHAPTER 3

The Death Toll in the Democratic Republic of the Congo

Claims that national mortality rates decline during periods of warfare are not only deeply counterintuitive but they also stand in sharp contrast to the findings of the largest, most widely cited, and most influential research project ever undertaken on the human costs of war.

In 2008, after carrying out five retrospective mortality surveys in the Democratic Republic of the Congo (DRC), researchers at the International Rescue Committee (IRC) concluded that some 5.4 million people died between 1998 and 2007 who would not have died had there been no war.[1] The IRC estimated that more than 90 percent of the victims perished from war-exacerbated disease, malnutrition, or other nonviolent causes, rather than violence. Indeed, by 2007, less than 1 percent of war-related fatalities were due to violence.

This huge death toll arises, according to the IRC, because the mortality rate in the DRC increased dramatically after the war started in 1998. They note that it dropped in 2001, but has remained significantly higher than the IRC's assumed pre-war—"baseline"—mortality rate of 1.5 deaths per 1,000 per month ever since.

But, while no one doubts that the death rate in the DRC is tragically high, critical analysis of the IRC's data and methodology presented in this chapter suggests that a number of the key assumptions made by the organization's researchers are highly questionable and that the claim that 5.4 million Congolese have died because of the war cannot be sustained.

The IRC is a New York-based humanitarian organization with operations in many parts of the developing world and a long history of engagement in the DRC. In its three nationwide surveys carried out in 2002, 2004, and 2007, IRC researchers used standard survey methodology, selected large samples, and reported appropriate confidence intervals for their mortality estimates. The US Center for Disease Control and, subsequently, the Burnet Institute at the University of Melbourne, Australia, were consulted on the methodology used to undertake the surveys.

The surveys in 2000 and 2001, were compromised by questionable methodological assumptions, however. And, while they clearly reveal very high levels of mortality in parts of the eastern region of the DRC, we argue that the excess death estimates they produced should be rejected.

The IRC's findings on mortality in the DRC have become widely known and accepted and have attracted none of the public controversy that has surrounded war death estimates for Iraq and Darfur. They have been published in the influential UK journal, *The Lancet*, and have been cited in enumerable other peer-reviewed journals, as well as by governments, international agencies, the media, and many nongovernmental organizations (NGOs).[2]

The IRC's reputation, and the effective publicity that has attended the launches of its reports on the DRC, have ensured that its findings have gained widespread media attention for a humanitarian crisis that had long been neglected. Its research has also helped increase public understanding of the indirect impact of wartime violence on population health.

Moreover, there is no doubt the IRC's tireless and effective advocacy has helped focus the attention of the US government and other major donors, as well as the United Nation's (UN's) Security Council on the violence in the DRC. "Following the release of the 2000 survey results, total humanitarian aid

increased by over 500% between 2000 and 2001. The United States' contribution alone increased by a factor of almost 26."[3]

The number of peacekeepers in the country has also increased substantially. Indeed, with a force of 20,255 uniformed personnel on the ground, the DRC is now host to the UN's biggest peacekeeping force.[4]

The IRC's research-informed advocacy has, in other words, had a considerable impact not only in the global media but also on donors and international agencies.

Two Challenges to the International Rescue Committee's Findings

Although the extraordinary figure of 5.4 million excess deaths has attracted little public controversy, two recent reports in the public domain, both released in French, have produced mortality estimates that are sharply at odds with those of the IRC. Neither has received much media attention in the English-speaking world.

In October 2008 two Belgian demographers, André Lambert and Louis Lohlé-Tart, published a critique of the IRC's findings that drew on demographic data collected between July 2005 and February 2006 for the voter registration process in the DRC, together with data from the national census in 1984 and a demographic survey taken in 1956.[5] (Both authors had been invited by the European Commission to assess the voter registration process in 2005 and 2006.) Their estimate of the excess death toll between 1998 and 2004 was some 200,000—*just one-twentieth of the IRC's 3.9 million excess death estimate for the same period*.[6]

Both the Belgian study and the IRC assume very high mortality levels in the DRC from 1998 to 2004, but the critical difference is that the IRC assumes a dramatic jump in the mortality rate after the war starts. Indeed, it is this sudden increase from a very low—we believe too low—baseline mortality rate that creates the IRC's huge cumulative excess death toll. By contrast, the Belgian study assumes that mortality rates are uniformly high *before*, as well as during and after, the war.

The Belgian study has in turn been criticized by other demographers both on methodological grounds, and because there was insufficient information provided in the paper to permit independent replication of its findings. The publication of the paper triggered a review of its methodology and that of the IRC by the World Health Organization (WHO)-affiliated, Health and Nutrition Tracking Service (HNTS).[7] The HNTS reviewers were critical of some of the methodological assumptions and the lack of information provided in the Belgian study, but they also criticized the IRC's methodology.[8]

The second challenge to the IRC's estimates comes from a survey undertaken in the DRC in 2007 by the authoritative Demographic and Health Survey (DHS).[9] The DHS data indicate that the DRC's under-five mortality rate—the most sensitive indicator of the indirect costs of war—is dramatically lower than that reported by the IRC for the same period. Since the IRC found that children made up 47 percent of all excess deaths in the DRC during the final survey period, the child mortality rate is clearly an important indicator of overall mortality.

For the 2006-2007 period, the IRC's survey data indicates that the nationwide child mortality rate is 5.00 under-five deaths per 1,000 per month. The DHS estimate for this period is 148 deaths per 1,000 live births over a five-year span.[10] This translates into 2.63 deaths per 1,000 children per month—*a little over half the IRC's estimate*.[11] Both estimates cannot be correct.

The DHS data show the under-five mortality rate (calculated by the direct estimation method) declining from the end of 1994 to the end of 2004, with the decline continuing through all periods of warfare covered by their survey data.[12] By contrast, the IRC's data indicate that the overall mortality rate

increased dramatically after the war started in 1998, decreased substantially as of late 2001, and subsequently decreased more gradually.

However, as with the earlier discussion of the Belgian study, our point here is not to determine which of the estimates is correct. It is simply to note that the IRC's fatality estimates, while not publicly controversial, have not only been challenged but are *much* higher than those of other studies.

Questioning the International Rescue Committee's Methodology

The analysis that follows reviews the methodology used in all five of the IRC's surveys. It argues that key assumptions used by the researchers to estimate excess death tolls are incorrect, and that these errors had the effect of unwarrantably increasing the excess death toll estimates.

The first and second surveys only covered the war-affected eastern part of the DRC—the three subsequent surveys were nationwide.

The first survey was conducted in 2000, and covered a 22-month period from the beginning of the most intense period of fighting in August 1998.[13] It found that some 1.7 million people had died in the eastern part of the country who would not have died had there been no war. However, as we explain below, the methodology used to make this estimate is highly problematic because the areas to be surveyed were not chosen appropriately.

The second survey was carried out in March and April 2001. It had a recall period of some 15 months from January 2000 to March 2001. Its findings—along with interpolated excess death estimates from the nonsurveyed period covering April 2000 to December 2000—boosted the cumulative excess death toll estimate for the two survey periods to 2.5 million, of which 350,000 were violent deaths. As with the first survey, its findings were compromised because of the way the areas to be surveyed were chosen.

The primary problem with the three nationwide surveys that were conducted in 2002, 2004, and 2007 was the IRC's reliance on a baseline mortality rate that was too low.

In reaching its cumulative nationwide excess death estimate of 5.4 million for the period covered by all five surveys, the IRC added the excess death tolls from the first two surveys to those of the subsequent three surveys.

Readers may wonder how the IRC could calculate *nationwide* excess war deaths from 1998 to 2001, given that the two surveys taken in this period only provided fatality data for the war-affected eastern part of the country. The short answer is the IRC assumed that the violence was concentrated in the east and that there were *no* excess war deaths in the west of the country over this period. From this it follows that the excess war death toll for the east of the country in this period will also be the nationwide excess death toll.

In the analysis that follows, we do not rely on demographic data as did the Belgian study, nor do we draw on other surveys—except to note some of the findings from the 2007 DHS data. The focus here is rather on the IRC's own estimates, and the methodology and assumptions that underpin them.

In All of the Surveys the Baseline Mortality Rate is Too Low

In determining the excess death toll, the "baseline" mortality rate is critically important. If it is too low, the excess death toll will be too high.

The IRC uses the sub-Saharan average of 1.5 deaths per 1,000 per month as its baseline mortality rate for all but the very last survey when the sub-Saharan average drops to 1.4.[14] Using the sub-Saharan African average mortality rate as a comparator—to indicate how high death rates were in the east of the

DRC compared to the rest of sub-Saharan Africa, for example—would have been both instructive and appropriate. Using it as a measure of the pre-war mortality rate in the DRC itself makes little sense.

The IRC argues the sub-Saharan average mortality rate is a conservative choice for pre-war DRC because it was the highest estimate available.[15] But, the DRC is in no sense an average sub-Saharan African country—indeed, it is ranked at, or near, the bottom of every sub-Saharan African development indicator. The baseline mortality rate for the country as a whole should therefore be considerably higher than the sub-Saharan African average. The survey evidence from the western part of the country suggests that this is indeed the case.

In 2002 the IRC recorded no violent deaths in the western region—which it refers to as the "nonconflict" zone. Yet, the mortality rate in this zone is 2.0 deaths per 1,000 of the population per month—a third higher than the sub-Saharan African average that the IRC uses as its pre-war baseline mortality rate.

The fighting in the DRC was also heavily concentrated in the eastern provinces during the period covered by the first two surveys. This suggests that in this period too there was no significant violent death toll in the western part of the country. Indeed, this is precisely the assumption the IRC makes in arriving at its 5.4 million excess death toll estimate for the DRC for the period 1998 to 2007.

As we show later, using this 2.0 deaths per 1,000 rate as the baseline mortality figure, rather than the sub-Saharan African average of 1.5 deaths, sharply reduces the estimated excess death toll attributable to the war throughout the entire period, with the decreases being greatest for the three most recent surveys.

The 2000 Survey: Survey Locations Inappropriately Selected

The most serious problem with the IRC's first survey is that the survey locations were inappropriately selected for the purpose of estimating excess mortality in the war-affected eastern region of the country. (This was also the case with the second survey.) In addition, too few areas were surveyed to allow much confidence in the results even if the locations had been selected appropriately.

The IRC's May 2000 report on the first survey notes: "While the 1.2 million people within the sampling universe of the five IRC studies *are not representative of the approximately 20 million people in eastern DRC*, these surveys probably represent the best broad-based data available."[16]

While the latter part of the above statement is very likely true, the fact remains that extrapolating from a small convenience sample of five nonrandomly selected populations to the region's entire population is a serious violation of basic statistical principles. Furthermore, there are no indications of any attempt to implement alternative selection criteria for the survey sites that would have ensured that, even if not randomly chosen, they were nevertheless representative of the population of the eastern DRC.

It is theoretically possible that the nonrandomly chosen survey areas could by chance have been representative of the population as a whole, but the IRC's selection procedure minimized this possibility.

Three of the five areas the IRC selected were those in which it was operating—or intended to operate––humanitarian assistance missions. Since there would be little point in setting up humanitarian operations in areas where the war had had little or no impact, the IRC's selection of Kisangani, Kabare, and Katana as areas to be surveyed meant that parts of the eastern DRC that had low mortality rates had little chance of being chosen. Had the selection of locations been random, low-mortality areas could well have been selected, in which case the surveys would have revealed a lower excess death toll.

It is not clear what criteria were used to select the other two areas surveyed. But, whatever the reason for the choice, both areas had extremely high mortality rates.

The information obtained from the raw survey data may well have been useful for humanitarian purposes, and it certainly indicated that parts of the eastern region of the DRC were suffering dramatically high levels of mortality, but the statistically inappropriate selection of the survey areas means that the findings should never have been used to generate excess death estimates for the eastern region as a whole.

The 2000 Survey: Estimation Methods Challenged

Even if the inappropriate selection procedure is ignored, the IRC's methodology remains highly problematic. In the first survey, the IRC's researchers used three separate estimation methods to determine the excess death toll. Each of these methods is different, but all three produce similarly large death tolls—ranging from 1.6 to 1.8 million. The IRC takes the fact that very different estimation methods all produce comparably high death tolls as evidence for the robustness of their findings. It turns out, however, that each of the estimation methods is based on questionable methods and/or assumptions.

The first estimation method takes the arithmetic mean of the mortality rates of the five individual areas surveyed and assumes that this figure is the average mortality rate for the entire population of the conflict-afflicted eastern region of the country.

The average regional mortality rate thus estimated is 5.2 deaths per 1,000 population per month. The IRC's baseline mortality rate of 1.5 per 1,000 per month is then subtracted from this figure to arrive at the excess mortality rate of 3.7 deaths per 1,000 per month for the five areas surveyed. This rate, in turn, is applied to the estimated population of some 20 million in the eastern region of the DRC for the period covered by the surveys—22 months. This estimation method yields an excess death toll of some 1.6 million.

The problem with this approach is that it biases the total estimate upwards by giving too much weight to high death rates in survey areas with small populations. Because the population sizes, as well as the death rates, of the surveyed areas are very different, the appropriate procedure would have been to take a *population-weighted* average of the mortality estimates.

This is easy to calculate and the weighted average turns out to be 3.55 deaths per 1,000 per month, not the 5.2 rate produced by the IRC's calculations. If the weighted average mortality rate is used to determine the excess death toll, the excess death rate shrinks from 3.7 to 2.05 and *the IRC's estimate of 1.6 million excess deaths is almost halved—to 897,500.*

But, this revised estimate uses the baseline mortality figure that we have argued is too low. Recalculating the excess death toll using the corrected CMR estimate of 3.55 deaths per 1,000 per month for the five areas surveyed, *and* the more appropriate baseline mortality rate of 2.0 deaths per 1,000 per month, reduces the total excess mortality toll by some 60 percent—down from the IRC's original figure of 1.6 million to 678,600.

The second and third estimation methods that the IRC uses to calculate excess deaths for the survey in 2000 are also problematic. In the survey carried out in Moba in Katanga province, the average mortality rate was 11.4 per 1,000 per month—the highest recorded in *any* of the IRC's DRC surveys from the earliest to the most recent. In its second and third estimation methods, the IRC extrapolates the Moba death rate to the entire population of Katanga.[17]

What is happening here is that a single survey area with an extremely high death toll and a relatively small population is being treated as typical of an entire province. Since Moba's death rate is so high, and since Katanga province has the largest population of those in which the five surveys were carried out, the impact of this single survey location on the excess death rate for the entire region is very large.

In the second estimation method, Katanga accounts for 1.4 of the estimated 1.8 million deaths (or 77 percent) for the region as a whole; in the third "conservative" estimate, it accounts for 0.9 out of 1.7 million deaths (or 54 percent). In other words, the death toll from the single Moba survey—which we have no compelling reason to assume is representative of Katanga as a whole—is driving most of the death toll estimate for the entire eastern region.

The IRC provides no argument to support its assumption that it is appropriate to extrapolate the Moba mortality rate to Katanga as a whole. In fact, it is highly improbable that the Moba rate—or indeed any other rate from a single survey in Katanga—would be equal to the Katangan provincial average. This is because, as subsequent surveys have demonstrated, there is a high degree of intraprovincial variation in death rates throughout the whole of the country, including the eastern provinces.

There are, in other words, no good reasons to accept the excess mortality estimates that derive from the IRC's second and third estimation methods. But, the biases generated by the IRC's procedures are then compounded by the decision to sum the provincial totals in order to provide an excess death estimate for the eastern region as a whole. The more statistically appropriate way to provide a region-wide estimate would have been to use all five surveys together—as was done (though without the appropriate population-weighting) in the first estimation method.

To reiterate, the methodological problems with the IRC's first survey are that:

- The five areas surveyed were not chosen randomly and were, at any rate, too few to obtain reliable projections.
- The excess mortality estimation methods used either:
    i)   failed to weight the mortality rates from the five surveyed areas by population (in the first estimation method); or
    ii) inappropriately generalized from a single survey to a province, and then—equally inappropriately—summed the excess death tolls calculated for each province to arrive at a regional total for the eastern part of the country (in the second and third estimation methods).

All three estimation approaches applied an inappropriately low baseline mortality rate. However, the error generated by the use of the inappropriately low baseline has a much greater impact on mortality estimates in the final three surveys than in the first two.

The 2001 Survey: Survey Locations Inappropriately Selected

The second survey, whose results were published in 2001, surveyed five additional areas, but again without random sampling and using the same inappropriately low baseline mortality estimate. However, the significant bias generated by the excessive reliance on the death toll in Moba in the first survey was not an issue in the second survey. In the 2001 report, the IRC used the results of all five surveys taken in 2000, *plus* the five taken in 2001, as well as a single survey taken in 1999, when estimating cumulative the death toll.[18]

Because of the inappropriate selection of the areas to be surveyed, we believe that the IRC's excess death toll estimates for the eastern region of the DRC derived from the second survey should also be rejected.

The 2002, 2004 and 2007 Surveys: Impact of the Inappropriate Baseline Mortality Rate

This section demonstrates how the IRC's inappropriately low baseline mortality rate generates unwarrantably high excess death estimates.

The methodology the IRC relied on in the three nationwide surveys (i.e., the 2002, 2004, and 2007 surveys) does not suffer from the same flaws as the first two. The areas to be surveyed were selected appropriately, and the mortality rate for the country as a whole is based on a large number of surveyed areas, which increases confidence in the accuracy of the estimates. The mortality estimates are, however, subject to a number of sources of uncertainty.[19] These include:

- Very wide confidence intervals for some mortality estimates, particularly in the case of the first of the three nationwide surveys that was carried out in 2002.
- Uncertainties arising from design effects—especially with the survey in 2002. In 2002 the design effect was huge, which increased the magnitude of the standard errors, in turn increasing the range of uncertainty of the excess death toll estimates.
- Lack of reliable data on population size and growth rates—which can impact excess mortality estimates.
- Absence of survey-based mortality data for the between-survey periods in 2001 and 2004 to 2005.

An Alternative Estimate of Excess Mortality

The IRC's best estimate of the excess death toll calculated from the three surveys carried out in this period is 2.83 million. However, this does *not* mean that the IRC believes that figure is necessarily the correct one. In fact, the very wide confidence intervals associated with the 2.83 million fatality estimate indicate that the IRC's researchers are 95 percent confident that the cumulative death toll for the most recent three surveys lies somewhere between 1.34 and 4.54 million. The 2.83 million figure is simply the one that has the highest probability of being correct.[20]

Table 2.1 Excess Deaths in the Democratic Republic of the Congo, 2001-2007: International Rescue Committee and Human Security Report Project Estimates

Period	IRC (best)	HSRP (best)	IRC (low)	HSRP (low)	IRC (high)	HSRP (high)
May 2001-December 2001	418,400	209,200	180,800	29,800	654,500	402,300
January 2002-December 2002	343,200	257,400	120,100	34,300	583,400	497,600
January 2003-April 2004	607,000	101,200	101,200	-404,700	1,112,900	607,000
May 2004-December 2005	735,000	136,600	419,300	-179,700	1,138,100	539,100
January 2006-April 2007	727,000	158,600	522,000	-31,800	1,050,000	371,300
May 2001-April 2007	2,830,600	863,000	1,343,400	-552,100	4,538,900	2,417,300

Data Sources: IRC and Human Security Report Project.

The International Rescue Committee's (IRC) 'best estimate' of excess deaths in the Democratic Republic of the Congo for the period May 2001 to April 2007 is 2.83 million. Using the IRC's survey data, but a more realistic baseline mortality rate, the Human Security Report Project's 'best estimate' of the excess death toll for this period is 0.86 million. In both cases the margin of probable error is large, as indicated by the wide confidence intervals.

But, the high level of uncertainty surrounding the 2.83 million death toll estimate is not our reason for rejecting it. The problem lies with the baseline mortality rate.

We have argued that the IRC's estimated baseline mortality rate of 1.5 deaths per 1,000 per month is too low and that the 2.0 mortality rate recorded in the western part of the country for 2002 is more appropriate. WHO epidemiologist, Francesco Checchi, makes essentially the same case in his review of the IRC's DRC research for the HNTS.[21]

When the IRC's excess death figures for the period of May 2001 to April 2007 are recalculated using the revised baseline rate, there is a massive reduction in the excess death toll. *The best estimate of the excess death toll shrinks to less than one-third of the IRC's original figure—from 2.83 million to 0.86 million.*[22]

Conclusion

In this analysis, we argued the IRC's inappropriate selection procedures for the areas surveyed in 2000 and 2001 mean that for this period the organization's excess death estimates are statistically invalid. The survey data leave no doubt that mortality levels in much of the eastern part of the DRC are very high. But, because the IRC failed to choose the areas it surveyed in a way that ensured they were representative of the population of the eastern region as a whole, they should not have been used to generate excess death estimates. In addition, we noted that even if this problem were ignored, other methodological errors had the effect of increasing the excess death tolls significantly and unwarrantedly. For these reasons, we argued that the findings of both the 2000 and 2001 surveys should be rejected.

We also demonstrated how, for the May 2001 to April 2007 period, the inappropriately low baseline mortality rate used by the IRC grossly inflated the excess death toll. Using a more appropriate baseline derived from the IRC's own data, the "best estimate" of the excess death toll for this period declines from the IRC's 2.83 million figure to just over 0.86 million.

Our revision of the IRC's estimates reduces the excess death toll dramatically, but the revised data still show a large number of excess deaths (direct as well as indirect), which, given the deadliness of the conflict measured in terms of battle deaths, is not surprising. The accuracy of our revised estimate, which still relies on the IRC's survey data for overall mortality rates, is however, impossible to determine.

The primary reason for concern here is that the IRC's estimate of the under-five mortality rate is *twice* that of the 2007 DHS for the same periods. Both estimates, as we noted earlier, cannot be correct.

In the next chapter, we discuss a major, but largely ignored, source of potential error that arises when retrospective mortality surveys are used to estimate excess death tolls. We demonstrate this source of error is rarely possible to correct, and argue that the goal of accurately estimating excess death tolls using surveys is effectively unachievable, except in very short wars.

WHY THE NUMBERS MATTER

Since no one doubts that mortality levels in the Democratic Republic of the Congo are tragically high, does getting it wrong about excess death toll estimates really matter? The country remains trapped in a major humanitarian crisis, and preventing further deaths and alleviating suffering remains a critically important task whatever the excess death toll.

And even if the International Rescue Committee's (IRC) estimates are too high, they have drawn world attention to the previously ignored plight of the Congolese and have helped successfully pressure the international community into providing more humanitarian assistance and increasing the number of peacekeeping forces. This has made a real difference to the lives of millions.

All of this is true. But, getting it wrong about excess mortality tolls, nevertheless, matters a great deal.

Take the case of Darfur. In the fall of 2006, the high-profile Save Darfur Coalition, a US-based advocacy group, claimed that since the fighting in Darfur had started some three years earlier, "400,000 innocent men, women and children have been killed."[23]

This figure was at least double that of most expert estimates at the time and the reference to innocents being "killed" was wholly misleading. The overwhelming majority of deaths in Darfur in this period were *not* the result of a government-instigated "slaughter"—as Save Darfur had claimed—but of disease and malnutrition, which were already major killers before the war. Determining what percentage of these deaths could be attributed to the impact of wartime violence rather than pre-existing conditions of abject poverty and malnutrition is extraordinarily difficult, if not impossible.

Getting mortality estimates wrong can have real-world consequences and the Save Darfur campaign's claims have been sharply criticized by humanitarian groups and area specialists. As one critic noted, "Exaggerated death tolls . . . make it difficult for relief organizations to deliver their services. Khartoum considers the inflated numbers to be evidence that all groups that deliver aid to Darfur are actually adjuncts of the activist groups that the regime considers its enemies, and thus finds justification for delaying visas, refusing to allow shipments of supplies and otherwise putting obstacles in the way of aid delivery."[24]

Humanitarian agencies and nongovernmental organizations (NGOs), as well as human rights advocacy groups, actively publicize the plight of the war-affected populations they seek to assist—and often use excess mortality tolls to make a case for more aid. There are compelling reasons for doing this, as the IRC's Rick Brennan and Anna Husarska pointed out in an article in the *Washington Post* on July 16, 2006, "When there is media coverage, aid increases. Large donors may be more inclined to press for a greater presence of international peacekeeping forces to protect civilians and humanitarian assistance teams. And the presence of peacekeepers makes it easier for the media to report."

If these factors come together, they accomplish the goal of every humanitarian response: saving lives.[25]

Saving lives is, of course, the raison d'etre of humanitarian organizations.

However, a potential conflict of interest arises here because the institutional survival of humanitarian NGOs is dependent on donor funding. But, the level of funding they receive is directly related to assessments of humanitarian need—assessments that they themselves are usually responsible for generating.

Some critics believe that individual NGOs deliberately exaggerate death tolls in order to secure more funding, while others argue that lack of experience in survey design and implementation is the problem.[26]

There is also disagreement within the expert community about *how* to estimate excess war deaths. In Iraq, for example, a series of nationwide mortality surveys—two undertaken for United Nations agencies and two by independent researchers (whose findings were published in the prestigious UK medical journal, *The Lancet*)—have produced sharply divergent excess death estimates over the same time periods. There is no consensus as to the causes of the differences.[27]

The challenges to the IRC's findings noted in this report and others will almost certainly generate more controversy about the value of using retrospective mortality surveys to measure excess deaths.[28]

This is cause for concern because, whatever the reason for the controversies, the effect has been the same—mutual suspicion between donors, NGOs, and humanitarian agencies, and an increased risk that survey methods as a whole—which remain critically important in this field—will be discredited.

NOTES ON FIGURES

Table 2.1   **Excess Deaths in the Democratic Republic of the Congo, 2001-2007: International Rescue Committee and Human Security Report Project Estimates**

The figures in the table have been rounded to the nearest hundred.

Sources: Benjamin Coghlan et al., "Mortality in the Democratic Republic of Congo: Results from a Nationwide Survey" (New York: International Rescue Committee/Melbourne: Burnet Institute, 2004); Benjamin Coghlan et al., "Mortality in the Democratic Republic of Congo: A Nationwide Survey". The Lancet 367, no. 9504 (13 January 2006): 44-51; Benjamin Coghlan et al., "Mortality in the Democratic Republic of Congo: An Ongoing Crisis" (New York: International Rescue Committee, 2008), http://www.theirc.org/sites/default/files/migrated/resources/2007/2006-7_congomortalitysurvey.pdf (Accessed 14 January 2010); Les Roberts, "Mortality in Eastern DRC: Results from Five Mortality Surveys" (New York: International Rescue Committee, May 2000); Les Roberts et al., "Mortality in Eastern Democratic Republic of Congo: Results from Eleven Mortality Surveys" (New York: International Rescue Committee, 2001); Les Roberts et al., "Mortality in the Democratic Republic of Congo: Results from a Nationwide Survey" (New York: International Rescue Committee, 2003).

ENDNOTES

[1] See Benjamin Coghlan et al., *Mortality in the Democratic Republic of Congo: An Ongoing Crisis* (New York: IRC, 2007), http://www.theirc.org/resources/2007/2006-7_congomortalitysurvey.pdf. (Accessed 20 December 2009). A single survey was also carried out by the IRC in the eastern Congo in 1998-1999.

[2] Benjamin Coghlan et al., "Mortality in the Democratic Republic of Congo: A Nationwide Survey," *The Lancet* 367, no. 9504 (13 January 2006): 44-51.

[3] Richard Brennann et al., "Mortality surveys in the Democratic Republic of Congo: humanitarian impact and lessons learned," *Humanitarian Exchange Magazine 35, November 2006*, http://www.odihpn.org/report.asp?id=2838 (Accessed 10 January 2010).

[4] UN, "Democratic Republic of the Congo—MONUC—Facts and Figures," MONUC Fact Sheet,, http://www.un.org/Depts/dpko/missions/monuc/facts.html (Accessed 6 January 2010). Figure on total uniformed personnel as at 30 November 2009.

[5] André Lambert and Louis Lohlé-Tart, "La Surmortalité au Congo (RDC) Durant les Troubles de 1998-2004: Une Estimation des Décès en Surnombre, Scientifiquement Fondée à Partir des Méthodes de la Démographie," ADRASS, October 2008, http://www.obsac.com/E20090105172451/index.html (Accessed 22 December 2009).

[6] Ibid.

[7] The Human Security Report Project commissioned Yale University's Dr. Beth Daponte to review the Belgian demographers' findings. Her—critical—findings are available on request.

[8] The review done for the HNTS was released into the public domain after this report was completed. It is available at http://www.icn.ch/HNTS_peer_review.pdf (Accessed 22 December 2009).

[9] Macro International Inc., "Democratic Republic of the Congo: Demographic and Health Survey 2007 Key Findings," August 2008, http://www.measuredhs.com/pubs/pdf/SR141/SR141.pdf (Accessed 20 December 2009). While the main DHS report was published in French, its key statistics were also published in

English. Interestingly, the DHS report does not mention the very different IRC findings, let alone challenge them, though it does cite other survey research on the DRC.

[10] Macro International Inc., "Democratic Republic of the Congo," 16, (Accessed 20 December 2009).

[11] The IRC and DHS calculate child mortality differently. The IRC, like most humanitarian organizations, is interested in determining short-term mortality levels, so it measures child mortality in deaths per 1,000 per month. The DHS organization focuses its analyses on long-term trends, and its mortality estimates are measured in deaths per 1,000 live births over a five-year period. The different approaches to measuring child mortality are not comparable in some cases—when comparing, for example, countries with markedly different underlying demographic structures. But, since there is little difference in the IRC's child mortality estimates between 2003 and 2007, the two rates are in fact reasonably comparable in this case. Jon Pedersen, in his review of the IRC's research for the HNTS, notes that the IRC's estimate of child mortality would translate into 350-400 deaths per 1,000 live births over five years. This is well in excess of double the DHS estimate of circa 150 deaths per 1,000 live births over five years in 2006. Pedersen notes, "[I]t is difficult to see how the DHS 2007 could be that wrong without glaring data quality problems."
www.who.int/hac/techguidance/hnts/hnts_drc_re_examinig_mortality_1998_2006.pdf, p.19.

[12] The *direct* method of estimation is generally more accurate than the *indirect* method. See "Methodology of DHS Mortality Rates Estimation",
http://www.measuredhs.com/help/Datasets/Methodology_of_DHS_Mortality_Rates_Estimation.htm (Accessed 20 December 2009).

[13] The recall period of the first survey only went back to January 1999. The researchers extrapolated backwards in order to cover the first five months of the fighting.

[14] During the fifth survey, the sub-Saharan average mortality rate was revised downwards, so for part of the period covered by this survey—January 2006 through April 2007—the IRC uses the new baseline mortality rate of 1.4 deaths per 1,000 per month. This change had the somewhat bizarre consequence of increasing the IRC's excess death toll estimate for the DRC, regardless of whether or not a single additional Congolese person actually died.

[15] Coghlan et al., *Mortality in the Democratic Republic of Congo*, 17, (Accessed 22 December 2009).

[16] IRC, *Mortality in Eastern DRC: Results from Five Mortality Surveys* (New York: IRC, May 2000), 12. Emphasis added.

[17] The IRC's third, preferred, estimation method is simply a variation on the second. Here, the IRC assumes in addition that "one-third of the population has escaped Katanga and is somewhere else, having never experienced excess mortality from this war." No reason is given for this latter assumption, which is dropped in the survey that follows. See Les Roberts et al., *Mortality in Eastern DRC: Results from Five Mortality Surveys* (New York: IRC, 2000), 13.

[18] See Les Roberts et al., *Mortality in Eastern Democratic Republic of Congo: Results from Eleven Mortality Surveys* (New York: IRC, 2001).

[19] Such uncertainty has many other possible causes, including sampling error, reporting bias, response bias, recall bias, and survival bias.

[20] When presenting survey results, standard statistical practice is to provide not only the single best estimate but also some measure that indicates the degree of certainty about its accuracy. The conventional approach is to calculate confidence intervals. Standard practice is to provide "95 percent confidence intervals" for the point estimate. What does this mean? Simply, it means that if one were to sample the same population repeatedly, then the range within which 95 percent of the samples falls would constitute the confidence interval.

[21] Francesco Checchi, "Comments on studies of war-related excess mortality in the Democratic Republic of the Congo," in *Re-examining mortality from the conflict in the Democratic Republic of Congo, 1998-2006*,

HNTS Peer Review Report, May 2009,
http://www.who.int/hac/techguidance/hnts/hnts_drc_re_examinig_mortality_1998_2006.pdf. p.41
(Accessed 27 December 2009).

[22] In the following chapter, we challenge the standard assumption that baseline rates remain constant—mostly they do not.

[23] Cited in Sam Dealey, "An atrocity that needs no exaggeration," *New York Times*, 12 August 2007, http://www.nytimes.com/2007/08/12/opinion/12iht-eddealy.1.7088161.html (Accessed 8 December 2009).

[24] Dealey, "An atrocity that needs no exaggeration," (Accessed 8 December 2009).

[25] Richard Brennan and Anna Husarska, "Inside Congo, An Unspeakable Toll," *The Washington Post*, 16 July 2006, http://www.washingtonpost.com/wp-dyn/content/article/2006/07/14/AR2006071401389.html (Accessed 8 December 2009).

[26] See Ian Smillie and Larry Minear, *The Charity of Nations: Humanitarian Action in a Calculating World* (Bloomfield: Kumarian Press, 2004) for a detailed discussion on inflated claims by NGOs seeking humanitarian funding.

[27] See, for example, J. Bohannon, "Iraqi death estimates called too high; methods faulted," *Science* 314 (20 October 2006): 396–397; J. Bohannon, "Calculating Iraq's death toll: WHO study backs lower estimate," *Science* 319 (18 January 2008): 273; B. O. Daponte, "Wartime estimates of Iraqi civilian casualties," *International Review of the Red Cross* 89, no. 868 (2007): 943–957; J. Giles, "Death toll in Iraq: Survey team takes on its critics," *Nature* 446, no. 7131 (2007): 6–7; D. Guha-Sapir and O. Degomme, "Estimating mortality in civil conflicts: Lessons from Iraq: Triangulating different types of mortality data in Iraq," CRED working paper (June 2007), http://www1.cedat.be/Documents/Working_Papers/CREDWPIraqMortalityJune2007.pdf (Accessed 8 December 2009).

[28] One way to address this challenge would be to make assessments of the health consequences of armed conflicts *independent* of the organizations responsible for on-the-ground implementation of humanitarian assistance. This idea, canvassed by UNHCR's Paul Spiegel, among others, would improve the often uneven quality of data from the field, while addressing donor concerns that NGOs may inflate the seriousness of crises to secure more assistance. NGOs, on the other hand, would be able to point to independent assessments when making the case that more assistance is needed.