

Assessing Mortality in Conflicts: A Comparison of Surveys from Iraq, Darfur and the Democratic Republic of Congo

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Abstract

In 2004, the Lancet published results from a survey that estimated the death toll attributable to the conflict in Iraq until then at almost 100,000. Since that moment, the topic has been subject of a large debate among scientists. Besides this publication, four other surveys conducted in Iraq reported data on mortality due to the conflict. Although each one of these studies had its own specific objectives and methods, some clear patterns common to each of them can be identified. These common characteristics are quite distinct from those of surveys in other conflict settings such as the Sudanese region of Darfur and the Democratic Republic of Congo. This paper looks into the specificities of mortality surveys in Iraq, compares them with surveys conducted in other conflict settings and suggests alternatives in order to assess mortality in Iraq.

Key Words: Iraq, mortality, civil conflict, Darfur, Democratic Republic of Congo

1. Background

Between 2004 and 2007, 5 nationwide studies were conducted in Iraq aimed at assessing the death toll of the conflict since 2003. The results of these analyses showed significant differences in mortality figures. The survey with the lowest estimate reported around 2,000 conflict related deaths per month, whereas the highest estimate was ten times higher, around 20,000 per month. Different time frames, methods used, areas covered, questions asked, and other factors make the comparison of the results a challenging exercise. However, beyond all these differences, some patterns are clearly distinguishable for mortality surveys in Iraq.

2. Materials

Five surveys were identified that provided mortality data in Iraq. A first study was the survey jointly conducted by UNDP/COSIT/FAFO called the Iraq Living Conditions Survey (ILCS) [1]. The survey used a stratified, cluster design with more than 21,000 households in their sample. The estimation of mortality was not the main objective of the study, but a question regarding conflict deaths was included in the questionnaire.

A second study was conducted in 2004 by researchers from the Johns Hopkins School of Public Health (JHSPH) [2]. This survey was designed to assess the mortality rates after the 2003 invasion and to compare them to pre-invasion levels. The method used was a nationwide cluster sampling of 33 clusters representing 988 households. The same group of researchers conducted a follow-up survey in 2006 to examine to evolution since their first study [3]. A method similar to the 2004 survey was used, although more clusters were sampled and more households included, 47 and 1849 respectively.

The fourth study, called the Iraq Family Health Survey (IFHS), was done by the World Health Organization (WHO) and the Iraqi authorities in 2006 [4]. A stratified, cluster sampling was used with 971 clusters accounting for 9,345 households. The study did not focus exclusively on deaths, but mortality was an important component of the questionnaire.

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The last analysis is based on a survey jointly undertaken by two polling companies, namely Opinion Research Business (ORB) and the Independent Institute for Administration and Civil Society Studies (IIACSS) [5]. Their mortality estimate was based on extrapolating the average number of deaths per household from a representative, national sample to all households across the country. The sample, consisting of 2,414 households, was obtained through multi-stage random probability sampling and covered 112 unique sampling points.

In addition to data from Iraq, mortality data for other countries was collected from the Complex Emergency Database (CE-DAT) of the Centre for Research on the Epidemiology of Disasters (CRED) [6]. This database contains data from nutrition, mortality and vaccination coverage surveys conducted in complex emergency settings since 2000. A query was run to collect surveys reporting crude mortality rates worldwide. Results from this search were used to identify global trends regarding mortality surveys and specific trends for Darfur and the Democratic Republic of Congo.

3. Results

3.1 Mortality surveys in Iraq

Table 1 summarizes selected characteristics of the 5 mortality surveys conducted in Iraq. A first finding relates to the organizations conducting surveys in Iraq. Two surveys were carried out by UN agencies (although ILCS was conducted jointly with FAFO, a research organization), two by an academic group from JHSPH and one by polling companies. None of the surveys were done by a non-governmental organization (NGO or private volunteer organizations - PVO) working in Iraq.

Table 1: Overview of characteristics of 5 mortality survey conducted in Iraq from 2004 to 2007

<i>Survey</i>	<i>Organization</i>	<i>Area covered by survey</i>	<i>Period covered by survey</i>
ILCS, 2004	UNDP, COSIT, FAFO	National, stratified by governorate	Mar 2003 - Mar 2004
Roberts et al., 2004	JHSPH	National	Mar 2003 - Mar 2004
Burnham et al., 2006	JHSPH	National, excl. Dahuk and Muthanna	Mar 2003 - Jun 2006
IFHS, 2008	WHO	National, stratified by governorate	Mar 2003 - Jun 2006
ORB and IIACSS , 2007	ORB, IIACSS	National, excl. Karbala, Anbar and Irbil	Mar 2003 - Aug 2007

Second, all five surveys focus on the entire country, i.e. the final estimate is a national death toll. Two surveys however have used stratified designs. This means that estimates for smaller areas can be extracted from the data, but nothing can be said about areas smaller than provinces.

Finally, all surveys capture deaths that have occurred over long periods of time. The recall periods range from 12 to 53 months.

3.2 Global picture of mortality surveys

Figure 1 shows the distribution of 1,154 mortality surveys included in the CE-DAT database by type of organization that collaborated in the survey. On a global scale, NGO's are by far the most important source of mortality surveys with an involvement in over 80% of the surveys. UN agencies rank second with little over one quarter of the mortality surveys and governments third with 11.7%. Academic groups are involved in less than 1% of all mortality surveys conducted in complex emergencies.

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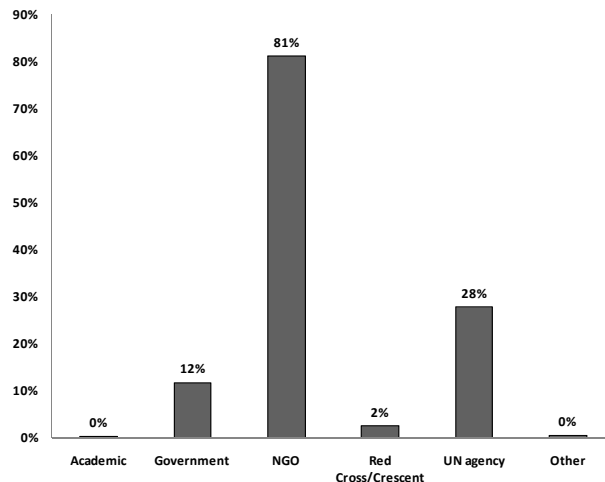


Figure 1: Distribution of mortality surveys by organization type involved in the survey (source: CE-DAT), categories are not mutually exclusive

Second, CE-DAT data shows a clear distinction between NGO's and UN agencies regarding the area covered by mortality surveys (Figure 2). While NGO's typically conduct surveys at a low resolution, often the 3rd administrative level (typically subdistricts), UN agencies focus on a higher level, typically 1st or 2nd administrative level (provinces and districts). However, the UN agencies do provide a very large proportion of the data from camps. In general, this information is collected in refugee camp by UNHCR.

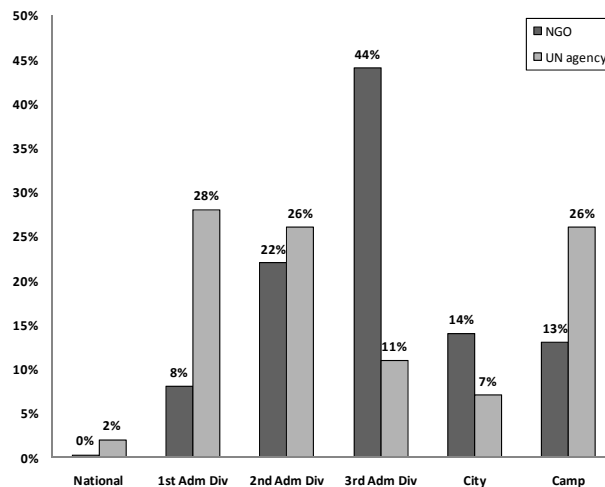


Figure 2: Distribution of NGO and UN surveys worldwide by geographic area covered by the survey (source: CE-DAT)

Finally, the average recall period for mortality surveys included in CE-DAT is 4.6 months (95% CI [4.3;5.0])

3.3 Mortality surveys in the Darfur region and the Democratic Republic of Congo

Patterns in Darfur and the Democratic Republic of Congo (DRC) largely reflect this global picture. Table 2 shows that both in Darfur and DRC, NGOs conducted almost three times more surveys than UN agencies. Academic groups were only marginally involved in both countries and are not represented in the table.

In Darfur, most of the NGO surveys are small scale surveys, conducted at city or camp level. UN surveys, on the other hand, covered larger areas and were mainly conducted at state level (North, West and South Darfur). Additionally, UN surveys reported mortality data from camps in Darfur.

Table 2: Distribution of NGO and UN surveys in Darfur and DRC by geographic area covered by the survey
(source: CE-DAT)

	<i>Darfur, Sudan</i>		<i>Democratic Republic of Congo</i>	
	<i>NGO</i>	<i>UN agency</i>	<i>NGO</i>	<i>UN agency</i>
National	NA	NA	0 (0%)	0 (0%)
1 st Adm Div	1 (1%)	20 (67%)	0 (0%)	0 (0%)
2 nd Adm Div	10 (12%)	1 (3%)	22 (15%)	7 (16%)
3 rd Adm Div	7 (8%)	0 (0%)	119 (80%)	25 (58%)
City	31 (36%)	2 (7%)	6 (4%)	0 (0%)
Camp	36 (42%)	7 (23%)	2 (1%)	11 (26%)
Grand Total	85 (100%)	30 (100%)	149 (100%)	43 (100%)

The pattern in DRC is slightly different. Both NGO and UN surveys are mainly conducted at a small scale, i.e. 3rd administrative level. This is largely due to the collaboration of UNICEF with NGO's in conducting surveys. The figures indicate that no mortality surveys are done using a nationwide or provincial sampling frame.

Finally, the recall period for mortality surveys in Darfur is on average 4.1 months (95%CI [3.7;4.6]) whereas in DRC it is slightly longer with 7.7 months (95%CI [6.8;8.6])

3.4 Situating Iraq in the Global Picture

The sources of mortality surveys in Iraq are quite different than Darfur or DRC. First, the number of mortality surveys conducted in recent years is considerably lower than the two other countries: 5 for Iraq versus 102 in Darfur and 170 in DRC.

Second, the absence of survey data from NGO's is significant. Where NGO's are by far the main source of mortality data worldwide as well as in Darfur and DRC in particular, in Iraq they are not reporting any information at all.

Although one cannot exclude the possibility of the CE-DAT database not capturing mortality surveys from Iraq, there seems to be two other explanations for this finding. Personal communication with UN and NGO staff working in Iraq - or from Amman, Jordan - revealed that NGO's were indeed not conducting mortality surveys and that in addition, no mortality information from Iraq can be published without the consent of the Iraqi authorities.

A final finding relates to small scale surveys. These surveys are typically conducted for programmatic purposes by NGO's and focus on a limited period of time, typically 3 to 6 months. For Darfur and DRC, these small scale surveys represent the majority of the surveys. In Iraq however, there seems to be none of this type of surveys since all are conducted on a much larger scale and have longer recall periods.

4. Discussion

All of these scenarios present important difficulties in obtaining reliable estimates of mortality. Three of these challenges can be critical to the usefulness and interpretation of the results. These are discussed below.

First, surveys with long recall periods (more than 12 months) do not allow for a detailed time trend analysis. Variations over time are levelled out and the results are averages covering relatively long periods of time. In Iraq, recall periods were sometimes more than 3 years and although rates were reported for sub-periods, the precision of those rates is often insufficient.

Second, large scale surveys do not provide useful information for a geographical analysis of mortality. The surveys report mortality rates for entire countries or provinces, ignoring significant differences in space. Therefore, national figures such as those presented in the Iraq surveys do not make any distinction between those areas with very high mortality and areas with lower levels of mortality.

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Third, highly clustered phenomena, such as the one faced in civil conflict situation present a major challenge in sampling techniques that ensure reliable estimates. The 2004 Iraq mortality survey by Roberts et al. showed a very high clustering of deaths in and around the city of Fallujah, several times higher than the rest of the country. Therefore, the authors decided to exclude a cluster from their final analysis.

In previous works on mortality estimations undertaken on data from Darfur and other conflicts, the triangulation of multiple survey have yielded encouraging results [7]. A number of small scale surveys pooled together, could provide better approximations of the reality than one large scale survey in these circumstances.

In contrast to large scale surveys, small scale surveys have a considerable value as they give a more detailed picture of the mortality level at a specific point in time and in space. Figure 3 shows a time chart representing the results of all mortality surveys from 2003 to 2007 from Darfur included in the CE-DAT database. Each line corresponds to the recall period from a specific survey; the Y axis shows the level of crude mortality rate expressed in deaths per 10,000 people per day. A clear time trend can be distinguished with a mortality peak around end 2003 - early 2004, lower levels of mortality during 2005 and 2006, and flare-ups from mid 2006 all through 2007. Furthermore, small scale surveys would also allow a better understanding of geographical variations in mortality levels especially in situations such as Iraq where mortality fluctuations can be significant (Figure 4).

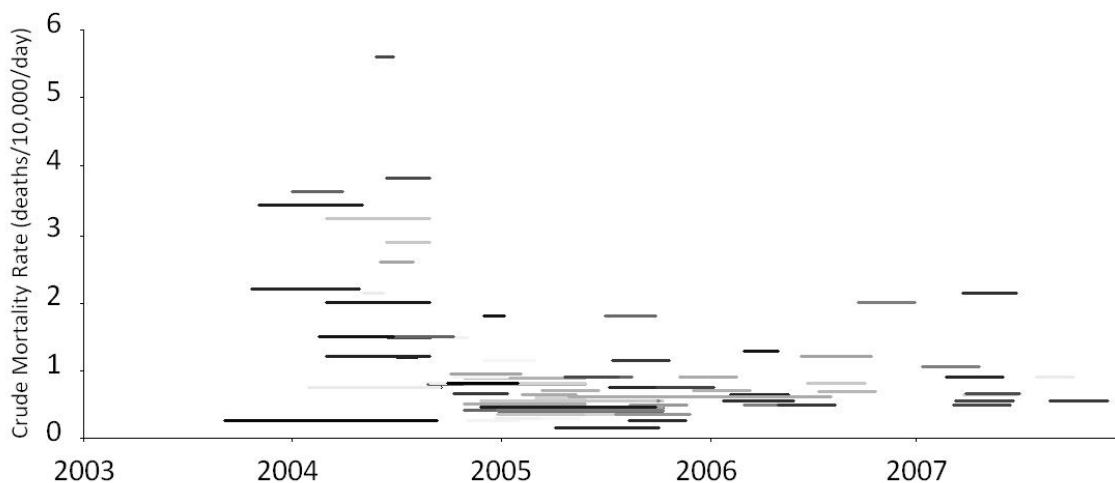


Figure 3: Time chart representing the Crude Mortality Rates of surveys conducted in Darfur, Sudan (source: CE-DAT)

This approach also has several limitations. Although, small scale surveys give a better appreciation of mortality levels at a low resolution, one has to ensure that all areas are included in the analysis. Typically, few surveys will be available from insecure areas, leading to a selection bias. Then again, inaccessible areas are a problem of large scale surveys as well and can also bias their results.

Second, areas that are frequently surveyed will account for more data points than other areas, which might lead to skewed results. Attributing specific weights to each survey reduces this type of error.

Finally, the precision required for small scale surveys is typically less than that of large scale surveys, which might result in surveys of a lesser quality. However, the corroboration between different surveys can help in assessing the quality of each survey separately and in validating their results.

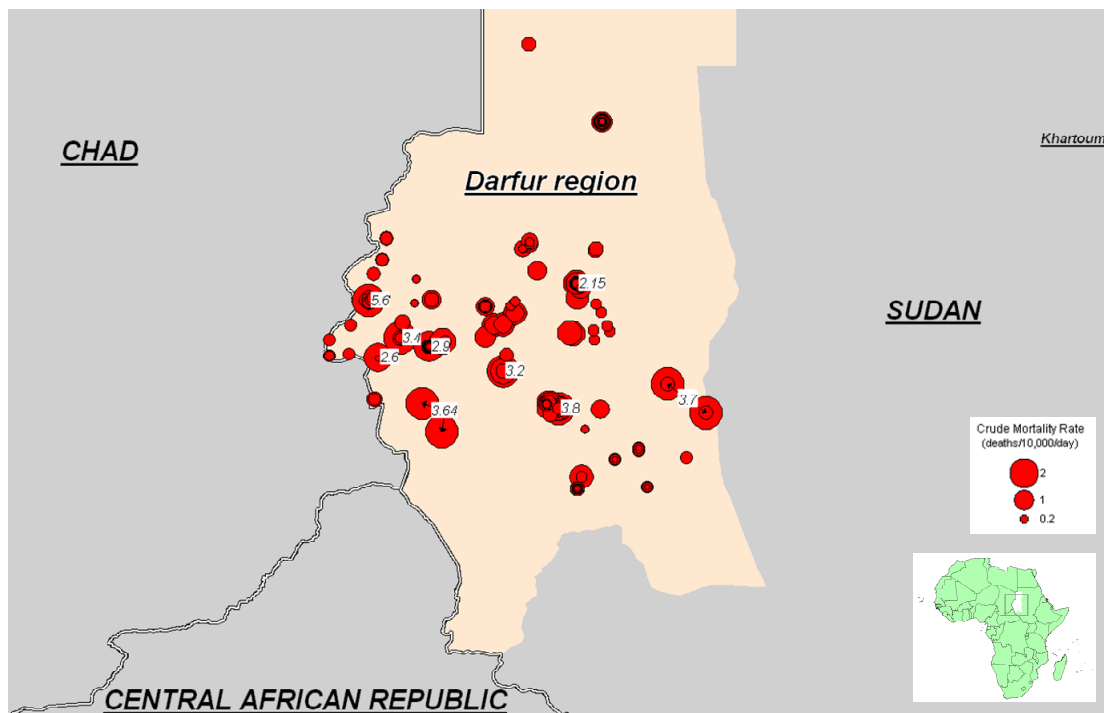


Figure 3: Map representing the locations of surveys conducted in Darfur, Sudan (source: CE-DAT), surface of circle ~ Crude Mortality Rate

5. Conclusion

Mortality surveys from Iraq present a different profile than those from other conflict settings, both quantitatively and qualitatively. Compared to Darfur, there were 20 times less surveys conducted in Iraq during the period 2003-2007; the difference with DRC is even larger. Furthermore, NGO's, typically an important source of mortality data, are not reporting anything related to mortality in Iraq. The mortality surveys that have been published are mainly from UN agencies and academics. This type of surveys typically focuses on the entire country or sometimes provinces and reports average figures for longer periods.

NGO mortality surveys could provide an important additional insight to mortality in Iraq. The smaller scale of these surveys, both in space and in time, makes it possible to have a more precise picture of temporal and geographical variations of mortality during the course of a conflict. Although the use of this type of data is promising, methods for pooled analysis of small scale surveys should be developed and properly validated.

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