Patterns of mortality rates in Darfur conflict

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See Editorial page 253

See Comment page 255

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Summary

Background Several mortality estimates for the Darfur conflict have been reported since 2004, but few accounted for conflict dynamics such as changing displacement and causes of deaths. We analyse changes over time for crude and cause-specific mortality rates, and assess the effect of displacement on mortality rates.

Methods Retrospective mortality surveys were gathered from an online database. Quasi-Poisson models were used to assess mortality rates with place and period in which the survey was done, and the proportions of displaced people in the samples were the explanatory variables. Predicted mortality rates for five periods were computed and applied to population data taken from the UN's series about Darfur to obtain the number of deaths.

Findings 63 of 107 mortality surveys met all criteria for analysis. Our results show significant reductions in mortality rates from early 2004 to the end of 2008, although rates were higher during deployment of fewer humanitarian aid workers. In general, the reduction in rate was more important for violence-related than for diarrhoea-related mortality. Displacement correlated with increased rates of deaths associated with diarrhoea, but also with reduction in violent deaths. We estimated the excess number of deaths to be 298 271 (95% CI 178 258–461 520).

Interpretation Although violence was the main cause of death during 2004, diseases have been the cause of most deaths since 2005, with displaced populations being the most susceptible. Any reduction in humanitarian assistance could lead to worsening mortality rates, as was the case between mid 2006 and mid 2007.

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Introduction

Mortality in complex emergencies has been an important subject of research and debate during the past decade. Recent conflicts—eg, in the Democratic Republic of Congo, Iraq, and Darfur, have generated substantive discussions about numbers and rates of death as a result of wars.[1,2] Humanitarian aid has often been sidetracked because mortality data have been used for political purposes and the resulting legal implications, as shown by the expulsion of humanitarian non-governmental organisations from Darfur after the issue of a warrant of arrest by the International Criminal Court against Omar Bashir, the president of Sudan.

Table 1 shows the estimates of mortality rates during 2003–08. In 2006, a group of experts convened by the Government Accountability Office and the National Academy of Sciences reviewed these studies to assess the quality and reliability of the estimates.[15] Although none of the estimates was consistently rated to be accurate, in general, the experts had confidence in the studies in which few deaths were reported.[15]

Many of the previous analyses focused mainly on the number of deaths, and little on the causes or patterns. In several studies,[15] a constant death rate was extrapolated to the entire duration of the conflict and affected population. With this approach, conflict-related mortality was assumed to be constant with time, and geographically, which was not the case. Furthermore, the affected population varied with time. Estimation of the number of cause-specific deaths, but not crude numbers of deaths, could improve our understanding of conflict and its dynamics.

We therefore analysed data from retrospective mortality surveys that were done in Darfur to identify patterns in time and space for several types of mortality indicators; assessed the effect of individual displacement on mortality; and estimated the number of deaths in excess of the expected number.

Methods

Sources of data

Data for mortality rates in Darfur were obtained from Centre for Research on the Epidemiology of Diseases' online complex emergency database.[16] Statistical data for health and nutrition were extracted from population-based surveys done in conflict-affected areas since 2000 and stored on this database. The main indicators for mortality included crude and child (<5 years) mortality rates.[17] We repeated the validation process to recheck the quality of the stored survey data. To assess the sampling methods, calculation of rates, and limitations, we verified that the clusters were selected on the basis of population sizes; ensured all households, including those without children younger than 5 years, were included in the survey; recalculated all rates using the number of deaths, demographic data, and duration of the recall period; and appraised the effect of non-accessible clusters.

	Period	Estimate
WHO[3]	March to September, 2004 (7 months)	45 000–80 000 total deaths; 35 000–70 000 excess deaths
UN[4]	September, 2003, to February, 2005 (18 months)	180 000 from hunger and disease
Hagan et al[5]	February, 2003, to March, 2005 (26 months)	396 563 total deaths
Reeves[6]	February, 2003, to March, 2005 (26 months)	380 000 excess deaths
Reeves[7]	February, 2003, to April, 2006 (39 months)	480 000–530 000 total deaths; 220 000–270 000 violent deaths
Coebergh[8]	April, 2003, to December, 2004 (21 months)	Three estimates of excess deaths: 218 449, 253 573, and 306 130
US Department of State[9]	March, 2003, to January, 2005 (23 months)	98000–181000 total deaths; 63 000–146 000 excess deaths
CRED[10]	September, 2003, to January, 2005 (17 months)	134 000 total deaths; 118 142 excess deaths
CRED[11]	February to June, 2005 (5 months)	36 237 total deaths; 23 658 excess deaths
Hagan and Palloni[12]	February, 2003, to August, 2005 (31 months)	170 000–255000 total deaths
Petersen and Tullin[13]	April, 2003, to September, 2005 (30 months)	57 000–128 000 killed in village attacks
UN[14]	February, 2003, to April, 2008 (63 months)	300 000 excess deaths

CRED=Centre for Research on the Epidemiology of Disasters.

***Table 1:* Overview of previous analyses of mortality rates in Darfur**

We used the UN's series[18] about Darfur as a second source of statistical data for the number of affected people and other essential data about humanitarian issues such as displacement of people and humanitarian aid staff, and food supply. The series of reports was published monthly from April, 2004, until January, 2006, and then quarterly. Therefore, missing monthly data were estimated by interpolation of values from the nearest 2 months for which data were available.

Conflict phases

We divided the period from February, 2003, to December, 2008, into six phases on the basis of availability of data, patterns in numbers of affected people, and humanitarian aid (figure; panel 1).

Regression model for mortality rates

We used a quasi-Poisson regression model in which the variance could be different from the mean because the variance in our analysis was not equal to the mean as a result of overdispersion. The estimates of the variables remained equal but SEs changed accordingly in this regression model.

We did regression analyses of crude, violence-related, diarrhoea-related, and child (<5 years) mortality rates, with the natural logarithm of the number of deaths as the outcome variable. The state and period in which the survey was done and the proportion of internally displaced people within the survey sample were used as explanatory variables. Two dummy variables were used for surveys done in west and south Darfur, and north Darfur was the reference. Since the period from February to August, 2003, was not included in any survey, it was also not included in the regression analysis. Variables for the other five periods were calculated as the proportion of the recall time that fell within that period. The number of internally displaced people remained constant during January, 2005, to June, 2006, while the number of affected residents increased substantially. As a result we introduced an interaction term (IDP×Period 4) to assess the effect of displacement during this period.

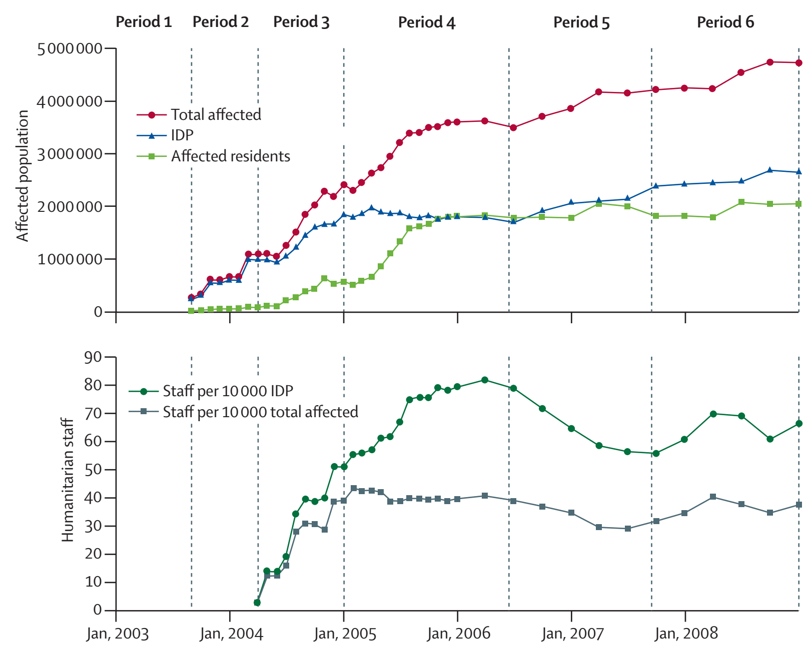

***Figure:* Patterns of affected populations and numbers of humanitarian aid workers per 10 000 affected people during periods 1–6**

Period 1=February to August, 2003. Period 2=September, 2003, to March, 2004. Period 3=April to December, 2004. Period 4=January, 2005, to June, 2006. Period 5=July, 2006, to September, 2007. Period 6=October, 2007, to December, 2008. IDP=internally displaced people.

We calculated the number of deaths by multiplying the mortality rates with the recall period and sample size. For violence-related and diarrhoea-related deaths, this equation was further multiplied with the percentage of deaths attributable to violence and diarrhoea, respectively. For child (<5 years) mortality, the number of people included in the sample was multiplied with the percentage of 5-year-old children in the sample. We included an offset

Panel 1: **Phases of Darfur conflict**

- February to August, 2003 (period 1): not included in any retrospective survey, and mortality data should therefore be estimated with other techniques
- September, 2003, to March, 2004 (period 2): fighting intensified, leading to large-scale displacement with little humanitarian action undertaken
- April to December, 2004 (period 3): after the April, 2004, ceasefire agreement, number of affected people continued to increase (doubled between April and December), and number of humanitarian aid workers increased from 200 individuals (about three per 10 000 people affected) at the beginning of the period to 8500 (40 per 10 000 affected individuals) by the end of 2004
- January, 2005, to June, 2006 (period 4): number of internally displaced people remained constant, but the number of affected residents tripled; the increase in humanitarian aid was similar to the increase in total number of people affected, resulting in a constant ratio of 40 humanitarian aid workers per 10 000 people affected. In May, 2006, the Darfur Peace Agreement was signed between the Sudanese Government and the Minni Minnawi faction of the Sudan Liberation Movement/Army rebel group, but fighting continued[19]
- July, 2006, to September, 2007 (period 5): because of insecurity, number of internally displaced people increased by about 40% (from 1 717 092 to 2 387 594); concomitantly and partly as a result of reduced funding, the number of humanitarian aid workers decreased from 14 751 to 12 122 by July, 2007 (ie, 29 aid workers per 10 000 people affected)
- October, 2007, to December, 2008 (period 6): continued increase in number of internally displaced people, with increase in number of humanitarian aid workers (37 per 10 000 people affected in December, 2008)

Panel 2: **Equations used for regression analyses of mortality rates**

$$\ln(CMR\times rec\times ss)=stateWD+stateSD+IDP+P2+P3+P4+P5+IDP\times P4+offset(\ln[rec\times ss])$$

$$\ln(viol\times CMR\times rec\times ss)=stateWD+stateSD+IDP+P2+P3+P4+P5+IDP\times P4+offset(\ln[rec\times ss))$$

$$\ln(diar\times CMR\times rec\times ss)=stateWD+stateSD+IDP+P2+P3+P4+P5+IDP\times P4+offset(\ln[rec\times ss])$$

$$\ln(U5MR\times rec\times ss\times U5)=stateWD+stateSD+IDP+P2+P3+P4+P5+IDP\times P4+offset(\ln[rec\times ss\times U5])$$

CMR=crude mortality rate. rec=recall period. ss=sample size. stateWD=west Darfur (dummy). stateSD=south Darfur (dummy). IDP=percentage of internally displaced people in sample. P2=September, 2003, to March, 2004. P3=April to December, 2004. P4=January, 2005, to June, 2006. P5=July, 2006, to September, 2007. viol=percentage of deaths attributable to violence. diar=percentage of deaths attributable to diarrhoea. U5MR=mortality rate for children younger than 5 years. U5=percentage of children younger than 5 years in sample.

term that was the natural logarithm of the recall period multiplied with the sample size (panel 2). Since overdispersion can also be accounted for with a negative binomial model, we assessed the robustness of our results with another model.

Extrapolation

We computed mortality rates with the regression model and data extracted from the UN's reports[18] about Darfur. For each period, we calculated the proportion of affected people living in west and south Darfur and of internally displaced individuals. We input the data into the model and obtained period-specific predicted mortality rates for Darfur, weighted for state and accounting for displacement status. We also calculated 95% CIs for every estimate.

To obtain the number of deaths, the estimated period-specific mortality rates were applied to the number of person-days that people were affected by the conflict, which was obtained from the UN.[18] We calculated the number of deaths at baseline to differentiate between the expected and excess numbers by applying a baseline mortality rate to the number of person-days that people were affected by the conflict in Darfur. We used two different baselines. The first was 0·44 deaths per 10 000 people per day, a commonly used reference mortality rate for sub-Saharan African countries.[20] The second was 0·3 per 10 000 per day on the basis of a report by the World Bank from 2003[21] and matched the mortality rate that was described by de Waal[22] in the late 1980s.

Role of the funding source

The funding source had no input at all at any step of the this analysis, and both authors had full access to the data that were used. The corresponding author had final responsibility for the decision to submit for publication.

Results

Table 2 shows the data from 107 surveys that were done between September, 2003, and August, 2008, in Darfur. Overall, crude mortality rates were reported in 100 (93%) of 107 surveys. Data for deaths associated with violence (77 [72%]) or diarrhoea (72 [67%]) were reported in 78 surveys. Mortality rates for children younger than 5 years were provided in 103 (96%) surveys.

Explanatory variables that we needed for our regression model were provided in 75 (70%) surveys. One or more of these variables were not reported in 32 surveys, which we therefore excluded from the analysis (table 3).

All data required for mortality indicators, cause-specific deaths, and explanatory variables were provided in 63 surveys, which were therefore included in the analysis. The total number of person-months covered by these surveys was 32 691 776 (120 014 956 for 107 surveys). This total, however, might include some overlap between state-wide surveys and small-scale surveys of similar populations during the same period. However, we were not able to identify exactly which areas were included or excluded in the state-wide surveys and were therefore unable to adjust for this overlap.

The total number of affected person-months in Darfur was 205 976 171—ie, 16% of all affected person-time was included in the analysis, whereas the entire dataset of

107 surveys included 58%. The difference arose because some surveys included large areas and long periods, and therefore many person-months were not included in the 63 retained surveys.

Table 4 shows the results of the regression analyses of the different mortality rates—crude, violence-related, diarrhoea-related, and children (<5 years).

Crude mortality rate in south Darfur was higher than that in the north (table 4). The difference between north and west Darfur was not significant, but the cause-specific mortality rates differed more significantly between the two states. Diarrhoea-related mortality rates were higher in west Darfur, whereas violence-related mortality rates were lower. Only diarrhoea-related mortality rates were significantly higher in south Darfur than in north Darfur. Mortality rates for children younger than 5 years were higher in south Darfur than in north Darfur.

The proportion of internally displaced people in the survey sample correlated with the mortality rate (table 4). Crude ($p=0\cdot02$) and diarrhoea-related ($0\cdot0077$) mortality rates were significantly higher in populations with many displaced individuals, whereas there were non-significantly fewer violent deaths (table 4).

Crude mortality rates consistently decreased with time—crude mortality rates for periods 2–5 were higher than those during period 6 (table 5). The main reduction was in violence-related mortality rates, and was continuous with time, although the reductions during periods 4 and 5 were not significantly different from those during period 6. Rates of diarrhoea-related deaths during periods 2, 3, and 5 were higher than those in period 6. Although the rates declined during period 4, they were still non-significantly higher than those during period 6. The time pattern for the reduction in child (<5 years) mortality rates was similar to that for the diarrhoea-associated mortality rates.

The interaction term IDP×Period 4 suggested that the difference in mortality rates between displaced and non-displaced populations was absent during period 4. A detailed and technical description of the model is provided in the webappendix (pp 1–9).

Compared with period 2, a reduction in crude and violence-related mortality rates was noted, with an increase, however, in crude mortality rate during period 5 (table 5).

Table 5 also shows the calculated cumulative number of deaths and cumulative number of violent deaths during periods 2–6. With a baseline crude mortality rate of 0·3 per 10 000 population per day (0·91 per 1000 population per month), the expected number of deaths during periods 2–6 was 187 850, and the number of excess deaths was 298 271 (table 5). With a baseline of 0·44 per 10 000 population per day (1·34 per 1000 population per month), number of excess deaths was 210 607.

Discussion

Mortality rates were reduced after peaking near the end of 2003 to early 2004 when the crude mortality rate was eight to ten times higher than expected and almost four times higher than the emergency level of one death per 10 000 people per day. This pattern matched well with previously described general mortality patterns in complex emergencies.[23] After a sharp decrease in mortality rates, the conflict typically entered a phase of stabilisation, which did not imply that mortality rates returned to normal. Crude mortality rates remained high until at least the end of 2007, and probably until the end of 2008. However, this rate has remained below the emergency level since early 2005, with some exceptions between July, 2006, and September, 2007.

We estimated that the overall number of excess deaths in Darfur between March, 2003, and December, 2008, was about 300 000; with a higher baseline, there would be about 90 000 fewer excess deaths. The total number does not include deaths among the refugees living in Chad.

See Online for webappendix

Our findings also suggest that more than 80% of excess deaths were not a result of the violence. These results are in agreement with studies of other conflicts in which initial mortality peaks were often related to a period of intense violence and subsequently high number of violence-related deaths, but the main causes of mortality during the stabilisation period were diseases such as diarrhoea.[24]

We have further identified significant differences between residents and displaced people. Overall, surveys of populations with large proportions of internally displaced people have higher mortality rates than do those consisting of only non-displaced individuals. However, the effect of displacement is different if mortality rates are split into violence-related and

	Surveys	Surveys including indicators			
		Crude mortality rate	Violence-related mortality rate	Diarrhoea-related mortality	Child (<5 years) mortality rate
2003	5	0	0	0	5
2004	22	20	18	14	21
2005	41	41	33	33	38
2006	13	13	11	11	13
2007	15	15	6	6	15
2008	11	11	9	8	11
Total	107	100	77	72	103

Table 2: **Number of surveys by year and indicators**

	Surveys with variable
Exact period included	96 (90%)
Location	107 (100%)
Sample size	84 (79%)
Proportion of internally displaced people in sample	96 (90%)
All variables	75 (70%)

Data are number (%).

Table 3: **Regression variables in surveys of mortality rates**

	Crude	p value	Violence-related	p value	Diarrhoea-related	p value	Child (<5 years)	p value
Intercept	0·2369	<0·0001	0·0164	0·0037	0·0334	<0·0001	0·5945	0·2014
West Darfur*	1·2586	0·1380	0·4868	0·0726	1·6000	0·0394	0·9418	0·7865
South Darfur*	1·5527	0·0013	1·1503	0·6369	1·6161	0·0191	1·4333	0·0411
IDP (per 1% increase)	1·0059	0·0246	0·9919	0·2421	1·0110	0·0077	1·0037	0·2768
Period 2†	1·0209	<0·0001	1·0618	<0·0001	1·0190	0·0005	1·0199	0·0001
Period 3†	1·0147	<0·0001	1·0389	0·0028	1·0172	<0·0001	1·0145	<0·0001
Period 4†	1·0076	0·0430	1·0203	0·1669	1·0101	0·1000	1·0045	0·3689
Period 5†	1·0073	0·0032	1·0126	0·3605	1·0115	0·0034	1·0069	0·0307
Interaction (IDP×Period 4)	0·9931	0·0841	0·9960	0·7006	0·9927	0·2408	0·9965	0·5122

Data are coefficients of mortality rate , unless otherwise indicated. IDP=internally displaced people. *Reference is north Darfur, with a value of 1. †Reference is period 6; coefficients represent the effect per 1% of recall period that is within a specific period.

***Table 4:* Quasi-Poisson regression analyses of mortality rates**

	Crude mortality rate per 10 000 population per day (95% CI)	Violence-related mortality rate per 10 000 population per day (95% CI)	Person-months at risk	Deaths (95% CI)		Excess deaths (95% CI)	
				Total	Violence-related	Baseline 0·44 per 10 000 per day	Baseline 0·3 per 10 000 per day
P2	3·72 (2·37 to 5·86)	2·50 (1·25 to 4·98)	4 341 404	49 096 (31 279 to 77 340)	32 995 (16 497 to 65 725)	43 289 (25 472 to 71 532)	45 137 (27 320 to 73 380)
P3	2·06 (1·71 to 2·49)	0·30 (0·20 to 0·46)	14 305 260	89 585 (74 364 to 108 285)	13 046 (8698 to 20 004)	70 451 (55 230 to 89 150)	76 539 (61 318 to 95 239)
P4	0·60 (0·49 to 0·73)	0·05 (0·03 to 0·09)	57 552 719	104 976 (85 731 to 127 721)	8748 (5249 to 15 746)	27 994 (8748 to 50 738)	52 488 (33 242 to 75 233)
P5	0·85 (0·64 to 1·12)	0·03 (0·01 to 0·09)	58 724 401	151 744 (114 254 to 199 945)	5356 (1785 to 16 067)	73 194 (35 704 to 121 395)	98 187 (60 698 to 146 388)
P6	0·42 (0·28 to 0·63)	0·01 (0·00 to 0·10)	71 052 387	90 720 (60 480 to 136 080)	2160 (0 to 21 600)	–4320 (–34 560 to 41 040)	25 920 (–4320 to 71 280)
Total	··	··	205 976 171	486 121 (366 108 to 649 371)	62 305 (32 229 to 139 142)	210 607 (90 594 to 373 855)	298 271 (178 258 to 461 520)

P2=September, 2003, to March, 2004. P3=April to December, 2004. P4=January, 2005, to June, 2006. P5=July, 2006, to September, 2007. P6=October, 2007, to December, 2008.

***Table 5:* Calculated average mortality rates and number of deaths in affected population in Darfur by period (adjusted for population distribution by state and percentage of displaced people in total affected population)**

non-violence-related mortality rates. Mortality associated with violence is generally lower in samples with many displaced individuals, but that associated with non-violence is significantly higher. This difference could suggest that settings in which there are internally displaced people are protected from attacks, but overcrowding and precarious situations in which the displaced people live increase the risk of death from communicable diseases.

The results for July, 2006, to September, 2007, warrant some additional attention. The period was characterised by a rise in insecurity and robbery, leading to a new wave of displacement. Crude mortality rates for this period are similar to those of the previous period, but this continuity masks a divergent pattern in cause-specific mortality. On the one hand, deaths from violence continued to decrease, even though insecurity had increased. On the other hand, diarrhoea-related mortality rate increased during that period, as did the mortality rate in children younger than 5 years. A possible explanation is the 18% reduction in number of humanitarian aid workers during that period, while the number of affected people increased from 3·5 million to 4·2 million (figure). As a result, the ratio of affected people to humanitarian aid workers increased by almost 50% from 237 to 346 affected per staff member.

The first explanation for the reduction in the number of humanitarian personnel was increased insecurity resulting in accessibility to few areas, thus directly reducing the need for staff. The second reason is related to a reduction in humanitarian budget that was allocated to Darfur. In March, 2006, UNICEF's representative in Sudan warned that reduced funding could severely affect the humanitarian operations in Darfur.[25] 1 month later, the World Food Programme reduced the food aid rations by 50% because of funding shortages.[26] By November, 2006, 98% of funds needed for food aid had been pledged, but sectors such as health, water, and sanitation still had major gaps. By mid 2007, 85% of needed funds had been provided, including 78% for health and nutrition requirements, and 86% for water and sanitation. At about the same time, mortality rates decreased again, suggesting that although insecurity might have contributed mostly to the mortality increase during that period, the decreased humanitarian aid as a consequence of funding shortages and resulting increase in number of disease-related deaths accounted for the rise in mortality rate between July, 2006, to September, 2007.[27–29]

Since our analysis was done on the basis of retrospective mortality surveys, all limitations associated with such surveys should be considered. The first limitation was the access to affected populations. Some clusters in a sample were not accessible to the surveyors and therefore could not be included in the survey, resulting in an underestimation of the mortality rate if the rates were higher in the inaccessible areas. A second limitation was survival bias. In areas with high mortality rates, entire households have disappeared, and therefore these deaths could not be captured in a survey. Third, risk of recall bias might be higher in surveys with long recall periods (>1 year) than in those of short duration. The median recall period was 90 days (IQR 90–111) for the surveys included in our analysis and the maximum was 206 days, therefore reducing the risk of recall bias to some extent. The recall and survival biases could lead to underestimation of the mortality rate. Finally, information biases resulting from false statements of the respondent or false reporting by the interviewer should always be considered.

Other limitations, besides those inherent to mortality surveys, should also be mentioned. First, although the complex emergency database project was intended to be exhaustive, we cannot exclude the possibility that some surveys were not captured and thus not included in the database. We believe, however, that for Darfur, this number is negligible. Second, the surveys used in this analysis might not include all affected populations evenly. Indeed, mortality surveys are typically done in areas that are accessible to the UN or humanitarian non-governmental organisations, mainly camps for internally displaced people, and therefore might result in an over-representation of surveys done in settings with internally displaced people. We tried, however, to account for this selection bias by using the percentage of internally displaced people in the sample as a covariate in our model and subsequently, when extrapolating the results, by using the proportion of internally displaced people as reported in the UN's series about Darfur[18] to weigh our results. Third, we used only the point estimates reported in surveys and did not consider the 95% CIs for all these estimates, which might have resulted in narrow 95% CIs for the coefficients of our model. To assess this risk we added an error term to every crude mortality rate with a normal distribution around the rate with SE equal to 30%. The regression coefficients were then recalculated with this new dataset including an error term. We did 3550 iterations with different error terms every time, and, on the basis of these results, we calculated means and SEs for every coefficient. We obtained results that were similar to the coefficients of the original model and therefore excluded the hypothesis that our 95% CIs were too narrow.

Furthermore, we presented average mortality rates for the whole of Darfur and for periods that were sometimes long. As a result, some areas or months that had high or low mortality rates might have been masked. Additionally, we assumed that mortality rates were constant throughout the recall period of the survey.

Another constraint was that we could not identify any survey that included the first few months of the conflict before the deterioration in September, 2003. Other studies, however, provided some estimates for those months. In the report by the US Department of State, one of the most reliable studies according to the Government Accountability Office, mortality for that period was estimated to be between 1000–4500 deaths.[15] We only focused on the number of people who had died in Darfur and excluded the refugees living in camps in Chad, who accounted for 5% of affected population.

We conclude that the Darfur conflict shows a typical pattern of mortality rates with time, characterised by a peak in the number of violent deaths that is followed by a protracted phase of increased disease-related mortality rate. The phase particularly affects displaced individuals living in conditions of poor sanitary infrastructure, making them susceptible to diseases associated with diarrhoea. Adequate humanitarian assistance to prevent and treat these potentially fatal diseases is essential. The full effect of the expulsion of non-governmental organisations from Darfur is still not known, but the increased mortality rate during a period of reduced humanitarian deployment in 2006–07 suggests that we should fear the worst.

Contributors

OD gathered the data, did the analysis, and wrote the report. DGS provided inputs and comments.

Conflicts of interest

We declare that we have no conflicts of interest.

Acknowledgments

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