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Mortality among displaced former UNITA members and their families in Angola: a retrospective cluster survey

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BMJ 2003;327:650–3

Abstract

Objective To measure retrospectively mortality among a previously inaccessible population of former UNITA members and their families displaced within Angola, before and after their arrival in resettlement camps after ceasefire of 4 April 2002.
Design Three stage cluster sampling for interviews. Recall period for mortality assessment was from 21 June 2001 to 15-31 August 2002.
Setting Eleven resettlement camps over four provinces of Angola (Bié, Cuando Cubango, Huila, and Malange) housing 149 000 former UNITA members and their families.
Participants 900 consenting family heads of households, or most senior household members, corresponding to an intended sample size of 4500 individuals.
Main outcome measures Crude mortality and proportional mortality, overall and by period (monthly, and before and after arrival in camps).
Results Final sample included 6599 people. The 390 deaths reported during the recall period corresponded to an average crude mortality of 1.5/10 000/day (95% confidence interval 1.3 to 1.8), and, among children under 5 years old, to 4.1/10 000/day (3.3 to 5.2). Monthly crude mortality rose gradually to a peak in March 2002 and remained above emergency thresholds thereafter. Malnutrition was the leading cause of death (34%), followed by fever or malaria (24%) and war or violence (18%). Most war victims and people who had disappeared were women and children.
Conclusions This population of displaced Angolans experienced global and child mortality greatly in excess of normal levels, both before and after the 2002 ceasefire. Malnutrition deaths reflect the extent of the food crisis affecting this population. Timely humanitarian assistance must be made available to all populations in such conflicts.

Introduction

In Angola, 27 years of civil war between the ruling Movimento Popular de Libertação de Angola (MPLA) and the União Nacional para a Independência Total de Angola (UNITA) movement were tentatively ended by a ceasefire signed on 4 April 2002. During the last phase of the war (1998-2002) large areas of Angola were inaccessible to international relief organisations. After the ceasefire, three million people were estimated to be in need of immediate aid.[1]

Between April and August 2002, as part of the post-ceasefire demobilisation, about 81 000 former members of UNITA and 230 000 of their family members assembled in 35 resettlement camps country-wide.[2] The medical relief organisation Médecins Sans Frontières launched nutritional and healthcare programmes in several of these. We report the findings of a retrospective mortality survey, with the main objectives being to measure crude mortality and mortality in children aged under 5 years, to identify major causes of death, and to describe the demographic evolution of the population.

Copies of the survey manual and questionnaire used in this study are available on bmj.com

Participants and methods

The study included all 11 camps of former UNITA members in the four provinces of Bié, Cuando Cubango, Huila, and Malange (fig 1). Covering a registered population of 149 106, the survey included 38% of the total estimated former UNITA population. All camps in the survey were administered by UNITA, and relied on external assistance for food and health care. Camp population varied from 4800 to 42 000 people.

Data collection

The recall period for assessing mortality was from 21 June 2001 to the survey date (15-31 August 2002), or an average of 427 days. The starting date coincided with a complete solar eclipse visible throughout Angola, thus providing an easily memorable event. We designed and piloted standardised questionnaires in Portuguese and Umbundu (copies of the survey manual and questionnaire are available on bmj.com).

Trained interviewer teams, aided by local translators, conducted face to face interviews with heads or senior members of households. We collected infor-

Fig 1 Name and location of 11 resettlement camps for former UNITA members and their families included in the survey. (Base map provided by ReliefWeb-UN OCHA on 30 January 2003; modifications by Epicentre on 31 January 2003)

mation on the demographic composition of the household at the start and end of the recall period. We recorded all dates for people joining (newborns, reunifications) or leaving (deaths, disappearances, prolonged absences) the household. For each death reported in the household, we asked the respondent to select one of the following categories as the most likely cause—fever or malaria, diarrhoea, cough, measles, malnutrition, violence or war, or other causes.

The data collection process was anonymous, and, to minimise response bias (such as under-reporting of deaths or over-reporting of family size), respondents were clearly informed that the survey was not part of a registration or food distribution process.

Sample size and statistical analysis

We chose a cluster sampling design because the only information available for constructing a sampling frame was a list of resettlement camps and their population sizes. Survey sample size was determined so as to estimate a crude mortality of 1.5 deaths/10 000/day with a 95% confidence interval of 1.25 to 1.75 (relative precision 16%).The required sample size was calculated to be 4500 people, corresponding to 900 households.

Sampling occurred in three stages. At the first stage, 30 clusters were randomly distributed among the 11 camps proportionally to camp population size. At the second stage, the number of clusters assigned to each camp was randomly distributed among the camp's sectors, also proportionally to sector population. At the third stage, we used the standard World Health Organization and Expanded Programme on Immunization (WHO/EPI) method to identify 30 households within each cluster.[3]

We expressed mortality as the number of deaths/10 000/day. For calculating mortality before and after arrival in a resettlement camp, we used person-days as denominators, and we analysed the distribution of causes of death as proportionate mortality. A crude mortality of 1/10 000/day, representing a mortality twice normal levels in developing countries, is the threshold commonly applied by relief workers to denote an emergency situation.[4] (See bmj.com for details of sample size and statistical analysis.)

Results

The survey included 900 households, representing 6599 people. All heads of households consented to the interview. At the time of the survey, 5812 people were living in the interviewed households. Their median age was 12 years (range 0-83), with a nearly equal male:female ratio (2850:2962). Children under 5 years old represented 18% (1025/5812) of the sample. The male:female ratio differed markedly by age group: 1.0 (1657:1737) for children under 15 years, 0.8 (947:1171) for ages 15–44, and 4.6 (246:54) for those older than 44.

At the time of the survey, 3592 people (61.8%) lived in resettlement camps in Cuando Cubango, 1100 (18.9%) in Huila, 619 (10.7%) in Bié, and 501 (8.6%) in Malange. Eighty one per cent had arrived in the camps in April or May 2002. Of the 6599 people covered in the survey, 6300 had been present in the household at the time of the solar eclipse. Another 299 people joined the sample during the recall period, while 787 left the household before the time of the survey because of death (n = 390), disappearance (n = 42), or moving away (n = 355).

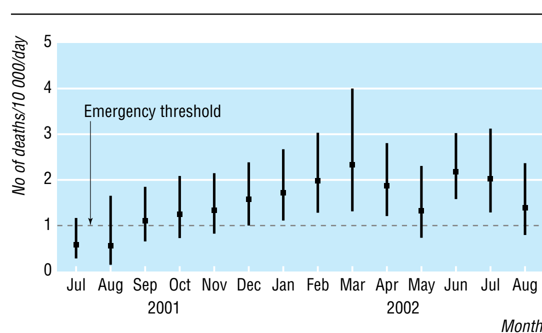

Fig 2 Reported monthly crude mortality (95% confidence interval) among former UNITA members and their families in 11 resettlement camps in Angola from July 2001 to August 2002. (Mortality of 1/10 000/day is the threshold applied by relief workers to denote an emergency situation)

Mortality

The 390 deaths corresponded to an average crude mortality of 1.5/10 000/day (95% confidence interval 1.3 to 1.8). Of these deaths, 182 (47%) occurred in children under 5, corresponding to a mortality of 4.1/10 000/day (3.3 to 5.2). Sixty seven (17%) of all deaths were reported among children under 1 year old. Of 206 infants born during the recall period, 47 (23%) had died by the time of the survey. Crude mortality for males was 1.7/10 000/day (1.4 to 2.1) and for females was 1.3 (1.0 to 1.8).

Monthly crude mortality increased from 0.6/10 000/day (0.3 to 1.2) in June-July 2001 to 2.3 (1.3 to 4.0) in March 2002. After March 2002, mortality decreased but remained higher than in 2001 (fig 2). Crude mortality between 21 June 2001 and arrival in the camps was 1.4/10 000/day (1.1 to 1.7) and for the period after arrival was 1.9 (1.4 to 2.5). Mortality in the camps was highest for the first three months after arrival, with 2 deaths/10 000/day, before starting to decline.

Causes of death

Malnutrition, fever or malaria, and war or violence were the three most frequently reported causes of death (see table). Children aged under 15 were disproportionately affected by malnutrition. War or violence was the leading cause of death in 2001 (43/126 (34%)) but was supplanted by malnutrition in 2002 (89/264 (34%)). Proportionate mortality from malnutrition rose steadily from 15% in June-September 2001 to 33% in January-March 2002 and 39% in April-June 2002. Fever or malaria remained the second most important cause of death throughout the recall period. Differences in proportionate mortality before and after arrival in the camps essentially concerned war or violence (decreasing from 66/280 (24%) before to 3/110 (3%) after) and diarrhoea (increasing from 21/280 (8%) before to 21/110 (19%) after).

Disappearances

Of the 42 disappearances, 23 occurred among children aged under 15, 11 among women aged 15 and above, and 10 after arrival in the camp. Counting all 42 disap-

Proportionate mortality among former UNITA members and their families in 11 resettlement camps in Angola by age group and reported cause (survey period from July 2001 to August 2002). Values are numbers (percentages) of deaths within age group

	Age groups				
	<5 years (n=182)	5-14 years (n=91)	15-44 years (n=79)	>44 years (n=38)	All ages (n=390)
Malnutrition	52 (29)	44 (48)	15 (19)	5 (13)	116 (30)
Fever or malaria	61 (34)	15 (16)	11 (14)	7 (18)	94 (24)
War or violence	6 (3)	12 (13)	37 (47)	14 (37)	69 (18)
Diarrhoea	26 (14)	10 (11)	3 (4)	3 (8)	42 (11)
Cough	6 (3)	1 (1)	2 (3)	2 (5)	11 (3)
Measles	0	1 (1)	0	0	1 (0.3)
Others	31 (17)	8 (9)	11 (14)	7 (18)	57 (15)

pearances as deaths increases the crude mortality for the whole recall period to 1.7/10 000/day (1.3 to 1.8).

Discussion

This retrospective survey provides country level mortality data representative of a large population of former UNITA members and their families displaced within four provinces of Angola. During the 14 months from June 2001 to August 2002, both crude mortality and mortality in children aged under 5 years remained above emergency levels. Mortality among children under 5 was some four times higher than normal, with nearly a quarter of all babies born during the recall period dying before the survey.

Limitations of study

Recall bias was probably limited by the choice of a solid starting date (all respondents vividly remembered the solar eclipse) and by the systematic placement in the questionnaire of repeated probing questions about mortality. Survival bias (absence from the sample of households in whom all members either died or could not reach the camps) may also have influenced our results. The observed crude mortality may also not be representative of former UNITA populations living in provinces not surveyed, or of other groups of displaced people.

The WHO/EPI sampling technique (originally conceived for immunisation and nutrition surveys) has not been fully validated as a tool to estimate mortality, and alternative methods have been suggested.[5-8] Nonetheless, our results are similar to those of other surveys performed during the same period in former UNITA camps in Huambo province (crude mortality 2.3/10 000/day)[9] and among a displaced population in Bié (crude mortality 1.5/10 000/day).[10]

Implications of results

In this population, violence was the dominant cause of death up to December 2001. Nearly half of those killed and the vast majority of those who had disappeared were women and children. Our survey results thus confirm reports that civilians were often direct victims of the war in Angola.[11]

Overall, malnutrition was the main killer in the study population, an observation mirrored throughout Angola during the 2002 crisis (among adults, it is possible that deaths such as from HIV infection and AIDS and from tuberculosis might have been misreported as malnutrition, but reliable information is lacking on the burden of these infections on the study population). The nutritional emergency peaked between January and June 2002, when hunger was responsible for almost half of reported deaths. The food crisis was aggravated by the surveyed population being inaccessible to relief organisations because of military operations and an embargo on UNITA held areas.

Crude mortality remained high after the ceasefire, when the study population emerged from isolation and settled into camps. Populations tend to have long recovery periods after complex emergencies, particularly after nutritional crises.[12 13] A follow up survey conducted in camps of former UNITA members in Cuando Cubango province showed that crude mortality remained at 1.1/10 000/day up to October 2002.[14] Our post-ceasefire data suggest that, at least for the first four months of demobilisation in Angola, medical and nutritional assistance to the former UNITA population was insufficient to restore mortality to normal levels. Also United Nations appeals for Angola were vastly underfunded, reflecting a general unwillingness on the part of donor agencies to commit to relief programmes during this crisis.[15] While needs assessments were limited in this context, it seems clear to us that minimum standards in emergency response were not met.[16]

Conclusions

Excess mortality of the extent shown here is a constant feature of armed conflicts currently affecting large areas of Africa.[17] Military and political considerations

What is already known on this topic

In Angola a tentative ceasefire was signed in 2002, bringing 27 years of civil war to an end

After the ceasefire, health assessments conducted among previously inaccessible displaced populations suggested a severe humanitarian crisis

What this study adds

This retrospective survey, conducted among former members of UNITA and their families living in resettlement camps, documents the effects of violence, isolation, and a food crisis on a large Angolan displaced population

The population experienced high mortality both before and after the ceasefire, mainly due to violence in 2001 and malnutrition in 2002; child mortality was particularly alarming

Military and political considerations should not prevent the delivery of adequate and timely humanitarian assistance to populations in need

must not come in the way of effective and timely humanitarian access to populations rendered isolated by such conflicts.

We thank all the Médecins Sans Frontières coordination and field teams involved for their help, particularly Fazil Tefera and Sandrina Simons. We acknowledge the invaluable assistance of many Angolan translators, and thank local authorities for their support and hospitality.

Contributors: See bmj.com

Funding: The study was financed entirely by Médecins Sans Frontières.

Competing interests: None declared.

Ethical approval: This study was not reviewed by an ethics committee. Field surveys of mortality in the context of humanitarian emergencies do not go through an institutional review board, and WHO guidelines on mortality assessments do not require an ethical review.

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(Accepted 12 May 2003)

Detecting chronic obstructive pulmonary disease using peak flow rate: cross sectional survey

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BMJ 2003;327:653–4

The British Thoracic Society recommends spirometry, not peak expiratory flow, for diagnosing patients as having chronic obstructive pulmonary disease.[1] Recording data from spirometry in patients' notes has been proposed as a marker of quality of care.[2] But general practitioners are more familiar with peak expiratory flow rate, and have questioned using more complex spirometry tests to identify chronic obstructive pulmonary disease.[3] We analysed data from the third national health and nutrition survey (NHANES III) to investigate how useful peak expiratory flow rate is for detecting people with chronic obstructive pulmonary disease in the community.

Participants, methods, and results

We included only white people aged 50-90 years because chronic obstructive pulmonary disease is uncommon in younger people, and we had insufficient statistical power to study other ethnic groups. We excluded people with self reported asthma.

For the remaining 3874 participants, we extracted information on lung function, history of smoking, and respiratory symptoms. Using equations developed from NHANES III, we calculated percentage predicted lung function.[4] We defined peak expiratory flow rates less than 80% of that predicted as abnormal, and people as having chronic obstructive pulmonary disease if we found evidence of airflow obstruction (forced expiratory volume in one second less than 80% of that predicted and a forced expiratory volume to vital capacity ratio of less than 70%), ever smoking at least 100 cigarettes, and had one or more respiratory symptom. These patients were subdivided on the basis of their predicted forced expiratory volume in one second into those with mild (60%-80%), moderate (40%-59%), or severe (<40%) disease.

We calculated the specificity and sensitivity of an abnormal peak expiratory flow rate. Classic statistical methods were not applicable because of the complex survey design used in NHANES III (www.cdc.gov/nchs/data/nhanes/nhanes3/cdrom/nchs/manuals/nh3guide.pdf); we used specialised survey commands within STATA, weighting our data appropriately.

We identified 265 people with chronic obstructive pulmonary disease—a prevalence of 7.8%, after allowing for NHANES III's sampling method. Of these, 143 (54%) were men, and the overall mean age was 65 years. Among people with a diagnosis of chronic obstructive pulmonary disease, 235 had a peak expiratory flow rate of less than 80% of what we predicted. The sensitivity (adjusted for sampling methods) of an abnormal peak expiratory flow rate in detecting all people with chronic obstructive pulmonary disease was 91%, and for people with moderate or severe chronic obstructive pulmonary disease was 100% (table). The specificity of an abnormal peak expiratory flow rate was lower at 82%, although 62% of the false