# Estimating Demographic Indicators in a Conflict-Affected Population in Eastern Sudan

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## Abstract

**Introduction:** Although the international community currently is focused on Darfur, it is important that the status of other conflict-affected populations throughout Sudan are not overlooked. For the past decade, the Beja population, located along the Sudan-Eritrea border, has been affected by a conflict that has drawn little attention from the international community.

**Methods:** This study assessed crude mortality rates and other demographic characteristics using a mortality study nested within a nutrition assessment using cluster sampling methods.

**Results:** The crude mortality rate among the Beja population in the National Democratic Alliance (NDA)-controlled territories between October 2003 and October 2004 was estimated at 1.4/10,000/day (95% confidence interval (CI): 1.2–1.6); the under five years of age mortality rate was estimated at 2.7/10,000/day (95% CI: 2.2–3.3). Both of these are elevated rates that exceed the accepted threshold to declare a humanitarian emergency.

**Conclusions:** When considered with recent reports of elevated malnutrition rates, the status of Beja is critical by international standards. Study findings suggest that: (1) nesting demographic objectives into other planned assessments (such as nutrition) are a feasible and cost-effective means for non-governmental organizations to characterize beneficiary populations; and (2) the Beja residing in the NDA-controlled territories are facing elevated mortality and are in urgent need of humanitarian assistance.

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## Introduction

Humanitarian conditions in Sudan remain among the worst in the world, and the consequences of decades of war and government neglect are severe in terms of damaged and underdeveloped infrastructure and immeasurable human costs. The Beja population of eastern Sudan has been affected by ongoing fighting. Those residing in areas controlled by the National Democratic Alliance (NDA) have remained particularly isolated and inaccessible to the international community. Fighting between the Sudanese army and the NDA, a Sudanese rebel coalition that includes the Sudan Peoples Liberation Army/Movement (SPLA/M), began along the Sudan-Eritrea border in 1995. The international community has shown little interest in the conflict in eastern Sudan. The amount of humanitarian and development assistance has been limited to small-scale projects, and no efforts have been made to understand or mitigate the root causes of the conflict.[1]

Conflict and mining has affected the semi-nomadic Beja population's herding livelihood. Traditional trade and herding migratory routes have been cut off, grazing grounds are no longer accessible, labor and market opportunities are limited, and the Government of Sudan has terminated all services to the area, including health care and education. The combination of war and recent drought has placed the Beja in crisis, and has resulted in declining food
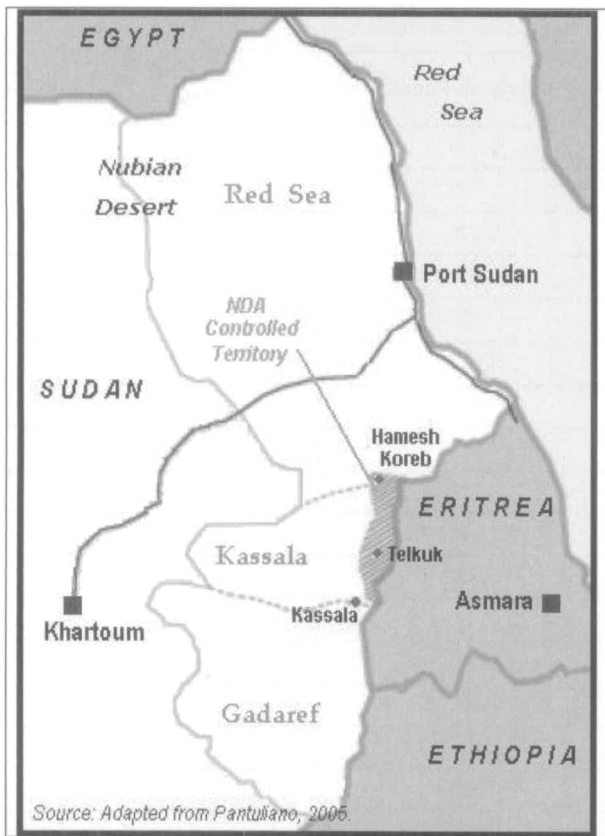
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Figure 1—Map of study area (NDA-controlled territory)

is no easy tool or commonly used method. Nested methods, conducted routinely by NGOs, incorporate demographic measures into population-based surveys and are cost-effective means of characterizing beneficiary populations.

The aim of this study was to provide data on population status and demographics while assessing the quality and feasibility of incorporating a nutritional survey. The objectives of the survey were to: (1) assess population status by estimating the crude mortality and under-five malnutrition rates; (2) analyze the validity and methodology used to obtain existing population estimates and estimate the size of the population in the NDA territories; and (3) employ a feasible method for NGOs to facilitate the collection of the operational information necessary for planning humanitarian assistance. The methodology used in this study included analysis and validation of existing population estimates, population counts of all women residing in communities (excluding Telkuk and Hamesh Koreb), and demographic survey results (household size) that were extrapolated to develop a population estimate.

The assessment of the Beja population began in October 2004, in the context of significant methodological and operational challenges. Obtaining a representative sample of the population was challenging due to the semi-nomadic lifestyle, lack of accurate population data, and land mines and other security risks that precluded travel and sampling in several areas. In light of these constraints, the lack of attention to the plight of the Beja in the NDA-controlled territories and the insufficient data on this population were significant factors in the decision to continue the assessment.

## Methods

The initial phase of the study focused on finding existing information on the sedentary Beja population in the NDA-controlled territories. This population included two population centers, Hamesh Koreb and Telkuk, and more than 20 smaller communities. While planning this survey, all known Beja towns and villages in the NDA-controlled territories (n = 26) were included in order to derive a sampling frame. The population of each town was estimated with the assistance of SPIR and the IRC. Existing estimates varied greatly among sources, and were based on: (1) reports from local authorities; and (2) food distribution lists. Reports speculated that the population in the NDA-controlled territories is 42,000–102,000, but these were determined to be over-estimates, as no systematic assessment had been performed prior to the current study.[4,8] Nomadic populations are known to inhabit the region, however, reports from SPIR suggest that migration may not be common and that the majority of the group is sedentary.

Once all of the available, relevant data had been compiled and examined, an estimated reference population was identified and the survey was planned accordingly. Because SPIR and IRC were the only two groups active in the area, no other pre-existing detailed population or settlement data were available. Reports based on physical counts of women or structures were used in planning the sample because they were considered to be most accurate. In communities in for which physical counts of women or structures

security and high rates of malnutrition. The prevalence of global acute malnutrition was 27.4% in 2004.[2–4]

There are an estimated 1.9 million ethnic Beja,[6] however, this value is questionable, as population estimates frequently are relied upon with little knowledge about their accuracy or how they were derived. The focus population in this study was Beja residing in areas controlled by the NDA (Figure 1). This region extends approximately 260 km south from Hamesh Koreb to just below Telkuk along the Sudan-Eritrea border. Little is known about the inhabitants of this area, and a literature search did not identify any scientific articles on the Beja that has been published within the last 20 years.

The United Nations (UN) reports that the NDA-controlled territory has been inaccessible to humanitarian workers since 2002. However, two international organizations, the International Rescue Committee (IRC) and Samaritan's Purse International Relief (SPIR) have been working in the region.[7] Knowledge of population characteristics is essential for estimating needs and planning an effective response to ensure proper targeting and equity in the provision of humanitarian assistance. Information on population size and structure also can help identify missing and vulnerable groups; this is important in settings where no services are available because the priorities for relief efforts have not been identified. Although it is necessary for NGOs to measure their beneficiary populations, there

| Beja Community | Population Estimates | | |
|---|---|---|---|
| | IRC Reference Population[1] | SPIR Reference Population[2] | SPIR Counts and Assessment Findings[3] |
| Adardeb | 1,500 | 2,500 | 257 |
| Akaidi | 3,600 | 800 | 309 |
| Balastaff | 2,500 | 3,200 | 206 |
| Elateot | 150 | 150 | 155 |
| Fagada | 300 | 300 | 386 |
| Gadamayeb | 3,000 | 3,000 | 155 |
| Gambalaweb | 3,000 | -- | 566 |
| Gir Gir | 4,000 | 4,000 | 283 |
| Hameshkoreb | 60,000 | 12,000 | 8,224 |
| Hashaneyt East | 490 | 1,800 | 309 |
| Hashaneyt West | 750 | 2,700 | 360 |
| Kurbaweb | 1,050 | -- | 257 |
| Lamfeef | -- | 2,300 | 607 |
| Maman Bymok | 600 | 600 | 257 |
| Maman Belingala | -- | -- | 180 |
| Maman HK | 3,500 | 3,500 | 607 |
| Maman Masgeet | 9,000 | 3,900 | 1,028 |
| Maman Sharam | 500 | -- | 206 |
| Rabasim | 300 | 1,800 | 360 |
| Shagaloba/Rubda | 250 | -- | 155 |
| Tamerein | 150 | 150 | 386 |
| Telkuk | 16,000 | 8,000 | 1,800 |
| Temekit | 225 | 225 | 231 |
| Thadai | 8,000 | 6,900 | 1,285 |
| Ugamayet | 4,090 | 4,100 | 437 |
| Yedrout | 10,000 | 6,300 | 1,131 |
| **Total** | **132,995** | **68,225** | **20,139** |

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Table 1—Beja population estimates, 2004 (IRC = International Rescue Committee; SPIR = Samaritan's Purse International Relief)
[1]Based on reports from Beja leadership
[2]Based on ration card lists and IRC information
[3]Based on counts of women or structures in each settlement and average household size from SPIR staff and the survey

were not available (n = 5), and when there were discrepancies in the population estimates from NGO the sources (3 of 5 communities with no count information), local SPIR staff and Beja leaders were consulted and the population size was based on size relative to the other villages with more reliable population estimates (Table 1). Convergence among population proportions of the estimates by location was attempted in order to minimize sampling error.

A two-stage cluster survey was conducted with 30 clusters of 30 households and a probability proportional to size sampling methodology was used. This methodology was selected because it satisfied the dual objectives of the demographic and nutritional assessments. The sampling interval was determined by dividing the estimated population by 30, the number of clusters in the survey. Of the 26 towns in the survey area, 20 were included in the sample and five had multiple clusters. One village was excluded because it was located in an area with reports of active conflict and could not be sampled due to security risks. The closest neighboring village without security risks was sampled instead.

When each survey team entered a cluster, they met with the village sheik to explain the purpose of the survey and to

request permission to proceed. Cultural norms prohibiting outsiders from freely entering residential areas of the villages precluded systematic or random sampling of households. The Beja culture is restrictive of female activities, and Beja women almost are never permitted to leave their villages, even if they are urgently in need of medical care. Thus, it was likely that women would be in villages and could be sampled systematically. Since the assessment was implemented in conjunction with a nutritional survey, interviewing women also was ideal because they are the primary caretakers of children. Interviews and anthropometric measurements of children were conducted in central village locations identified by village sheiks. The village sheiks notified the female residents about the survey and requested their presence. When possible, notification was provided a day in advance. Because the survey provided a unique opportunity for Beja women to congregate, something that usually is discouraged by Beja men, almost all of the villages surveyed reported high attendance. An estimate of the total number of women in each village was obtained by counting the women that congregated at the central location (as well as those reported absent) whenever possible, or by recording the within-cluster sampling interval. Within-cluster sampling was conducted by selecting every $n^{th}$ woman from those gathered at the local meeting place(s). Because the survey was designed to meet the dual objectives of a nutritional and demographic assessment, all women were eligible to participate, regardless of whether they had children that met the criteria for the nutritional component of the survey. During the interviews, information was gathered on household composition, and anthropometry measurements were obtained for all children 6–59 months of age that resided in their household. Thirty women were surveyed in each cluster, except in five towns where the number of women gathered at the central location was <30; in those cases, all of the women were surveyed.

Questionnaire-based interviews were conducted in Arabic by trained female interviewers because Beja cultural norms prevent free contact between outside men and Beja women. Also, because Beja women do not speak Arabic and few non-Beja speak Bedawit, Beja men (who speak Arabic as a second language) were used as translators. The survey did not seek sensitive or private information, and investigators do not believe that having a community member serve as a translator influenced the results significantly. Initially, the questionnaire was three pages in length and included additional questions on morbidity and food security. However, during field testing, it became apparent that the survey instrument was too complex once language and other considerations were taken into account. Consequently, the survey was limited to one page, and focused solely on household members and vital events during the year preceding the survey. Past and current household composition data were obtained; the past household composition later was used to cross-check current household information once vital events and migration were considered. In order to be identified as a household member, an individual had to be physically present for a portion of the month preceding the survey. Attempts to approximate

ages and dates of vital events were made using the local calendar and significant events; the one-year recall period was selected because it corresponded with Ramadan, which is a universally recognized event among the Beja. In-migrants were defined as persons who moved into the household during the recall period and remained in the household at the time of the survey. Out-migrants were defined as individuals who moved out of the household during the survey period and had not returned by the time of the survey.

The number of households or families in a village was determined by the actual counts of the number of shelters or of the women in each village and were conducted by SPIR or Johns Hopkins University. The only town in which no physical count of women or structures was obtained was Hamesh Koreb, the largest Beja town. Population estimates for Hamesh Koreb were based on key informants and data reported by SPIR staff. The final population estimate was determined by multiplying the estimated number of households in a village by the average household size that was calculated based on survey responses.

Accurate estimation of the ages of the individuals especially was challenging due to the fact that the Beja do not measure time in Western calendar years and, consequently, the validity of age data was uncertain. Ages were reported in 10-year intervals rather than the more common five-year intervals to reduce misclassification.

Rates were determined using the mid-interval survey population as a denominator. The mid-interval population (n = 4,782.5) was calculated by adding one-half of the number of reported deaths and subtracting one-half of reported number of births from the population at the time the survey was conducted. The age was not reported for a large number of deaths (n = 88). In order to ascertain the age-specific mortality, an assumption was made that the known age distribution of those who died was similar to the age distribution of those who died for whom age was not reported.

A calculation of the intra-cluster correlation coefficient for sample household mortality resulted in a design effect of 2.6. In order to detect a difference between the observed mortality rate and a crude death rate of 1/10,000/day (the threshold mortality rate to designate a complex emergency as serious) with $\alpha = 0.05$ and power = 0.80, a sample size of at least 1,499 individuals would have been required for statistical calculations based on an assumption of simple random sampling. The survey sample was sufficiently large to accommodate a design effect of three. Confidence levels for mortality rates were calculated based on standard errors from cluster-level analysis in order to account for the cluster survey design.[9] Data processing was performed using STATA Version 8 (Stata Corp, College Station, TX) and SPSS Version 12.0 (SPSS Inc., Chicago, IL).

This study was approved by the Committee on Human Research of the Johns Hopkins Bloomberg School of Public Health and by local Beja leadership.

## Results
An analysis of existing population estimates, formative research with the local population and SPIR staff, population counts in smaller villages at the time of the survey, and
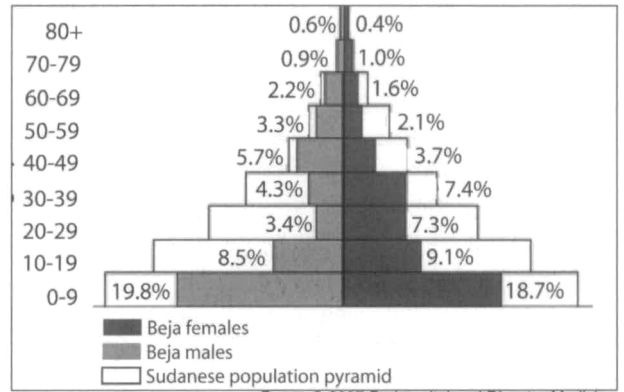
| Population Proportions | Number | % |
|---|---|---|
| By age-interval (n = 4,640); in years | | |
| 0–9 | 1,785 | 138.5 |
| 10–19 | 816 | 117.6 |
| 20–29 | 496 | 110.7 |
| 30–39 | 543 | 11.7 |
| 40–49 | 434 | 9.4 |
| 50–59 | 254 | 5.5 |
| 60–69 | 178 | 3.8 |
| 70–79 | 134 | 2.9 |
| 80+ | 45 | 1.0 |

| Mortality | Death rate per 10,000/day (95% CI) | Death rate per 1,000/year (95% CI) |
|---|---|---|
| Children 0–14 (n = 158) | 1.9 (1.6–2.2) | 68 (58–79) |
| Adults 15–49 (n = 46) | 0.9 (0.6–1.1) | 31 (23–40) |
| Elderly 50+ (n = 33) | 1.5 (1.1–2.1) | 56 (39–78) |
| Overall (n = 247) | 1.4 (1.3–1.6) | 52 (46–59) |

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**Table 2**—Beja population age structure and mortality rates. (References populations for mortality data are mid-interval populations)



Figure 2—Beja population pyramid (Percentages represent the proportion of the Beja population in the age/sex category. The Sudanese population pyramid was adopted from 2005 data from the US Census Bureau International data)

survey data (primarily household size) were used to develop an estimate of 21,150 sedentary Beja residing in the NDA-controlled territories. Although it is difficult to estimate the number of Beja that either are migratory or residing outside of well-established villages, it is reasonable to speculate that as many as 10,000 Beja are migrating with herds or residing in smaller groups outside of known communities, and thus, are not included in this survey. Combining the population identified in the survey with the estimated population that is nomadic or residing elsewhere, a conservative estimate of the Beja population in the NDA-controlled territories of the Sudan-Eritrea border region is between 25,000 and 30,000.

A total of 926 interviews were conducted. The sample used for analysis encompassed 4,745 individuals in 924 households residing in 20 known communities. The mean household size was 5.1 (95% CI: 5.0–5.3) and reported household sizes ranged from 1–17. The population was 48.7% (95% CI: 47.3–50.2) male and 51.2% (95% CI: 49.8–52.8) female. The 0–4 and 0–17 year old populations represented 18.5% (95% CI: 17.4–19.6) and 51.6% (95% CI: 50.2–53.2) of the total population, respectively. Ages were reported in 10-year intervals instead of the more com-

mon five-year intervals as a means to reduce age-misclassification in the population pyramid (Table 2, Figure 2). A noticeable proportion of males in the 20–29 year and 30–39 year age groups were not present, which could be due to under-reporting or to sex-specific migration patterns. There also were a greater number of older males than females in the sample population. Although this is inconsistent with most population structures and also could be due to misreporting, it also is the case that the death rate among elderly men was significantly greater than that of among elderly women. The characteristics of the Beja noted in the population pyramid approximates that of a population with high birth and mortality rates (Figure 2).

Death rates, birth rates, and migration rates for the year preceding the survey were calculated. A total of 189 in-migrations were reported, resulting in an in-migration rate of 40/1,000/year (95% CI: 35–46). There were 288 out-migrations with a resultant out-migration rate of 60/1,000/year (95% CI: 54–68). The net migration rate was 21/1,000/year (95% CI: 17–25) with a net total of 99 out-migrations reported. The accuracy of some of the migration data is uncertain, particularly due to recall issues. Implausible in-migration and/or out-migration data were reported in 16 households that subsequently were excluded from the analysis.

Crude death and crude birth rates were based on a mid-interval population of 4,772.5. A total of 165 births were reported during the year preceding the survey, resulting in a crude birth rate of 35/1,000/year (95% CI: 30–40). The crude death rate was determined to be 52/1,000/year (95% CI: 35–74) or 1.4/10,000/day (95% CI: 1.0–2.0) based on a total of 247 reported deaths during the past year. The observed crude mortality rate (CMR) surpassed the benchmark of 1/10,000/day, indicating that the Beja population faces a humanitarian crisis. The seasonality of mortality was not assessed because it was not possible to identify recognizable events within the local Beja calendar that adequately corresponded to the Western calendar; however, there were no known major events during the recall period that would have been expected to have an impact on mortality rates. Ages were recorded in 64% of reported deaths. Of deaths

for which age was reported, 36% (95% CI: 27–46) were among children <5 years of age. In addition to the CMR, the mortality rates for select population sub-groups also were estimated (Table 2). The age-specific mortality rate for children under five years of age (U5MR) was determined to be 98/1,000/year (95% CI: 68–128) or 2.7/10,000/day (95% CI: 1.9–3.5). Mortality rates were similar among males and females for children and adults.

The sex and reported cause of death were recorded for 95% of the deaths; 58% (95% CI: 49–68) were males and 42% (95% CI: 35–51) were females. The cause of death was reported as a categorical variable (categories included sickness, violence/conflict, and other) because verbal autopsies were thought to be too complex in the context of linguistic and cultural barriers. Sickness was the most common cause of mortality, with 87% of deaths (95% CI: 76–100) being attributed to illness. The actual proportion of deaths due to illness may be greater than estimated because many Beja consider death to be a divine intervention; thus, the death of a sick individual may be interpreted as a result of "the will of God" and not due to illness or disease. This is a likely explanation for the relatively high proportion of deaths (12%; 95% CI: 8–17) that were attributed to other causes. Only 1% (95% CI: 0–4) of the deaths were attributed to conflict or violence. Based on conversations with Beja community leaders and SPIR staff, it appears that violent deaths most likely are a result of the Beja fighting amongst themselves and not due to conflict with the Government of Sudan.

*Study Population and Methods*
The survey focused on sedentary Beja communities in the NDA-controlled territories, including the principal population center of Hamesh Koreb and villages to the south. The survey encompassed the 26 known Beja settlements in the region and did not attempt to include nomadic Beja populations that may transit through or inhabit the region for only a portion of the year. A population estimate was developed from the most reliable source (SPIR counts of women and/or structures), and a well-documented methodology for obtaining the estimate. The survey team attempted to validate SPIR estimates by counting all women present at the time of the survey. This number was used as a proxy for the number of households in the village and multiplied by average household size (from the survey data) to obtain a final population estimate.

## Discussion
*Study Population and Methods*
In hindsight, the survey provided valuable lessons in conducting assessments and field research under difficult conditions, and provided valuable information on the status of the Beja in the NDA-controlled territories.

The total Beja population in this region was estimated between 20,000 and 30,000 which is substantially less than obtained from other previous estimates. The population (nomadic and sedentary) was estimated to be between 42,000 and 102,000 by the IRC in 2001; however, these findings were based only on key informant reports.[8] Samaritan's Purse International Relief estimated a similar

population, but indicated that estimates were based on Beja authority and IRC reports, as well as ration card lists; which are subject to over-reporting. The SPIR staff indicated that these estimates were not consistent with field observations, where households had multiple ration cards and Beja authorities had a tendency to misrepresent population size as a means of increasing political influence and the amount of humanitarian assistance provided.

The validation methods for the population counts had two primary limitations: (1) it is likely that not all women representing households were present at central sites; thus there is a serious risk of underestimating the number of households in a community; and (2) counting the number of women/households was not feasible in the larger communities of Hamesh Koreb and Telkook. Consequently, population estimates in the two population centers were not validated by the survey team.

The population counts are not representative of the entire population. The estimated number of sedentary Beja does not account for nomadic groups, and is likely to under-estimate the population due the methods employed. This is a limitation, because the nomadic Beja also are affected by conflict and are in need of humanitarian assistance. Key informants indicated that small groups of households often lived outside of the recognized villages; however, no such groups were encountered while the survey was being conducted and the SPIR staff working in the region indicated that encounters with nomadic Beja were rare. Considering the restrictive context of the study, the methods used provided a more reliable estimate of population size, even though the estimate is known to be conservative. Application of conservative population estimates in the humanitarian context could be detrimental to the work of NGOs and the beneficiary populations they serve when resource requests are based on these estimates. When feasible, other validated population estimation methods such as area sampling, quadrants, and $T$-square would produce more reliable estimates of population size and should be used.

*Demographic Findings*
The primary methodological limitations are related to the cultural context. Due to the cultural norms, which only allow limited activities and mobility of women, within-cluster sampling was modified to make survey methodology culturally appropriate. As a result of the adjusted within-cluster sampling methodology used, it is possible that some groups, particularly older women living on their own and women whom community leaders may have sought to exclude, could have been systematically overlooked. Households with no women, either due to death or in the case of males who do not reside with extended families, also are likely to have been under-represented as a result of survivor and/or sampling biases. Beja men are permitted to have multiple wives and to remarry. In addition, households often incorporate extended family; thus, it is unlikely that there were a number of households excluded because they did not have an adult female.

The Beja population pyramid approximates that of a population with high birth and mortality rates. The

absence of males in the 20–29 year and 30–39 year age groups was apparent. This most likely was due to the fact that the definition of a household member may have excluded males who reside outside of the household for extended periods of time. It is probable that the missing male population is a result of herding, trading, or other income-generating activities outside of Beja villages, and thus, is not accounted in the survey. The observed net out-migration is not unexpected for the Beja, as economic hardship and food insecurity likely are motivating factors for emigration. Cash labor is cited as an important feature of the Beja economy, and Port Sudan is known to have a large number of Beja labor migrants.[10] These findings suggest that the Beja population may not be largely nomadic, but that males may be highly migratory.

An uncommon feature of the sample population pyramid is that the proportion of older males is greater than that of older females, which is inconsistent with usual pyramids. This finding is likely an artifact of operational constraints and/or misreporting. Female deaths are more likely to be under-reported than male deaths because of survivor bias. If a male dies, the death would be reported by the surviving female household member; if a female dies and there was no surviving female household member, the death would not be reported because all survey respondents were women. Potential explanations for higher reporting of older males include: (1) unwillingness to come to a central location to be interviewed (older women, particularly those living alone, may have been systematically missed in within cluster sampling, while older men, who are more likely to remarry, would have been included in the survey because of their attachment to households with younger women); (2) male preference, where males outlive females due to cultural dominance, resulting in an advantage; (3) a historically high maternal mortality rate due to poverty, under-development, and a lack of access to health care; and (4) female respondents may have been motivated to over-report the number of males in the household as a means of obtaining additional rations because food ration cards are provided only to male household members. Estimating age was extremely difficult due to the low educational status of respondents, unfamiliarity with the Western calendar, and lack of birth certificates. However, it is anticipated that age misreporting would affect both males and females, and it remains unclear if tendencies to over- or under-report age affected groups differentially introduced bias into survey findings.

Demographic findings from the Beja survey were relatively consistent with national and regional statistics. The crude birth rate among the Beja of 35/1,000/year is similar to those reported for Sudan and sub-Saharan Africa,

which, in 2002, were 33/1,000 and 39/1,000, respectively.[6] The national CMR for Sudan was 12/1,000 in 2003 and significantly less than the rate of 53/1,000/year found among the Beja.[13] However, the Beja CMR by the study (1.4/10,000/day) is similar to other conflict-affected populations in Sudan, such as those in Darfur (Darfur CMRs in late 2004 were 2.0 (CI: 1.3–2.7) in Kalma; 2.3 (CI: 1.2–3.4) in Muhajiria; and 3.2 (CI: 2.2–4.1) in Kass).[12] The estimated Beja death rate exceeds the 1/10,000/day rate, which designates a humanitarian emergency. Conflict-affected and internally displaced populations often are at risk for excess mortality. In addition to hardships resulting from prolonged conflict, the Beja have virtually no access to health care and the region suffers from intermittent drought, declines in food availability, and inflation of staple food prices.[2] Global acute malnutrition rates among children 6–59 months of age were estimated at 27% in October, 2004, suggesting that poor nutritional status may be associated with the elevated death rate.[14] The Beja U5MR, estimated at 403/1,000/year, is much higher the national rate for Sudan which was reported at 109/1,000/year in 2002.[13] Because age was reported in only 64% of deaths, age-specific mortality rates and the U5MRs should be interpreted with caution.

## Conclusions
Providers of humanitarian assistance must know key demographic characteristics (size, mortality rate, cause of death, etc.) in a beneficiary population in order to prioritize humanitarian interventions. Findings from the present study indicate that assessments of demographics and population status can be successfully nested in surveys that are conducted routinely by NGOs and that they are feasible in challenging contexts such as conflict-affected areas. Findings of the present survey indicate that mortality rates among the Beja exceed the threshold for humanitarian emergencies, and that the Beja indeed are facing a humanitarian crisis. This is a further reminder that many conflict-affected populations, particularly those that are smaller and less accessible, do not receive adequate humanitarian assistance. In spite of relief activities, the Beja remain in need of increased assistance and remain largely overlooked by the international community.

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