Household based survey of retrospective mortality rates, prevalence of malnutrition, vaccination coverage and basic needs

Yida Refugee Camp

Unity State, South Sudan

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List of abbreviations

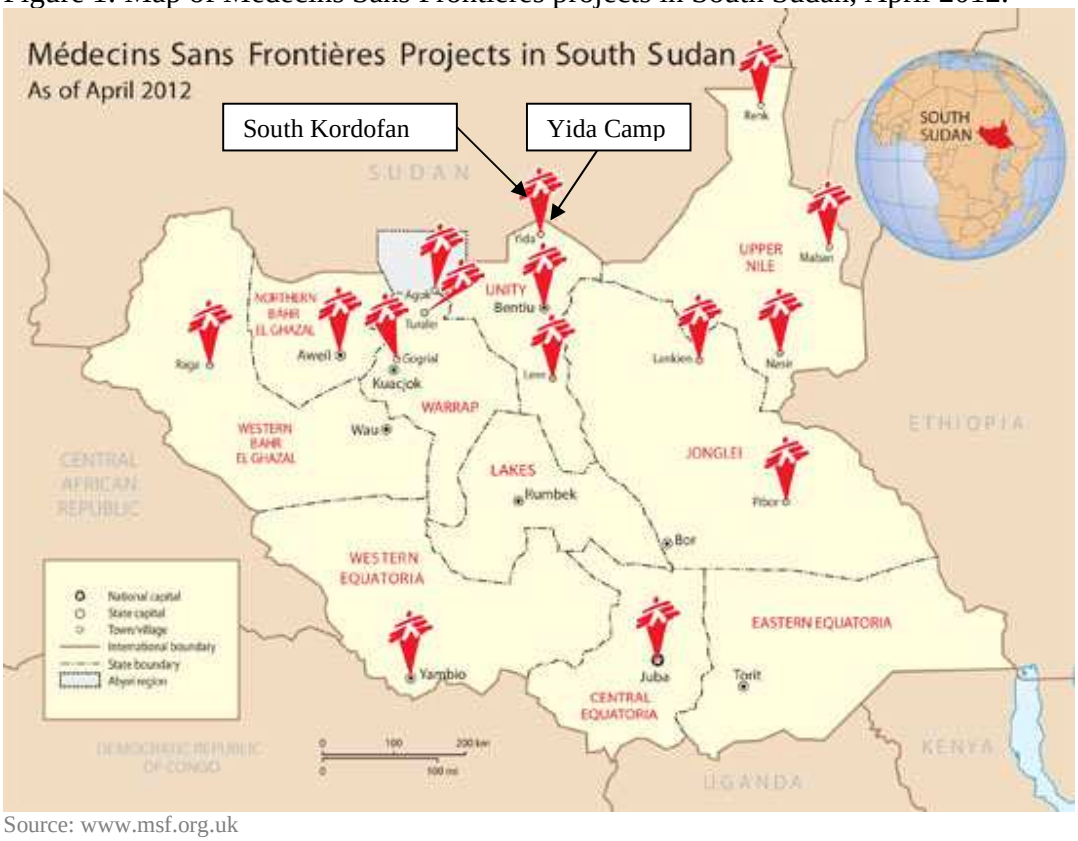
CHW	Community Health Worker
CI	Confidence Interval
GAM	Global Acute Malutrition
IPD	Inpatient Department
MSF	Médecins Sans Frontières
MUAC	Mid Upper Arm Circumference
NGO	Non Governmental Organization
OPD	Out Patient Department
OR	Odds Ration
SAM	Severe Acute Malnutrition
SPLM	Sudan People's Liberation Movement
UNHCR	United Nations High Commission for Refugees

Background

Following 22 years of civil war, South Sudan seceded from Sudan in July of 2011. Despite the secession, fighting continues in some areas along the new border. South Kordafan is a region of the Sudan, but much of its population, especially those living in the Nuba mountains, took the side of the South and the Sudanese People Liberation Movement (SPLM) during the war. There has been ongoing violence between SPLM-North and troops from Khartoum since the South Sudan's independence. Thus despite the Comprehensive Peace Agreement signed in 2005 and secession of the South in 2011, people of the Nuba mountains are crossing the border to seek refuge in South Sudan.

Although Yida Camp has been home to refugees from Sudan since South Sudan's independence, the displaced population arriving in Yida has dramatically grown in recent weeks: from 17,000 population confirmed by census in mid-February to current UNHCR estimates of 60,000. The timing of the influx links to the re-opening of a transport corridor in March 2012, deteriorating conditions in the Nuba Mountains and a food shortage resulting from inability to plant and harvest due to increased violence.

Figure 1: Map of Médecins Sans Frontières projects in South Sudan, April 2012.



Source: www.msf.org.uk

Yida is normally inhabited by a Dinka population of about 700 people. The refugee population has largely grouped into 'bomas' reflecting the organization in the Nuba

Mountains. Respective boma leaders form part of the refugee council, precided over by a council leader, which has coordinators for specific areas such as health and education. Since the formation of the camp and clearing of a crude airstrip, non governmental organizations (NGO) have been supporting the growing number of refugees. The Operational Centre of Médecins Sans Frontières based in Paris (MSF-OCP) provides outpatient (OPD) and inpatient (IPD) services including nutritional support, in the camp.

There is no surface water source nearby Yida, and with only 5 of 7 water pumps operational in this camp of 9,000 square kilometres and 60,000 people, water supply is not meeting even minimum emergency standards.[1] There are few private latrines and defecation in the open is common. Soap and jerry cans have been minimally distributed.

Based on MSF OPD and IPD statistics, severe diarrheal disease is a common problem. With hospital deaths in June and early July ranging between 2-5 per day, there was growing concern that, even if MSF was seeing most camp deaths, mortality rates, particularly among children under 5 years of age, were close to emergency thresholds.

Despite the presence of several humanitarian actors, at the time of this survey, the camp had not been mapped nor was mortality officially monitored.

In response to increasing concern about the mortality in the camp, MSF requested Epicentre to conduct a baseline survey in the camp.

Objectives

Gobal objectives

To monitor the severity of the situation in the camp by retrospectively assessing mortality in the camp and prospectively monitor mortality by grave counting in parallel with direct recording of new deaths.

Specific Objectives

- To prospectively describe weekly CMR and U5MR/10000/day
- To describe retrospective mortality stratified by time period spent in Nuba Mountains, on the way and in the camp during the first round of the surveillance system
- To describe measles vaccine coverage in children 9 month to 15 years (with card and according to the caretaker)
- To describe the prevalence of malnutrition by MUAC in children 6 months to 5 years

[1] Verbal communication with MSF-OCP watsan and Sphere Handbook (2011) minimum standards in water supply sanitation and higyiene: 7.5-15 liters per person per day.

Methods

Prior to the survey, population estimates per boma were obtained from the Refugee Council and these compared to UNCHR level-1 registrations, of around 53,000 people.

A community based survey was conducted covering all areas of Yida camp and the resident Dinka population, between 7 and 12 July 2012. Cluster sampling was used for the refugee population, while all households in the resident population were included in the survey.

The Eastern side of the camp, which hosts approximately 40% of the camp population, was divided into a grid of 18 clusters and sampled using a sampling interval of 10. The rest of the camp was divided into 24 clusters using roads and other recognized boma limits. On average 15 households were sampled per cluster or boma. Boma information was collected at household level for appropriate re-classification and weighting in the analysis.

The survey consisted of household level questions regarding: household composition, registration, problems encountered during migration, date since arrival and since food distribution, possession of basic needs, time for water collection, use or not of latrines, illness in the previous two weeks (including symptoms) and if healthcare was sought, and presence of pregnant or lactating women and disabled persons in the household. Additional questions collected individual level information regarding: mortality, arrival, departure and births, as well as nutrition status (presence of oedema and recording of mid upper arm circumference, MUAC) of children under 5 years (65-110cm in height), measles vaccination for children 6 months to 15 years.

A sample size of 3,267 from 545 households was determined to be needed to detect a crude mortality rate of 1.5 per 10,000 per day with precision of +/- 0.4, assuming a design effect of 1.5, average household size of 6 persons, and 180 days recall.

Nineteen community health workers (CHWs) were recruited and trained for five days. The training included survey techniques and the specific instrument to be utilized. Each team of two CHWs (and one of three) was assigned geographic areas occupied by specific bomas.

Data were entered into an Epidata (EpiData, Odense, Denmark) database and analyzed using Stata V.10.1-SE (Stata Corp, College Station, TX, USA). Analysis is adjusted for probability of selection based on declared boma for the household. Stratified estimates specific to the Eastern area take the sampling method into account in calculation of standard error. As the host population exhaustively included in the survey, this stratum does not include confidence intervals. For crude and under five mortality rates (all and under five deaths respectively), by place and time of death constitute the numerator. The denominator is calculated in terms of person-days, corresponding to presence within the household for the respective period (half the period is assumed for those absent or not born at the start or absent at the end; one quarter for those absent at both but present in between; dates of death allowed for exact person day calculation for those who died,

though the 15th of the respective month was assigned when month but not day could be specified.)

Additionally CHWs were trained to run discussion groups for collecting qualitative information from varied groups of people, on three subjects: main problems and challenges faced by the community, perceptions of healthcare facilities and utilization, and burial practices.

Surveillance

All Boma Leaders (45 at the time of the survey) will be equipped with a register and burial cloths. They will register all deaths, births and new arrivals in their boma weekly . The CHWs will be assigned to one or two bomas depending on the size of the boma and will insure that all new arrivals, departures, deaths and births from their assigned population are registered with the Boma Leader. Two surveillance supervisors will collect the aggregated numbers of arrivals, departures, deaths and births from all the boma leader weekly and will organize weekly feedback meetings with the Boma Leaders to present the trends and discuss problems in the camp.

Two burial assistants will be hired, one at each burial site. They will help families with identification of location of the graves and tools to dig graves. They will keep a tally sheet of the numbers of people <5 years and 5 years and over who were buried in each of the sites. The surveillance supervisor will visit them on a weekly basis (or the report will be given to the supervisor once a week). See surveillance guideline Appendix 3 for details.

Results

Information was collected on 4,685 individuals in 678 households. The mean adjusted household size was 6.45 (95%CI: 6.06-6.84), ranging from single dwellers up to 25 individuals per household. For refugees the mean was 6.48 (6.08-6.88) and for the host community 6.81.

Demographics

The adjusted proportion of children under 5 years was 22.2% Adjusted age and sex breakdown for host and refugee population are provided in Table 1.

Table 1. Host and refugee population by age and sex, Yida camp, South Sudan, July 2012.

	Refugees					
Age group	%	(95% CI)		% male	(95% CI)	
0-4y	22.1	16.8 -	27.4	50.6	40.1 -	61.0
5-15y	31.7	26.9 -	36.4	52.9	42.7 -	63.2
>15y	46.2	41.4 -	51.0	40.6	34.4 -	46.9
	Host population					
0-4y	16.2			70.6		
5-15y	31.4			60.6		
>15y	52.4			52.7		

64.7% (56.4-72.9) of refugee households and 57.7% of host households had at least one pregnant or lactating woman.

There was at least one disabled household member in 13.7% (9.9-17.4) of refugee and 21.2% host households.

Migration, registration and food distribution

More than half (56%) of the camp's households arrived after the New Year, and more than a quarter (27%) since May (Table 2).

Table 2. Proportion f refugees by month of arrival, Yida camp, South Sudan, June2011-July 2012

Arrival date	Percent	95% CI
before 2012	43.8	31.8 - 55.8
Jan-12	3.1	1.4 - 4.9
Feb-12	7.6	3.9 - 11.2
Mar-12	4.9	2.6 - 7.1
Apr-12	13.4	8.2 - 18.7
May-12	15.3	9.0 - 21.7
Jun-12	9.9	5.5 - 14.4
1-12 Jul 2012	2.0	0.7 - 3.2

The main reason for migration were the conflict, 68.6% (62.7-74.5), or the resulting food scarcity, 29.6% (22.8-36.5). The average length of journey from the Nuba mountains to Yida was 4.8 days (3.4-6.0) and ranged from 1 to 60 days. 76.4% (69.5-83.2) of households faced problems during migration: the most common were lack of food 48.1% (36.5-59.7), lack of transport 35.4% (25.8-44.9), and lack of water 32.8% (22.7-43.0).

95.3% (92.4-98.4) of refugee households were fully registered with UNHCR; 2.3% (0.8-3.7) of households had only some members registered and 2.4% (0.1-4.7%) were unregistered.

97.2% (95.2-99.3) of households had received food distribution, with the latest having been received on average 23 (22-24) days prior to the survey date.

Water and sanitation

84.8% of host community and 48.5% (39.2-57.8) of refugees responded that they defecate in the open. The vast majority of refugees 90.3% (85.2-95.5) stated that not having access to a latrine (their own or another) was the main reason for open defecation., 96.6% of the host community gave the same reason for open defecation.

42.6% (31.6-54.0) of refugees and 39.1% of host households reported that water collection takes more than one hour; and 52.7% (44.8-60.6) of refugee households needed to collect water more than twice a day; for host community this proportion was 45.7%.

Non-food items

Less than 15% of refugee households reported having enough of most non-food items (water containers, soap, plastic sheeting, mosquito nets). The remaining households stated they had either none or insufficient NFIs, and that accessing wood for cooking was problematic (Table 3).

Table 3. Possession of non-food-items by refugee and host community, Yida camp, South Sudan, July 2012

	Refugee				Host
	Percent	95% CI			Percent
Jerry cans					
no	47.4%	39.7%	-	55.1%	44.8%
yes	7.9%	4.9%	-	10.9%	7.6%
some	44.7%	37.0%	-	52.3%	47.6%
Soap					
no	71.3%	62.3%	-	80.3%	94.3%
yes	2.8%	0.9%	-	4.8%	1.0%
some	25.9%	17.3%	-	34.5%	4.8%
Plastic sheeting					
no	50.1%	40.9%	-	59.2%	86.7%
yes	13.7%	7.9%	-	19.4%	1.0%
some	36.3%	28.0%	-	44.5%	12.4%
Blanket					
no	66.5%	58.3%		74.7%	94.3%
yes	10.7%	6.0%	-	15.3%	1.9%
some	22.8%	16.5%	-	29.2%	3.8%
Mosquito net					
no	73.2%	66.5%	-	79.8%	97.1%
yes	8.4%	4.0%	-	12.8%	2.9%
some	18.5%	12.6%	-	24.3%	0.0%
Pots/utensils					
no	58.3%	49.3%	-	67.2%	44.8%
yes	6.0%	3.0%	-	9.0%	11.4%
some	35.7%	27.7%		43.7%	43.8%
wood/fuel					
no	3.4%	1.6%		5.3%	3.8%
yes	22.6%	13.2%		32.0%	7.6%
some	74.0%	64.7%		83.3%	88.6%

Illness

82.2% (76.5-88.0) of refugee households and 69.5% of host households had at least one member ill in the two weeks prior to the survey. Among refugee households 43.9% (35.0-50.8) had 1 person ill, 33.3% (28.2-38.4) had two and 14.8% (9.6-20.1) had three. Among host households 62.2% had one ill, 24.3% had two, and 13.5% had three or more ill.

Among those ill, the most common conditions were diarrhoea 62.9% (56.0-70.0), respiratory illness 36.5 (31.4-41.6) and fever 22.2% (12.2-32.2) – often concomitant. These three were also the most common among those ill in the host community (56.9%, 30.6% and 31.9%, respectively).

Mortality

There were 50 recorded deaths since January 2012 among the 678 surveyed households: 12 (24%) in the first three months, 11 (22%) between April and May, and 27 (54%) between June and 9 July. 43 (83%) of the total occurred in the camp; 19 (38%) were among children younger than 5 years; 8 (16%) among children younger than 12 months, 17 (34%) among children 5-15 years, and 14 (28%) among those older than 15 years of age. 8 (16%) of deaths were among the host population and 29 (58%) among refugees living in the Eastern part of the camp. Proportions adjusted for sampling strategy are presented in the table below.

Table 4. Deaths by month, location, age-group and area, Yida camp, South Sudan, January-July 2012.

Adjusted mortality	Adj %	95% CI			DE
Month of 2012					
January	2.34	0	-	7.56	1.30
February	9.01	0	-	18.75	1.26
March	20.59	4.19	-	37.00	1.79
April	5.32	0	-	13.24	1.36
May	10.33	0	-	24.35	2.32
June	25.71	9.82	-	41.60	1.44
1-9 July	26.70	9.03	-	44.37	1.74
Location					
not camp	11.81	0	-	26.55	2.28
in camp	88.19	73.45	-	100	2.28
Age group					
0-12m	18.14	1.20	-	35.08	2.11
0-4y	38.56	6.92	-	70.20	4.61
5-14y	40.82	10.21	-	71.42	4.23
>15y	20.63	2.43	-	38.82	2.21
Area					
Central/West	45.62	10.67	-	80.57	5.37
East	53.37	18.60	-	88.14	5.30
Host	1.02	0	-	3.28	0.56

The most common cause of death as reported by the heads of households was diarrhoea, which was reported in more than half of all deaths (Table 5).

Table 5. Cause of death by age group, Yida camp, South Sudan, January-July, 2009

Cause of death	Adj.%	95% CI			DE
Younger than 5 years					
diarrhoea	54.75	36.29	-	84.52	0.85
respiratory	1.62	0.18	-	45.70	0.46
fever	37.56	19.79	-	112.10	1.12
childbirth	6.08	0.60	-	191.80	1.92
5 years and older					
diarrhoea	51.06	31.08	-	149.00	1.49
respiratory	1.22	0.19	-	35.97	0.36
malaria	7.94	2.06	-	123.70	1.24
fever	17.61	2.94	-	469.60	4.70
measles	3.81	0.44	-	148.90	1.49
malnutrition	9.07	2.26	-	149.20	1.49
accident	8.90	1.94	-	175.60	1.76
violence	0.17	0.02	-	7.15	0.07
unknown	0.21	0.03	-	7.78	0.08

Crude and Under 5 mortality rates are shown below.

Table 6A. Retrospective crude and under five mortality rates per 10,000 population per day with 95%CI, Yida Camp, South Sudan, July 2012.

Population	6 month		3 month		5 week	
	CMR	U5MR	CMR	U5MR	CMR	U5MR
Overall	.73 (.35-1.12)	1.19 (0-2.44)	.97 (.47-1.48)	1.68 (.35-3.01)	1.95 (.82-3.09)	3.98 (.55-7.39)
Refugee	.74 (.35-1.14)	1.22 (0-2.49)	.99 (.48-1.50)	1.70 (.34-3.06)	2.00 (.84-3.15)	4.04 (.53-7.54)
East	.66 (.42-.91)	1.24 (.56-1.92)	.98 (.57-1.39)	2.04 (.84-3.24)	1.89 (.99-2.80)	4.54 (1.72-7.37)
Host	.60	1.16	1.00	2.23	1.08	3.65

Crude and Under 5 mortality rate for deaths in the camp are provided below.

Table 6B. In camp retrospective crude and under five mortality rates per 10,000 population per day with 95%CI, Yida Camp, South Sudan, July 2012.

Population	6 month		3 month		5 week	
	CMR	U5MR	CMR	U5MR	CMR	U5MR
Overall	.95 (.36-1.54)	.58	.91 (.40-1.43)	1.78 (.38-3.18)	.82 (.68-2.97)	4.13 (.58-7.69)
Refugee	.96 (.36-1.56)	1.84 (0-3.81)	.93 (.40-1.45)	1.81 (.37-3.24)	.86 (.69-3.03)	4.20 (.57-7.85)
East only	1.04 (.64-1.44)	.08 (.90-3.26)	.95 (.53-1.37)	2.16 (.88-3.43)	1.89 (.96-2.82)	4.91 (1.86-7.97)
Host	.58	1.35	.85	2.19	1.08	3.64

Nutrition

Of 1079 children measured (65cm-110cm indicative of 6 months to 4 years of age), 107 had GAM (MUAC < 125 mm) and 39 had SAM (MUAC < 115 and/or oedema). Of the 39 children with SAM, 20 Population estimates adjusted for sampling strategy are presented below.

Table 7. Malnutrition status by camp population; Yida camp, South Sudan, July 2012

	Overall		Refugees		East		Host
	Percent	(95%CI)	Percent	(95%CI)	Percent	(95%CI)	Percent
GAM	11.55	(9.07-14.60)	11.59	(9.09-14.67)	10.3	(7.94-12.66)	6.92
SAM	4.27	(2.85-6.36)	4.29	(2.86-6.40)	3.9	(2.40-5.40)	2.31
Oedema	2.65	(1.50-4.63)	2.67	(1.51-4.67)	2.18	(1.05-3.31)	0

* Design effect Overall GAM 2.0, SAM 1.9, Oedema 2.3; Refugees GAM 2.0, SAM 1.9, Oedema 2.3

Arrival period (last month vs. earlier), or being settled in the East (e.g. from Angula speaking bomas) did not significantly predict malnutrition among under 5 year olds (<110 cm on height stick).

The survey did not identify any children absent due to hospitalization, but did find about half the malnourished cases to be receiving nutritional support (Table 8).

Table 8. Number and proportion of children with GAM, SAM and oedema receiving nutritional support, Yida camp, South Sudan, July 2012

Nutritional Status	n	total	Adj.%	(95%CI)	DE
GAM	49	107	44.6	(29.7-60.5)	3.14
SAM	21	39	52.6	(29.9-74.3)	2.62
Oedema	8	20	36.8	(13.4-68.7)	2.86

Measles vaccination coverage

Vaccination status was assessed for 2,394 children age 6 months to 15 years living in 602 households. Vaccination coverage estimates adjusted for sampling strategy are shown below:

Coverage for the June vaccination campaign was 78.7% (72.2-85.2) by card (DE=14.4), and 82.6 (76.9-88.2) by either card or verbal confirmation (DE=12.8).

Considering vaccination at registration or previous campaigns, the proportion of children receiving at least a single dose of measles vaccine was 90.9% (87.0-94.9) (DE = 11.15) and of at least two doses 40% (27.7-52.3) (DE=36.6) – both reported verbally.

Discussion groups.

Nine discussion groups were held on each of the following topics

Topic 1: Main problems faced in the camp

Invariably, the principal challenge stated in participants was how long it takes to get water (distance and time spent waiting). The second biggest challenge was lack of plastic sheeting for the rainy season, followed by illness in the camp. Additional top issues mentioned were lack of blankets, insufficient food variety and grinding mills, water containers and hygiene (lack of latrines, soap, and water in sufficient quantity for washing). One group of women 45 years and older also mentioned security related to fetching wood.

Topic 2: Healthcare services perception and utilization

Several groups brought up their strong belief in traditional medicine and expressed mistrust of medicine provided by healthcare facilities; belief that only one type of pill is available and distributed for all ailments was expressed, and questioned why injections and syrups are not used. Two groups brought up availability of medicines from pharmacists and that these are more effective than what is provided at healthcare facilities. Two groups mentioned long wait for services and favouritism in the line as problems with healthcare facilities. One brought up lack of any transport to bring the sick

to the facilities. Two groups brought up ignorance by doctors or lack of qualified healthcare personnel. One group in the Angula speaking community stated that there are more deaths in the camp than there were in the mountains.

Additionally discussion leaders posed the question of when an ailing household member would be brought to healthcare facilities. Answers included, when a child is not talking or eating or when he is shaking; others brought up diarrhoea, weakness, eye infection, fever injuries and coughing. One group brought up that most diseases including malaria and diarrhoea have effective herbal treatments and would only bring very serious cases.

Topic 3: Burial practices

Several groups brought up the practice of burying the young separate from adults, and some mentioned that this was not possible in Yida and that they were buried together. One group mentioned that small children are buried next to the house. Besides the cemetery on the South East end of the camp, one by the air strip was also mentioned. Most groups stated that deaths are not reported to Boma leaders but that they often come when they hear the crying or see the crowding, then help organize the burial. Lack of anything to bury the dead in, transport and perfume for the body was brought up in two groups.

Discussion

Yida camp is facing additional strain due to an influx of 40,000 people since the beginning of 2012. Although the peak of arrivals occurred in April and May 2012, refugees continue to arrive. Although the number of arrivals is expected to decrease with the upcoming rainy season, our results show that living conditions to be below standard for both for the refugees and the minority resident populations.

Water, hygiene and sanitation are major concerns in the camp. Open defecation is widely practiced due insufficient latrines and water supply is insufficient in quantity and access. In addition only half of the population reports owning a jerry can. The lack of jerry can will further aggravate storage of, and therefore access to, clean drinking water for the other half of the population. One third of families report that it takes them more than 1 hour to collect water, many having to make more than one journey per day to collect water. This limits access to quality water and may increase the probability that any standing water created during the rainy season will be collected and used as household water. This would be a major risk for diarrhoeal disease when open defecation is a common practice.

The lack of stored water and the lack of soap (less than one third of household report having soap) combined with open defecation suggests that hand washing with soap after defecation is uncommon. This again greatly increases the risk of diarrhoeal disease in the camp.

Most families are also lacking other major NFIs. 50% of families report not having plastic sheeting, which with the rains starting means they will have inadequate shelter. The majority of households also report not having cooking pots although access to a neighbour's cooking pots was not measured. Two thirds of families report not owning a blanket and more than 70% of families report not owning a mosquito net. With the rainy season beginning, it is likely that there will be standing water in the camp and its environs which may increase the risk of malaria.

Mortality rates are high and apparently increasing. The 6 month retrospective figures, which this study was designed to estimate, are below emergency threshold values. But crude and under 5 estimates of mortality since April and since June 1, are respectively higher and suggest an acute crisis; while confidence intervals are consequently larger for this shorter recall period, point estimates concur with hospital surveillance figures to indicate a deteriorating situation in terms of mortality, particularly among those under 5 years of age. The above description of the water, hygiene and sanitation situation along with the lack of NFIs would also support a deteriorating situation. Fully half the deaths reported in the both adults and children are reported to be due to diarrhoea.

The prevalence of global and severe acute malnutrition were borderline to alert thresholds at over 11% and 4% respectively, with lower confidence bounds for GAM at 9% and SAM at 3%. Although therapeutic feeding programmes have been established in Yida

camp, only half of the children identified with GAM, were reported not to be in a feeding programme. The situation is the same for children identified to be suffering from SAM. The children with SAM are at high risk of death and increasing provision of therapeutic feeding programmes is essential.

Coverage for the measles vaccination campaign fell short of the aim of 95%, but this may be in part due to recent arrivals and those who had been recently been vaccinated at registration not being revaccinated during the campaign. When combining any source of measles vaccination, the verbal recall was 91%. Considering that efficacy of the vaccine in field situations is about 85%, renewed efforts should be made to vaccinate newcomers and children attending health structures.

The discussion groups confirmed that the perceived perception by the population of the problems in the camp are those presented in our results: access to water, lack of plastic sheeting, water containers, blankets and soap. The security of women when fetching wood was also mentioned in the discussion group. While they did not bring up a lack of cooking pots, they did bring up problems in accessing grinding mills.

The strong belief in traditional medicine by the community will not be changed in the short term. However, the discussions revealed that waiting time at the health structures and perceived favouritism in the waiting lines discourage use of the existing health structures.

The information provided in the discussion groups regarding burial practices, including the lack of burial cloths should be used to improve mortality surveillance in the camp.

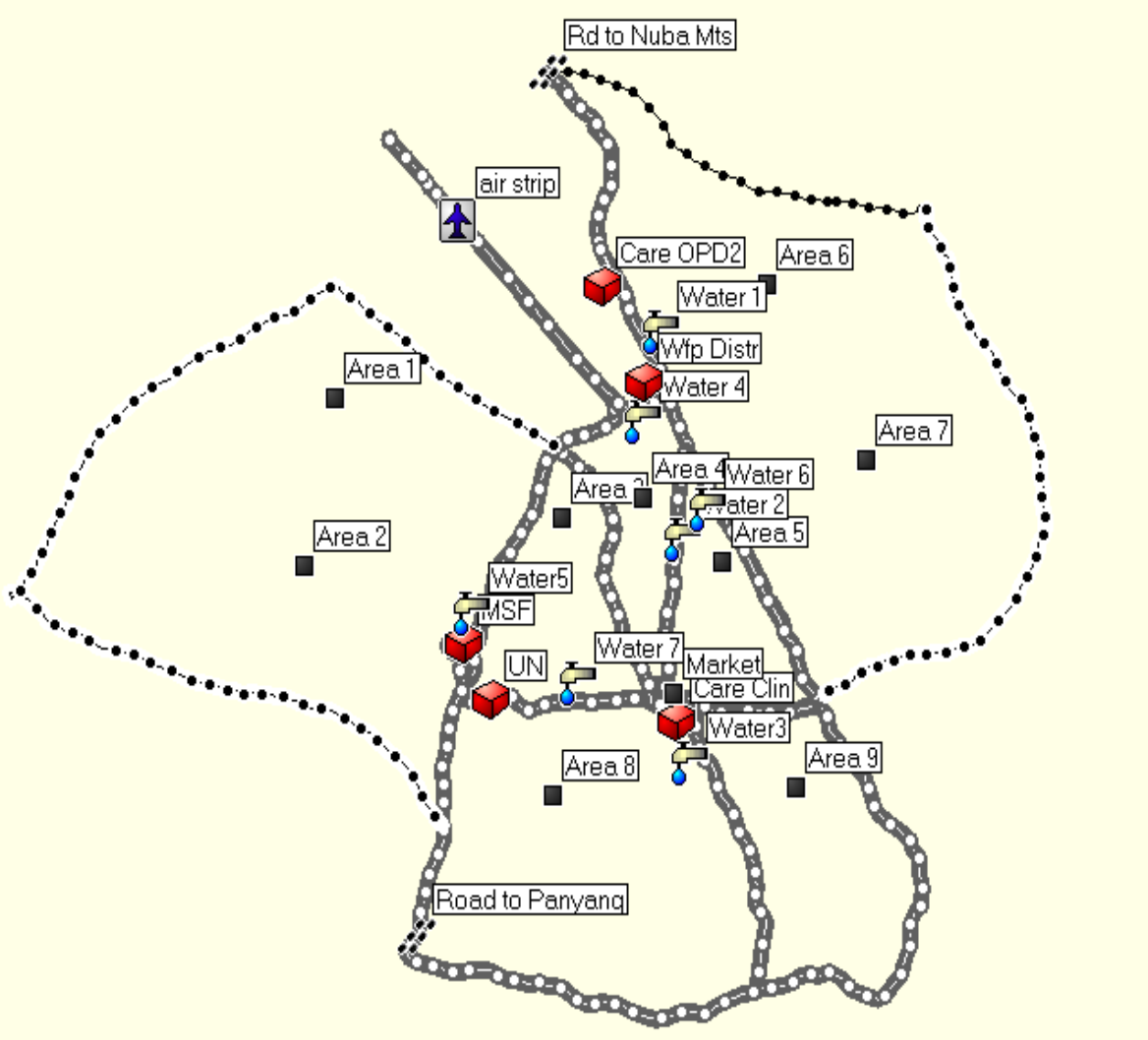
Given the elevated prevalence of malnutrition and diarrhoeal illness and the increasing mortality rate, continued efforts to improve the water and sanitation of the camp are a priority, including additional boreholes, latrines and slabs and soap distribution. As the rainy season is upon the camp distributing mosquito nets is also a priority.

Recommendations

The following activities should be considered priority activities for both the refugee and residents of Yida:

- Improve access to water
- Distribute jerry cans or other water storage containers
- Increase latrine construction either directly or by increasing access to tools and materials to build latrines
- Organise soap distribution
- Organise a distribution of non-food items including blankets and cooking pots and mosquito nets and plastic sheeting
- Reinforce mortality surveillance using CHWs and Boma Leaders
- Improve coverage of therapeutic feeding programmes
- Reinforce measles vaccination at registration and at health structures
- Investige the functioning of the health centres with focus on waiting times and favouritism in waiting lines

Appendix 1 – Map of Yida camp with proposed surveillance areas, South Sudan, July 2012



Appendix 2 – Survey instrument, Yida South Sudan, July 2012-07-26

Verbal Informed Consent
YIDA 2012

Good morning/afternoon. I am _____ and work as a community health worker for MSF.

MSF, is an international medical aid organization which is providing free medical services in Yida.

We have come to the community with permission from Boma leaders to conduct a survey on the health and other basic needs of the community. Your home has been selected at random along with many others to provide the information needed to improve services in the community.

The aim of this survey is to know about the health of adults and children including nutrition and vaccination status as well as deaths in the family in the last 6 months.

Anything you tell us will remain confidential (secret) and we will **not** ask you your name. You do not need to answer any question you are not comfortable with.

While there is no direct benefit to you for participating in this survey, the information you provide will help to better understand the health and needs of the community.

Do you agree to answer a few questions? This should last about 15 minutes.

Thank you.

Household questionnaire – Yida, July 2012

Date: _____ Team #: _____ Cluster_____ Household #: _____ Consent: _____

How many people currently live in this household?..... _____

What is the BOMA of this household? (see Codebook for Boma)……_____

When did this household arrive in Yida? (month/year) ……. __ __ __ __/__ __ __ __ (00 if host)

How long was the migration from their home to Yida?..... _____ days (00 if host)

What was the main reason for leaving?:…… 1. Conflict 2. drought 3. Food 4. Other (00 if host)

Has household been registered by UNHCR?..... 0. No 1. Yes 2. some household members only

Has household received food distribution since arriving?..... 0. No 1. Yes

If yes, when did they last received a food distribution?..... _____days ago

Where do household members defecate?..... 1. Latrines 2. Open defecation

If open, why do they not use latrines? (see Codebook)……. _____

How long does it take to collect water?.....1. less than 30 mins 2. 30 mins to 1 hr 3. more than 1hr

How often must you collect water?..... 1. Once per day 2. two times 3.More than two times

Does household have closed water container?..... 0. No 1. Yes 2. yes but not enough

Does household have soap for hand washing?..... 0. No 1. Yes 2. yes but not enough/sometimes

Does household have tents/plastic sheeting?..... 0. No 1. Yes 2. yes but not enough

Does household have blankets?..... 0. No 1. Yes 2. yes but not enough

Does the household have mosquito nets? ……..0. No 1. Yes 2. yes but not enough

Does household have cooking pots/utensils?.....0. No 1. Yes 2. yes but not enough

Does household have cooking fuel/wood?..... 0. No 1. Yes 2. yes but (problem: too far, etc)

During migration, did your household face any problems? ..... 0. No 1. Yes

If yes, what problems (see Codebook - put all that apply)…….. _____

Was anyone in household ill during last 2 weeks?..... 0. No 1. Yes (how many?)_____

S1. If yes, what were the symptoms? (see Codebook – put all that apply)......_____

S2. If yes, was the most recently ill treated at a health facility?..... 0. No 1. Yes

If no, why not? (see Codebook)…….. _____

Number of pregnant or lactating women in household?……_____

Is there anybody with a disability in the household ……0. No 1.Yes (if yes how many_____)

Individual questionnaire – Yida, July 2012

Date: ___ /7 /2012 Team #: _____ Cluster #_____ Household #: _____

ID number	Sex	Age (years)	Status today	Status at start of period	*Died* since January?	Cause of death	Place of death
	M=**Male** F=**Female**	0= **0-11 m** 1= **1 y** 2= **2 y** **Etc.**	1=**Part of HH** 2=**No longer part of HH** 3=**Dead** 4=**Missing**	1=**Part of HH** 2= **Not yet part of HH** 3=**Not yet born**	**If yes, specify month**	See Codebook	See Codebook
1							

IS THERE ANYBODY ELSE WHO LIVED IN THE HOUSEHOLD BETWEEN JANUARY AND TODAY?

Nutrition questionnaire – Yida

Date: _____ Team #: _____ Cluster #: _____

Child #	Household #	Sex (M/F)	Height 1) 65-84 2) 85-110	Oedema Y=Yes N=No	MUAC value (###)	MUAC Color	Receiving nutritional support at home? N=No Y=Yes	Absent N= No Y=Yes	If absent, in ITFC? N= no MSF= Yes at MSF SP= Yes at SP	Name (absents only)
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
14										
15										
16										

Measles Vaccination questionnaire – Yida 2012

Date: _____ **Team #: _____** **Cluster #: _____**

Measles Vaccination (6 months to 15 years ONLY)

Child #	Household #	**Sex** (M/F)	**Age group** 1) 6-59 months 2) 5-15 years	**At campaign (June)** N= no Y= Yes-verbal C= Yes-card U= unknown/not sure	**At registration or other…** N= no Y= Yes-verbal C= Yes-card U= unknown/not sure
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					

Tetanus Vaccination questionnaire – Yida 2012

Date: _____ **Team #: _____** **Cluster #: _____**

Tetanus Vaccination (**for women 15 to 45 years only**)

Woman#	Household #	**Sex** (M/F)	**Age group** 1) 15-30 years 2) 31-45 years	**Tetanus vaccine** N= no never Y= Yes-verbal C= Yes-card U= unknown/not sure	**If yes,** how many times total in their life 1= once 2= at least twice 3= three or more times
1		F			
2		F			
3		F			
4		F			
5		F			
6		F			
7		F			
8		F			
9		F			
10		F			
11		F			
12		F			
13		F			
14		F			

Tetanus vaccine usually given during **pregnancy**,
--so IF APPROPRIATE –
Ask about vaccines received during previous pregnancies

Also, remember this questionnaire only for **women 15 years to 45 years of age**

Codebook – survey

1	A Shargia	16	Farandala	31	Mazarik
2	Abasía	17	Fur	32	Miri
3	Abu Hshim	18	Hiban	33	Shat Daman
4	Adar	19	Hira	34	Shat Safiya
5	Al Hemir	20	Hjar Hnab	35	Tafere
6	Al Kutang	21	Katsha	36	Tarawi
7	Alburam	22	Kauda	37	Tbanya
8	Aliri	23	Kaugniaro	38	Toludi
9	Angola	24	Kawalib	39	Torge
10	Areka	25	Kega Kharbia	40	Tuku
11	Atess	26	Kordeleb	41	Tuma
12	Balanya	27	Korongu	42	Tuna
13	Damba	28	Kululu	43	Um Shoran
14	Doloka	29	Lira	44	Umdorian
15	Fama	30	Longan	45	Warni

Question B – origin of household:

Question H – reason for not using latrines
1= Too far to go / wait is too long
2= Latrines are dirty
3= Prefer to defecate in open for cultural reasons
4= Don't have access/permission to one
5= other _____

Question R – problems faced during migration
1= Lack of water
2= Lack of food
3= Attacked / Robbed
4= Family members prevented from migrating
5= Family member illness / injury / death
6= Sexual assault
7= No Transport
8= Long/tiresome journey
9= no access to medicine/medical services
10=other _____

Question S – Symptoms
1= Diarrhoea
2= Cough/breathing difficulties
3= Fever
4= Malnutrition
5= Injury
6= Weakness
7= Infection (eye or skin)
8= other _____
(Measles, not eating, meningitis, oedema, etc)

Question S2 – reason for not seeking healthcare
1= It was during the migration
2= unaware that free health care was available
3= Illness did not seem serious enough
4= Health facility was too far or takes too much time
5= Not confident in care provided
6= Prefer traditional med
7= Busy/No time (chores, children, sole caretaker)
8= Medicine more easily available elsewhere
9= No Transport
10=Other_____

Individual Questionnaire

Cause of death:
1=Diarrhoea
2=Cough/Breathing difficulties
3=Malaria
4=Fever
5=Measles
6=Malnutrition
7=During pregnancy
8=During or just after childbirth (within 1 month of childbirth)
9=Accidental trauma
10=Intentional violence
11=Other
12=Unknown

Place of death:
1= In Yida, at medical facility
2= In Yida, not at medical facility
3= In Yida, on way to medical facility
4= In Nuba Mountains
5= During migration
6= Other
7= Unknown

Appendix 3 Surveillance guideline

Community based surveillance system Yida : Guidelines 0712 KP

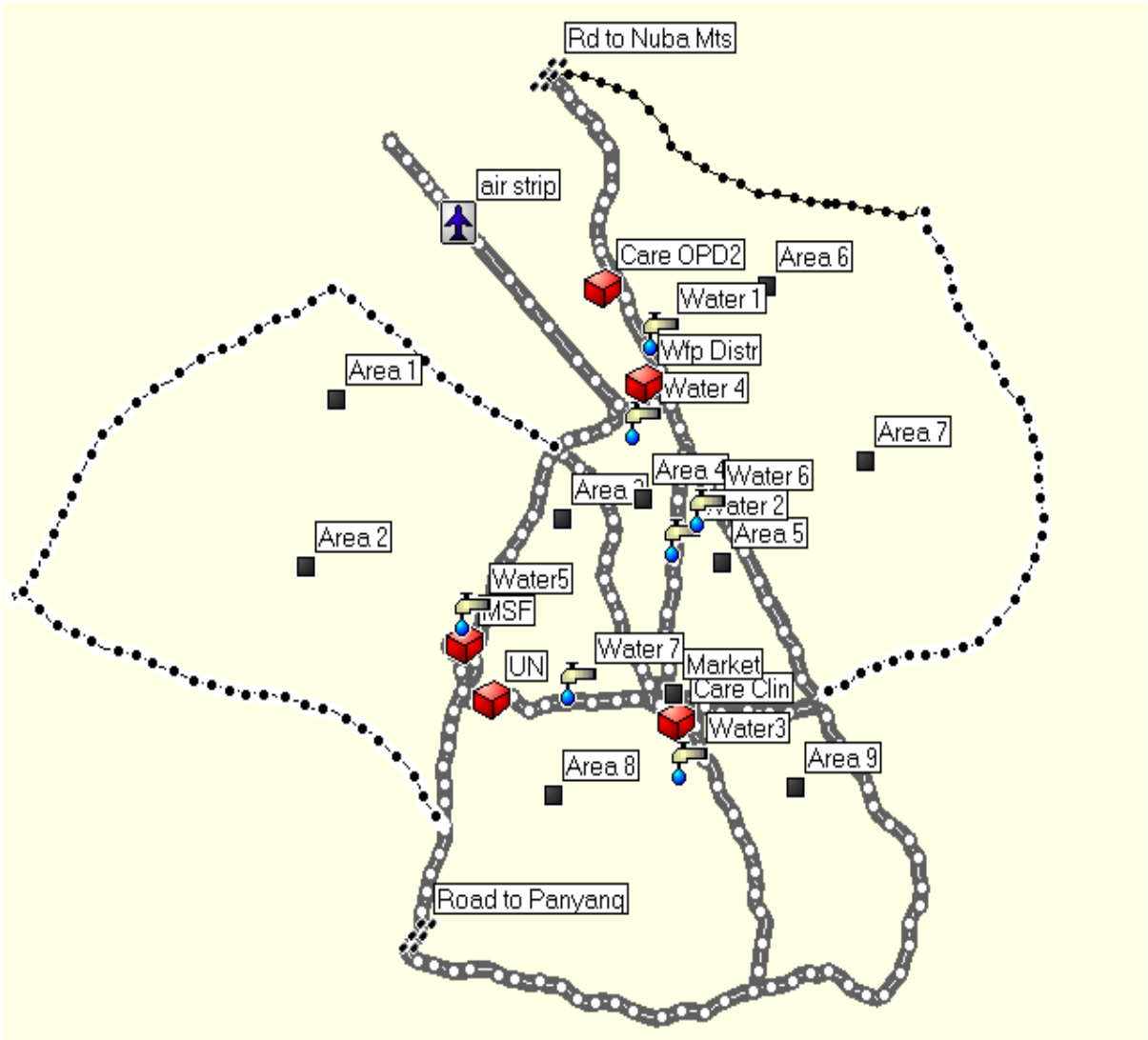
Objective

The overall aim of this community based surveillance system is to support the MSF field team to reduce morbidity and mortality by providing ongoing information on the population figures, mortality and referrals to the nutritional programs.

The specific objectives are :
- To update regularly population figures by reporting births, new arrivals and departures.
- To estimate prospectively the crude all-age (CMR), under 1 (U1MR) and under 5 years (U5MR) mortality rate in the population.
- To monitor the evolution (severity) of the situation by following the trends of mortality rate.
- To monitor the number of referrals to the nutritional program .

Setting

Yida camp has an estimated population of 60000 people. The camp is divided in 45 bomas



Surveillance staff:

In total, 30 community health workers (CHW) will be assigned a clear delimited part of a boma or a full boma depending on the size. And will be responsible for an average of 300 households each. Each boma has a boma leader who will be given burial clothes and a register, with the help of the CHWs responsible for their boma , they will keep a register of births deaths arrivals and departures . One overall surveillance supervisor is responsible for supervising the team of all CHW and will do the round of the boma leaders as well as organizing the boma leader meeting for feedback and exchange of important informations on a regular basis.
2 burrial site worker will be employed, one at each of the two burial sites and will help to identify the place and dig the grave and will keep a register of the burials,

Data collected and definitions

CHW support the boma leaders to collect the following data :
- Number of deliveries
- Number of deaths per age category (<1 year, 1-<5 years, 5 years or more)[2]
- Number of new arrivals
- Number of departures

Burial site workers will register the detaths (<5,5+)

Denominator

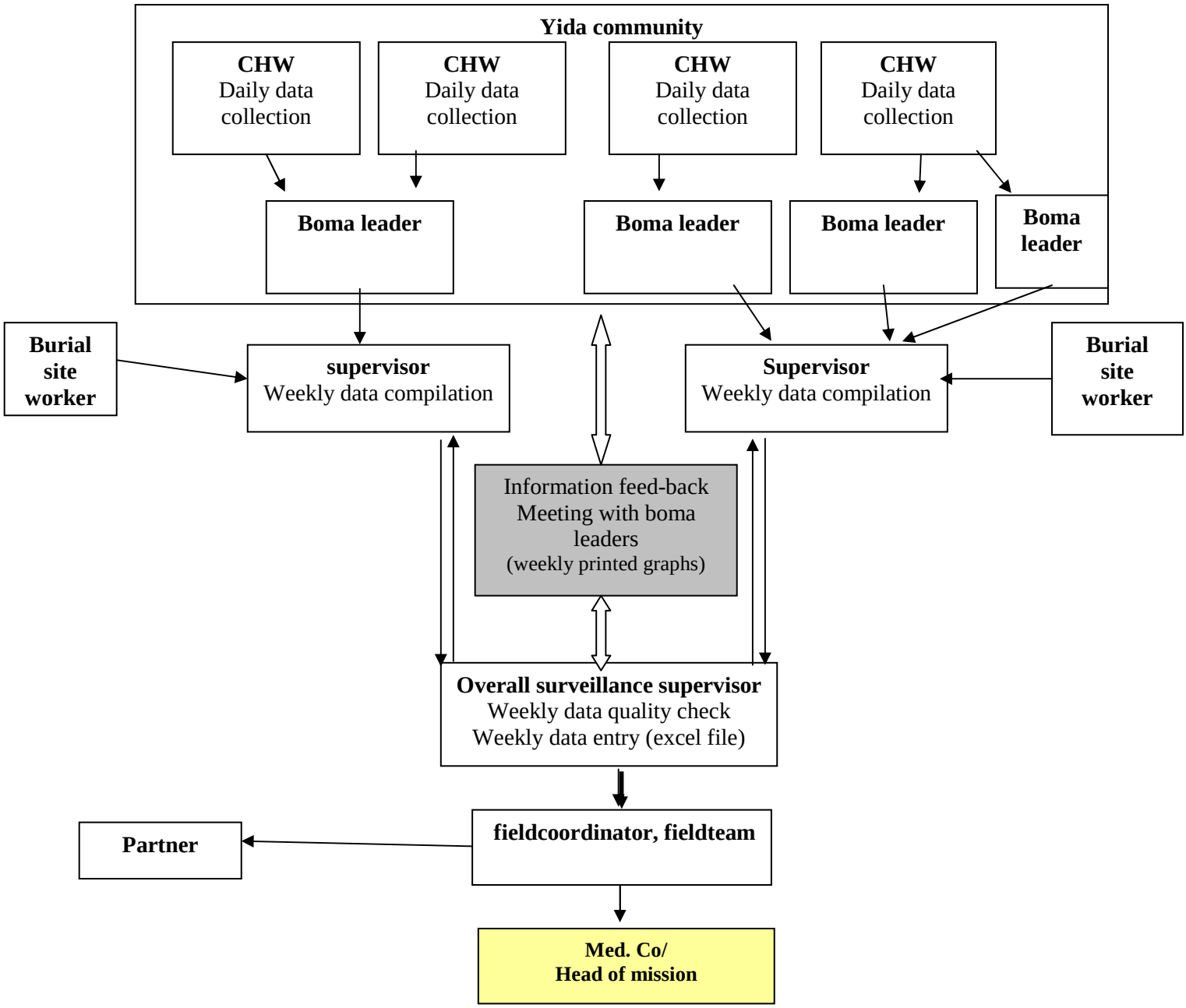
Population figures from the initial estimation of the boma leader will be updated regularly by the deaths , births arrivals and departures.

Reporting

On a daily basis, the CHW collect the data in a book note.
The CHW report the collected data to the boma leader on a daily basis (see Appendix 1).
The boma leader will keep the register for his boma
The supervisor will compiled the data on a weekly basis on a paper form (see Appendix 2).
The supervisor will bring the weekly summary to the overall surveillance supervisor at the end of each week (or the latest on the beginning of the new week).
The overall surveillance supervisor will enter the data in the surveillance system excel sheet (see Appendix 3 and the attached file).

Communication

The overall surveillance supervisor will give a feed-back of the weekly analysis:
- to the field co and the rest of the team by sending the excel file by mail and will add a narrative summary of additional qualitative information from the boma leaders
- to the Epicentre epidemiologist by sending the excel file by mail during the first weeks only
- to the boma leaders by printing and distributing the graphs of their data at the regular meeting .
-The field co will report to coordination and the UNHC.



Surveillance system flow chart

MUAC screening

On a daily basis, each CHW is visiting 10 households of his/her sector of responsibility. These households visited are different every day. When all households have been visited, the CHW start again with the first household. This ensures that all the households are systematically visited on a regular basis. In addition to information cited above (immunization defaulter, health topic discussed and referrals), the CHW collect the MUAC and presence of oedema of all children under 5 years part of these households;

Proposed data collection tool is presented in the Appendix In this form, for each visited household, the CHW would have to tick one circle for each child age from 6 months to less than 5 years according to their nutritional status:

- with edema (whatever the MUAC of these children)
- with a MUAC < 115 mm (red) and no edema
- with a MUAC between 115 and < 125 mm (orange) and no edema
- with a MUAC over 125 mm (yellow or green) and no edema

As for the surveillance system, the reporting would be as follow:
- On a daily basis, the CHW collect information on the appropriate form for the 10 households visited. The CHW give the data collection form to the surveillance supervisor and fill the weekly form at central level (see Appendix 6).
- The supervisors will compiled the data on a weekly basis by filling the last column of the weekly form (see Appendix 6). The supervisor will bring the weekly summary to the overall surveillance supervisor at the end of each week (or the latest on the beginning of the new week).
- The overall surveillance supervisor will enter the data in the surveillance excel sheet.

Appendix 3A: Example of daily surveillance data collection form

Boma	section								
date	Delivery		Death	<1 year	<5 years	>5years	New arrivals	departure	Home Visits
	M	**F**							

Date:_____ Supervisor:_____

Appendix 3B: Example of weekly surveillance data collection form

weekly compilation

NAME OF boma and the boma leader:

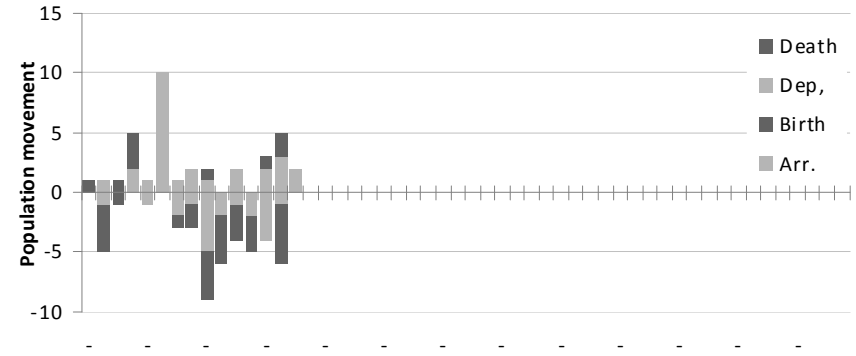
	Medical cases	ANC	SFP	OTP	Immunization defaulter	Mental case	Home Delivery		Death	<1 year	<5 years	>5years	New arrivals	departure	Home Visits	Health Education and topics
							M	**F**								
Total																

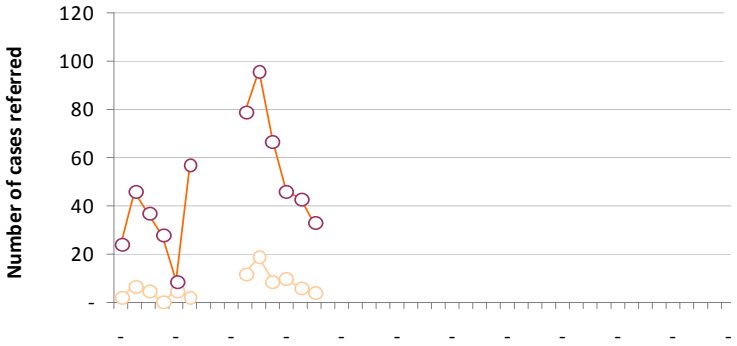
Date:_____ Supervisor:_____

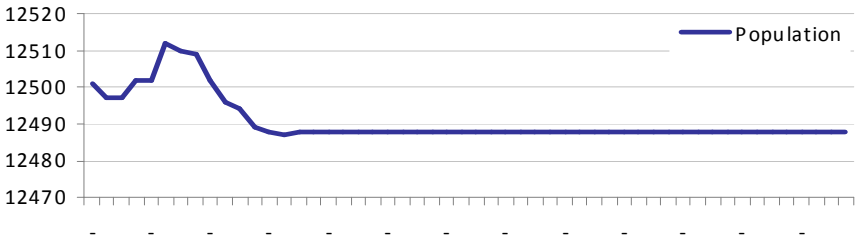
Appendix 3C: excel surveillance tool - example

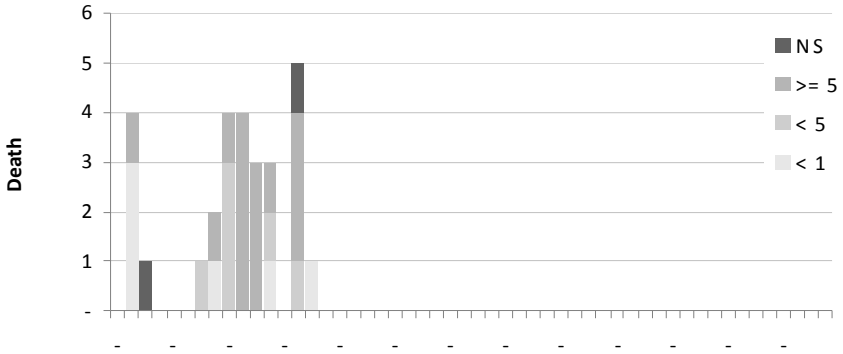
Yida (OCP)

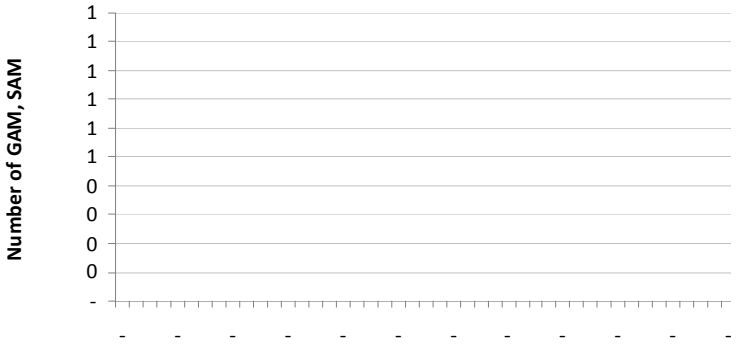
Date				Nutritional screening				Death				Birth	Arr.	Dep,	Population		Nutrition		Mortality	
Start	W			Oed.	<115	<125	>= 125	< 1	< 5	>= 5	NS				<5	T	SAM%	GAM%	U5MR	CMR
25/04/11	18							-	-	-		1	-	-	2500	12501	#N/A	#N/A	0,00	0,00
02/05/11	19							3	-	1		-	1	1	2499	12497	#N/A	#N/A	1,71	0,46
09/05/11	20										1	1	-	-	2499	12497	#N/A	#N/A		0,11
16/05/11	21							-	-	-		3	2	-	2500	12502	#N/A	#N/A	0,00	0,00
23/05/11	22							-	-	-		-	1	1	2500	12502	#N/A	#N/A	0,00	0,00
30/05/11	23							-	-	-		-	10	-	2502	12512	#N/A	#N/A	0,00	0,00
06/06/11	24							-	1	-		-	1	2	2502	12510	#N/A	#N/A	0,57	0,11
13/06/11	25							1	-	1		-	2	1	2502	12509	#N/A	#N/A	0,57	0,23
20/06/11	26							-	3	1		1	1	5	2500	12502	#N/A	#N/A	1,71	0,46
27/06/11	27							-	-	4		-	-	2	2499	12496	#N/A	#N/A	0,00	0,46
04/07/11	28							-	-	3		-	2	1	2499	12494	#N/A	#N/A	0,00	0,34
11/07/11	29							1	1	1		-	-	2	2498	12489	#N/A	#N/A	1,14	0,34
18/07/11	30							-	-	-		1	2	4	2498	12488	#N/A	#N/A	0,00	0,00
25/07/11	31							-	1	3	1	2	3	1	2497	12487	#N/A	#N/A	0,57	0,57
01/08/11	32							1					2	-	2498	12488	#N/A	#N/A		
08/08/11	33														2498	12488	#N/A	#N/A		
15/08/11	34														2498	12488	#N/A	#N/A		
22/08/11	35														2498	12488	#N/A	#N/A		
29/08/11	36														2498	12488	#N/A	#N/A		

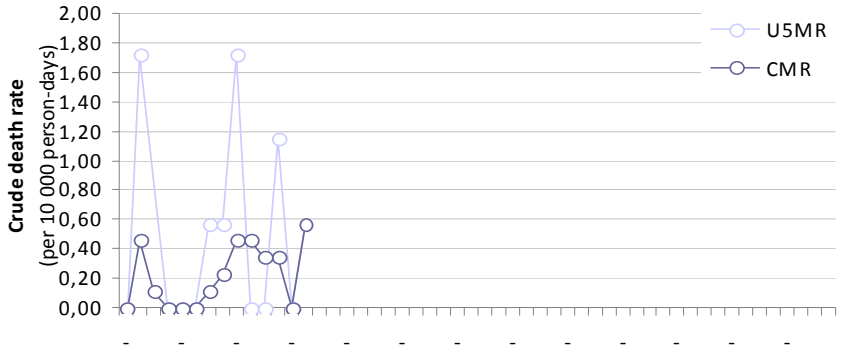

Population movement
15
10
5
0
-5
-10
Death
Dep,
Birth
Arr.

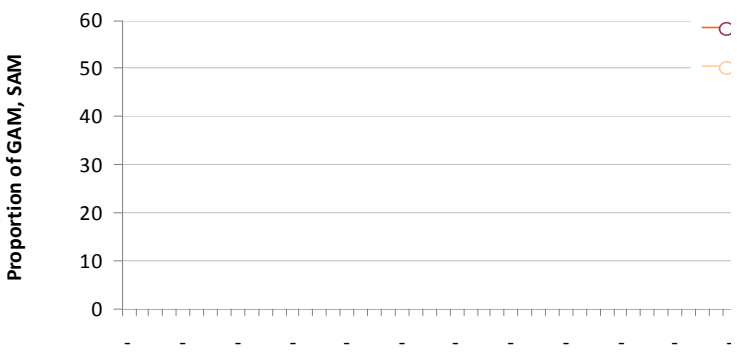

Number of cases referred
120
100
80
60
40
20
-


12520
12510
12500
12490
12480
12470
Population


Death
6
5
4
3
2
1
-
NS
>= 5
< 5
< 1


Number of GAM, SAM
1
1
1
1
1
1
0
0
0
0
-


Crude death rate
(per 10 000 person-days)
2,00
1,80
1,60
1,40
1,20
1,00
0,80
0,60
0,40
0,20
0,00
U5MR
CMR


Proportion of GAM, SAM
60
50
40
30
20
10
0

Appendix 3D: MUAC screening data collection form

CHW Activity Register	Name of CHW:			
Date and block:				
Name:				
<5 Age:	Edema **O O O O**	MUAC<115 **O O O O**	<125 **O O O O O**	>=125 **O O O O O**
Vaccination status:				
Health Topic Discussed:				
Referred to and why:				
Date and block:				
Name:				
<5 Age:	Edema **O O O O**	MUAC<115 **O O O O**	<125 **O O O O O**	>=125 **O O O O O**
Vaccination status:				
Health Topic Discussed:				
Referred to and why:				
Date and block:				
Name:				
<5 Age:	Edema **O O O O**	MUAC<115 **O O O O**	<125 **O O O O O**	>=125 **O O O O O**
Vaccination status:				
Health Topic Discussed:				
Referred to and why:				
Date and block:				
Name:				
<5 Age:	Edema **O O O O**	MUAC<115 **O O O O**	<125 **O O O O O**	>=125 **O O O O O**
Vaccination status:				
Health Topic Discussed:				
Referred to and why:				
Date and block:				
Name:				
<5 Age:	Edema **O O O O**	MUAC<115 **O O O O**	<125 **O O O O O**	>=125 **O O O O O**
Vaccination status:				
Health Topic Discussed:				
Referred to and why:				
Date and block:				
Name:				
<5 Age:	Edema **O O O O**	MUAC<115 **O O O O**	<125 **O O O O O**	>=125 **O O O O O**
Vaccination status:				
Health Topic Discussed:				
Referred to and why:				
Date and block:				
Name:				
<5 Age:	Edema **O O O O**	MUAC<115 **O O O O**	<125 **O O O O O**	>=125 **O O O O O**
Vaccination status:				
Health Topic Discussed:				
Referred to and why:				
Date and block:				
Name:				
<5 Age:	Edema **O O O O**	MUAC<115 **O O O O**	<125 **O O O O O**	>=125 **O O O O O**
Vaccination status:				
Health Topic Discussed:				
Referred to and why:				
Date and block:				
Name:				
<5 Age:	Edema **O O O O**	MUAC<115 **O O O O**	<125 **O O O O O**	>=125 **O O O O O**
Vaccination status:				
Health Topic Discussed:				
Referred to and why:				
Date and block:				
Name:				
<5 Age:	Edema **O O O O**	MUAC<115 **O O O O**	<125 **O O O O O**	>=125 **O O O O O**
Vaccination status:				
Health Topic Discussed:				
Referred to and why:				

Appendix 3E:

Week number

Boma _____ DAILY CHW REPORT ON Nutritional Screening

Boma	Day 1						Day 2						Day 3						Day 4						Day 5						Day 6						Total week					
	Nb hh	6 months to <5 Age:					Nb hh	6 months to <5 Age:					Nb hh	6 months to <5 Age:					Nb hh	6 months to <5 Age:					Nb hh	6 months to <5 Age:					Nb hh	6 months to <5 Age:					Nb hh	6 months to <5 Age:				
		edema	MUAC					edema	MUAC					edema	MUAC					edema	MUAC					edema	MUAC					edema	MUAC					edema	MUAC			
			<115	< 125	>=125			<115	< 125	>=125				<115	< 125	>=125				<115	< 125	>=125				<115	< 125	>=125				<115	< 125	>=125				<115	< 125	>=125		