

Research Terms of Reference

[Multi-Sectoral Needs Assessment, Aweil Centre County, Northern Bahr el Ghazal State, South Sudan]

[Research Cycle ID: SSD 1908a]

[South Sudan]

[Release date]

[Version number]

REACH Informing more effective humanitarian action

1. Executive Summary

Country of intervention	South Sudan		
Type of Emergency	<input type="checkbox"/>	Natural disaster	<input checked="" type="checkbox"/> Conflict
Type of Crisis	<input type="checkbox"/>	Sudden onset	<input type="checkbox"/> Slow onset <input checked="" type="checkbox"/> Protracted
Mandating Body/ Agency	UNICEF, Medair, REACH		
Project Code	32DLF		
Overall Research Timeframe (from research design to final outputs / M&E)	14/05/2019 to 14/06/2019		
Research Timeframe Add planned deadlines (for first cycle if more than 1)	1. Start collect data: 25/07/2019		5. Preliminary presentation: 20/08/2019
	2. Data collected for household survey: 08/08/2019		6. Outputs sent for validation: 31/08/2019
	3. Data analysed: 21/06/2019		7. Outputs published: 30/08/2019
	4. Data sent for validation: 16/08/2019		8. Final presentation: __/__/____
Number of assessments	<input checked="" type="checkbox"/>	Single assessment (one cycle)	
	<input type="checkbox"/>	Multi assessment (more than one cycle) [Describe here the frequency of the cycle]	
Humanitarian milestones Specify what will the assessment inform and when e.g. The shelter cluster will use this data to draft its Revised Flash Appeal;	Milestone		Deadline
	<input type="checkbox"/>	Donor plan/strategy	__/__/____
	<input type="checkbox"/>	Inter-cluster plan/strategy	__/__/____
	<input type="checkbox"/>	Cluster plan/strategy	__/__/____
	<input type="checkbox"/>	NGO platform plan/strategy	__/__/____
<input checked="" type="checkbox"/>	Other (Specify): IPC Analysis		08/2019
Audience Type & Dissemination Specify who will the assessment inform and how you will disseminate to inform the audience	Audience type		Dissemination
	<input checked="" type="checkbox"/>	Strategic	<input type="checkbox"/> General Product Mailing (e.g. mail to NGO consortium; HCT participants; Donors) <input type="checkbox"/> Cluster Mailing (Education, Shelter and WASH) and presentation of findings at next cluster meeting <input checked="" type="checkbox"/> Presentation of findings (e.g. at HCT meeting; Cluster meeting)
<input checked="" type="checkbox"/>	Programmatic		
<input type="checkbox"/>	Operational		
<input type="checkbox"/>	[Other, Specify]		

			X Website Dissemination (Relief Web & REACH Resource Centre) <input type="checkbox"/> [Other, Specify]
Detailed dissemination plan required	<input type="checkbox"/>	Yes	X No
General Objective	To better understand the multi-sectoral needs, humanitarian conditions and causes of malnutrition in Aweil Center County to inform IPC Classification, Needs Analysis Working Group and Medair programs		
Specific Objective(s)	<ul style="list-style-type: none"> • To determine prevalence of Global and Severe Acute Malnutrition (GAM and SAM) among children aged 6 to 59 months of Aweil Center County. • To determine the proxy coverage of selective feeding programs. • To estimate the Under-five crude mortality rate and Crude mortality rate of Aweil Center County population over a determined recall period. • To estimate the coverage of measles vaccination (9-59 months), Vitamin A supplementation (6-59 months) and deworming (12-59 months). • To assess the 2-week retrospective morbidity of fever, pneumonia and diarrhea among children 6-59 months and to determine the health seeking behavior of the caregivers. • To assess the multi-sectoral needs and potential contributing conditions, food security, WASH, livelihoods, and health. • To determine the proxy infant and young child feeding (IYCF) practices of caregivers of children 0-23 months. • Recommend appropriate health, nutrition, WASH and FSL interventions based on the survey findings in the former Aweil Center County. 		
Research Questions	<p>RQ1: What is the prevalence of Global Acute Malnutrition (GAM) among children 6 to 59 months in host community and population living in camp-like settings in Aweil Center County?</p> <p>A. What is the GAM by weight-for-height?</p> <p>B. What is the proxy GAM by mid-upper arm circumference (MUAC)?</p> <p>RQ2: What is the crude death rate (CDR) and under-five death rate (U5DR) for host community and population living in camp-like settings in Aweil Center County?</p> <p>A. What are the CDR and U5DR calculated from the retrospective household survey method in host community and population living in camp-like settings in Aweil Center County?</p> <p>B. What are the CDR and U5DR calculated from the informant method in host community populations in Aweil Center County?</p> <p>RQ4: What are the vulnerabilities for host community and population living in camp-like settings in Aweil Center County?</p> <p>RQ5: What are the food security and livelihoods needs and conditions for host community and population living in camp-like settings in Aweil Center County?</p> <p>A. What are food consumption levels at the household level?</p> <p>B. What are the main sources of income / livelihoods?</p> <p>C. What food and livelihood coping strategies are being used?</p> <p>D. What shocks have households experienced in the past 6 months?</p>		

	<p>RQ6: What are the water, sanitation and hygiene needs and conditions for host community and population living in camp-like settings in Aweil Center County?</p> <p>A. What are the main sources of drinking water? To what extent are households relying on unimproved water sources?</p> <p>B. What are defecation practices in the community?</p> <p>C. What percentage of households have access to latrines?</p> <p>RQ7: What are the health needs and conditions for under-5 children in host community and population living in camp-like settings in Aweil Center County?</p> <p>A. To what extent have children under-5 accessed vaccination and supplementation services?</p> <p>B. What illnesses have children under-5 had in the past 2 weeks?</p> <p>C. How have caregivers sought treatment for illnesses in the past 2 weeks?</p> <p>D. To what extent are children under 5 sleeping under long-lasting insecticide treated mosquito nets (LLITN)?</p> <p>RQ8: What are the infant and young child feeding practices for under-2 children for host community and population living in camp-like settings in Aweil Center County?</p> <p>A. Are children 0-23 months appropriately breastfeeding?</p> <p>B. Are children 6-23 months appropriately given complementary foods in terms of quantity, diversity and time of introduction?</p> <p>RQ9: What are the characteristics and experiences of households with malnourished children compared to non-malnourished children?</p> <p>A. How have daily lives of households with malnourished and non-malnourished children changed compared to previous seasons and years?</p> <p>B. What differences are there between households with malnourished children and those with non-malnourished children in social, health, and WASH environments?</p> <p>C. What differences are there in perceptions of causes of malnutrition between households with malnourished children and those with non-malnourished children?</p>		
Geographic Coverage	Aweil Centre County, Northern Bahr el Ghazal State, South Sudan		
Secondary data sources	IPC Phase Classifications – January 2018, September 2018, January 2019 A New Method to Estimate Mortality in Crisis-Affected Populations: Validation and Feasibility Study. Version 2. Francesco Checchi, Bayard Robers, Oliver Morgan. Food and Nutrition Technical Assistance (FANTA) USAID. March 2009. SMART Methodology Manual v2.0		
Population(s) <i>Select all that apply</i>	<input checked="" type="checkbox"/>	IDPs in camp	<input type="checkbox"/> IDPs in informal sites
	<input type="checkbox"/>	IDPs in host communities	<input type="checkbox"/> IDPs [Other, Specify]
	<input type="checkbox"/>	Refugees in camp	<input type="checkbox"/> Refugees in informal sites
	<input type="checkbox"/>	Refugees in host communities	<input type="checkbox"/> Refugees [Other, Specify]
	<input checked="" type="checkbox"/>	Host communities	<input type="checkbox"/> [Other, Specify]
Stratification <i>Select type(s) and enter number of strata</i>	<input type="checkbox"/>	Geographical #: __ __ __ Population size per strata is known? <input type="checkbox"/> Yes <input type="checkbox"/> No	<input checked="" type="checkbox"/> Group #: 2 Population size per strata is known? X Yes <input type="checkbox"/> No
	<input type="checkbox"/>		<input type="checkbox"/> [Other Specify] #: __ __ Population size per strata is known? <input type="checkbox"/> Yes <input type="checkbox"/> No
Data collection tool(s)	<input checked="" type="checkbox"/>	Structured (Quantitative)	<input checked="" type="checkbox"/> Semi-structured (Qualitative)
	Sampling method		Data collection method
Structured data collection tool # 1	X Probability / Cluster sampling		X Children 6-59 months – Host Community (Target #): 531

Select sampling and data collection method and specify target # interviews		X Household interview – Host Community (Target #): 538
Semi-structured data collection tool (s) # 1 Select sampling and data collection method and specify target # interviews ***If more than 2 structured tools please duplicate this row and complete for each tool.	X Snowballing	X Key informant interview – Village leaders (Target #: Exhaustive within study site) X Key informant interview – Religious leaders (Target #: Exhaustive within study site) Key informant interview – Elderly men / women (Target #: Minimum 2 men, 2 women per study site)
Semi-structured data collection tool (s) # 1 Select sampling and data collection method and specify target # interviews ***If more than 2 structured tools please duplicate this row and complete for each tool.	X Purposive	X Key informant interview – Village leaders (Target #: 59, one per cluster/village)
Target level of precision if probability sampling	95% level of confidence	3.5+/- % margin of error
Data management platform(s)	<input type="checkbox"/> IMPACT	<input type="checkbox"/> UNHCR
	X Medair internal server	
Expected output type(s)	<input type="checkbox"/> Situation overview #: __	X Report #: 1
	X Presentation (Preliminary findings) #: 1	<input type="checkbox"/> Presentation (Final) #: __
	<input type="checkbox"/> Interactive dashboard #: _	<input type="checkbox"/> Webmap #: __
	<input type="checkbox"/> [Other, Specify] #: __	<input type="checkbox"/> Profile #: 1
Access	X	Public (available on REACH resource center and other humanitarian platforms)
	X	Restricted (bilateral dissemination only upon agreed dissemination list, no publication on REACH or other platforms) - Pending result validation by Nutrition Information Working Group (NIWG) and Medair
Visibility Specify which logos should be on outputs	Medair, USAID-OFDA, SDC	

2. Rationale

2.1. Rationale

Former Northern Bahr el Ghazal (NBeG) state borders Western Bahr el Ghazal to the south and west and Warrap to the east. Aweil Center county is located in Northern Bahr el Ghazal which has largely escaped the direct effects of the civil war and its population is mainly free to move around the region. Aweil Center is one of the five counties in the former NBeG State which comprises seven Payams. The seven Payams are Aroyo, Aulic, Awada,

Barmayen, Chel South, Nyalath and Umora. Although still impacted by the broader indirect effects of the war (such as the economic crises), Northern Bar el Ghazal is reported to have the highest population of cattle in the country and has some of the most fertile lands. Despite these factors, emergency levels of global acute malnutrition (GAM) remain high. The high rates of malnutrition in the county are mainly related to food insecurity (below average harvests and soaring food prices seriously eroding people's ability to feed themselves) and disease (a failing health system and a lack of available medicine to treat common childhood illnesses). Gender features a prominent role in the evolution of food and nutrition insecurity in Northern Bahr el Ghazal. Poverty and poor access to resources among women result in widespread food access constraints. The population in Aweil Center County consists of host communities and internally displaced people (IDPs) who have integrated with host community. The living circumstances and the access to health care services are similar for all communities. Furthermore, the region is characterized by the significant presence of female-headed households (58% of the HHs in NBeG are female headed)¹, widows and divorced landless women with significantly poorer access to resources and services^{2 3}.

According to the February 2019 IPC report, Aweil Center is currently in IPC3 (Crisis, with likelihood to be at least 1 Phase worse in the absence of humanitarian assistance) and will continue to stay in the same Phase 3 also during the period May-July 2019. On top of this, the IPC classification for Acute Malnutrition foresees a 'critical' situation (IPC4) for the period May-August 2019. While population figures vary and range widely, Medair estimates that 199,461 individuals currently live in Aweil Center County and Aweil Town⁴.

The SMART survey conducted in July 2017 by Medair showed a GAM prevalence rate of 23.3% (19.6-27.5; 95% CI), and a SAM rate of 6.3% (4.6-8.5; 95% C.I.). The annual follow up SMART survey conducted in July 2018 (during the implementation period – from April 2018 to September 2018 - of a General Food Distribution targeting around 140,000 individuals and a Blanket Supplementary Feeding Program reaching around 11,000 PLW and 25,000 children under 5) reported a GAM prevalence rate of **6.3%** (3.8-10.4; 95% C.I.), and a SAM rate of **1.3%** (0.5-2.9; 95% C.I.). It should be noted in 2017, Aweil town was included in the SMART survey while in 2018 it was excluded, which could partially explain the large difference in GAM rates between the years.

3. Methodology

2.1. Methodology overview

There are three general sections to the assessment

- Standardized Monitoring and Assessment of Relief and Transition (SMART) methodology
- Rapid Mortality Assessment (Informant Method)
- Key informant interviews

SMART survey – SMART methodology employs a standardized set of protocols for the collection and analysis of anthropometric data, in order to estimate the prevalence of GAM in a population. SMART utilizes quantitative, household survey method to select a representative sample of households, and exhaustively samples all children 6-59 months within the household. The six core anthropometric variables are measured in order to determine children's nutritional status. Additional multi-sectoral variables are added onto the survey at the household level to try and understand the key drivers of malnutrition in the population. Resources for the SMART methodology can be found [here](#).

¹ FSNMS Round 22 August 2018, Report published in January 2019

² IOM tracking of spontaneous Returns Project, 2005

https://www.iom.int/jahia/webdav/shared/shared/mainsite/.../tracking_returns.pdf

³ BRACED Flood Impact Assessment Greater Bahr el Ghazal, South Sudan, 2015.

<http://www.reachresourcecenter.info/system/files/resource-documents/lea.macias-05112013-095735-BRACEPhaseIBaselineReportFINAL.pdf>

⁴ Extrapolated from Medair & MSF mass measles campaign & Medair coverage survey, Feb 2018

Rapid Mortality Assessment (Informant Method) - The informant method is an alternate methodology for assessing the death rates in the population, that has been previously validated in several contexts (Malawi, Thailand, Afghanistan⁵). The strength of this method is that it is less resource intensive than a traditional household retrospective survey, and could be used with sub-county level rapid assessments to estimate crude death rates. This is in contrast to the traditional retrospective survey method, which requires a large sample size and is often more time/resource intensive. While this method has been validated in other settings, it has yet to be fully tested in emergency contexts. The aim of testing this method in conjunction with a SMART survey would be to (1) provide a direct comparison between SMART and informant method results, and (2) allow for the derivation of a minimal number of clusters/sites needed with the informant method to have comparable results to retrospective household survey.

The method involves listing of deaths from several key informant sources within each of the study sites, and estimating the population through shelter counts, or similar method in each study site. Key informant sources will be identified through formative key informant interviews to inform potential sources of information for listing deaths (such as village chiefs, community leaders, village elders, etc.), and appropriate ways of discussing death in the context of local practices and beliefs. The observed rate of deaths per household is modelled against a poisson distribution to attain a mean and standard error, which is then used with a statistical method known as bootstrapping to derive an estimated CDR and 95% confidence intervals. More details on the method can be found [here](#).

2.2. Population of interest

The assessment is being conducted in Aweil Centre County in collaboration with Medair, the nutrition and health partner in the county. Medair conducts SMART surveys each year in the rainy season (July) as a means of situation and program monitoring. Clusters will be defined as villages/settlements or sub-sections of larger urban settlements.

2.3. Secondary data review

SMART Manual v2.0 – SMART is a standardized methodology for assessing nutrition and mortality in emergencies. This assessment will adhere to SMART guidelines, as well as in-country standards and guidance set by the Nutrition Information Working Group (NIWG). Resources for SMART can be found [here](#).

Informant Method Validation Study⁶ - Guidance for the informant method has previously been written for the analysis, which will be incorporated and guide the calculation of the CDR in this method. REACH has previously piloted this method in a rapid assessment format.

2.4. Primary Data Collection

Method 1 – SMART Survey

Methodology – The SMART survey will utilize a quantitative household tool, using tablets for data collection. The questionnaire will be a multi-sectoral covering food security, livelihoods, WASH, Health, Infant and Young Child Feeding (IYCF), and vulnerabilities. Some questions in the survey will be asked about specific individuals in the household (mothers and children).

Sampling – A two-stage, cluster sampling design will be used for the SMART survey, with villages/settlements being the primary sampling unit (PSU) and households being sampled randomly within each PSU, either with simple random sampling or systematic random sampling depending on what is feasible at the cluster. A sampling frame of PSUs with population estimates will be attained from the Medair, based on populations estimates from Medair mass MUAC campaigns and MSF mass measles campaigns done in the county. Clusters will be sampled with Probability Proportional

⁵ A New Method to Estimate Mortality in Crisis-Affected Populations: Validation and Feasibility Study. Version 2. Francesco Checchi, Bayard Robers, Oliver Morgan. Food and Nutrition Technical Assistance (FANTA) USAID. March 2009.

⁶ Francesco Checchi, Bayard Roberts, Oliver Morgan. A New Method to Estimate Mortality in Crisis-Affected Populations: Validation and Feasibility Study. March 2009

to Size (PPS) sampling. In PPS, each cluster is assigned a population estimate. This estimate is used to weight the probability of that cluster being selected. This results in a 'self-weighted' sample within the strata, so that all households within the population have an equal chance of selection.

Household sample size calculations were done using ENA for both anthropometry and mortality with the parameters summarized in the below tables. The highest resulting sample, whether from anthropometry or mortality, was taken as the final sample. In this case 487 households for the camp population and 494 for the host community population. The final necessary sample for mortality may change on the field once a recall event is chosen, which would change the final recall period chosen.

Table: Sample size calculation for Anthropometry

Parameters for Anthropometry	Value (Host)	Assumptions based on context
Estimated prevalence of GAM	10.4%	The upper limit of the GAM prevalence, 6.3% (3.8-10.4; 95%CI), obtained in July 2018. This is due to exclusion of Aweil Town villages which have reported high malnutrition rates as per Medair clinic records
Desired precision	3.5%	SMART Methodology recommendation for GAM prevalence 10-15%
Design Effect	1.69	Aweil Centre 2018 SMART Survey Report
Average household size	6.9	Aweil Centre 2018 SMART Survey Report
% of children under five years of age	16.8	Aweil Centre 2018 SMART Survey Report
% non-response households	3	Anticipated non-response rate
Children to be included	538	
Sample size of households to be included	531	

Table: Sample size calculation for Mortality

Parameters for Mortality	Value (Host)	Assumptions based on context
Estimate prevalence (CDR)	0.23	SMART survey of July 2018 conducted by Medair; 0.23 (0.10-0.53); point prevalence used
Desired precision	0.3%	Recommended precision level for a CMR less than 1
Design effect	1.2	Aweil Centre 2018 SMART Survey adjusted DEFF.
Recall period	93 days	Default RP used, to be adjusted upon determination of a recall event
Average household size	6.9	
% of non-response households	3	Anticipated non-response rate
Population to be included	1379	
Sample size of households to be included	206	

The number of households to be completed per day was determined according to the time the team could spend on the field excluding transportation, other procedures and break times. The details below are taken into consideration when performing this calculation based on the context:

The number of households to be completed per day was determined according to the time the team could spend on the field excluding transportation, other procedures and break times. The details below are taken into consideration when performing this calculation based on the context:

- Departure from office at 8.00 am and back at 5.30 pm.
- Average travel time to reach each cluster (one-way): 1 hour

- Duration for initial introduction and selection of households: 30 minutes
- **Time spent to move from one household to the next: 15 minutes**
- **Average time in the household: 30 minutes**
- Breaks: One lunch break of 30 minutes

The above gave an average 6.5 hours of working time in each cluster. There are locations in the county where the time to reach the village is a bit longer. The survey coordinator will prepare a movement plan and this will indicate the farthest villages in order to plan departure days when the enumerators need to start off earlier. On average teams spend **30 minutes in each HH** and **15 min moving from one HH to another**. This will enable one survey team to accomplish 9 households per day. The total number of households in the anthropometry sample was divided by the number of households to be completed in one day by one team to determine the number of clusters to be included in the survey i.e $(531/9) = 59$. Therefore, based on the aforementioned calculation **59** clusters are planned to be included in the survey.

Data Collected – Standard questionnaires developed by the South Sudan Nutrition Cluster will be used for the survey. Upon reaching the selected households, the team will enquire whether there are children less than five years of age. In each household all children aged 6-59 months will be included for anthropometric measurement whereas in households that have no children under five, only the mortality questionnaires will be administered. All children aged between 6-59 months of the same household will be included in the survey for anthropometric measurements and all members of the household who were in the house as well as died or left the house during the recall period will be listed in the designated sections of the individual mortality questionnaire. No substitution of houses will be done. The survey coordinator would conduct daily reviews of the completed questionnaires and feedback will be shared with the teams every morning before commencement of data collection.

The key six anthropometric variables will be collected for all eligible children (6-59 months) the following information:

- ✓ **Age:** The primary source for this information will be the child's immunization card, birth certificate or birth notification. In the absence of these documents, a local calendar of events will be used to estimate the age.
- ✓ **Child's Sex:** This will be recorded as either 'f' for female or 'm' for male.
- ✓ **Weight:** A digital weighing scale will be used to measure the children's weight. The teams on a daily basis will calibrate the electronic scale using a standard weight to ensure accuracy. Children are to be weighed with minimal clothing and weight recorded to the nearest 0.1 kg. Minimal clothing means underwear such as underpants only.
- ✓ **Height:** A height board will be used to measure height for children above 2 years of age while length will be taken for children less than 2 years of age. While ensuring minimal or no movement of the child and maintaining height readings at eye level the height or length will be recorded to the nearest 0.1 cm.
- ✓ **MUAC:** The Mid-upper arm circumference will be measured using the internationally standardized approach. It will be measured to the nearest 0.1 cm. In the event of a disability on the left arm or a left-handed child, the right arm will be used. The cutoffs for children 6-59 months are <11.5cm for severe acute malnutrition, and from 11.5-<12.5cm for moderate acute malnutrition. For PLWs, severe acute malnutrition is determined by <18cm and moderate acute malnutrition from 18-<23cm, as per MIYCN guidelines.
- ✓ **Bilateral Oedema:** This will be assessed by the application of moderate thumb pressure for at least 3 seconds on both feet. If a depression formed upon pressure application, then presence of bilateral oedema will be confirmed.

The core infant and young child feeding indicators will be collected for all children 0-23 months:

- ✓ **Early initiation of breastfeeding:** All caregivers of children 0-23 months will be asked if they were put to the breast within the first 24 hours.
- ✓ **Exclusive breastfeeding:** All caregivers of children 0-5 months will be asked a standard series of questions for the previous day's recall to determine if (1) the child received breastmilk, either from the breast or expressed, and (2) if the child received any other food or liquid. If the child had consumed any food or liquid other than breastmilk, the child is not exclusively breastfeeding. The exception is if the child received ORS, drops or syrups (vitamins, minerals or medicines).

- ✓ **Continued breastfeeding at 1 and 2 years:** All caregivers of children 0-23 months will be asked if they were breastfed the previous day. The results of this indicator will be disaggregated by age of the child to determine continued breastfeeding. Continued breastfeeding at age 1 is determined by the proportion of children 12-15 months who received breastmilk the previous day. Continued breastfeeding at age 2 is determined by the proportion of children 20-23 months,
- ✓ **Introduction of solid, semi-solid or soft foods:** All caregivers of children 0-23 months will be asked if about solid foods and liquids the child may have consumed in the previous day. The indicator for appropriate introduction of solid, semi-solid or soft foods is determined by the proportion of children 6-8 months who received these foods the previous day.
- ✓ **Minimum dietary diversity** – The indicator is calculated only for children 6-23 months, though all caregivers of children 0-23 months will be asked about foods, liquids and breastmilk consumed by the child the previous day. If the child has consumed a minimum of 4 out of 7 food groups the previous day, they meet the criteria. Breastmilk is not included in this indicator as it is meant to reflect the complementary diet only.
- ✓ **Minimum meal frequency** – The indicator is calculated only for children 6-23 months, though all children 0-23 months will be asked how many times they ate solid, semi-solid or soft foods in the previous day. The appropriate number of meals depends on whether the child is breastfeeding or non-breastfeeding, and the age of the child. For breastfed children, they are recommended to eat 2 times for 6-8 month olds, 3 times for 9 month olds. For non-breastfed children 6-23 months, 4 times is recommended per day. “Meals” refers to both meals and snacks the child had based on caregiver reports.
- ✓ **Minimum acceptable diet (MAD):** This indicator is calculated by the proportion of children 6-23 months who meet the criteria for both minimum meal frequency and minimum dietary diversity.

Data Quality Control – Quality of household and child measurements will be ensured through the following:

- a. Training – All enumerators will be given a 4-day training on taking anthropometric measurements, use of ODK applications, field procedures and field testing.
- b. Standardization Test – All enumerators will be subject to a standardization test prior to data collection. A standardization test entails each screener taking two of each measurement (weight, length, MUAC) on 10 children each (so 20 measurements total). The results are analysed in ENA software to assess the **accuracy** and **precision** of the measurements using the following indicators⁷:
 - I. Technical Error of Measurement (TEM) - a measure of the average measurement error in mm. (measurement of precision)
 - II. Team TEM – The technical error of measurement in mm, for the team of measurers as a whole.
 - III. R coefficient - ranges from 0-100, it is the proportion of measurement variation attributable to real differences in the child, as opposed to measurement technique. An R coefficient of 97.6 means that 97.6% of the variation is from real differences, while 2.4% of the variation is from measurement error. (measurement of precision)
 - IV. Bias - the average difference between the enumerator value and the assumed “true” value provided by the enumerator. (a measurement of accuracy/validity)

For each of the above indicators, each participant is graded as either good, acceptable, poor, or reject. The cutoffs in Table 1 below are used for this classification.

- c. *Daily Data Checks / Digit Preference Checks* – As possible, ODK data will be uploaded at the end of each day. Anthropometric measurements will be analysed with ENA to check for digit preference, age and sex ratios, and feedback will be given to teams the following morning. Household data will also be analysed for patterns or issues, and feedback also given to the teams.

⁷ SMART Methodology Manual 2.0. 2017.

- d. *Field Observations – Field Supervisors and Assessment Officer will make efforts to observe measurers work to ensure quality measurements are being taken.*

Ethical Considerations – all children found to be severely acutely malnourished will be referred to the nearest Outpatient Therapeutic Feeding Program site (OTP site) for admission and treatment. A referral slip will be provided with the referral information recorded. Referral criteria will be:

- Weight for height z-score <-3
- MUAC <11.5 cm
- Presence of bilateral pitting oedema

Method 2 – Rapid Mortality Assessment

Rapid mortality has the following key steps:

- 1) Create a household list in the community
- 2) Build a list of key informant interviews for the mortality interviews
- 3) Death listing
- 4) Verification

Household Listing – *A list of heads of households will be generated on the field, either from house to house listing or from verbal reporting by a community leader. This household list will be used to identify deaths within a set group of the population.*

Snowball Sampling and Building the Key informant list – *Rapid mortality data collection occurred in each site/cluster where SMART data collection took place. One rapid mortality enumerator was on each team, and within the site was instructed to conduct a minimum of six key informant interviews. As best as possible, the enumerator was instructed to get at least one of six identified types of key informant which were identified in discussion with partners on the field. Key informant types included: (1) village chief/deputies, (2) religious leaders, (3) health workers such as health facility staff, community health workers or nutrition volunteers, (4) teachers, (5) elderly men, or (6) elderly women. Rapid Mortality enumerators will use snowball sampling to identify key informants within the site for reporting deaths.*

Death Listing – *Each key informant will be asked about whether a death occurred during the recall period for every household on the household listing. A separate list of deaths will be created for each key informant type identified. For each death, additional information will be gathered including the name, age, sex, nicknames, place of origin, place of death, cause of death, or other uniquely identifiable information determined from preparatory field work. The same death being reported by multiple KIs will still be reported and matched in analysis after data collection.*

Tools – *A paper questionnaire will be provided for the initial preparatory field work, and paper death listing forms will be used during data collection.*

Quality Control

- **Training** – *enumerators specific for death listing will be subject to a two-day training along with the rest of the team. This will cover data collection forms, and expected conduct when asking about deaths.*
- **Debriefing** – *Daily debriefs will be conducted with the death listing enumerators to identify issues and check the quality of data collection.*

Ethical Considerations – *The following will be considered for data collection and reporting:*

- **Anonymized** - *Data will be anonymized in the final data-set. The mortality dataset will not be shared publicly.*

- **Community Informed Consent** – Permission will be sought from the community leaders to collect mortality data in the settlement.
- **Individual Informed Consent** – Participants will be informed on what information will be collected and how it will be used prior to seeking their consent. The participant can choose not to participate in the interview, choose to stop the interview at any point and there will be no consequences in terms of aid reception for the participant if they choose not to participate.
- **Sensitivities surrounding mortality data collection** – given previous research in South Sudan has demonstrated that mortality can be a sensitive topic when interviewing HH members, guidance will be sought from community leaders prior to the start of data collection on how this is best approached and explained in the local language to ensure research is sensitive to the issues surrounding this topic.

Method 3 – Key informant interview

The key informant interview is intended to be a brief, 5-10 minute complementary interview to the SMART survey asking questions on flooding, accountability to affected population, and perceptions of shocks in the community. Key informants will be purposively sampled, targeting community leaders such as village chiefs or elderly in the community. One key informant interview will be conducted per location for the SMART survey.

2.5. Data Processing & Analysis

Method 1 – SMART Survey

Household data from the tablets will be uploaded at the end of each day to the Medair Kobo server. Data will be downloaded and plausibility checks run for anthropometry and mortality data using ENA for SMART (9th July, 2015 version) software. Feedback will be given to the field teams each morning based on the results. Household data will also be assessed for patterns or errors for feedback. Anthropometric and mortality data will be analysed using ENA and standard SMART procedures, while the analysis of household variables will be done in IBM SPSS version 20 or R version 3.5.2. A preliminary report and anonymized data sets will be submitted to the NIWG within 2 weeks after completion of data collection for validation.

Method 2 – Rapid Mortality Assessment

Data Entry and Storage – Data entry will be done with EpiData v3.1. Double data entry will be used to check and limit errors. Duplicates within an individual list will be identified and removed. Hard copies of the death listings will be kept for one month after data collection for reference during data cleaning/analysis, then destroyed. Only an anonymized dataset with capture histories will be stored for long-term use.

Data Cleaning and Processing Steps - The aim of the data processing steps will be to “match” death records and summarize the “capture history” of each record in a format applicable for analysis with the [DGA package in R](#). Steps are as follows:

- 1) For each death list, remove any special characters and spaces from all string variables, and convert all characters to lowercase. Deaths that occurred outside the data collection sites or outside the recall period of interest will be excluded at the end of the deduplication and matching processes.
- 2) Use the compare.dedup function in “[RecordLinkage](#)” package to check for duplicates within each list. Weights are calculated to evaluate the strength of a match, however no set threshold will be used to determine whether a match is true or not. Remove confirmed duplicates and record in cleaning log.
- 3) Use compare.linkage function in “[RecordLinkage](#)” package to generate record pairs between lists. This comparison will be performed iteratively between each list collected. Matched pairs and possible pairs will be visually checked for confirmation.

- 4) A column will be created on each list to represent the other lists, and will be used to record captures on other lists (e.g List1_Match, List2_Match, etc.) and if there is a match that record will be given a value of 1, for no-match a value of 0. These columns will be considered as the “capture histories” for each death record.
- 5) Death records from all lists will be appended into one master list, dropping now duplicate records. A unique ID will be generated for each record.
 - a. Choose List #1 as the master list. Remove records from all other lists that have a match with List 1.
 - b. Look at List #2. Remove matches all other lists that have a match with List 2. Append List 2 onto the master list, List 1.
 - c. Repeat step b for any remaining lists.
- 6) All columns will be dropped keeping the “list match” columns and dropping everything else. These “list match” columns are defined as the “capture histories” for these deaths.

Data Analysis – CDR results will be calculated for each specific information source, as well as by two methods to aggregate the lists: (1) the Informant Method, and (2) Capture-Recapture analysis.

For the **Informant Method**, the total number of uniquely identified deaths are identified by all key informants or sources is merged together and treated as the total number of deaths, used for the CDR calculation in combination with the estimate of the mid-period population. Bootstrapping techniques will be used to calculate the CDR and corresponding confidence intervals, with the total unique captured deaths by all informant sources used as the numerator and bootstrap sampling of the population parameters below for the denominator.

$$CDR = \frac{\text{captured deaths}}{(\text{Mean household size} * \text{num. households}) - 0.5\text{num. inmigrants} - 0.5\text{num. births} + 0.5\text{num. outmigrants} + 0.5\text{num. deaths}}$$

For **capture-recapture analysis**, the “true” total number of deaths is estimated based upon the overlap of reporting same deaths between different key informants or mortality sources. There are two main approaches to this analysis, the “model-selection” approach, where a single model is fit to estimate the uncaptured deaths, or **Bayesian Model Averaging**^{8,9}, where the highest probability estimate of the number of uncaptured deaths is attained by averaging the probability across several models. There are noted limitations in choosing and selecting any single model for the total estimation of deaths, as there is still a given amount of certainty in the results, hence Bayesian Model Averaging can help improve the reliability of the estimation. Several packages exist to help facilitate these calculations, however we will be using R version 3.5.2 with the “DGA” package. The CDR will be similarly calculated as with the key informant method, however an additional parameter of “uncaptured deaths” will added to the numerator and be bootstrapped from the weighted sum likelihood profiles given by the DGA package.

For either of the above methods for determining the total deaths, the **population denominator** is needed to calculate the CDR and U5DR. Several options are available for estimating this, though which option is best will be determined during field work when on the ground information can be used for triangulation:

- 1) Listing of heads of household provided by community chief. The household size, sex and age composition, will be determined by the SMART survey and can be applied to the total households. (To be collected)
- 2) Population figures provided in SMART sampling frame (TBD)

3. Roles and responsibilities

Table 2: Description of roles and responsibilities

⁸ Jennifer A. Hoeting, David Madigan, Adrian E. Raftery and Chris T. Volinsky. Bayesian Model Averaging: A Tutorial. 1999 Statistical Science. Vol. 14. No. 4

⁹ International Working Group for Disease Monitoring and Forecasting. Capture-Recapture and Multiple-Systems Estimation I: History and Theoretical Development. 1995. American Journal of Epidemiology.

Task Description	Responsible	Accountable	Consulted	Informed
Research design	Nutrition Assessment Officer	Nutrition Assessment Officer	Research Design Unit, Medair, NIWG	Assessment Manager
Supervising data collection	Nutrition Assessment Officer, MEDAIR	Nutrition Assessment Officer	Research Design Unit,	Assessment Manager
Data processing (checking, cleaning)	Nutrition Assessment Officer	Nutrition Assessment Officer	Data Unit	Assessment Manager
Data analysis	Nutrition Assessment Officer	Nutrition Assessment Officer	Data Unit, MEDAIR	Assessment Manager
Output production	Nutrition Assessment Officer	Nutrition Assessment Officer	Reporting Unit, MEDAIR	Assessment Manager
Dissemination	Nutrition Assessment Officer	Nutrition Assessment Officer	Reporting Unit, MEDAIR	Assessment Manager
Monitoring & Evaluation	Communications Manager	Communications Manager	Research Design Unit	Country Coordinator
Lessons learned	Nutrition Assessment Officer	Nutrition Assessment Officer	Research Design Unit	Assessment Manager

Responsible: the person(s) who executes the task

Accountable: the person who validates the completion of the task and is accountable of the final output or milestone

Consulted: the person(s) who must be consulted when the task is implemented

Informed: the person(s) who need to be informed when the task is completed

NB: Only one person can be Accountable; the only scenario when the same person is listed twice for a task is when the same person is both Responsible and Accountable.

Data Analysis Plan

TOOL 1: SMART HOUSEHOLD SURVEY TOOL

Research questions	IN #	Data collection method	Indicator / Variable	Questionnaire Question	Questionnaire Responses	Data collection level
RQ1: What is the prevalence of Global Acute Malnutrition (GAM) among children 6 to 59 months in Aweil Centre County?		HH survey	Date of birth	What is the date of birth of [child name]? (ask for birth record)	Date	Individual child (0-59 months)
		HH survey	Age in months	How old is [child name] in months? (use local events calendar)	Integer	Individual child (0-59 months)
		HH survey	Sex of child	What is the sex of [child name]	1 = Male 2= Female	Individual child (0-59 months)

	HH survey	Weight (kg)	What is the weight of [child name]?	Integer	Individual child (6-59 months)
	HH survey	Height (cm)	What is the height of [child name]?	Integer	Individual child (6-59 months)
	HH survey	MUAC (mm)	What is the MUAC of [child name]?	Decimal	Individual child (6-59 months)
	HH survey	Oedema	Does [child name] have oedema?	1 = Yes 0 = No 98 = DK 99 = NR	Individual child (6-59 months)
RQ2: What is the crude death rate (CDR) and under-five death rate (U5DR) for host community and population living in camp-like settings in Aweil Centre County?	HH survey	Name household member	What is the HH member's name?	Text	Individual
	HH survey	Sex household member	What is the sex of [name]?	1 = Male 2 = Female	Individual
	HH survey	Age (years)	What is the age in years of [name]?	Integer	Individual
	HH survey	Joined HH during recall period	Has [name] joined the household since [recall event]?	1 = Yes 0 = No 98 = DK 99 = NR	Individual
	HH survey	Left household during recall period	Has [name] left the household since [recall event]?	1 = Yes 0 = No 98 = DK 99 = NR	Individual
	HH survey	Born during recall period	Has [name] born in the household since [recall event]?	1 = Yes 0 = No 98 = DK 99 = NR	Individual
	HH survey	Died during recall period	Has [name] died the household since [recall event]?	1 = Yes 0 = No 98 = DK 99 = NR	Individual
	HH survey	Cause of death	What was the cause of death?	1 = Illness 2 = Injury/Trauma 97 = Other 98 = DK 99 = NR	Individual
	HH survey	Location of death	Where did the person die?	1 = Current location 2 = During migration 3 = Place of last residence 97 = Other 98 = DK 99 = NR	Individual
RQ3: What is the proxy coverage of Medair nutrition programs in Aweil Centre County?	HH survey	Coverage of feeding programs	Is this child currently in any feeding program?	0 = No 1 = OTP 2 = TSFP 3 = SC	Household
	HH survey	Coverage for Care groups	Are you part of a Care Group OR does a Care Group Volunteer regularly visit you at your home or talk to you in a group with other mothers in your neighbourhood about health, hygiene and nutrition related topics?	1 = Yes 0 = No 98 = DK 99 = NR	Household
RQ4: What are the vulnerabilities for	HH survey	Sex head of household	What is the sex of the head of household?	1 = Male 2 = Female	Household

population living in Aweil Centre County?	HH survey	Elderly head of household	What is the age of the head of household?	Integer	Household
	HH survey	Pregnant or lactating woman	Is there a pregnant or breastfeeding woman in the household?	1 = Yes 0 = No 98 = DK 99 = NR	Household
	HH survey	Separated or unaccompanied children	Are there any children living in your household who are not staying with their parents?	1 = Yes 0 = No 98 = DK 99 = NR	Household
	HH survey	Chronically ill or disabled HH member	Is there any household member that has been ill for more than 3 months, or is mentally/physically disabled?	1 = Yes 0 = No 98 = DK 99 = NR	Household
RQ5: What are the food security and livelihoods needs and conditions for host community and population living in camp-like settings in Aweil Centre County?	HH survey	Food Consumption Score	How many days over the last 7 days, did members of your household eat the following food items, prepared and/or consumed at home? <ul style="list-style-type: none"> - Cereals, grains, roots and tubers, including wild roots: - Legumes / nuts: - Milk and other dairy products: - Meat, fish and eggs: - Vegetables and Leaves, including all wild vegetables and leaves: - Fruits including wild fruits: - Oil / fat / butter: - Sugar, or sweet: - Condiments / Spices: 	Integer (0 to 7) For each food group	Household
	HH survey	Household Dietary Diversity Score (HDDS)	Did your household eat any of the listed food items yesterday during the day and night? <ul style="list-style-type: none"> - Cereals and grains: - Roots and tubers, including wild roots: - FLESH meat: - Organ meat: - Fish/shellfish: - Eggs - Orange vegetables - Green leafy vegetables: - Orange fruits 	1 = Yes 0 = No 98 = DK 99 = NR For each food group	Household
	HH survey	Household Hunger Scale	In the past 4 weeks (30 days), was there ever no food to eat of any kind in your house because of lack of resources to get food?	1 = Yes 0 = No 98 = DK 99 = NR	Household

	HH survey	Household Hunger Scale	How often did this happen in the past [4 weeks/30 days]?	1 = Rarely (1-2 times) 2 = Sometimes (3-10 times) 3 = Often (more than 10 times)	Household
	HH survey	Household Hunger Scale	In the past 4 weeks (30 days), did you or any household member go to sleep at night hungry because there was not enough food?	1 = Yes 0 = No 98 = DK 99 = NR	Household
	HH survey	Household Hunger Scale	How often did this happen in the past [4 weeks/30 days]?	1 = Rarely (1-2 times) 2 = Sometimes (3-10 times) 3 = Often (more than 10 times)	Household
	HH survey	Household Hunger Scale	In the past 4 weeks (30 days), did you or any household member go a whole day and night without eating anything at all because there was not enough food?	1 = Yes 0 = No 98 = DK 99 = NR	Household
	HH survey	Household Hunger Scale	How often did this happen in the past [4 weeks/30 days]?	1 = Rarely (1-2 times) 2 = Sometimes (3-10 times) 3 = Often (more than 10 times)	Household
	HH survey	Reduced Coping Strategies Index (rCSI)	In the past 7 days, if there have been times when you did not have enough food or money to buy food, how often has your households had to : <ul style="list-style-type: none"> - Rely on less preferred and less expensive food - Limit portion size at meals - Restrict consumption by adults in order for small children to eat - Borrow food or rely on help from friends or relatives - Restrict the consumption of elderly household members - Restrict the consumption of adult women in the household 	Integer (0 to 7) For each behaviour group	Household
	HH survey	Main source of food last 7 days	What was the household's main source of Cereals, Grains, Roots and tubers in the past 7 days?	1 = Own production (crops, animals) 2 = Market (purchase on cash or credit) 3 = Food assistance 4 = Hunting / Fishing 5 = Borrowing food from neighbours or family 6 = Exchange food for labour	Household

				7 = Gifts from neighbours / relatives 8 – Wild food collection (i.e. fruit and leaves) 97 = Other 98 = DK 99 = NR	
	HH survey	Main source of income/livelihoods	What was the household's main source of income in the past 3 months?	0 = No income 1 = Agriculture and sale of crops 2 = Livestock and sale of livestock or livestock products and poultry 3 = Sale of alcoholic beverages 4 = Casual labour 5 = Skilled labour 6 = Trader / shop owner 7 = Salaried work (public/private) 8 = Sale of natural resources (firewood, charcoal, grass, etc.) 9 = Borrowing 10 = Fishing or sale of fish 11 = Kinship support from family/friends (remittances) 12 = Begging 13 = Food assistance/sale of food assistance 14 = Gathering of wild foods and hunting 97 = Other 98 = DK 99 = NR	Household
	HH survey	Livelihood coping strategies	During the past 30 days, did you or anyone in your household do any of the following due to a lack of food or money to buy food? (answer for each below) (0) None (1) Sell household assets or goods (2) Send any household members to eat elsewhere (3) Sell more animals than usual (4) Consume seed stocks intended for planting, including any seeds from a distribution (5) Borrow money and/or purchase food on credit (6) Sell productive assets or means of transport (panga, hoe, tools, bicycle, etc.) (7) Reduce essential non-food expenses,	1 = Yes 2 = No, because I didn't have a shortage of food 3 = No, because I've already exhausted that strategy 4 = No, it is not applicable to me	Household

			such as health or education (8) Engage in risky or illegal activities like theft, prostitution, raiding (9) Sell the last female animal (10) Entire household migrates		
	HH survey	Shocks experienced in last 6 months	Has your household experienced any difficulties or shocks ¹⁰ in the past 6 months? (don't read answers out loud)	0 = None 1 = Loss or reduced employment for HH member(s) 2 = Reduced income of a household member(s) 3 = Serious illness or accident of HH member(s) 4 = Death of working HH member/head of household/Spouse 5 = Unusually high food prices 6 = Unusually high prices of fuel/transport and other non-food prices 7 = Drought/irregular rains, prolonged dry spell 8 = Unusually high level of crop pests and disease 9 = Insecurity/violence/theft 10 = Epidemics (human disease outbreak) 97 = Other 98 = DK 99 = NR	Household
	HH survey	Household had access to land for agriculture last season	Did you have access to land for agriculture?	0 = No, Not applicable to me 1 = Yes, this year and last year 2 = Yes, this year but not last year 3 = Not this year, but yes last year 4 = Not this year and not last year 98 = DK 99 = NR	Household
	HH survey	Household planted/harvested last season	Did you plant last season (2018)?	0 = No, did not plant or harvest 1 = Yes, planted and harvested 2 = Yes, planted but partially harvested 3 = Yes, planted but no harvest 98 = DK 99 = NR	Household
	HH survey	Household has access to land for agriculture this season	Do you have access to land this season (2019)?	1 = Yes 0 = No 98 = DK 99 = NR	Household
	HH survey	Household plans for planting this season	Have you or will you plant this season (2019)?	0 = No, did not plant or harvest	Household

¹⁰ An abnormal event which negatively affects a household's ability to access resources, resources, or food

					<p>1 = Yes, planted and harvested</p> <p>2 = Yes, planted but partially harvested</p> <p>3 = Yes, planted but no harvest</p> <p>98 = DK</p> <p>99 = NR</p>	
RQ6: What are the water, sanitation and hygiene needs and conditions for population in Aweil Centre County?		HH survey	Main drinking water source	What is your household's main source of drinking water?	<p>1= Borehole</p> <p>2= Tap stand</p> <p>3= River/stream</p> <p>4= Unprotected well</p> <p>5= Swamp</p> <p>6= Puddle/stagnant water</p> <p>7= Hand dug well</p> <p>97 = Other</p> <p>98= I don't know</p> <p>99= I don't want to answer</p>	Household
		HH survey	Household collects water < 30min	How long does it take for you to collect water (walking from your household to your main water drinking collection point, waiting there, filling the container and returning home)?	<p>1 = Water available</p> <p>2 = inside the compound</p> <p>3 = Under 30 minutes</p> <p>4 = 30 minutes to less than 1 hour</p> <p>5 = 1 hour to less than 6 = half a day</p> <p>7 = Half a day</p> <p>8 = More than half a day</p> <p>97 = Other</p> <p>98= I don't know</p> <p>99= I don't want to answer</p>	Household
		HH survey	% HH with 15 l/p/d household water	<p>Can you show me all the water containers you have in this household?</p> <p>(enter the number of each type of container used to collect water)</p> <ul style="list-style-type: none"> - 20L bucket - 14L bucket - 20L rigid jerry can - 10L jerry can - 5L collapsible jerry can - 5L oil jerry can - 2L jug - Other 	Integer	Household
		HH survey		How many times did you fill each container yesterday from the water point (including for drinking, cooking, bathing and laundry.	Integer	Household
	Observation	% HH safely storing drinking water	Are the containers used for storing drinking and cooking water covered and clean?	<p>1=Yes, all containers cleaned and covered</p> <p>0 = None (or only some) of the containers are clean and covered</p>	Household	

	HH survey	Household latrine access	Is there a family, shared or communal latrine in your settlement?	0 = No 1= Family latrine 2= Communal/ institutional latrine (in marketplace, school, etc.) 3= Shared latrine (between neighbouring HHs) .97 = Other 98= DK 99= NR	Household
	HH survey	Household latrine utilization	In the last two weeks, where did you usually go to the toilet (Defecate)?	1= In the bush 2= In the river 3= Dig a shallow hole and fill in (also known as the cat method) 4= I always use a latrine 97 = Other 98= DK 99= NR	Individual (mother)
	HH survey	% mothers who report washing their hands 3 of 5 critical times in the last 48 hours	Do you use a cleansing agent to wash your hands?	1 = Yes 0 = No	Individual (mother)
	HH survey		What cleansing agent do you use to wash your hands?	1 = water only 2 = soap (appears in one minute) 3 = soap (doesn't appear in one minute) 4 = ash 97 = other	
	HH survey		When did you wash your hands with a cleansing agent in the last 48 hours? (select all that apply)	1 = after defecation 2 = after attending a child that defecated 3 = before cooking 4 = before eating 5 = before feeding a child 6 = other (specify)	Individual (mother)
RQ7: What are the health needs and conditions for under-5 children population in Aweil Centre County?	HH survey	Vitamin A supplementation in last 6 months (6-59 months)	Has [name] received a capsule of vitamin A during the last 6 months?	1 = Yes 0 = No 98 = DK 99 = NR	Individual (6-59 months)
	HH survey	Measles vaccination (9-59 months)	Was [child name] vaccinated against measles?	1=Yes (seen vaccination book) 2=Yes, according to the memory of the mother and verbal narrative 3=No	Individual (9-59 months)
	HH survey	Deworming treatment (12-59 months)	Has [name] received any de-worming treatment during the last 6 months?	1 = Yes 0 = No 98 = DK 99 = NR	Individual (12-59 months)
	HH survey	Illness in past 2 weeks	Has [NAME] had any illness in the last 2 weeks?	0=No 1=Diarrhea 2=Fever 3=Cough (fast/difficult breathing) 98 = DK 99 = NR	Individual (0-59 months)
	HH survey	Treatment sought for illness in past 2 weeks	What treatment was sought for [child name]?	0 = None 1 = Hospital 2 = PHCC/U 3 = Mobile outreach clinic 4 = Community based distributor (CBD)	Individual (0-59 months)

					5 = Pharmacy / store 6 = Private clinic 97 = Other 98 = DK 99 = NR		
	HH survey	Child slept under LLITN last night	Did [child name] sleep under a mosquito net (LLITN) last night?	1 = Yes 0 = No 98 = DK 99 = NR		Individual (0-59 months)	
	HH survey	PLW status	What is the status of the woman?	0 = None 1 = Pregnant 2 = Breastfeeding 3 = Pregnant and Breastfeeding		Individual (PLW)	
	HH survey	Maternal MUAC	What is the MUAC of the mother? (mm)			Individual (PLW)	
RQ8: What are the infant and young child feeding practices for under-2 children in Aweil Centre County?	HH survey	All IYCF Indicators (these are composite indicators, hence why cover all these questions)	Has [NAME] ever been breastfed?	1 = Yes 0 = No 98 = DK 99 = NR		Individual (0-23 months)	
	HH survey	Child ever breastfed	How long after birth did you first put [NAME] to the breast?	1 = Less than one hour 2 = Between 1 and 23 hours 3 = More than 24 hours 98 = DK 99 = NR		Individual (0-23 months)	
	HH survey	Early initiation of breastfeeding	Was (NAME) breastfed yesterday during the day or at night?	1 = Yes 0 = No 98 = DK 99 = NR		Individual (0-23 months)	
	HH survey	Exclusive breastfeeding	Yesterday, during the day or at night, did [NAME] receive any of the following liquids?	1 = Yes 0 = No 98 = DK 99 = NR		Individual (0-23 months)	
			Continued breastfeeding at 1 year	- Plain water - Juice or juice drinks			
			Continued breastfeeding at age 2 years	- clear Broth - Thin Porridge - Other water base liquids	For each liquid		
	HH survey	Introduction of solid, semi-solid and iron-fortified foods	Yesterday, during the day or at night, did [NAME] receive any of the following liquids?		Integer (how many times)	Individual (0-23 months)	
		Minimum dietary diversity (MDD)	- Infant formula - Milk such as tinned, powdered, or fresh animal milk		For each liquid		
		Minimum meal frequency (MMF)	- Sour milk or Yoghurt				
	HH survey	Minimum acceptable diet (MAD)	Describe what did (NAME) eat yesterday during the day or night, whether at home or outside the home since (NAME) woke up yesterday until NAME went to sleep?	1 = Yes 0 = No 98 = DK 99 = NR		Individual (0-23 months)	
			- Cereals, flours, grains, roots and tubers		For each food group		

			<ul style="list-style-type: none"> - legumes and nuts (Beans, Peas, Lentils, Nuts and Seeds) - dairy products (milk, yogurt, cheese) - flesh foods (meat, fish, poultry and liver/organ meats) - eggs - vitamin-A rich fruits and vegetables (carrot, red pepper, pumpkin, Ripe Mangoes, papaya) - other fruits and vegetables (Avocado, Banana, Apple, Grapes, Guava, Lemon, Pineapple, Cabbage, onions, tomatoes, etc) 		
		HH survey	How many times did [child's name] eat solid or semi-solid food other than liquids yesterday during the day or at night?	Integer	Individual (0-23 months)
		HH survey	Yesterday during the day/night, did [child's name] consume any food given by a health centre for the treatment of malnutrition (Plumpy'Nut, Plumpy' sup, Plumpy'Nut dose, sprinkles/sachet etc) OR fortified food (porridge consisting of several meal mixed, CSB) OR any food with added a micronutrient powder(MNP)?	1 = Yes 0 = No 98 = DK 99 = NR	Individual (0-23 months)

TOOL 2: DEATH LISTING FORM

Research questions	IN #	Data collection method	Indicator / Variable	Questionnaire Question	Questionnaire Responses	Data collection level
RQ2: What is the crude death rate (CDR) and under-five death rate (U5DR) for population Aweil Centre County?		Key informant or data source (TBD)	Mortality source	What is the source of the reported death?	1 = Wunda / Village Chief / Deputy 2 = Religious Leader (Mosque/Church) 3 = Village Admin 4 = Teacher 5 = Elderly Man 6 = Elderly Woman	Individual
	2.13	Key informant or data source (TBD)	First Name	What was the name of the deceased?	Text	Individual

	2.14	Key informant or data source (TBD)	Father's Name	What was father's name?	Text	Individual
	2.15	Key informant or data source (TBD)	Grandfather's Name	What was the grandfather's name?	Text	Individual
	2.16	Key informant or data source (TBD)	Sex	What was the sex of the deceased?	1. Male 2. Female 3. DK 4. NR	Individual
	2.17	Key informant or data source (TBD)	Age of death known	Do you know the age of the person when they died?	1. Yes 2. No	Individual
	2.18	Key informant or data source (TBD)	Age at Death	How old was the deceased when he or she died?	Integer	Individual
	2.19	Key informant or data source (TBD)	Died between recall periods	Did THIS PERSON die since the recall event?	1. Yes 2. No	Individual
	2.20	Key informant or data source (TBD)	Date of death known	Do you know the date the person died?	1. Yes 2. No	Individual
	2.21	Key informant or data source (TBD)	Date of death	What was the date of death?	Date	Individual
	2.22	Key informant or data source (TBD)	Place of death	Where did the person die?	1. Current location 2. During migration 3. In place of last residence 4. Other	Individual
	2.23	Key informant or data source (TBD)	Cause of death	What was the cause of death?	1. Illness 2. Trauma/Injury 3. Other	Individual
	2.24	Key informant or data source (TBD)	Christian or Other Name	Does the deceased have a Christian or any other name?	TBD	Individual

**Additional acceptable matching characteristics between deaths will be identified at the field level.*

TOOL 3: KEY INFORMANT FORM

Research questions	IN #	Data collection method	Indicator / Variable	Questionnaire Question	Questionnaire Responses	Data collection level
RQ2: What is the crude death rate (CDR) and under-five death rate (U5DR) for population in Aweil Centre County?		Key informant or data source (TBD)	Type of respondent	Who is this respondent?	Village chief / Deputy Elderly Man Elderly Woman Religious leader (church or mosque) Other	Settlement
	2.13	Key informant or data source (TBD)	Age of respondent	What is the age of the respondent?	Integer	Settlement

	2.14	Key informant or data source (TBD)	% of settlements where received humanitarian assistance in last 6 months	Has ANY humanitarian assistance been accessed by people in \${site_name} in the past 6 months?	<p>Yes</p> <p>No</p> <p>Don't know</p> <p>No response</p>	Settlement
	2.15	Key informant or data source (TBD)	% of settlements where residents reportedly need most a type of assistance, by type	What type of assistance do people in \${site_name} need the most?	<p>None, people do not need assistance</p> <p>Nutrition</p> <p>Shelter</p> <p>Non-food items (NFI)</p> <p>Water, Sanitation, Hygiene (WASH)</p> <p>Health</p> <p>Food</p> <p>Livelihood</p> <p>Protection</p> <p>Peace building</p> <p>Communication</p> <p>Education</p> <p>Other</p> <p>Don't know</p> <p>No response</p>	Settlement
	2.16	Key informant or data source (TBD)	% of settlements where residents reportedly have preference for receiving info on assistance by mode of information	How would most people in \${site_name} prefer to receive information about assistance?	<p>Phone call</p> <p>Text message (phone)</p> <p>In person (community meeting in the settlement with humanitarian workers)</p> <p>Through word of mouth (through other members of the community)</p> <p>Television</p> <p>Radio</p> <p>Newspaper</p> <p>Posters</p> <p>Leaflets</p> <p>Loudspeaker</p> <p>Email</p> <p>Social media (Facebook, Whatsapp, Viber, etc.)</p> <p>Other</p>	Settlement
	2.17	Key informant or data source (TBD)	% of settlements where residents reportedly received assistance in the last 6 months and were satisfied	If people in \${site_name} have received assistance in the last 6 months, were most people satisfied with that assistance?	<p>Yes</p> <p>No</p> <p>Don't know</p> <p>No response</p>	Settlement
	2.18	Key informant or data source (TBD)	% of settlements where residents reportedly received assistance in the last 6 months and were not satisfied, by reason for dissatisfaction	What is the main reason for dissatisfaction with the assistance?	<p>Does not target the right beneficiaries</p> <p>Insufficient</p> <p>Not what is most needed</p> <p>Does not help people become more self-reliant</p> <p>The assistance comes for a short period and then stops</p> <p>Most of the community is not aware that the services exist</p>	Settlement

					<p>Most of the community is not aware how to access the services</p> <p>People face safety concerns when accessing assistance</p> <p>Assistance is delivered too far</p> <p>Other</p>	
2.19	Key informant or data source (TBD)	% of settlements where hunger was reportedly bad, by severity	In the last month, how bad was hunger for MOST people because they were not able to access enough food in \${site_name}?	<p>Almost no hunger</p> <p>Hunger is small, strategies are available to cope with the reduced access to food</p> <p>Hunger is bad, limited options to cope with the reduced access to food</p> <p>Hunger is the worst it can be, all over the settlement, and causing many deaths</p> <p>I don't know or don't want to answer</p>	Settlement	
2.20	Key informant or data source (TBD)	% of settlements where child malnutrition was reportedly bad, by severity	In the last month, how bad has malnutrition with children been in \${site_name}?	<p>NONE of children are malnourished and NONE are getting sick</p> <p>LESS THAN HALF of children are malnourished and only a few are getting sick</p> <p>HALF of children are malnourished and some are getting sick.</p> <p>MORE THAN HALF of children are malnourished and many are getting sick</p> <p>ALL OR NEARLY ALL children are malnourished. Malnutrition with children is the worst we have seen and most are getting sick.</p> <p>I don't know or don't want to answer</p>	Settlement	
2.21	Key informant or data source (TBD)	% of settlements where mortality has reportedly increased in the last month	In the last month, have MORE people died than in the months BEFORE for any reason in \${site_name}?	<p>Yes</p> <p>No</p> <p>Don't know</p> <p>No response</p>	Settlement	
2.22	Key informant or data source (TBD)	% of settlements where the arrival of IDPs or returnees has reportedly impacted access to enough food, by severity of impact	In the last month, has the arrival of IDPs or returnees had any impact on the ability to access enough food for MOST people in \${site_name}?	<p>Positive Impact</p> <p>No impact</p> <p>Small impact</p> <p>Large impact</p> <p>I don't know or don't want to answer</p>	Settlement	
2.23	Key informant or data source (TBD)	% of settlements where increase in cereal prices has reportedly impacted the ability to access enough food in the last month	In the last month, has the increase in cereal price had any impact on the ability to access enough food for MOST people in \${site_name}?	<p>No impact</p> <p>Small impact</p> <p>Large impact</p> <p>I don't know or don't want to answer</p>	Settlement	
2.24	Key informant or data source (TBD)	% of settlements where livestock diseases have reportedly impacted the ability to access enough food in the last month	In the last month, have livestock disease outbreaks had any impact on	<p>No impact</p> <p>Small impact</p> <p>Large impact</p> <p>I don't know or don't want to answer</p>	Settlement	

				the ability to access enough food for MOST people in \${site_name}?		
		Key informant or data source (TBD)	% of settlements where flooding reportedly made people leave their homes, by magnitude of households affected	In the last month, was there ANY flooding which made people leave their home and sleep somewhere else in \${site_name}?	No, none affected Yes less than half of HHs affected Yes, half of HHs affected Yes, more than half of HHs affected Yes, all HHs were affected	Settlement
		Key informant or data source (TBD)	% of settlements where flooding reportedly destroyed crops, by magnitude of households affected	In the last month, was there ANY flooding which destroyed crops in \${site_name}?	No, none affected Yes, less than half of HHs lost some or all crops Yes, half of HHs lost some or all crops Yes, more than half of HHs lost some or all crops Yes, all of HHs lost some or all crops	Settlement

5. Data Management Plan

- Please complete the Data Management Plan below

Administrative Data			
Research Cycle name	Aweil Center Multi-sectoral Needs Assessment		
Project Code	32DLF		
Donor	OFDA		
Project partners	Medair, UNICEF		
Research Contacts	Saeed Rahman, Nutrition Assessment Officer (saeed.rahman@reach-initiative.org)		
Data Management Plan Version	Date: 16/04/2019	Version: 01	
Related Policies	IMPACT Data Management SOPs for Personally Identifiable Information		
Documentation and Metadata			
What documentation and metadata will accompany the data? Select all that apply	<input checked="" type="checkbox"/>	Data analysis plan	<input checked="" type="checkbox"/> Data Cleaning Log, including: <input type="checkbox"/> Deletion Log <input type="checkbox"/> Value Change Log
	<input type="checkbox"/>	Code book	<input type="checkbox"/> Data Dictionary
	<input type="checkbox"/>	Metadata based on HDX Standards	<input type="checkbox"/> [Other, Specify]
Ethics and Legal Compliance			
Which ethical and legal measures will be taken?	<input checked="" type="checkbox"/>	Consent of participants to participate	<input checked="" type="checkbox"/> Consent of participants to share personal information with other agencies
	<input type="checkbox"/>	No collection of personally identifiable data will take place	<input checked="" type="checkbox"/> Gender, child protection and other protection issues are taken into account
	<input checked="" type="checkbox"/>	All participants reached age of maturity	[Other, Specify]
Who will own the	Medair		

copyright and Intellectual Property Rights for the data that is collected?

Storage and Backup			
Where will data be stored and backed up during the research?	<input type="checkbox"/>	IMPACT/REACH Kobo Server	X Other Kobo Server: <i>[specify]</i>
	<input type="checkbox"/>	IMPACT Global Physical / Cloud Server	<input type="checkbox"/> Country/Internal Server
	<input type="checkbox"/>	On devices held by REACH staff	X Physical location <i>[REACH Juba Office, locked in secure location]</i>
	X	[Paper forms with identifiable information will be destroyed after 1 month, after no longer needed for data analysis.]	
Which data access and security measures have been taken?	<input type="checkbox"/>	Password protection on devices/servers	X Data access is limited to <i>[Limited to REACH staff]</i>
	<input type="checkbox"/>	Form and data encryption on data collection server	X Partners signed an MoU if accessing raw data
	<input type="checkbox"/>	[Other, Specify]	
Kobo Access Rights			
Kobo Access	Person	Account Name	
View Form	Medair M&E Manager	REACH will not access, Medair will share files	
View and Edit Form	Medair M&E Manager	REACH will not access, Medair will share files	
View Form and Submit Data	Medair M&E Manager	REACH will not access, Medair will share files	
Download Data	Medair M&E Manager	REACH will not access, Medair will share files	
Raw Data Access Rights			
Raw Data Access	Reason	Person	
Accountable	Accountable	<i>Medair M&E Team</i>	
Access	<i>Analysis Purposes</i>	<i>Saeed Rahman</i>	
Preservation			
Where will data be stored for long-term preservation?	<input type="checkbox"/>	IMPACT / REACH Global Cloud / Physical Server	<input type="checkbox"/> OCHA HDX
	X	REACH Country Server	<input type="checkbox"/> [Other, Specify]
Data Sharing			
Will the data be shared publically?	<input type="checkbox"/> Yes	X	No, only with mandating agency / body
Will all data be shared?	<input type="checkbox"/> Yes	X	No, only anonymized/ cleaned/ consolidated <i>[delete what does not apply]</i> data will be shared
	<input type="checkbox"/> No, [Other, Specify]		
Where will you share the data?	<input type="checkbox"/>	REACH Resource Centre	<input type="checkbox"/> OCHA HDX
	<input type="checkbox"/>	HumanitarianResponse	

Data protection risk assessment					
Have you completed the Indicators Risk Assessment table below?		<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No, no information that potentially allows identification of individuals is to be collected.		
[Please complete the first 4 columns in the Indicators Risk Assessment table below]					
Risk indicator	Type of identification risk	Disclosure implications	Benefits	Class	Required mitigation
Surname	Identification of KI reporting on deaths, including violence or conflict related deaths	Backlash from specific individuals or groups that may not want deaths reported	Deduplication of deaths, and matching of death records in the capture-recapture analysis	B1	Deleted immediately after data processing completed. Raw mortality KI dataset secured internally and only accessible to person listed as accountable for raw data above.
First name	Identification of KI reporting on deaths, including violence or conflict related deaths	Backlash from specific individuals or groups that may not want deaths reported	Deduplication of deaths, and matching of death records in the capture-recapture analysis	B1	Same as above
Any other identifying variable in the death listing (location of death, cause of death, age and sex of deceased, date of death, other identifying variables to be identified.)	Identification of KI reporting on deaths, including violence or conflict related deaths	Backlash from specific individuals or groups that may not want deaths reported	Deduplication of deaths, and matching of death records in the capture-recapture analysis	B1	Same as above
GPS coordinates	Identification of KI reporting on deaths, including violence or conflict related deaths	Backlash from specific individuals or groups that may not want deaths reported	Quality checks on data collection	B1	Deleted immediately after data cleaning completed.
Responsibilities					
Data collection	Saeed Rahman, Nutrition Assessment Officer, saeed.rahman@reach-initiative.org				
Data cleaning	Saeed Rahman, Nutrition Assessment Officer, saeed.rahman@reach-initiative.org				
Data analysis	Saeed Rahman, Nutrition Assessment Officer, saeed.rahman@reach-initiative.org				
Data sharing/uploading	Saeed Rahman, Nutrition Assessment Officer, saeed.rahman@reach-initiative.org				

6. Monitoring & Evaluation Plan

- Please complete the M&E Plan column in the table and use the corresponding Tools in the Monitoring & Evaluation matrix to implement the plan during the research cycle.

IMPACT Objective	External M&E Indicator	Internal M&E Indicator	Focal point	Tool	Will indicator be tracked?
Humanitarian stakeholders are accessing IMPACT products	Number of humanitarian organisations accessing IMPACT services/products Number of individuals accessing IMPACT services/products	# of downloads of x product from Resource Center	Country request to HQ	User_log	X Yes
		# of downloads of x product from Relief Web	Country request to HQ		X Yes
		# of downloads of x product from Country level platforms	Country team		X Yes
		# of page clicks on x product from REACH global newsletter	Country request to HQ		X Yes
		# of page clicks on x product from country newsletter, sendingBlue, bit.ly	Country team		X Yes
		# of visits to x webmap/x dashboard	Country request to HQ		X Yes
IMPACT activities contribute to better program implementation and coordination of the humanitarian response	Number of humanitarian organisations utilizing IMPACT services/products	# references in HPC documents (HNO, SRP, Flash appeals, Cluster/sector strategies)	Country team	Reference_log	HNO 2020 South Sudan HRP 2020 Cluster strategies IPC Workshop
		# references in single agency documents			UN Agencies, INGOs and NNGOs strategic planning documents.
Humanitarian stakeholders are	Humanitarian actors use IMPACT evidence/products as a	Perceived relevance of IMPACT country-programs	Country team	Usage_Feed back and	Survey Monkey to be conducted following dissemination with cluster coordinators, key UN

<p>using IMPACT products</p>	<p>basis for decision making, aid planning and delivery</p> <p>Number of humanitarian documents (HNO, HRP, cluster/agency strategic plans, etc.) directly informed by IMPACT products</p>	<p>Perceived usefulness and influence of IMPACT outputs</p> <p>Recommendations to strengthen IMPACT programs</p> <p>Perceived capacity of IMPACT staff</p> <p>Perceived quality of outputs/programs</p> <p>Recommendations to strengthen IMPACT programs</p>		<p>Usage_Survey template</p>	<p>Agencies and INGOs, Humanitarian coordination bodies.</p>
<p>Humanitarian stakeholders are engaged in IMPACT programs throughout the research cycle</p>	<p>Number and/or percentage of humanitarian organizations directly contributing to IMPACT programs (<i>providing resources, participating to presentations, etc.</i>)</p>	<p># of organisations providing resources (i.e.staff, vehicles, meeting space, budget, etc.) for activity implementation</p> <p># of organisations/clusters inputting in research design and joint analysis</p> <p># of organisations/clusters attending briefings on findings;</p>	<p>Country team</p>	<p>Engagement_log</p>	<p>X Yes</p> <p>X Yes</p> <p>X Yes</p>

ANNEX 1: ABBREVIATIONS (IF RELEVANT)

BCC	Behaviour Change Communication
BMI	Body Mass Index
BMS	Breastmilk substitute
BSFP	Blanket Supplementary Feeding Program
CMR	Crude Mortality Rate
CMAM	Community Management of Acute Malnutrition
ENA	Emergency Nutrition Assessment
FANTA	Food and Nutrition Technical Assistance
GAM	Global Acute Malnutrition
GNC	Global Nutrition Cluster
ICCM	Integrated Community Case Management
IMAM	Integrated Management of Acute Malnutrition
MAM	Moderate Acute Malnutrition
MUAC	Mid-Upper Arm Circumference
OTP	Outpatient Therapeutic Program (for acute malnutrition)
PHCC	Primary Health Care Center
PHCU	Primary Health Care Unit
RUTF	Ready to Use Therapeutic Food (Plump nut)
RUSF	Ready to Use Supplementary Food (Plump sup)
SAM	Severe Acute Malnutrition
SC	Stabilization Center (inpatient treatment for acute malnutrition)
SMART	Standardized Methodology for Assessment in Relief and Transition
TSFP	Targeted supplementary feeding program
U5MR	Under five mortality rate
OEDEMA	Bilateral pitting oedema, or swelling of both feet, otherwise identified as a sign of oedema caused by malnutrition