

Moroto district in April 2010. Other districts that have reported cases are Kotido and Amudat. The case fatality rate in Moroto district was 1.9% by 20th May 2010.

In December 2009, the overall Global Acute Malnutrition (GAM) and Severe Acute Malnutrition (SAM) rate was 9.5% (7.8%-11.2%) and 1.8% (0.9%-2.6%) respectively. During the same period a nutritional anthropometric survey conducted by Makerere University unveiled similar results- GAM of 10.1% (9.3%-11.0%) and SAM of 2.1% (1.7%-2.6%).

Objectives

- To monitor the nutritional status of children aged between 6 and 59 months.
- To determine health, food security and Water Sanitation and Hygiene (WASH) factors linked to malnutrition
- To build the capacity of nutrition surveillance focal persons and health workers on running of the surveillance system.

Methodology

- A three stage cluster sampling method was used to select clusters and households. In stage one, 25 clusters of 12 households (sample of 300) were randomly selected in each of the 5 districts. In the second round, the sampling unit was changed to household instead of children as advised by Center for Disease Control (CDC) to eliminate selection biases and also ensure households without eligible children are included in the sample. The 25 clusters were distributed in each livelihood zone (agricultural, agro pastoral and pastoral) according to population size. This provided an opportunity of data analysis by both districts and livelihood zones. The population in the same livelihood zone is homogeneous and the result is more representative of the actual situation.
- In the second stage, accessible population of the villages was entered in EpiInfo/ENA software and clusters assigned randomly.
- In the third stage, using the simple ballot system, selected village or manyatta was segmented into units with 12 households (an estimate of one child per household was considered in Karamoja) based on locally accepted boundaries. Data was collected in a randomly selected zone. All children 6 - 59 months in the household were assessed and nutrition security questionnaire administered to all households.
- Five teams comprising of four health workers in each team collected data in each district for a period of 5 days. Action Against Hunger (ACF) surveillance staff provided technical support to field teams. Field work was conducted between 7th and 15th May 2010.

2. Anthropometric results

The GAM and SAM results in Table 1 below were calculated using EpiInfo/ENA software and SMART flags were excluded. The sample size for GAM and SAM based on WHO 2006 standards was: Nakapiripirit (288), Moroto (312), Kotido (343), Kaabong (292), and Abim (302).

Table 1: Nutrition and health status results

INDEX	INDICATOR	Moroto	Kotido	Kaabong	Nakapiripirit	Abim
WHO (2006)	Global Acute Malnutrition W/H < -2 z and/or oedema	14.7% (9.6%-21.9%)	10.8% (7.6%-15.1%)	13.0% (9.1%-18.2%)	9.0% (6.5%-12.5%)	8.3% (4.8%-13.9%)
	Severe Acute Malnutrition W/H < -3 z and/or oedema	3.5% (1.9%-6.4%)	1.5% (0.6%-3.3%)	1.4% (0.4% - 4.6%)	1.0% (0.3%-3.2%)	2.6% (1.2%-5.9%)
	Stunting W/H < -2 z	51.0% (43.8%-58.1%)	34.0% (28.1%-40.5%)	37.2% (30.6%-44.2%)	43.0% (37.4%-48.7%)	35.4% (29.2%-42.1%)
	Underweight W/H < -2 z	39.2% (33.2%-45.5%)	24.7% (16.9%-34.6%)	32.1% (25.5%-39.5%)	22.4% (17.6%-28.0%)	19.7% (14.6%-26.0%)
NCHS (1977)	Global Acute Malnutrition W/H < -2 z and/or oedema	14.6% (9.4%-21.9%)	10.8% (7.6%-15.0%)	12.3% (7.8% - 18.9%)	7.9% (5.1%-12.1%)	7.5% (4.3%-12.9%)
	Severe Acute Malnutrition W/H < -3 z and/or oedema	1.6% (0.6%-4.4%)	1.5% (0.6%-3.4%)	0.3% (0.0% - 2.6%)	1.0% (0.3%-3.2%)	2.0% (0.7%-5.5%)
	Global Acute Malnutrition W/H < 80% and/or oedema	10.1% (6.5%-15.5%)	6.1% (3.8%-9.7%)	6.1% (3.7% - 10.1%)	4.5% (2.2%-9.0%)	4.9% (2.9% - 8.3%)
	Severe Acute Malnutrition W/H < 70% and/or oedema	1.3% (0.4%-4.2%)	0.0% (0.0% - 0.0%)	0.0% (0.0% - 0.0%)	0.0% (0.0% - 0.0%)	2.0% (0.7%-5.5%)
MUAC Height >65 cm	Global Acute Malnutrition (<125 mm)	18.6%	3.6%	9.9%	14.0%	5.1%
	Severe Acute Malnutrition (<115 mm)	4.2%	0.6%	1.4%	1.8%	2.0%
Number of SAM and MAM cases not in feeding program		15 26	6 23	1 22	4 21	7 13
Measles immunization coverage (≥ 9 months)		92.1%	97.5%	95.3%	92.1%	95.1%
Vitamin A supplementation in last 6 months		89.9%	98.5%	97.6%	96.2%	89.6%
Child morbidity in previous 2 weeks		68.6%	58.7%	84.6%	64.8%	79.9%

The results in brackets are expressed with 95% confidence.

Figure 2 below shows that GAM rates increased in all districts except Nakapiripirit with the significant increase noted in Kaabong (Two sided T test p value <0.05). Moderate Acute Malnutrition (MAM) forms the bulk of the malnutrition cases. There were still many cases (>50%) of SAM and MAM not covered by the feeding programs. The survey teams referred 105 MAM cases for treatment in community based Supplementary Feeding Program (SFP) in all the five districts.

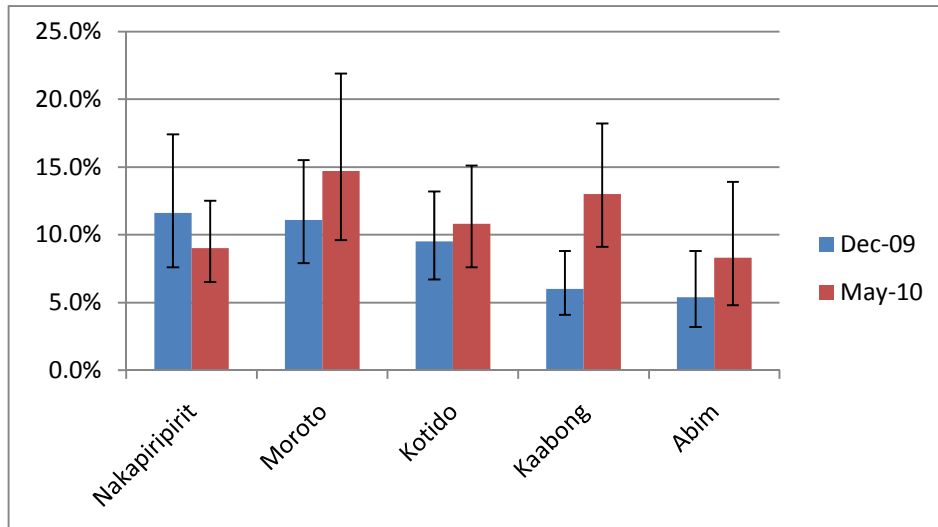


Figure 2: Trend of GAM in districts of Karamoja region

Figure 3 below illustrates that SAM rates declined slightly in Nakapiripirit and Kotido districts while slight increase was recorded in Moroto and Kaabong districts (p values >0.05). The increase in Abim district was significant (P value <0.05). A total number of 33 SAM cases not yet covered were referred to Out Patient Therapeutic Care (OTC) programs. The prevalence of SAM based on Weight for Height Z score (WFHZ) less than -3 SD of the WHO standards and those based on a MUAC cut-off of 115 mm were found to be similar (Pearson r=0.83 and coefficient of determination at 68%). The contributing factors linked to malnutrition in each district are summarized below.

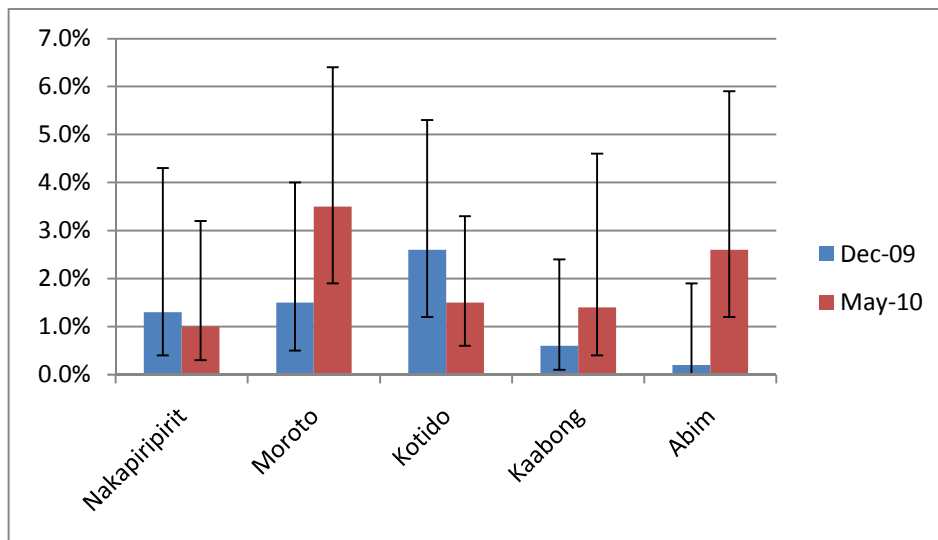


Figure 3: Trends of SAM in districts of Karamoja region

Table 2 below shows locations that had cases of acute malnutrition

Table 2: Distribution of malnutrition cases in geographical locations

District	Sub counties with high numbers of acute malnutrition cases
Nakapiripirit(25)	Namalu, Nabilatuk and Loroo
Moroto(41)	Nadunget, Rupa, Iriri, Ngoloriet, Matany and Lotome
Kotido(29)	Kacheri, Panyangara and Kotido
Kaabong(23)	Karenga, Kalapata, Kathile, Loyoro and Kapedo
Abim(20)	Morulem, Alerek and Nyakwae

The factors linked to malnutrition in each district are summarized below.

- Kaabong: End of General Food Distribution (GFD) in December 2009, temporary end of Supplementary Feeding Program in March contributed to many cases of Moderate Acute Malnutrition. Cattle raids in Kathile, Kalapata, Lolelia and Kapedo affected availability of milk, livestock for sale and reduced number of meals consumed by children.
- Moroto: Malnutrition in Rupa, Nadunget, Iriri, Lotome and other locations are linked to poor sanitary conditions (least latrine coverage in the region), limited accessibility in the rain season (Rupa and Iriri), disruptions in Plumpy Nut supply to health centres (late April through May), weak health centre and Village Health Team (VHT) linkage, sharing of supplementary and therapeutic food, and low access to milk.
- Kotido: Milk consumption declined, disease prevalence reduced, latrine usage increased, OTC operations affected by Plumpy Nut supply.
- Nakapiripirit: SFP was introduced in December; MAM cases are concentrated in Namalu and Nabilatuk. Cases of Malaria and diarrhea increased.
- Abim: Increased seasonal agricultural labour in a community dependent on cultivation compromised child care. No partner is supporting treatment of SAM in the district. VHTs are not doing community screening and support supervision to health centres is limited by lack of fuel for motor cycle transport. Shallow wells in Odolo East Katabok parish are suspected to be contaminated and could lead to water borne diseases.

Livelihood based results

The data from various livelihood zones was weighted and analyzed using complex sample frequency statistic in EpiInfo 3.5. The results are shown in Table 3 below.

Table 3: Nutrition status by livelihood zone (WHO standards)

Livelihood zone	Indicator	Dec 2009	May 2010
Agricultural (Dec 2009, N=709)	Global Acute Malnutrition W/H < -2 z and/or edema	10.3% (6.9%-13.7%)	12.9% (7.9%-17.8%)
	Severe Acute Malnutrition W/H < -3 z and/or edema	1.5% (0.0%-3.1%)	2.3% (0.9%-3.7%)
Agro-pastoral (Dec 2009, N=416)	Global Acute Malnutrition W/H < -2 z and/or edema	8.8% (5.4%-12.1%)	8.9% (5.5%-12.3%)
	Severe Acute Malnutrition W/H < -3 z and/or edema	1.4% (0.1%-2.7%)	1.4% (0.1%-2.7%)
Pastoral (Dec 2009, N=650)	Global Acute Malnutrition W/H < -2 z and/or edema	9.4% (7.0%-11.8%)	12.8% (9.6%-16.0%)
	Severe Acute Malnutrition W/H < -3 z and/or edema	2.1% (0.8%-3.5%)	1.6% (0.5%-2.7%)
Global (Dec 2009, N=1775)	Global Acute Malnutrition W/H < -2 z and/or edema	9.5% (7.8%-11.2%)	11.8% (9.6%-14.0%)
	Severe Acute Malnutrition W/H < -3 z and/or edema	1.8% (0.9%-2.6%)	1.8% (1.1%-2.5%)

There was insignificant increase in Global Acute Malnutrition in the agricultural zone (p value >0.05) while the change in the pastoral zone was almost significant (p value=0.05). The increase in the pastoral zones is not expected

since the period coincides with rain season in which pasture and water are easily available. However, access to milk and blood are constrained by keeping livestock in distant kraals, frequent cattle raiding and livestock diseases.

The overall GAM rate in Karamoja increased (p value =0.029) from 9.5% (7.8%-11.2%) to 11.8 % (9.6%-13.9%) while the SAM rate remained at the same level of 1.8%. This indicates that MAM forms the bulk of the malnutrition problem and hence the need to focus on underlying causes while more children need to be treated to reduce SAM.

3. Health Indicators

Over 90% of the children assessed in the region had been immunized against measles and received vitamin A supplementation which meets the Ministry of Health target of 85%. There was no significant change in this indicator between December 2009 and May 2010 results. No case of micronutrient deficiency was reported among the households assessed.

In May 2010, there was an increase in the proportion of children who suffered from childhood illnesses such as diarrhea and malaria across the four districts of Moroto, Kaabong, Abim and Nakapiripirit compared to December 2009 findings (Figure 4). Kotido registered a decline in child morbidity in all the three disease conditions while the number of Acute Respiratory Infection (ARI) cases increased in Nakapiripirit from 14.1% to 31.0% and Kaabong from 45.1% to 52.9% .The increase in diarrhea cases could be attributed to utilization of unsafe water from seasonal streams, wells and swamp water due to easy accessibility during rainy season as well as low pit latrine coverage in the region.

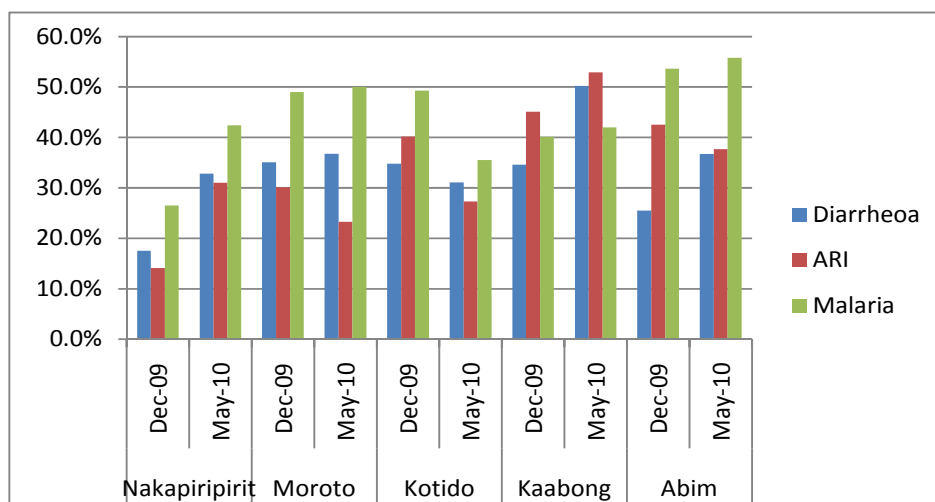


Figure 4: Childhood illnesses, 2 weeks retrospective assessment

Possession of mosquito nets by households reduced in all districts except Kotido as illustrated in Figure 5 below. Considering that mosquito nets are poorly used, the upsurge in malaria cases in the rain season is expected. The districts have also been experiencing a shortage of antimalarial drugs as reported during Moroto Health and Nutrition planning meeting in April 2010.

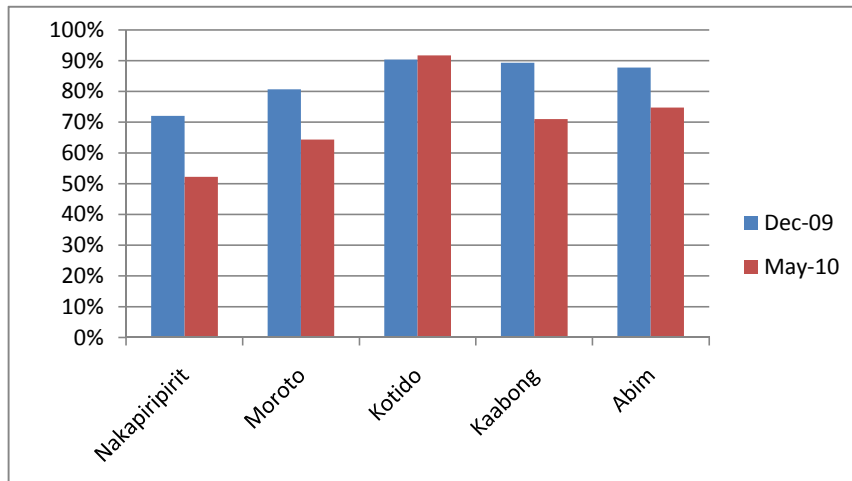


Figure 5: Mosquito net ownership

4. Food Security and Livelihood Indicators

Main food sources

Current results show increased reliance on buying as the main source of food especially in Moroto, Kotido and Kaabong districts (Figure 6). Cultivation was the main source of food in Abim district. The end of general food distribution in December 2009 and the temporary disruption of targeted food distribution in May 2010 contributed to many households dependency on food purchase. Prices of sorghum and maize were stable (approximately 500 and 600 Uganda shillings per 1 kilogram respectively). Prices of cereals in Nakapiripirit were lower than other districts. The region has been receiving rainfall as from the first quarter of 2010 and many households have made efforts to cultivate crops such as maize and sorghum. Green maize is expected to be ready by August. Continued heavy rainfall is likely to affect crop performance as it has been reported in lowland areas of Nakapiripirit district⁴.

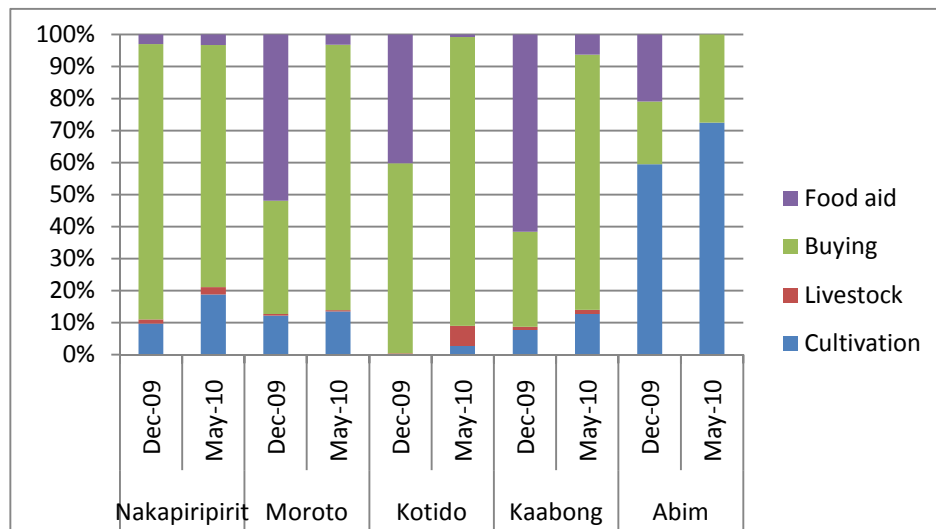


Figure 6: Food sources

Coping mechanisms such as kinship support, gathering, domestic labour in exchange for food, farm labour and stone quarrying were noted among households. In Moroto and Kotido districts kinship support increased from 0.3% to 1.9% and 0.4% to 2.0% respectively. Large scale cattle raiding in Kaabong district (Kalapata, Kathile, Kapedo and Lolelia)

⁴ Nakapiripirit district local government, Report on floods, May 2010.

affected household asset base and access to milk. Fears of theft of oxen during ploughing of gardens were reported by key informants.

Household Dietary Diversity Score (HDDS)

A 24 hour food recall period was used to assess foods consumed by household members at household level. Figure 7 below shows the trend of mean HDDS. Most households consumed cereals, vegetables, oils and spices.

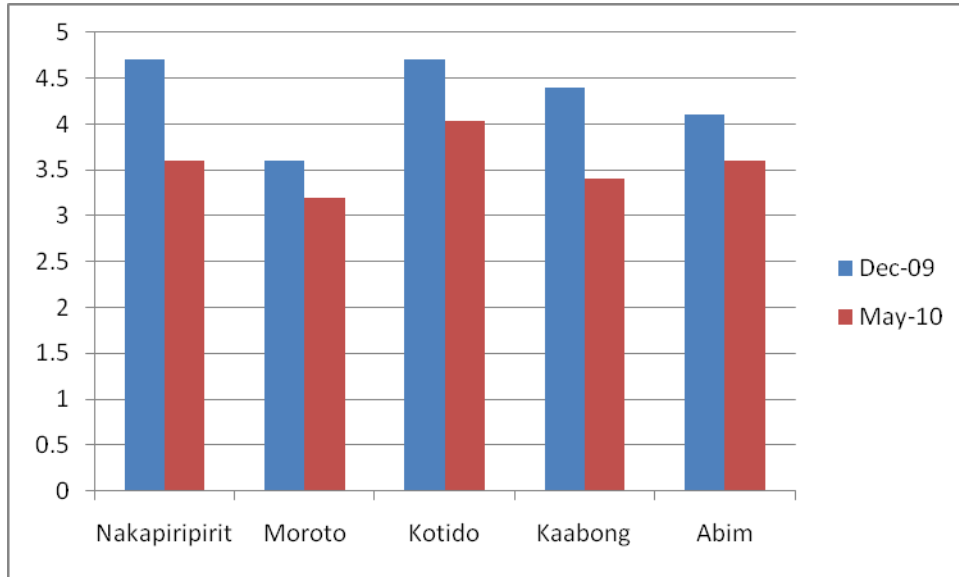


Figure 7: Mean Household Dietary Diversity Score

Consumption of food groups with high nutritional value in children’s growth and development is illustrated in Figure 8 below:

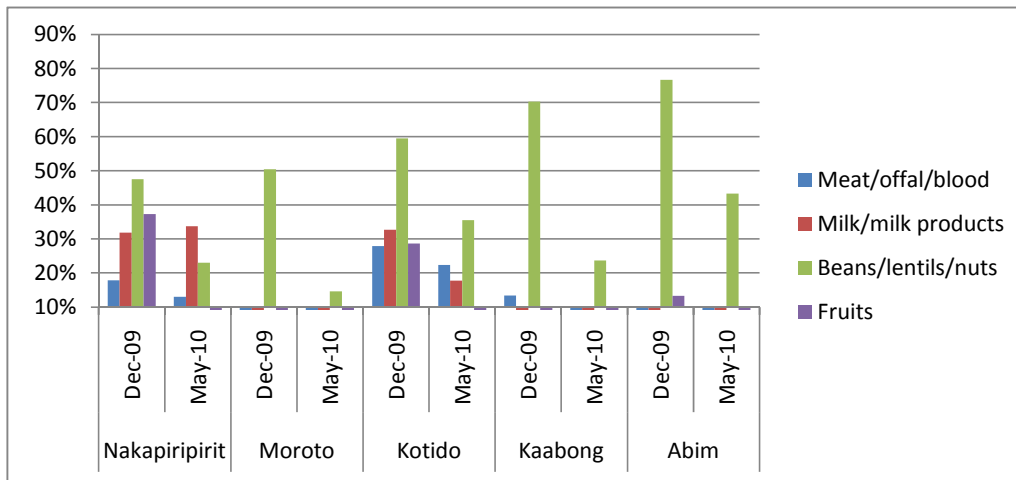


Figure 8: Food groups for growth and development

The consumption of milk increased slightly in Nakapiripirit and especially among households in Pokot County where households have better access to milk. Consumption of milk remained very low in Moroto, Kaabong and Abim districts. In Moroto and Kaabong the limited consumption of milk is caused by selling of the milk, compromised access to milking cows in distant kraals and cattle raiding, while in Abim it is attributed to low ownership of cows. Consumption of legumes declined since the households obtained the commodity mostly through general food aid

distributions which had ended in December 2009. This contributed to the decline in HDDS levels. Less than 10% of the households reported consumption of fruits.

Frequency of meals, residue⁵ and alcohol consumption

Assessment of frequency of meals was based on children 6-23 months (Figure 9); alcohol and residue consumption is based on children below 5 years and respondents.

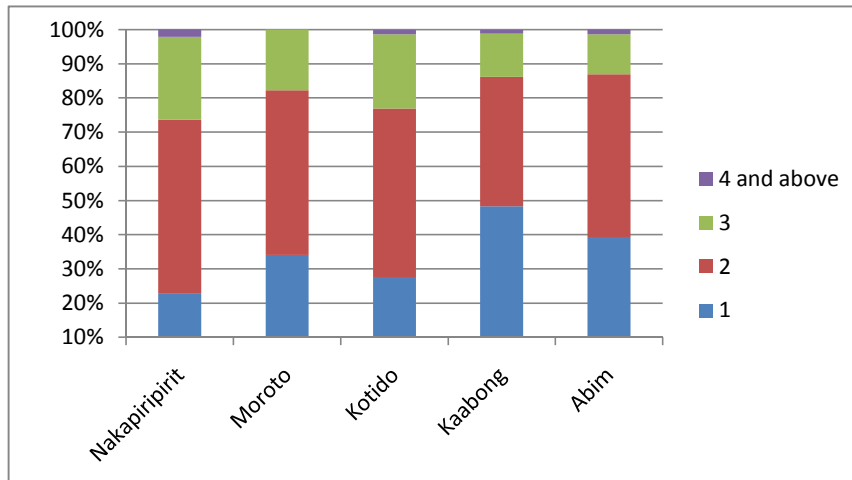


Figure 9: Frequency of meals

Most households (70% and above) fed young children on 1 and 2 meals in the last 24 hours. An average of 60% of the adults consumed 1 meal in the last 24 hours, with the exception of Nakapiripirit and Kaabong where most adults consumed 2 meals; 49% and 40% respectively.

A high consumption of residue for children in Moroto and Kaabong districts was (30%-35%). Consumption of local alcohol commonly known as *kweite* among children was less than 20% in all districts except Kotido (38.3%). Adults who consumed residue and or alcohol ranged from 30-50% with the exception of Abim in which the adults that consumed residue and or alcohol was less than 20%.

5. Water Sanitation and Hygiene (WASH) Indicators

The main source of drinking water was still borehole (80% and above). However, the results show a reduction in percentage of people using borehole as their main source of drinking water in the region and an increase in the percentage of population relying on unsafe water sources like seasonal streams occasioned by the rainfall season. Households in the following locations reported use of unsafe water: Moroto (Nadunget, Matany, Lotome and Lopeei), Abim (Alerek, Lotukei and Morulem) and Nakapiripirit (Lolachat, Kakomongole and Amudat), Kotido (Rengen and Kotido Sub County), Kaabong (Karenga and Kalapata).

Human waste was still disposed off mainly in the bush: Nakapiripirit (81.7%), Moroto (89.8%), Kotido (71.3%), Kaabong (46.0%) and Abim (20.3%). Private pit latrine usage slightly increased from December 2009 to May 2010 (Figure 10). The increase is attributed to latrine construction intervention after the outbreak of Hepatitis E in the region.

⁵ A by product of local alcohol made from sorghum or maize.

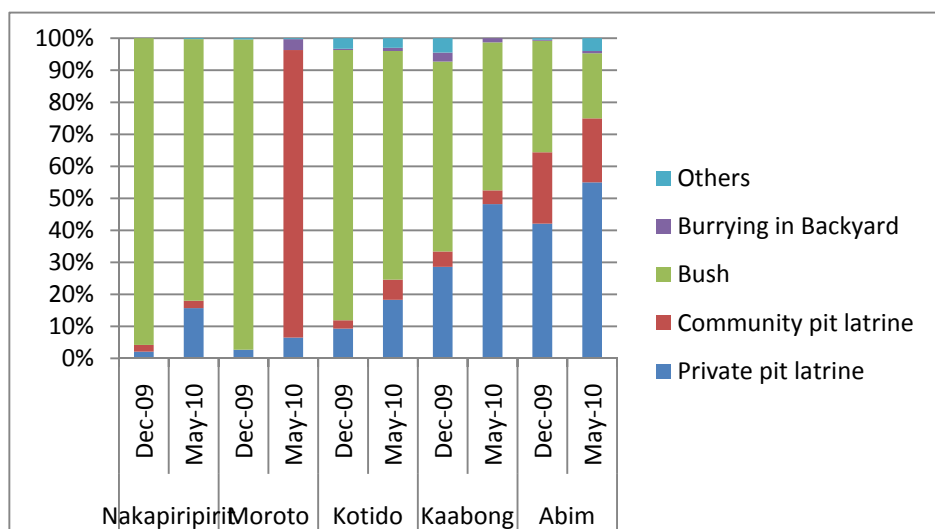


Figure 10: Private pit latrine usage

During the same period, communicable diseases like diarrhea increased and epidemic outbreak of Hepatitis E and Cholera was reported across the region. The disease outbreaks are linked to poor sanitary conditions and hygiene practices. The first case of Hepatitis E was reported in Kaabong district in August 2009 and eventually spread to other districts. The case fatality rate in Kaabong and Moroto districts is about 5%. Cholera cases were reported in Moroto district in April 2010. Other districts that have reported cases are Kotido and Amudat. The case fatality rate in Moroto district was 1.9% by 20th May 2010.

6. Recommendations

NAKAPIRIPIRIT DISTRICT

- Increase access to safe water in areas relying on seasonal streams in Lolachat.
- Strengthen detection and prevention of moderate acute malnutrition in high risk areas.

MOROTO DISTRICT

- Improve distribution of Plumpy Nut from the district stores to health centres that are currently facing shortages such as Nadunget, Rupa, Loputuk and Amedek.
- Hold partner meetings to share information and address issues affecting treatment such as referral, double registration, and distribution schedules and defaulting.
- Repair and rehabilitation of broken boreholes in Lopeei and Nadunget and construction of alternative water catchments systems in Lopeei, Morulinga, Matany, Lotome (Lomuno) and Nadunget.

KOTIDO DISTRICT

- Strengthen supply of Plumpy Nut to Health centre III and on job coaching of health staff on Integrated Management of Acute Malnutrition (IMAM).
- Replicate private and community pit latrine construction to other parishes so as to improve coverage as it has been done in Kacheri as well as community education on effective latrine use and clear up cultural perceptions hampering latrine use.

KAABONG DISTRICT

- Advocate for action to improve security and control cattle raiding in Kathile, Kalapata, Lolelio and Kapedo so that households have better access to livestock and livestock products.

ABIM DISTRICT

- Training of VHTs and linking them with health centres so that screening and referral of moderate and severe cases can be scaled up.

- Improve access to safe water in Alerek, Lotukei and Morulem through treatment of shallow wells and explore feasibility of drilling boreholes.

GENERAL RECOMMENDATIONS

- Strengthen detection, referral, treatment and prevention of severe and moderate acute malnutrition based on IMAM guidelines in all districts of Karamoja sub region.
- Comprehensive pit latrine construction and proper use campaign.
- Strengthen health and nutrition promotion in health centers and at community level by putting emphasis on prevention of diarrhoea, cholera, Hepatis E, Acute Respiratory Infection and malaria. Messages on treatment of malnourished children, Infant and Young Child Feeding and disadvantages of feeding children on alcohol and residue should be incorporated.
- Implement hunger safety net programs that cushion households against reduction of number of meals and consumption of less quality foods.
- Collect data on measles vaccination and vitamin A supplementation once per year (May) since the indicators have not changed significantly in the short run.
- Data on micronutrient deficiency will not be collected in the next round although the system should remain flexible to context specific information that might be required from time to time.

CONCLUSION

The second round of surveillance produced valid results benchmarked against validity checks in Uganda nutrition survey guidelines. The district nutrition focal persons presented the results on 26th May during the Nutrition Technical Working Group (NTWG) held in Nakapiripirit district. The meeting was attended by stakeholders such as District Health Officers (DHOs), UNICEF, WFP, Concern Worldwide, ACF, Andre Food Consult and Community Action for Health. The DHOs recognized the skills and efforts of the nutrition focal persons in collecting and analyzing nutrition surveillance data under the support of ACF.

Aspects of the surveillance system that require strengthening are dissemination of reports and response to recommendations. The nutrition focal persons shared the first round of results with their respective District Health Teams and this should be continued and extended to other sectors like WASH and food security and livelihoods. The DHOs also need to share the information at regional and headquarter level, and advocate for response to recommendations.

In the next project phase Amudat will be incorporated as a district, discussions on handover process will be initiated and expansion to Acholi region is dependent on funding. UNICEF has also proposed to support recruitment of nutritionists for Karamoja region who will also need to be trained on the surveillance system.

The next round of data collection and reporting will be in August 2010.