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The Link between Health/Nutrition and Household Vulnerability for Phase II of the Zondoma Food Security Initiative in Burkina Faso: MAHFP as a Tool for Targeting Project Interventions

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Objectives: The baseline study^v of the Zondoma Food Security Initiative, Phase II (ZFSI Phase II) in Burkina Faso focused, in part, on the influence of household vulnerability in terms of food security level on health and nutrition practices and status among household members. It was suspected that households that suffered differentially from food insecurity would suffer differentially from illness, would have different healthcare practices, and would vary in their access to potable water sources. In particular, the baseline study explored feeding practices and nutrition of pregnant or lactating woman and young children, child and mother health and treatment practices, and household access to water to see if they varied by household food security level. This study used the Africare indicator Month of Adequate Household Food Provisioning (MAHFP) (Africare 2005) to show the link between vulnerability and health and nutrition practices. This data is intended to be used to inform ongoing intervention strategies with specific goals of improving mother and child health. The complete findings of the baseline study are presented in Konda and Nanema (2005). The particular objective of this paper is to demonstrate the utility and identify the challenges of using MAHFP as a tool for linking vulnerability and health/nutrition practices.

Background: While it is critical to increase food access and availability in Zondoma Province, it is unlikely that this alone will lower the region's high malnutrition rates. Zondoma Province is plagued with a host of health constraints that affect increased food security. These constraints include unclean water and inadequate water hygiene. Other constraints are inadequate health infrastructure and local peoples' unwillingness to frequent and support these services. New risks are posed by the province's high HIV/AIDS infection rate^{vi}—both for those who become infected and the family members who provide them with support. Africare uses MAHFP as an indicator of household vulnerability.^{vii} The ZFSI II project team intended to break ground on the use of MAHFP to detect links between vulnerability and household practices related to health and nutrition, as well as many other activities targeted by the ZFSI II project (e.g., agriculture, income generating activities, health and nutrition).

Methods: For each household^{viii} in the baseline study, the enumerators randomly identified one mother with a child 0-23 months of age and one male 18-35 years of age or one female 15-45 years of age. A total of

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900 mothers of children 0-23 months of age were interviewed. A total of 1,364 children aged 0-36 months of age were measured for underweight analysis. A total of 787 children aged 24-59 months of age were measured for stunting. Therefore, a total of 1,971 children less than five years of age were targeted for anthropometric measurement. Household food security level was based on data collected for Africare's, Month of Adequate Household Food Provisioning (MAHFP), as part of the survey packet that was used to interview the mothers of children less than 24 months of age (Box 1).^{ix} Based on the local cultural norms, the concept of "satisfying hunger" was defined as eating two meals per day. MAHFP was used to classified households into three vulnerability categories: those with zero months of food insecurity, those with one to three months of food insecurity and those with more than three months of food insecurity. For a complete discussion of the sampling method used for the baseline study please see Konda and Nanema (2005).

A community survey that included the administration of the Africare Food Security Community Capacity Index (FSCCI) was conducted in 26 original and 28 new project villages (Africare 2005). Six separate questionnaires packets were used (Annexes III-VII): a production unit (PU) questionnaire, a household questionnaire, an HIV/AIDS questionnaire, an anthropometric questionnaire, and a community questionnaire. The data collected for calculating MAHFP for each household was collected and entered into the electronic data files separately from these survey data. The files were merged during the analysis stage.

Results:

Children's Nutritional Status and Households Vulnerability. Table 1 shows the percentage of malnourished children by household food security level using three different indicators of malnourishment. The results indicate that approximately 50 percent of malnourished children (based on insufficient weight) come from the most vulnerable households (i.e., those who face more than three months of food insecurity). Based the stunting indicator of malnourishment, 51 percent of stunted children come from these very vulnerable households.

Box 1. Questions Used to Determine the Months of Adequate Household Food Provisioning (MAHFP), ZFSI Phase II Baseline Survey, May 2005

- 1) How many times per day does your family actually eat?
- 2) When your family eats, do they satisfy their hunger?
 1. Yes
 2. No

If yes, between now and the next harvest in October, how many months will your family eat enough to satisfy its hunger?

If not, how many months did your family satisfy its hunger (i.e., eat two meals per day) after the last harvest?

Data from the last row of Table 1 reflect the distribution of children with acute malnutrition who are the target group for the program *Foyer d'Apprentissage et de Rehabilitation Nutritionnelle (FARN)*. The data from this study shows that 53 percent of the acutely malnourished children based on wasting (which is 20 percent of all sampled 0-36 month old children) come from the most vulnerable households in terms of food security. Therefore, all three indicators of malnourishment show the approximately fifty percent of these malnourished children come from the most food insecurity households.

Feeding Practices and Household Vulnerability.

It is assumed that feeding practices would be closely linked to household access to food and, therefore, household food security. Data was collected to explore this link for four variables: mother's feeding practices during pregnancy, feeding practices of lactating women, the percentage of mothers who feed their newborns with colostrum, and the percentage of mothers who supplement their infants' diet with porridge.

Table 2 shows the different feeding patterns of mothers during pregnancy according to level of household food security. It is generally recommended that pregnant women augment their food intake by increasing meal frequency in order to satisfy additional nutritional needs. The data from this study reveal that throughout the province, on average, approximately 17 percent of mothers interviewed eat more during their pregnancy. As expected, data show that the

Table 1. Percentage of Malnourished Children for Different Household Food Security Categories

Indicator of malnourishment	Households with 0 months of insecurity (% of children)	Households with 1-3 months of insecurity (% of children)	Households with > 3 months of insecurity (% of children)
Insufficient weight for children 0-36 months of age (W/A < -2ET)	20.5	30.0	49.5
Stunting for children 24-59 months of age (H/A < -2ET)	21.4	27.5	51.1
Wasting of children 0-36 months of age (W/H < -2ET)	20.0	26.8	53.2

Table 2. Feeding Practices of Mothers during Pregnancy for Different Levels of Household Food Security

Feeding practices during pregnancy	Households with 0 months of insecurity n = 146 (% of mothers)	Households with 1-3 months of insecurity n = 223 (% of mothers)	Households with > 3 months of insecurity n = 413 (% of mothers)
More than before	21.2	23.3	16.4
Same as before	26.7	31.4	26.2
Less than before	52.1	45.3	57.4
Total	100	100	100

proportion of mothers who implement good feeding practices (increased consumption) is higher among the households with zero or one to three months of food insecurity than for households with more than three months of food insecurity. In fact, 21 and 23 percent of mothers eat more during their pregnancy in households with zero and households with one to three months of food insecurity, respectively, compared to 16 percent in households with more than three months of food insecurity.

Table 3 shows the prevailing feeding practices of mothers during lactation according to the level of the household food security. Unexpectedly, the results demonstrate that the level of household food security doesn't seem to influence whether lactating women eat the same or more than prior to lactation. However, there is a connection between food insecurity and the percentage of lactating women who eat less than usual. A higher percentage of lactating women eat less in the more vulnerable (i.e., food insecure) households (8.8 percent of lactating women in households with more than three months of food insecurity compared to 2.9 and 1.4 percent of lactating women in households with one to three months of food insecurity and households with zero months of food insecurity, respectively).

One important goal of the ZFSI Phase I IEC campaign was to dispel some of the traditional ideologies that encouraged mothers to delay breastfeeding. Colostrum is secreted between one and three days after delivery, before a mother's regular milk comes in. It contains vitamin A and antibodies that protect children against child diseases; colostrum is essentially the first "vaccine" for the child. If the mother doesn't give colostrum to their newborn (i.e., if they delay breastfeeding for several days), the child is missing out on this natural protection. The results of the baseline study do not show drastic differences between the three categories of household food insecurity in terms of the percentage of mothers that feed colostrum to their babies. Regardless of the household's food security level, more than 50 percent of mothers fed colostrum to their most recently born child (Table 4).

Data was collected on the percentage of mothers who feed porridge to their children aged six to 10 months. The results come from responses provided by 180 mothers who have children within that age range (Figure 1).

Table 3. Feeding Practices of Lactating Women for Different Levels of Household Food Insecurity

Feeding practices during lactation	Households with 0 months of insecurity n = 106 (%)	Households with 1- 3 months of insecurity N = 158 (%)	Households with > 3 months insecurity n = 296 (%)
More than usual	72.6	72.3	69.2
Like usual	26.0	24.8	22.0
Less than usual	1.4	2.9	8.8
Total	100	100	100

Table 4. Colostrum Supplementation for Different Levels of Household Food Insecurity

Category of household food security	Percentage of mothers who fed colostrum to their newborns
0 month of insecurity (n = 146)	54.2
1 – 3 months of insecurity (n = 226)	56.6
> 3 months of insecurity (n = 418)	52.4

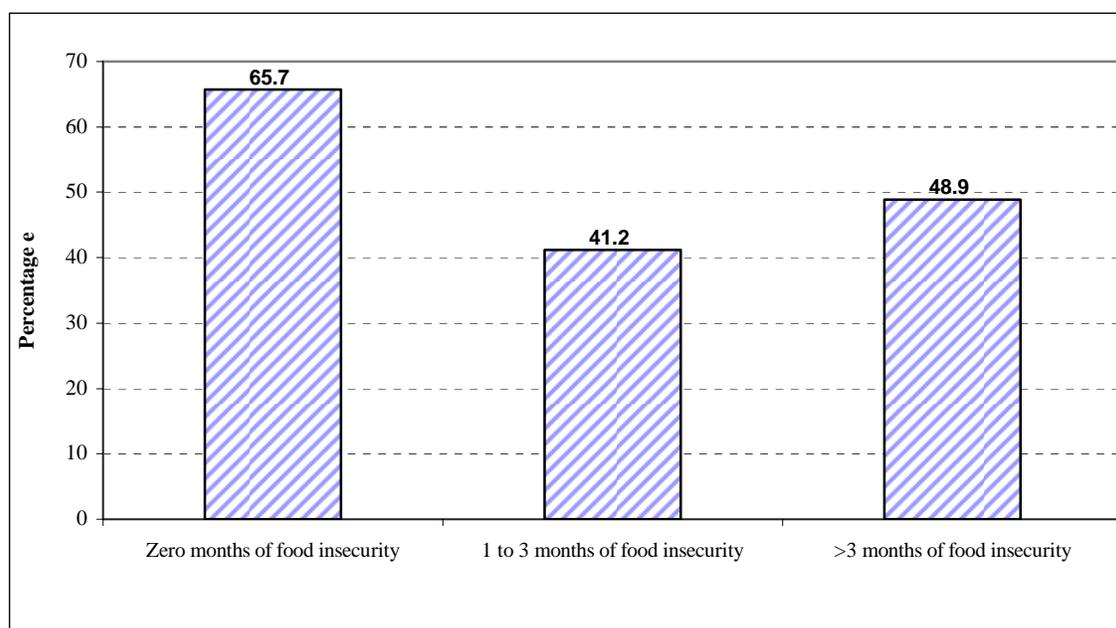


Figure 1. Proportion of Women who Give Porridge to their Six to 10 Month Old Children for Different Levels of Household Food Security

The results indicate that there is an important difference between the percentage of mothers from less vulnerable households and households in the other two categories. Approximately 66 percent of mothers from households with zero months of food insecurity give porridge to their child aged six to 10 months compared to 41 and 49 percent who do so from households with one to three months of food insecurity and households with more than three months of food insecurity, respectively (Figure 1).

Child Health and Households Vulnerability. The study also explored the link between household food security and other aspects of child health

including childhood sickness, specifically, mother's practices for childhood malaria, and mother's practices for childhood diarrhea. The data show that the percentage of the mothers who had children under five years of age that were sick during the 15 days prior to the interview is higher for households who experience food insecurity (Table 5). Households that encounter more than three months of food insecurity did have a higher percentage of children who had some sort of illness during the previous 15 day time period (51.3 percent), presumably due to the effect of undernourishment on immune system strength (Table 5).

Mother's Response to Childhood Illness and Household Vulnerability

Childhood malaria. The baseline study asked mothers to explain the initial methods of treatment they executed when children under five become ill with fever (fever is generally associated with malaria in the study area). When the initial methods of treatment are stratified by level of household food security, the data show that the percentage of those who first go to a medical center is higher in households with zero months of food insecurity. Table 6 shows that 52 percent of mothers in households with zero months of insecurity indicate that "going to a health center" is the first step they take in cases of childhood malaria. In households with one to three months and more than three months of food insecurity 41 and 34 percent, respectively, go to a health center as an initial method of treatment. Inversely, the more food insecure the household is the higher the percentage of mothers who initiate treatment of childhood malaria with measures other than a visit to the healthcare center. This is presumably due to the higher cost

associated with visits to the healthcare center in terms of both time (including travel to and from the center and waiting in line at the center) and financial investment.

The recommended duration of treatment for malaria using chloroquine/nivaquine on children less than five years old is three days. Table 7 shows the percentage of mothers that administer this drug to their children for malaria for different lengths of time by level of household food security. Approximately 31 percent of mothers from households with zero months of food insecurity administer chloroquine/nivaquine for the recommended three days compared to 21 and 22 percent who administer it for the recommended time period from households with one to three months of food insecurity and more than three months of food insecurity, respectively. Commonly, presence or lack of fever will dictate whether the mother continues or stops treatment. Since it is common for malaria fevers to break after one or two days of treatment, frequently the mother will stop

Table 5. Children of Less than Five Years of Age who were Sick during the 15 Days Prior to Interview

Household level of food security	Percentage of mothers whose child was sick
0 month of insecurity	39.0
1 – 3 months of insecurity	48.1
> 3 months of insecurity	51.3

Table 6. First Measures Taken by Mothers in Case of Childhood Malaria for Different Levels of Household Food Security

First reaction of mothers in case of childhood malaria	Percentage of Households		
	Households with 0 months insecurity n = 146	Households with 1- 3 months of insecurity n = 226	Households with > 3 months of insecurity n = 416
Health center	52.4	41.2	34.0
Treatment with herbs/leaves	21.7	29.2	35.3
Treatment with over the counter medication	25.9	29.6	30.7
Total	100	100	100

Table 7. Duration of Treatment for Childhood Malaria with Chloroquin/Nivaquine by Level of Household Food Security

Duration of use of chloroquine/nivaquine for childhood malaria	Households with 0 months of insecurity n = 78	Households with 1- 3 months of insecurity n = 136	Households with > 3 months of insecurity n = 211
1 day	39.7	44.1	39.3
2 days	29.5	34.5	38.9
3 days	30.8	21.4	21.8
Total	100	100	100

Table 8. Initial Treatment Methods Used by Mothers for Cases of Childhood Diarrhea for Different Levels of Household Food Security

Initial treatment method for childhood diarrhea	Households with 0 months of insecurity n = 145 (%)	Households with 1- 3 months of insecurity n = 224 (%)	Households with > 3 months of insecurity n = 413 (%)
Health center	39.3	37.0	24.9
Treatment with herbs/leaves	31.0	38.4	45.5
Treatment with over the counter medication	29.7	24.6	29.6
Total	100	100	100

treatment earlier than the recommended three days and will reserve the remaining doses for the next bout of malaria. This is often seen as a way to save money on the next malaria episode. The assumed financial distress of households that experience more food insecurity may explain why a higher percentage of mothers stop the treatment early and save the final dose(s) until the next episode of malaria.

Childhood diarrhea. For episodes of childhood diarrhea, the percentage of mothers who go to the health center as the first method of treatment changes based on household food security level. Similar to the results for initial treatment of childhood malaria, the percentage of mothers who visit the health center as a first step is higher among households that do not experience food insecurity (zero months of food insecurity). Inversely, the percentage of mothers who visit the health center first for childhood diarrhea is lower among households that experience more than three months of food insecurity. The results displayed in Table 8 show that only 25 percent of mothers in households with the most food insecurity go to a health center first; this rate is 39 and 37 respectively for households with zero and one to three months of food insecurity, respectively.

The percentage of the mothers who use traditional treatments (herbs/leaves) as the first measure increases with food insecurity (38 percent for households with one to three months of food insecurity and 46 percent for households that experience more than three months of food insecurity). These patterns of treatment may be explained, again, by the costs (in terms of time and money) associated with visits to the health center. Households that experience food insecurity would presumably also be less able to spend time and money on healthcare.

Whatever the level of household food security, 25 to 30 percent of mothers resort to administering over-the-counter medication to their children. Furthermore, the results show that 13 percent of mothers from households with zero months of food insecurity use ORS (Oral Rehydration Salt) or home-made remedies, such as salted-sweetened solution; this percentage increases to 18 and 15 percent for households that experience one to three months of food insecurity and more than three months of food insecurity, respectively.

In cases of severe diarrhea (as defined in the questionnaire), the percentage of mothers who go to a health center is at least 80 percent for all levels of household food security (i.e. no difference between categories of MAHFP).

Mother's Health and Household Vulnerability.

This section addresses the use of health services provided to women during pregnancy and delivery for the different levels of household food security. Table 9 shows the rate of women who went to the local health center for prenatal counseling according to level of household vulnerability (i.e., food security level based on MAHFP). The results indicate that approximately 39 percent of recently pregnant women in households with more than three months of food insecurity did not receive any prenatal counseling, 34 percent in households with one to three months of food insecurity received no prenatal counseling, and 26 percent in households with zero months of food insecurity received no prenatal counseling. The Ministry of Health recommends that pregnant women go three times to prenatal counseling prior to delivery. In this sample 42 percent of recently pregnant women in households with more than three months of food insecurity went three times to prenatal counseling. This rate increases to at least 45 for women from households with one to three months of food insecure and zero months of food insecurity.

The results of Table 10 show that the percentage of health center births were 38 percent of babies from households with zero month of food insecurity, 34 percent of the babies from households with one to three months food insecurity gave birth in a health center, and 30 percent of the babies from households with more than three months of food insecurity. Furthermore, the results indicate that the percentage of mothers who were assisted in their delivery by an untrained or informally trained individual is higher for more vulnerable households.

Access to Water and Household Vulnerability.

Figure 2 illustrates access to water for the different levels of household food security. Boreholes and wide-diameter wells are both considered to be potable water sources in the survey. We note a decrease in the percentage of households who have access to water from boreholes with an increase in the duration of the food insecurity period (43 percent for households with zero months of food insecurity compared to 34 percent for households with more than three months of food insecurity). There is an increase in access to wide-diameter wells with higher food insecurity (24 percent for households with zero months of food insecurity compared to 35 percent for households with more than three months of food insecurity).

It is also noted that the traditional wells (rehabilitated and not rehabilitated) are the main potable water source for households regardless of food security level. The explanation for this pattern is that there are a greater number of traditional wells compared to other water sources in the village and a majority of the households have access to these water sources regardless of food security level. In most cases traditional wells are family wells dug near the houses, while boreholes and wide-diameter wells are limited in number and located further from the majority of the villagers.

Discussion: The finding that approximately half of malnourished children come from the most vulnerable households is not surprising given the links between food security and nutrition. This data served as a check that MAHFP is indeed capturing accurate information regarding vulnerability and food security.

Data collected on feeding practices for pregnant and lactating women show some unexpected

results. For all vulnerability categories there is a much higher percentage of women who increase consumption during lactation (between 69 and 73 percent) than there is for women who are pregnant (between 16 and 23 percent). Education regarding increased consumption during pregnancy is important for all vulnerability categories.^x It would be useful to explore possible reasons that women do not often increase their food consumption during pregnancy, but do during lactation. MAHFP data have shown that the situation is worse (in terms of decreased consumption) for the most vulnerable households with pregnant women and the most vulnerable and moderately vulnerable households in terms of lactating women.

The data for feeding infants colostrum and porridge show that there may not be a linear relationship with vulnerability category. The highest percentage of mothers who feed their newborns colostrums is for the moderately vulnerable group, but again, it is lowest for the least food secure group. Although the percentages for all three vulnerability categories are near 50 percent. This may be explained in part by the fact that colostrum and breastmilk supply are not impacted by household's access to food unless it is a prolonged extreme famine situation (WHO 1997); however it is important to improve nutrition during lactation in order to improve the nutritional quality of the mother's milk. Regarding supplementation of six to 36 month old children with porridge, the vulnerability categories show that the moderately and most vulnerable households are in need of more targeted intervention and education. Again, not surprising considering the link between food security and food intake. However, the data show that a lower percentage of households in the moderately vulnerable category supplement with porridge compared to the most vulnerable category. The reason for this should be explored and may be useful in future project interventions, particularly if it is related to targeted activities of ZFSI Phase II.

Data collected on responses to childhood illnesses show that households in the most vulnerable category were more likely to have sick children and that as vulnerability decreased the likelihood of childhood illness went down. The likelihood of mothers taking their children to the health center for treatment of malaria and diarrhea decreased with increased vulnerability, which may be explained by the increased cost in

terms of time and money associated with visiting the health center compared to treatment at home with herbs or over the counter medication. Furthermore, households in the most vulnerable and moderately vulnerable categories were less like to complete the recommended three-day duration of over the counter malaria medication, also possibly by cost and financial hardship. Mothers often saved the other doses of the medication for the next malaria episode, since the fever normally ceases after one day.

However, there is an important difference in terms of treatment by vulnerability category between malaria/diarrhea and severe diarrhea. Approximately 80 percent of all households took their children to the health center when afflicted with severe diarrhea. The lack of difference in treatment of cases of severe diarrhea may indicate a common view of the life-threatening condition of severe diarrhea, which is one of the leading causes of death. Mothers of all food security categories are willing to risk household finances and do whatever they can to obtain the resources to send their children to the health

center when it is perceived as a life-threatening situation. While Malaria is also a life-threatening disease in this region, the common perception is that many people survive it. These results may reinforce the power of MAHFP as a tool for assessing the link between vulnerability/food insecurity and health/nutrition practices because it can accurately reflect thresholds beyond which household food security it no longer a significant factor. These results certainly call for further study.

The data collected on water sources show that the Africare project in Burkina Faso greatly increased access to potable water sources (through construction of wide-diameter wells), but less sanitary water sources (traditional wells) are still a major source of water for households in the study area, regardless of food insecurity level. The construction of wide-diameter wells by Africare was done in areas where household food insecurity levels were high and widespread and where there was little access to boreholes.

Table 9. Percentage of Women Who had Prenatal Counseling during their Most Recent Pregnancy

Number of prenatal tests during most recent pregnancy	Households with 0 months of insecurity n = 145 (% of women)	Households with 1 - 3 months of insecurity n = 223 (% of women)	Households with > 3 months of insecurity n = 416 (% of women)
0 visits	26.2	34.1	38.5
1 visit	12.4	9.4	9.1
2 visits	15.8	11.2	10.6
3 visits	45.6	45.3	41.8
Total	100	100	100

Table 10. Place of Delivery for Mothers for Different Levels of Household Food Security

Place of delivery	Households with 0 months of insecurity n = 146 (% of mothers)	Households with 1- 3 months of insecurity n = 225 (% of mothers)	Households with > 3 months of insecurity n= 418 (% of mothers)
Health center	37.7	33.8	30.4
Home w/ trained village birth attendant	38.3	40.9	37.8
Home w/ assistance from other	24.0	25.3	31.8
Total	100	100	100

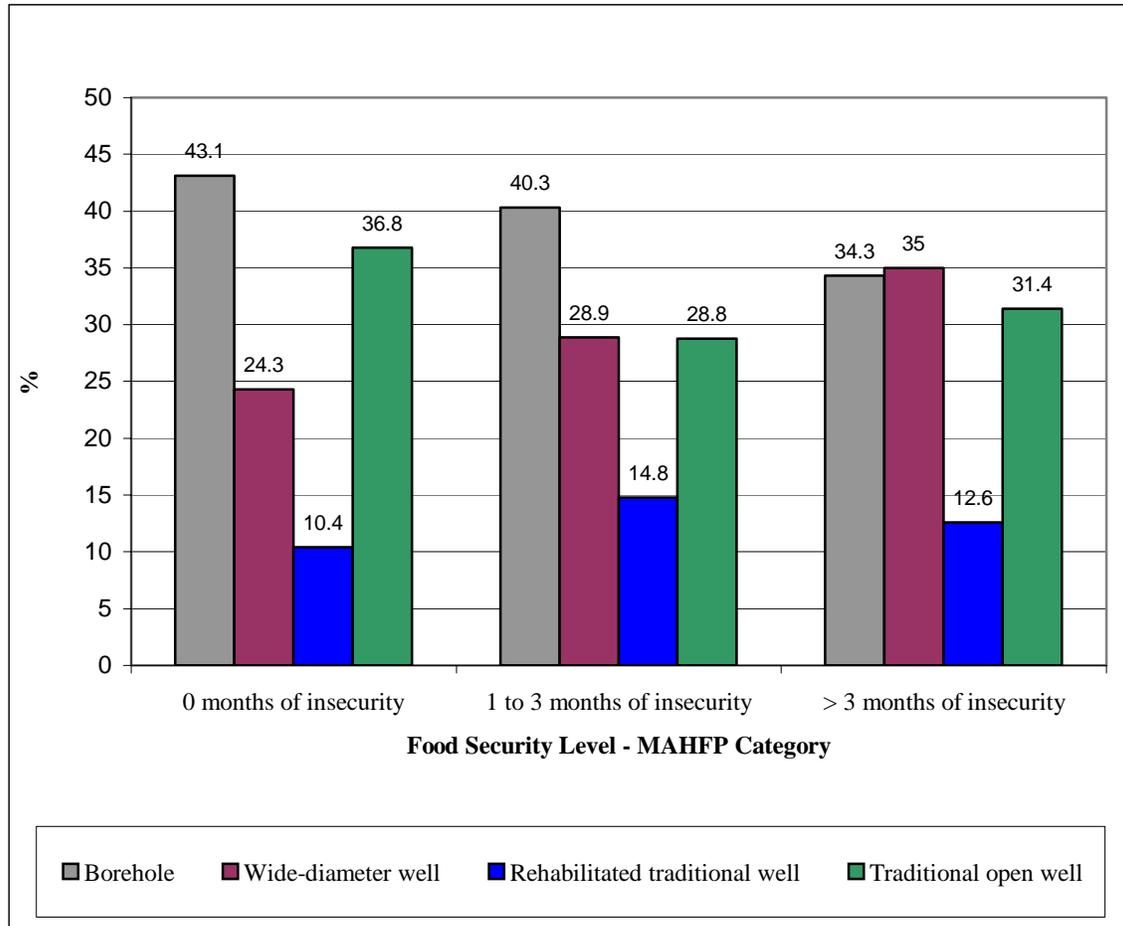


Figure 2. Access to Water Sources for Different Levels of Household Food Security

Data collected on the use of prenatal counseling show that although pregnant women from more vulnerable households are less likely to have prenatal counseling, if they manage to attend one prenatal counseling visit they may be more likely to follow through and attend all three of the visits recommended by the Ministry of Health. This indicates that in terms of project success, targeting the most vulnerable households for prenatal counseling will have the biggest impact in terms of follow-through. It also highlights the need to explore why less vulnerable households are not as likely to return after the first prenatal visit.

A higher percentage of pregnant women from the least vulnerable households give birth in a health center, reinforcing the results found for treatment of malaria and diarrhea in the health center. Again, cost and travel time may prohibit more vulnerable households from using these facilities. Over 30 percent of the women from the most vulnerable household give birth without the

assistance of a trained health care provider or a village birth attendant, leaving the women and their newborns at risk of death when complications are not predicted and medical care is not available. One of the main recommendations of the baseline study was to increase referrals to healthcare centers for deliveries by educating village birth attendants; however, this will not help the 30 percent of women from the most vulnerable households who do not consult a village birth attendant (VBA).

Lessons Learned and Recommendations:

Aside from the main recommendations based on data from the ZFSI Phase II baseline study (which incorporates impacts detected from Phase I) (see Konda and Nanéma 2005), this analysis has provided important insight that needs to be factored into future project work in the area and in Africare’s other projects. Most important is that the data presented here offer an opportunity to expand the use of MAHFP in monitoring and

evaluation of food security project activities. This was an initial step to explore the utility of this tool in detecting important and significant differences in health and nutrition practices based on vulnerability. Further studies should incorporate the use of this tool from the start of project activities, making it part of the baseline information collected (as was done by the Burkina Africare team), while using this study to improve the collection and analysis process in order to make it more insightful and user-friendly.

Technical Difficulties Observed. In this initial use of MAHFP for exploring the link between vulnerability and health and nutrition practices, it has been shown that some foresight and planning for the method of analysis of this data in conjunction with the survey data will avoid the immense and paralyzing technical difficulties experienced by this team. While a statistically sound sampling frame was used for the collection of data, complications in the merging and analysis of the different datasets, staff turnover, and difficult field conditions prevented follow-through on statistical tests of different. The MAHFP data was collected separately from the main baseline data and it was assumed that the two data files could easily be merged electronically after the collection stage. However, after merging the files numerous households were miss-matched, requiring months of work by analysis technicians to find and correct the errors. These corrections were in the end only completed for the health and nutrition data (presented here). The intense and extensive manipulation and adjustments to the merged files led to numerous difficulties in tracking down the original data to verify statistical differences in the data presented above, meaning that only the most obvious differences could be commented on here.

Recommendation. Future use of the MAHFP with survey data requires that the collection of the MAHFP data be incorporated into the survey forms. One option would be to have the household MAHFP classification written in the header of every survey form (health/nutrition, agriculture, etc.). Much like the household's basic statistics are recorded in the header (e.g. name, location, year of incorporation into the project, sex and age of the household head).

Recommendation. Additionally, field technicians collecting the data, project coordinators, and data

analysis technicians all need to understand the use, calculation, and ultimate outcome of the MAHFP classifications.

Expansion of Use of MAHFP. The evidence presented here in this analysis of the differences between vulnerability groups defined by the MAHFP for health and nutrition practices has shown that this is a useful tool to plan and target project activities in at least health and nutrition.

Recommendation. It is recommended that other components related to food security be assessed in the same way to explore the utility of the MAHFP vulnerability levels for behavior and practices in agriculture, NRM, HIV/AIDS, and income generating activities associated with Africare's Title II programming.

Specific Recommendations from the Baseline Re-assessed based on MAHFP. Once the utility of the MAHFP classifications has been established (as is the case for MAHFP and health/nutrition practices and outcomes) this tool can be used in all baseline, midterm, and final surveys to better target general recommendations based on vulnerability level. For example, while the recommendations made in the ZFSI Phase II Baseline study (Konda and Nanema 2005) for health and nutrition did distinguish between original project villages (Phase I) and new project villages (Phase II) it did not take into account the differences in households based on MAHFP vulnerability level. Specifically the baseline study's recommendations were as follows (Konda and Nanema 2005).

While it is clear that traditional beliefs and taboos may lead to certain negative nutrition practices, the study shows that household food insecurity also plays a major role. The same data show that although the state of health and nutrition may not be satisfactory, there is great potential for improvement based on the remarkable differences between some of the original and new project villages thanks to ZFSI Phase I interventions. Four areas where it is clear that the project can make major improvements during Phase II are:

1. Better use of village birth attendants in monitoring and counseling of pregnant women and referrals to health centers for assisted births;

2. The use of community health agents and village nutrition educators to promote improved practices for community based management of common childhood illnesses;
3. Support to the local health district for development of a minimum base of nutrition education activities that can be integrated into its other activities; and
4. The use of participatory approaches, such as GRAAP [*Groupe de Recherche et d'Action pour l'AutoPromotion*] and SARAR [Self Associated Strengths, Resourcefulness, Action, Planning and Responsibility] methods, to involve the community in training mothers, developing activities for sanitation and nutrition education programs, and identifying workable solutions to health, nutrition and sanitation problems.

This study of the use of MAHFP in classifying household vulnerability and linking this to health and nutrition practices has highlighted some additional areas to be targeted.

Recommendation. Considering the decreased use of village birth attendants or other trained birth assistants by women in households classified as most vulnerable by the MAHFP, the baseline survey recommendation to improve use of the VBAs to refer pregnant women to health centers would not impact a large portion of the women in the most vulnerable households since they are very unlikely to use VBAs at all. The MAHFP has identified that while activities to realize this recommendation may improve birth outcomes for some households – it will miss the mark for those that are most vulnerable and who are in most need of the intervention.

Recommendation. Once the MAHFP data has been collected and analyzed here it illuminate additional topics to explore during the interview

processes. For example, in this study increased consumption during lactation, but not as much during pregnancy is an important topic with which to follow-up as it may lead to insights that would be useful in planning education and intervention strategies. Perhaps the increased support to local healthcare extension could include a component where these healthcare educators are provided information and data found by analyzing MAHFP and health and nutrition practices. They would then be able to explore and follow up and possibly provide further explanations of why differences occur and how to incorporate this knowledge into extension programs.

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^v Data for this paper was collected as part of the ZFSI Phase II baseline survey (Konda and Nanema 2005). However, while the baseline study presented data on the variables presented in this paper for the original versus new project villages, it did not present this data stratified by household food security level. It is presented in this series for the first time.

^{vi} Seroprevalence of the North Region from the HIV/AIDS surveillance site of Ouahigouya was estimated at 4.8 percent in 2004—e.g., 7,150 persons potentially infected with HIV, affecting between ten and 19 percent of the area's households (Source: Africare. 2004. PL480 Title II. Development Assistance Program Proposal. Zondoma Food Security Initiative Phase II. Washington, DC: Africare/Headquarters. Pg. 21).

^{vii} The data for this paper is based on the quantitative household survey (not MAHFP-PRA data – see Africare [2007] for an explanation of MAHFP based on participatory rural appraisals).

^{viii} A household was defined as a man, his spouse (or spouses), and children. One production unit might include several “households.”

^{ix} The Phase II baseline survey was conducted during May 2005. This is a time period when the stores from the previous year's harvest (November) are running low and the demands for agricultural labor for field preparation and planting are at an all-time high. Therefore, it is the time of year when data would reflect the most number of food insecure households.

^x This does not address quality of food consumption, which is recognized as an important public health concern as well.