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HIV affected households is compromised by a variety of factors including the synergy generated by hosting a HIV positive family member and orphans. The gender of the household head is also an important consideration. Households headed by women tend to be more vulnerable, predisposing households to greater food insecurity.

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HIV affected households in Western Kenya experience greater food insecurity

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abstract

This was a cross-sectional study conducted in the first Millennium Village in Western Kenya. We compared the food security status of households affected by HIV/AIDS to households not affected by HIV/AIDS. We also identified coping strategies adopted by members of food insecure households.

315 Households were included in the study, consisting of 169 HIV affected households, (44 households with self-identified HIV positive adults, 80 households with orphans, and 45 households with both orphans and self-identified HIV positive adults). These households were compared to 146 HIV unaffected households.

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The food security of HIV affected households is compromised by a variety of factors including the synergy generated by hosting a HIV positive family member and orphans. The gender of the household head is also an important consideration. Households headed by women tend to be more vulnerable, predisposing households to greater food insecurity.

Keywords:

Food security
HIV/AIDS
Africa
Resource limited setting
Coping strategies
Nutrition
Millennium Villages

Introduction

Despite sub-Saharan Africa having only 12% of the global population, at the end of 2010 about 68% of people living with HIV resided in this region. However the number of AIDS related deaths fell to 1.8 million in the same period, from a peak of 2.2 million in the mid-2000s. Most of these deaths have been prevented by the greater availability of antiretroviral therapy since the 1990s (UNAIDS, 2011).

Food security is the secure access by all people at all times to enough food for a healthy active life (Misselhorn et al., 2012). Three distinct variables essential to the attainment of food security include food availability, access, and food utilization (FAO, 2011). Food insecurity is common in most parts of Africa as a result of a multitude of factors including poverty, disease, environmental changes, food price volatility, population increases, and a depen-

dence on food imports (Anema et al., 2009). Household food insecurity in this region has been exacerbated by the onset of the HIV/AIDS epidemic. As an example, between 2006 and 2008, 12.4 million people, or 33% of the Kenyan population was undernourished (UNAIDS, 2011). In a study conducted in Western Kenya, 67,038 individuals enrolled in HIV care programs clinics reported food insecurity prevalence ranging from 20% to 50% (Mamlin et al., 2009).

Nutritional status is associated both with the survival of individuals living with HIV and the development of AIDS (Macallan, 1999; Semba and Tang, 1999). Food insecurity is associated with incomplete HIV RNA suppression (de Pee and Semba, 2010). The HIV virus weakens the immunity of the body and gives greater access to different infections. The infections in turn affect nutritional status by reducing dietary intake and disrupting the body's metabolic state (Gillespie and Kadiyala, 2005; Weiser et al., 2009). Rapid weight loss is a common feature of HIV infection. Due to an increased frequency of illness, the virus reduces energy levels and ability to perform physical work. In addition, HIV positive individuals with severe food insecurity are less likely to adherence to their ART regimen, engage in increased HIV transmission risk behaviors

and decreased access to HIV treatment and care, and have reduced baseline CD4 cell count, incomplete virologic suppression, and decreased survival (Nguthi and Niehof, 2008). Hence such individuals are likely to be sicker and less productive (de Waal and Whiteside, 2003; Shah et al., 2001).

This is especially significant in countries like Kenya where about eighty percent of the population depends directly on small scale farming for their livelihood. The situation is further complicated by the fact that HIV mainly affects the most productive segment of the population (Yamano and Jayne, 2005). If individuals are too weak to engage in food production, they are also likely to be food insecure (Anema et al., 2009; Frega et al., 2010). As a result of limitations in labor, households are likely to make negative changes in agricultural production, including reduction in the area cultivated, shifts to less labor intensive crops and reductions in livestock (UNAIDS, 1999). Affected households stop engaging in labor-intensive cash crops and shifted to producing food crops (Shah et al., 2001). Lack of adequate food intake further escalates the HIV/AIDS situation. Family members are drawn away from production or income generation activities to care for sick relatives. Households sell assets, and draw from savings and income to provide for medical care. AIDS-affected households therefore experience a vicious cycle where there is a decline in income as cost related to managing the epidemic and its consequences rise (Boerma et al., 2003) and with the decline in income, the ability to obtain sufficient healthy foods declines.

The 57th World Health Assembly resolved to encourage countries and agencies such as the World Health Organization (WHO) to integrate nutrition into the comprehensive response to HIV/AIDS as part of the scaling up of treatment and care (WHA, 2004). The WHO recommends increase in energy requirements of 10% in the asymptomatic stage and as high as 20–30% during the later stages of the disease (WHO, 2003). The monitoring of the food security of households impacted by HIV and AIDS is essential to accurately plan and target food and nutrition supplementation interventions.

The objectives of this study were to compare the food security status of households affected by HIV/AIDS to households not affected by HIV/AIDS, and identify coping strategies adopted by members of both food secure and insecure households.

Material and methods

The study was conducted in Sauri village in Western Kenya between August and October 2006. Sauri was the first Millennium Village set up in August 2004 as part of an initiative of the Earth Institute of Columbia University's Millennium Villages Project (MVP). The MVP operates in 14 rural sites in 10 countries in sub-Saharan Africa, attempting to demonstrate that the Millennium Development Goals can be reached within 5–10 years with a package of integrated interventions adding up to \$60 per person per year. The MVP works with rural communities, local governments, and multidisciplinary teams of scientists and development experts in nutrition and health, agriculture, economics, and environment to apply a proven holistic package of interventions to move African villages out of extreme poverty. The interventions include practical, proven inputs into increased food production, access to health-care, primary education, water, infrastructure, and business development. The other 13 Millennium Villages are located in Ethiopia, Ghana, Kenya, Malawi, Mali, Nigeria, Rwanda, Senegal, Tanzania, and Uganda. The areas were selected to characterize agro-ecologic zones in sub-Saharan Africa that are representative of 93% of the agricultural land area in sub-Saharan Africa and the homes of 90% of the agricultural population. Each Millennium Village is located in a reasonably well-governed and stable country

and in a hunger hotspot, an area with the highest rates of rural poverty and hunger, as identified by the UN Millennium Project.

Sample selection

The Sauri Millennium Villages Project (MVP) baseline dataset (Mutuo et al., 2006) was used to select the households to include in the study. Households were drawn from eleven Sauri sub-locations. Two sampling methods were used to select two groups of eligible households.

The first group consisted of HIV affected households. These were defined as households having either an orphan child or a self-identified HIV positive adult. These households were selected in two ways. First, households with orphans were identified by consulting the Sauri MVP baseline database (Mutuo et al., 2006). Secondly, adults who were HIV positive and were part of a social support group in the village were invited to participate in the study and their households were therefore included in the study.

The second group consisted of households not identified as affected by HIV. These households were used as the control group. Stratified random sampling was used to select these households. First any households that were included in group one (HIV affected category) were excluded from the sampling pool. The Sauri village baseline database was also examined for households that were not included in group one, but nevertheless displayed proxies for HIV such as a family member being chronically ill for at least 3 months in the last six months. These households were excluded from the sampling pool. From the remaining sample, households were randomly selected by picking every third household in the list of households in each of the 11 sub-locations. Households in this category were over sampled to allow for exclusion of households with HIV positive subjects, or other proxies for HIV found during the data collection phase.

Household heads or other responsible adults were asked to sign consent forms giving their approval for their households to be included in the study. The study was approved by the Columbia University ethics committee.

This study collected household demographic data and measured food insecurity, and strategies used to cope with food insecurity. Data were collected by interviewing the person in the household who was responsible for food preparation, or if that person was unavailable, another adult, such as the head of the household. The questions refer to the household as a whole, not any single member of the household. Data was collected by enumerators at the homes of the respondents.

Household food insecurity

Household food insecurity was measured using the Household Food Insecurity Access Scale Indicator (HFIAS) guide (Coates et al., 2006). This questionnaire evaluates the access component of household food insecurity in the past four weeks (30 days). The guide was developed and validated by USAID's Food and Nutrition Technical Assistance Project (FANTA), by identifying a series of nine questions (Table 12) used in a variety of countries and that differentiate between food secure and insecure households in diverse cultural context. A HFIAS score variable was calculated for each household by summing the codes for each frequency-of-occurrence question. The maximum score for a household was 27, when the household response to all nine frequency-of-occurrence questions was "often", coded with response code of 3. A response of "rarely" was coded as 1 and "sometimes" was coded as 2. The minimum score was 0, when the household responded "no" to all occurrence questions. The average Household Food Insecurity Access Scale Score was calculated using the household scores calculated above. The higher the food security score the greater the household food insecurity experienced. The lower the score, the less food insecurity (access) a household experienced.

Coping strategies index

Strategies for coping with food insecurity were measured using the Coping Strategies Index (CSI) (Maxwell et al., 2003). This tool provides a rapid assessment of a household's current food security situation and measures behavioral changes made at the household level to adjust for food shortages and the frequency and severity of a household's coping strategies for addressing shortfalls in food supply. The higher the CSI score the more food insecure the household. Three categories of coping strategies were included in the questionnaire: (1) Dietary change (e.g. eating cheaper food, or wild foods); (2) Increasing access to food (e.g. borrowing, or asking for help from others); and (3) Rationing food (e.g. family skips meals, or mothers prioritize feeding children).

The three food strategies were weighted and aggregated into an index that summarized these indicators of the household's current food security status. The CSI tool was adapted for the Sauri community as recommended (Maxwell et al., 2003) by first identifying the locally relevant coping strategies from the generic list of coping strategies which include the four basic categories of, dietary change; short-term measures to increase household food availability; short-term measures to decrease numbers of people to feed; and rationing, or managing the shortfall. A context-specific list of coping strategies was established through focus group interviews with members of the local community. Three focus groups each consisting of six women were conducted. It was considered appropriate to have women as the participants, as they are more knowledgeable about household consumption patterns than men. Two steps were followed in this process.

First starting with the generic list of food insecurity coping strategies, community members were asked to brain storm on whether each of these strategies applied to their community i.e. were people in this community likely to do these things when there was not enough food in the household, such as during famine or when there was not enough money to buy food? Each strategy was read to the community members and they were asked whether they would do this in their community. A tick was put against each of the strategies that the members said they practiced or would practice. All the community members had to agree on a strategy before it was ticked. Three strategies from the generic list that did not apply were excluded from the final CSI questionnaire used with the study population. These were, rationing money to household members to buy street food; sending household members to eat elsewhere; and sending household members to beg.

Secondly, each of the coping strategies identified were categorized and weighed in terms of severity by the community mem-

bers. The focus group members were asked to consider each of the chosen coping strategies and select the most severe coping strategies, i.e., things that people in that community do or would do when there was extreme lack of food. The group members were then asked to identify the least severe strategies, i.e. strategies they would use when lack of food was not severe, followed by severe strategies, and lastly the moderate strategies. The individual strategies listed were grouped into four categories, and each category was weighed, where 1 = the least severe category; 4 = the most severe, and 2 and 3 were intermediate. However the category 1 was not included in the final questionnaire as the focus group participants did not report it.

Thirdly, the score for relative frequency of how often a household had to rely on the various coping strategies ranging from never to everyday were assigned as recommended (Maxwell et al., 2003), and all strategies aggregated as indicated in Table 1.

Household assets scores

A list of commonly owned household assets was compiled. The list was presented to community members during the three focus groups interview sessions. The members validated the list by including or deleting assets included in the original list. The focus group members were then asked to rate the assets from highest to lowest in terms of value. The assets list was then presented to study participants and they were asked whether they owned each of these assets. A tick was placed on the list against each asset that the participants indicated that they owned. A total household score was then calculated for each household by aggregating all owned assets.

Results

All data were analyzed using SPSS version 18.0 for Windows (SPSS, Chicago, Ill). The data were analyzed using independent t-test and ANOVA for the comparison of means and chi square test for comparison of proportions.

In total 315 households were recruited into the study. These households were divided into two groups. Group one consisted of 169 HIV affected households. In this group, 44 households had self-identified HIV positive adults, 80 households had orphans and 45 households had both orphans and self-identified HIV positive adults. Group two consisted of 146 HIV unaffected households (Table 2).

HIV affected households tended to have significantly more members at 5.82 persons, compared to the unaffected households

Table 1
Coping strategies index scoring template.

Selected strategies	Every day (7)	3-6x a week (4.5)	1-2x a week (1.5)	<1 x a week (0.5)	Never (0)	Weight	Total score
1. Rely on less preferred and less expensive food?						3	
2. Borrow food, or borrow money to buy food?						3	
3. Purchase food on credit?						3	
4. Rely on help from relative or friend outside household?						3	
5. Limit portions at mealtimes?						3	
6. Limit your own intake to ensure child gets enough?						3	
7. Reduce number of meals eaten in a day?						4	
8. Skip whole days without eating?						4	
9. Gather unusual types or amounts of wild food/hunt						3	
10. Harvest immature crops (e.g. green maize)						2	
11. Rely on casual labor for food						2	
<i>Excluded Strategies</i>							
1. Send household members to eat elsewhere							
2. Send household members to beg							
3. Rationing money to household members to buy street food							
Total index score							

Table 2
Distribution of households (HHs) by HIV status.

Household type	Number of households
HHs with a self-identified HIV+ adult	44
HHs with orphans	80
HHs with both a self-identified adult and hosting orphans	45
HIV affected sub total	169
HIV unaffected sub total	146
Total	315

Table 3
Eligible households (HHs) characteristics by HIV status.

	HIV affected HHs	HIV unaffected HHs	Total	<i>p</i> value
Number of HHs	169	146	315	
Total number of HHs members	996	664	1660	
Mean HHs size	5.82	4.45	5.19	.000 ^a
Proportion of female headed HHs	50 (29.6%)	21 (14.4%)	71 (22.5%)	0.001 ^b
Proportion of HHs members aged 616 years	488 (49%)	295 (44.4%)	783 (47.2%)	0.053 ^b

^a Independent *t*-test.

^b Chi square test.

that had an average of 4.45 persons ($p = 0.00$). Affected households also tended to have a higher proportion female headed households (29.6%) compared to unaffected households (14.4%) ($p = 0.001$). However the proportion of minors under the aged 16 years in both households did not significantly differ (Table 3).

When household sub-categories were compared, there were significant differences in the mean household sizes ($p < 0.000$). Multiple comparisons indicated that unaffected households (mean size 4.45) had significant fewer household members compared to households with orphans (mean size 6.38, $p < 0.000$) and households with orphans and HIV positive adults (mean size 6.00, $p = 0.004$). Households with HIV positive adults also had significantly fewer members (mean size 4.64) than households with orphans (mean size 6.38, $p = 0.003$). There was no significant differences in the number of minors and adults in the household sub-categories ($p = 0.08$).

The type of household heads differed significantly in the four household sub-categories ($p < 0.000$). Unaffected households were significantly more likely to have a male head (mean = 1.14) compared to households with orphans (mean = 1.38, $p < 0.000$). Similarly, households with HIV positive adults were significantly more likely to have a male head (mean = 1.14) compared to households with orphans (mean = 1.38, $p = 0.011$) (Table 4).

Table 4
Unaffected and affected households (HHs) sub-categories characteristics.

	Unaffected HHs	HHs with a self-identified HIV+ adult	HH with orphans	HH with orphans and self-identified HIV+ adults	Total HIV Affected HHs	<i>p</i> Value
No. of HHs	146	44	80	45	315	
Total number of members	664	206	518	272	1660	
Mean HHs size	4.45	4.64	6.38	6.00	5.19	<0.00 ^a
Mean of HHs members aged 16 years and below (1 = Minor, 2 = Adult)	1.55	1.57	1.50	1.48	1.53	0.08 ^a
Mean of female headed HHs (1 = Male, 2 = Female)	1.14	1.14	1.38	1.31	1.23	<0.00 ^a

^a One way Anova.

Household food insecurity and HIV status

There was a significant difference in household food insecurity between HIV affected and unaffected households. HIV affected households reported a significantly higher food insecurity score 11.11, compared to 9.53 in HIV unaffected households ($p = 0.037$) (Table 5).

Multiple comparisons with tukey post hoc test indicated that there were significant differences between unaffected households and the sub-category of households with orphans and HIV positive adults ($p = 0.016$). Household hosting orphans and HIV positive adults had the highest food insecurity score (Table 6). There were no significant differences in the other sub-categories of the HIV affected households food security scores.

Type of household head and food security

We found a significant difference in food security scores by gender of household headship. Overall households that were headed by women reported greater food insecurity (Table 7) compared

Table 5
Household food insecurity score by household type.

Household type	Mean food insecurity score	N	<i>p</i> Value
HIV affected households	11.11	169	0.037 ^a
Unaffected households	9.53	146	
All Households combined	10.38	315	

^a Independent *t* test.

Table 6
Food insecurity score by households (HHs) sub-category type.

Household type	Number of households	Food insecurity score	<i>p</i> Value
Unaffected HHs	146	9.53	
HH with HIV+ adult	45	11.02	0.026 ^a
HH with both orphan and HIV+ adult	46	12.91	
HH with orphans	82	10.15	
Total		10.38	

^a One way ANOVA.

Table 7
Gender of household head and food security.

Type of HH head	N	Food insecurity access score		Unaffected HHs	<i>p</i>
		All households	HIV affected HHs		
Female	73	12.33	0.017 ^a	10.32	0.041 ^b
Male	241	10.20		9.47	

^a Independent *t*-test.

^b Two-way ANOVA.

to those headed by men. When affected households were compared to unaffected, the affected households headed by women reported the worst food insecurity.

There were no significant differences in household food security scores when the combined gender and age of overall household heads were compared ($p = 0.24$) neither when gender and age of household heads, affected versus unaffected households were contrasted ($p = 0.985$), using two-way ANOVA.

Households with orphans

For households hosting orphans (with no identified HIV positive adult) our results indicate that male-headed households reported better food security scores (9.18) compared to female headed households that reported a higher mean food insecurity score (11.30), (Table 8).

Coping strategies

There was a significant difference in the coping strategies scores between HIV affected (64.48) and unaffected households (50.31) ($p = 0.004$). Affected households were therefore associated with more severe coping strategies (Table 9).

There were also significant differences in the coping strategies of the household subcategories ($p = 0.002$). Multiple comparisons with tukey post hoc test indicated that households with orphans and HIV positive adults had higher coping strategy scores (79.24) ($p = 0.002$) associated with greater food insecurity compared to unaffected households (50.31) (Table 10).

Assets. When household asset scores were evaluated, there were no significant differences in assets scores between affected and unaffected households ($p = 0.25$) (Table 11)

Table 8
Food Security in Households Hosting Orphans Only.

Gender of household head	Number of households	Mean household food insecurity score	<i>p</i>
Male	53	9.18	0.039 ^a
Female	27	11.30	
Total	80	10.2	

^a Independent *t* test.

Table 9
Coping strategies score by households (HHs) type.

Household type	Coping strategies score mean	Number of households	<i>p</i> value
Unaffected HHs	50.31	146	0.004 ^a
Affected HHs	64.48	169	
All households	57.91	315	

^a Independent *t* test.

Table 10
Coping strategies score by households sub-categories.

	N	Coping strategies score mean	<i>p</i> Value
Unaffected HHs	146	50.31	0.002 ^a
HHs with HIV+ adults	44	58.03	
HHs with orphans and HIV+ adults	45	79.24	
HHs with orphans	80	59.73	
Total	315	57.91	

^a One way ANOVA.

Table 11
Comparison of household assets score.

Household type	N	Mean asset score	<i>p</i> Value
Affected HHs	169	12.7929	0.250 ^a
Unaffected HHs	146	13.3562	
Total	315	13.0746	

^a Independent *t* test.

Discussion

The results from this study indicated that while all households in the setting had a degree of food insecurity, HIV affected households were significantly worse off. This finding could be explained by the difference in the characteristics of the two types of households. HIV affected households are typically female-headed, have a significantly higher dependency ratio and experience labor shortage despite their larger size (Nguthi and Niehof, 2008; Shah et al., 2001). Death due to AIDS, results in households either dissolving or become bigger (Nguthi and Niehof, 2008; Yamano and Jayne, 2004). The affected households in our study displayed some of these characteristics. Significantly more affected households were headed by women and were larger in size. These characteristics likely made them more vulnerable because women in this setting suffer discrimination in the allocation of resources such as land, access to employment outside the home and therefore a female family head may be a liability in this sense (UNAIDS, 1999). The household resources also had to be shared by a larger number of family members.

We did not find any significant difference in household assets scores between affected and unaffected households. Other studies have reported differences in assets in the two types of households with distress sales of property by affected households in some instances. Karuhanga (2010) for example found that there was a significant difference in ownership of small livestock between the two categories. Affected households also used their savings to cope (Nguthi and Niehof, 2008). However our finding of no significant difference in asset ownership could be explained by the fact that this study was set in a millennium village, typically characterized by extreme poverty, and hence as previously reported by Nombo (2007), if households are all more or less poor, and if the overall HIV prevalence is high, being affected or not does not make much of a difference in food security status.

One adverse effect of the HIV/AIDS pandemic has been the millions of children orphaned, especially in Sub-Saharan Africa (Ainsworth and Semali, 2000). When the affected household subcategories' food security status were examined, households hosting orphans and HIV positive adults were the worst off, followed by those with a HIV positive adult. The least food insecure in this group were households hosting orphans only. It is likely that the HIV positive adults became less productive and also allocated more resources in medical care due to their condition. However the already dwindling household resources were further challenged by the added responsibilities of caring for the orphans resulting in worsening food insecurity. The adverse effects of hosting orphans in economically poor setting are well understood (Deininger et al., 2003; Urassa et al., 1997). As described in our publication elsewhere, children living in HIV affected households in this community were significantly more stunted than those in unaffected households (Ndirangu et al., 2011). Similar results have been reported by others (Ainsworth and Semali, 2000; Ainsworth et al., 2005).

An interesting preliminary finding was that the households hosting orphans in general seemed to have relatively better food security. However, on further data analysis it became clear that only male-headed households hosting orphans reported better

Table 12
Household food insecurity access scale indicator (HFIAS) guide.

Question No.	Occurrence questions
1	In the past four weeks, did you worry that your household would not have enough food? 0 = No (skip to Q2) 1 = Yes 1.a. How often did this happen? 1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) 3 = Often (more than ten times in the past four weeks)
2	In the past four weeks, were you or any household member not able to eat the kinds of foods you preferred because of a lack of resources? 0 = No (skip to Q3) 1 = Yes 2.a. How often did this happen? 1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) 3 = Often (more than ten times in the past four weeks)
3	In the past four weeks, did you or any household member have to eat a limited variety of foods due to a lack of resources? 0 = No (skip to Q4) 1 = Yes 3.a. How often did this happen? 1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) 3 = Often (more than ten times in the past four weeks)
4	In the past four weeks, did you or any household member have to eat some foods that you really did not want to eat because of a lack of resources to obtain other types of food? 0 = No (skip to Q5) 1 = Yes 4.a. How often did this happen? 1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) 3 = Often (more than ten times in the past four weeks)
5	In the past four weeks, did you or any household member have to eat a smaller meal than you felt you needed because there was not enough food? 0 = No (skip to Q6) 1 = Yes 5.a. How often did this happen? 1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) 3 = Often (more than ten times in the past four weeks)
6	In the past four weeks, did you or any household member have to eat fewer meals in a day because there was not enough food? 0 = No (skip to Q7) 1 = Yes 6.a. How often did this happen? 1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) 3 = Often (more than ten times in the past four weeks)
7	In the past four weeks, was there ever no food to eat of any kind in your household because of lack of resources to get food? 0 = No (skip to Q8) 1 = Yes 7.a. How often did this happen? 1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) 3 = Often (more than ten times in the past four weeks)
8	0 = No (skip to Q9) 1 = Yes 8.a. How often did this happen? 1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) 3 = Often (more than ten times in the past four weeks)
9	In the past four weeks, did you or any household member go a whole day and night without eating anything because there was not enough food? 0 = No 1 = Yes 9.a. How often did this happen? 1 = Rarely (once or twice in the past four weeks) 2 = Sometimes (three to ten times in the past four weeks) 3 = Often (more than ten times in the past four weeks)

food security scores. Female-headed households hosting orphans were more food insecure. Even though we did not find any significant differences in the assets owned by the different types of households in this study, the difference in food security status

could be explained by the fact that male-headed households are likely to have resources (not captured by our study), and it could be that these households hence accepted to host orphans. Female-headed households on the other hand may have accepted

to host the orphans, in spite of limited resources. It is a common phenomenon in this setting for grandmothers to host the children of their deceased children.

HIV affected households were significantly more likely to engage in severe food insecurity coping strategies than unaffected households. This has been demonstrated in other settings (Weiser et al., 2007). Households with orphans and HIV positive adults had the highest coping strategy scores which are associated with greater food insecurity compared to unaffected households. Members of affected household are also likely to engage in more severe coping strategies to manage the food insecurity. As such, it is important for policy makers to bear this in mind when developing and implementing programs in such settings. HIV affected households need added safety nets to help cope with food insecurity. Integration of food security interventions into HIV/AIDS treatment programs may be essential to curtail the HIV/AIDS epidemic and improve health and quality of life among those infected and their households (Anema et al., 2009; Frega et al., 2010).

This study indicates that in resource limited settings such as the MVP, other variables in addition to HIV infection are at play in household food security status. Karuhanga (2010) in her study based in Uganda, refers to these as “multilayered impacts of AIDS”, that include type of household headship, and household wealth status. Our study supports the importance of considering the gender of household heads when evaluating and devising food security interventions.

Conclusion

The food security of HIV affected households is compromised by a variety of factors including the synergy generated by hosting a HIV positive family member and orphans. The gender of the household head is also an important consideration. Households headed by women tend to be more vulnerable, predisposing households to greater food insecurity.

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