



**Assessment of  
Food Security and Vulnerability  
of HIV-Affected Households  
in Selected Regions Of Ghana**

**JANUARY 2019**



**The Ghana AIDS  
Commission (GAC)**





Under the Office of the President

ASSESSMENT OF  
FOOD SECURITY AND  
VULNERABILITY  
OF HIV-AFFECTED  
HOUSEHOLDS  
IN SELECTED REGIONS OF GHANA

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# Foreword

This study assessed food insecurity and vulnerability status of HIV affected and infected households to inform the Ghana AIDS Commission and the World Food Programme about the food security situation of Persons Living With HIV in Ghana. The data collected and analyzed suggest that food insecurity is a problem for thousands of HIV affected and infected households. The report also reveals that various coping strategies were developed by food-insecure HIV affected households and these strategies range from food rationing to harvesting immature crops and/or begging for food or money.

As the need for optimal nutrition in effective HIV treatment success is undisputed, addressing the dehumanizing food consumption coping strategies documented in this study will contribute immensely to the realization of the global targets of 90-90-90. Risks posed by these negative coping strategies may be reduced through appropriate safety nets and also prioritizing female-headed households.

To ensure sustainability of interventions to mitigate the negative effects of food insecurity of HIV infected and affected households, the Ghana AIDS Commission and the World Food Programme together with their partners must undertake periodic food security and vulnerability profiling of Persons Living With HIV

households in order to inform both policy and programmatic decisions aimed at improving food and nutrition as well as health outcomes of persons infected and affected by HIV.

The World Food Programme must continue to offer nationally-tailored technical assistance and capacity development to build government's capacity in all fields, particularly private-sector capacity and willingness to produce and market affordable and safe fortified nutritious foods because the Programme believes food security and nutrition policies must be rooted in strong governance, responsive institutions and an enabling environment. The Programme should build awareness and demand for nutritious foods through social and behaviour change communication; strengthen market-based approaches to enhancing nutrition among populations with low purchasing power; and ensure that social protection programmes respond to the nutritional needs of the most vulnerable such as Persons Living with HIV.

The Ghana AIDS Commission's role of coordinating activities of various stakeholders engaged in the prevention of HIV and support for Persons Living with HIV needs to be continued and strengthened. The Commission overwhelmingly agrees that nutrition and food security are critical to mitigating the socio-economic impact on those infected and affected by HIV.



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# Acknowledgements

This report benefits immensely from the contributions and support of the below-mentioned institutions and individuals (some of whom are not named in this report). The Ghana AIDS Commission (GAC) provided leadership and coordinated the implementation of the assignment. Our heartfelt thanks go to all members of the Study Scientific Advisory Committee (SAC), a body constituted by the GAC to provide support and direction to the exercise. A complete list of the SAC is included below.

The efforts of the team that provided support to the Lead Consultant – Gideon Senyo Amevinya, Archibald Okotah, Marcella Ambenne, Alice Sallar-Adams, Elizabeth Asare are deeply appreciated. Ms. Akua Tandoh provided editorial and formatting support during the report writing phase of the exercise. We thank the GAC's Technical Support Units for their support during the community entry processes in the four focus regions. The research assistants, supervisors deserve commendation for their diligence during the data collection phase. Finally, we are grateful to the 1,666 households who availed themselves to be surveyed.

The Funding for the survey was generously provided by the United Nations World Food Programme. Dr. Amos Laar was contracted to oversee the implementation of the assignment (the 2018 food security and vulnerability assessment of HIV-affected households in selected regions of Ghana).

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# List Of Acronyms

<b>AIDS</b>	Acquired Immune Deficiency Syndrome
<b>ART</b>	Anti- Retroviral Therapy
<b>ARV</b>	Antiretroviral
<b>BMI</b>	Body Mass Index
<b>CRS</b>	Catholic Relief Services
<b>CSI</b>	Coping Strategies Index
<b>DHS</b>	Demographic and Health Survey
<b>FCS</b>	Food Consumption Score
<b>GAC</b>	Ghana AIDS Commission
<b>GHS</b>	Ghana Health Service
<b>GoG</b>	Government of Ghana
<b>HIV</b>	Human Immunodeficiency Virus
<b>ICAP</b>	Interactive Cluster Analysis
<b>IGAs</b>	Income Generating Activities
<b>LEAP</b>	Livelihood Empowerment Against Poverty
<b>MOH</b>	Ministry of Health
<b>NACP</b>	National AIDS/STIs Control Programme
<b>NGOs</b>	Non- Governmental Organizations
<b>NSF II</b>	National Strategic Framework II
<b>NSP</b>	National Strategic Plan
<b>PLHIV</b>	People living with HIV
<b>PRRO</b>	Protracted Recovery and Relief Operation
<b>SMART</b>	Standardized Monitoring and Assessment of Relief and Transitions
<b>TSU</b>	Technical Support Unit of the GAC
<b>UN</b>	United Nations
<b>WFP</b>	World Food Programme
<b>WHO</b>	World Health Organization



# Executive Summary

## Background:

Guided by evidence from scientific studies, the United Nations World Food Programme (WFP) has since the early 2000s developed various HIV policies to guide its interventions. The WFP has contributed integrally to the area of “food and nutritional support” an area now widely recognized as critical in enabling treatment uptake and adherence, and thus treatment success.

In Ghana, a gap analysis report of the WFP in Accra in 2010 revealed that key stakeholders engaged in prevention, care, and support for People Living with HIV (PLHIV) agreed that nutrition/food security is critical to mitigating the socio-economic impact on PLHIVs and those affected. They, however, noted the lack of information needed for nutrition-driven interventions for PLHIV in the country. Following this, a nationwide survey done in 2011, presented national data on food security and vulnerability among HIV-affected households. The 2011 survey was instrumental in the effective targeting of PLHIV for food assistance through the Protracted Relief and Recovery Operation (PRRO), in which about 15,000 HIV-affected households received assistance. The year 2018 marked the transitional period between the end of WFP’s Country Programme and a new 5-year Country Strategic Plan (CSP) spanning 2019-2023 would be developed. Data from the 2018 survey informed the development of the 2019-2023 CSP.

## Objectives:

The 2018 survey assessed food insecurity and vulnerability status of HIV-affected households in four regions of Ghana to enable WFP and other stakeholders glean relevant information on the food security profile of PLHIVs in Ghana and better tailor future strategies and interventions to address the problem.

## Methods:

A cross-sectional design using solely quantitative data collection techniques was adopted. The study population included adults in households caring for an HIV-sero-positive person in the indicated regions of Ghana. Food security and vulnerability to food insecurity were the key outcomes in the assessment. These attributes were measured using indicators commonly used by WFP - the coping strategy index (CSI) and the food consumption score (FCS). Survey data was conducted using an innovative mobile app (ONA Collect), and analyzed using IBM Statistics for Windows, Version 21.0. We used univariate analysis to generate descriptive tabulations for key variables. Bivariate analyses (such as Chi Square test of proportions) produced unadjusted associations between food consumption groupings, vulnerability categories, and some selected household background, demographic or health attributes. For continuous outcomes (such as CSI, FCS, BMI etc) and explanatory variables (such as age, dependency rate), Pearson Product Moment correlations were generated. T-test, ANOVA/ Kruskal-Wallis tests compared means of key outcomes. Two-sided test of statistical significance was performed with P value <0.05 was used to denote statistical significance.

## Key findings:

Data on household demographics, household income and expenditure, livelihood categories, food consumption, coping strategies, and nutrition status of selected household members among others were collected from 1,666 HIV-affected households.



The key findings emerging from the assessment are summarized below:

1. The data suggest that food insecurity is a problem for thousands of HIV-affected households in the four focus regions of Ghana. About 21 percent of the 1,666 households are food insecure (highest in Northern region – 24.0 percent and lowest in Brong Ahafo region – 16.4 percent). Also 30 percent of the 1,666 are classified as being on the edge of food insecurity (the borderline group). Extrapolations based on the entire number of PLHIV on ART in the focus regions (36,586) take the numbers who are food insecure to 7,778 PLHIV. Based on an average household size of four members, this means that altogether  $7,778 \times 4$  (31,112) persons infected or affected by HIV need to be targeted for assistance.
2. Various coping strategies were instituted by the HIV-affected households ranging from limiting portion sizes at mealtimes (61.9 percent), reducing number of meals eaten per day (59.9 percent), relying on less expensive or less preferred foods (57.6 percent), to harvesting immature crops, to sending out a household member to beg (5.7 percent).
3. As in previous surveys, the current study presents data on four different categories of vulnerability: The “worst off” (8.9 percent); and the “vulnerable” (41.9 percent); need some form of intervention, while those in the “acceptable” (28 percent); or “better off” (21.2 percent) do not. For planning and programming purposes, the 8.9 percent translate into 3,257 of the total 36,586 PLHIV on ART in the four focus regions requiring immediate targeting for assistance. Such planning should take cognizance of the vulnerable as well – in which case, a total, of 15,330 PLHIV on ART in the four focus regions would require some form of assistance. Consideration of other household members take these numbers to  $3,257 \times 4$ , and  $15,330 \times 4$  respectively.
4. Further statistical analysis reveals significant associations among food insecurity/vulnerability categorizations and several variables – as summarized below:
  - a. Apart from Tamale metropolis and East Mamprusi district (15 vs 10), the CSI was comparable in both the rural and urban districts of a selected region. The Cape Coast metropolis had the highest median CSI.
  - b. Households headed by females, households hosting a sick member for more than three months or has at least one orphan had significantly higher CSI.
  - c. Overall, mean CSI decreases with increasing asset wealth; and this is predictable, as asset wealth is linked to household income levels, resilience, and therefore better coping. On the contrary we observed a directly proportional/positive correlation between CSI and household size; CSI increases with increasing household size.
  - d. We also observed statistically significant differences in the rates of food insecurity and access to arable land, hosting a sick person for at least three months, dependency rate, and asset wealth
  - e. Intriguingly, we observed that whilst caring for a chronically ill person in a household was significantly associated with food insecurity, caring for a sick person in the household for less than a month was not
  - f. Access to arable land was found to be significantly associated with vulnerability to food insecurity
  - g. Households with more members and dependents were more vulnerable to food insecurity.
5. Taking data from the four focus regions (or eight districts) together, 26 percent of the main respondents were classified as being chronically energy deficiency (BMI < 18.5kg/m<sup>2</sup>).
6. The practice of blood pressure measurement by health workers is prevalent among the study respondents - 93 percent of the 1,666 had ever had their blood pressured measured. Fourteen percent of whom self-reported their hypertension status. However, BP measurements conducted by the research team estimated 24 percent of them to be hypertensive



7. Findings on adherence to antiretroviral therapy reveal reasonably high indicators of medication adherence. Over 96 percent of these HIV-positives reported taking correct doses of ARVs and other prescribed medications given them as directed. However, 91 percent of them were able to take their medications at the right time and also with the appropriate food. Among those who couldn't adhere to their medication, reasons cited include “no drugs, no money, side effects, distance to facility, stigma, forgetfulness, no food, too sick and spiritual reasons assigned to illness.”

## Recommendations

1. About 21 percent of the 1,666 households are food insecure, and 30 percent are on the edge of food insecurity (borderline). The 21 percent translate into 7,778 of the total 36,586 PLHIV on ART in the focus regions being food insecure. With an average household size of four members, this means that altogether 31,112 persons infected or affected by HIV in these four regions may need support to improve their food and nutrition security.
2. Alternatively, if interventions are dictated by vulnerability categorization, then the “worst off” (8.9 percent); and the “vulnerable” (41.9 percent), the 8.9 percent translate into 3,257 of the total 36,586 PLHIV on ART in the four focus regions requiring immediate targeting for assistance. While the 41.9 percent translate into a total, of 15,330 PLHIV on ART in the four focus regions requiring some form of assistance. Consideration of other household members take these numbers to 3,257x4, and 15,330x4 respectively. In either case, intervention could comprise social protection conditional household support (in the form of food transfer of cash transfer) or more sustainable capacity building interventions, with exit triggers and strategies outlined.
3. As the role of optimal nutrition in treatment success is undisputed, addressing the dehumanizing food consumption coping strategies documented in this study will contribute to the realization of the third of the 90-90-90 targets. The risks posed by these negative coping strategies may be reduced through appropriate safety nets. For instance, the Government of Ghana in line with their policy on LEAP may include food insecure PLHIV households deploying such dehumanizing negative coping strategies as beneficiaries of LEAP or other social protections interventions. In this regard, those assessed to be food insecure, or “worst off”, or “vulnerable” may be targeted
4. As the key variables of household size, households hosting chronically sick individuals, household asset wealth, and those with high number of dependents are associated with both vulnerability to food insecurity or outright food insecurity, it may be prudent to use these attributes as proxy indicators when targeting vulnerable households susceptible to food insecurity, especially for conditional household support or HIV impact mitigation interventions. For such assistance to be sustainable, however, measures that aim at improving capacity to earn a regular income – through livelihoods support and acquisition of a productive asset, or income generating activities such as petty trading or small business activities, should be encouraged or supported.
5. The sex of the household head may be of policy interest. Given that there were more female-headed households in the food insecure or borderline groups, female-headed households could be prioritized when designing and deploying interventions to address food insecurity and vulnerability to food insecurity.
6. While proxy indicators of medication adherence reveal an appreciably high level of adherence to the ARV regimen, the documented challenges of “no drugs, no money, side effects, distance to facility, stigma, forgetfulness, no food, too sick” need to be addressed.
7. To ensure efficient programming and roll out of the interventions suggested above, an updatable register which keeps record of all such vulnerable and food insecure households in each district or treatment center may be needed
8. The GAC, WFP, and its partners should consider undertaking annual food security and vulnerability profiling of PLHIV households in order to inform both policy and programmatic decisions aimed at improving food and nutrition as well as health outcomes of PLHIVs. This is important because the households classified as acceptable and better off groups do not need immediate food security-promoting interventions. However, the various categories of vulnerability or food insecurity status are not only transitory, progression/retrogression from one step to the other can be non-linear.







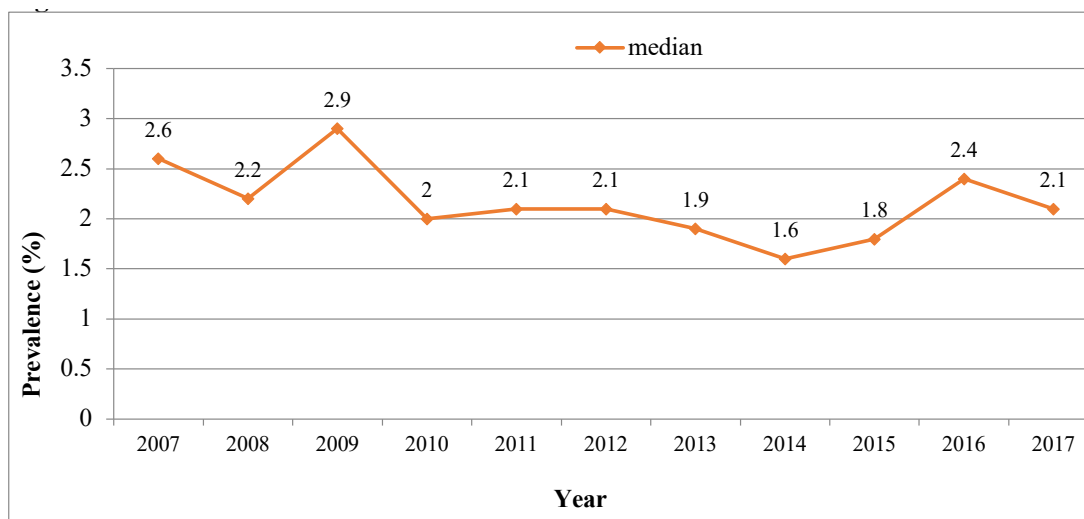
# CHAPTER ONE

## 1.0 BACKGROUND

For nearly four decades, Human Immunodeficiency Virus (HIV), has been a global public health, as well as development challenge. Of 36.9 million people estimated by the Joint United Nations Programme on HIV/AIDS (UNAIDS) to be living with HIV globally – in 2017, most were in sub-Saharan Africa. In Ghana, HIV prevalence among antenatal clients for 2017 was 2.1 percent (C.I 1.9-2.3) a decrease from the 2016 prevalence of 2.4 percent. The 2017 HSS outcome saw four regions recording prevalence above the national median prevalence of 2.1 percent. Greater Accra and Ashanti regions (2017 prevalence of 3.2 percent) have thus overtaken the Volta and Brong Ahafo regions as the regions with the highest HIV prevalence rate. The Northern region characteristically

recorded the lowest prevalence below 1 percent (0.6 percent). Brong Ahafo region has a current prevalence of 2 percent, and Central region, 1.8 percent. For three consecutive years there have been major swings in prevalence in all regions except the Northern, Upper East, Western and Central regions. Only two sites namely Salaga (rural/Northern Region) and Agormanya (urban/Eastern region) have experienced a consistent decline since 2013. Thus between 2007 and 2017, Ghana has worked, and continue to work hard to halt the rise in HIV prevalence and to increase access to treatment for persons living with HIV. The median HIV prevalence among antenatal clients reduced from 2.1 percent in 2012 to 1.6 percent in 2014. It then increased to 2.4 percent in 2016 and then fell to 2.1 percent in 2017 (see Figure 1.1 below).

Figure 1.1 Median HIV Prevalence 2007-2017



In 2017, the estimated adult national HIV prevalence was 1.67 percent, while estimated persons Living with HIV (PLHIV) and AIDS was 313,063 (284,860 adults, 28,203 children). Estimated annual new infections was 19,101

(adults - 15,679, and children - 3,422). Nearly sixteen thousand (15,694) annual AIDS-related deaths are estimated (adults - 12,792, and children - 2,902). Details of these estimates can be found in Table 1.1 below.

**Table 1.1 National HIV Estimates 2017**

Indices	Estimated number
HIV Population Adults + Children	313,063
HIV Population – Adults 15+	284,860
HIV Population – Children (0 -14)	28,203
Number of new HIV infections	19,101
New HIV infections- Adults (15+)	15,678
New HIV infections- children	3,422
Total AIDS deaths	15,694
Annual AIDS deaths- Adults (15+)	12,792
Annual AIDS deaths- Children (0-14)	2,902

Source: NACP

Like other countries in the sub-region, the fight against HIV and AIDS has been pursued through interventions to stop the spread of the virus and prolong the lives of those infected mainly through the use of antiretroviral therapy (ART). Significant successes have been made in this regard. In totality, the Ghana HIV numbers suggest a trending down of its prevalence. Significant national achievements since the baseline survey of 2011 include:

Ghana’s efforts to broaden access to ART have yielded considerable improvements in the lives of PLHIV. As at the end of 2016, a total of 100,665 PLHIVs were on treatment, an increase from 69,294 in 2012. Unfortunately, this translates to about 34 percent of PLHIV receiving antiretroviral treatment. Nevertheless, this is significant as annual number of AIDS-related deaths declined by 40 percent from 25,000 in 2010 to 15,000 in 2016. The number of sites providing Prevention of Mother-To-Child Transmission (PMTCT) services also increased from 2,325 in 2015 to 2,748 as at the end of 2016. Overall, the proportion of HIV-positive pregnant women who received ART for prevention of mother-to-child transmission (PMTCT) increased from to 64 percent in 2015 to 67 percent at the end of 2017. This resulted in reduction in new infections in children by 46 percent from 5,600 in 2010 to 3,000 in 2016. ART coverage among children increased 2.5-fold from 6 percent in 2010 to 15 percent in 2016.

The Ghana AIDS Commission (GAC), and partners developed and implementation of a 5-year National Strategic Plan (NSP) for period 2011 to 2016. A new NSP for the period 2016-2020 is being implemented. The development

of these NSPs is not only deliberative, and all-inclusive, they are also grounded in available scientific evidence and best practices. The 2016-2020 NSP acknowledged research findings which indicate that food insecurity is a major impediment to the regular uptake of anti-retroviral treatment and treatment/medication adherence<sup>2-4</sup>

In light of the above, and other recent scientific evidence, advancement in treatment coverage and an increased understanding of the role of nutrition in the prevention, treatment and care of HIV and TB, the United Nations World Food Programme (WFP) developed and has been implementing, with the support of partners, policies and programmes to address food insecurity and related vulnerability among persons infected or affected by HIV. For instance, in 2011, the WFP in collaboration with the GAC conducted a thorough nationwide Food Security and Vulnerability Assessment of PLHIV and their households in Ghana. In view of the above findings, the Government of Ghana (GoG) through the Ghana AIDS Commission in 2009 requested WFP to provide food assistance to food-insecure PLHIVs in Ghana. WFP, through the Protracted Relief and Recovery Operation, provided assistance to 6,000 food-insecure PLHIV and their families for an initial two-year period. The objective of the food assistance was to promote adherence to anti-retroviral treatment and to ensure that the nutritional status of food insecure PLHIV does not decline further.

In 2011 a nationally representative sample of 1,745 HIV-affected households was surveyed to estimate the prevalence of food



insecurity and adoption of coping strategies among these households. The majority of the respondents in the survey were females (75 percent). The proportion of female-headed HIV-infected households was almost equal to male-headed households although there were notable regional variations. The average size of households differed by household headship. Those headed by men had on average three members, compared to two for female-headed households. Forty-one percent of respondents were married, 15 percent were divorced, and 20 percent were widowed. Nearly 72 percent had attained at least a primary school education. Nationally, 16.3 percent of the main respondents were chronically energy deficient (defined as BMI < 18.5 kg/m<sup>2</sup>). The rate was highest in the Central Region To deal with food insecurity, the households reported some coping strategies they had employed such as limiting portion size (61.3 percent), reducing number of meals per day (59.5 percent) and relying on less expensive foods (56.2 percent) to survive. Conversely, the least employed strategies included household member going begging (5.6 percent), eating elsewhere (8.7 percent) and harvesting immature crop (7.6 percent). It is worth noting that most households do not use a single strategy, but a combination of strategies. (27.5 percent) (GAC/WFP 2011). The assessment was instrumental in the effective targeting of PLHIV for food assistance through the Protracted Relief and Recovery Operation in which about 15,000 HIV-affected households received assistance. The year 2018 marks the transitional period between the end of WFP's country Programme and a new 5-year Country Strategic Plan (CSP) spanning 2019-2023 would be developed. Gaps, and opportunities identified by this assignment will guide the development of the 2019-2023 CSP.

Some of the evidence pertaining to HIV and food insecurity, which have influenced the programming of WFP, GAC, and others are summarized in the following sections.

In spite of the successes pertaining to access to treatment commodities (enumerated above), and have been shown to lead to a reduction in the number of AIDS-related deaths<sup>5, 6</sup>, a major challenge many HIV-affected individuals and households in sub-Saharan Africa grapple with is food insecurity. Studies have shown that HIV exacerbates the vulnerability of

affected families to food insecurity, leading to hunger and malnutrition<sup>7, 8</sup>. For instance, a longitudinal study in Uganda among HIV-infected individuals had shown that severe food insecurity was associated with worsened quality of life<sup>9</sup>. Indeed, scholars have previously provided elucidation on the relationship between HIV and food insecurity. The relationship is complex and intertwined in a vicious cycle, with each worsening vulnerability and thus exacerbating the severity of the other<sup>9, 10</sup>. Food insecurity heightens susceptibility to HIV exposure and infection; HIV on the other hand, increases vulnerability to food insecurity. This relationship is often compounded by low income, resulting in profound consequences on health and nutritional status. Households that suffer from food insecurity due to poverty are malnourished prior to infection<sup>10</sup>. As a disease, HIV's impact on malnutrition as a result of its effect on the infected individual's metabolism, ingestion and digestion of food has long been clarified<sup>11-14</sup>

HIV also disrupts livelihoods as infected persons often lose the ability to work and generate income<sup>15</sup>. In addition, the propensity for uninfected family members to contribute economically to the household income basket is seriously affected due to the burden of care for the infected person(s). For instance, it is reported that caring for an individual with AIDS in sub-Saharan Africa can deplete as much as one-third of a family's monthly income. This situation feeds into the vicious cycle of HIV and food insecurity described above.

Sometimes described as a syndemic, the relationship between HIV and food insecurity often causes individuals and households to adopt coping strategies to maintain the status quo. Studies have demonstrated that such strategies are often negative, undesired, unsustainable and often irreversible<sup>16, 17</sup>. Strategies that have often been adopted include the sale of assets, taking children out of school, migrating and engaging in transactional sex<sup>10, 15, 18</sup>. Some authorities posit that these coping strategies may bring short-term relief, but increases the risk of exposure to HIV. Destitution and despair brought on by negative coping behavior may increase the risk that a person will resort to trading unprotected sex for food<sup>19, 20</sup>.



## 1.1 HIV and food insecurity

The relationship between food insecurity and HIV has been extensively studied. Food insecurity negatively impact ART adherence<sup>21</sup> leading to adverse health outcomes in people living with HIV. Food insecurity is a significant risk factor for non-adherence to ART among HIV infected individuals<sup>22</sup>. A positive association between severe food insecurity and poor ART adherence has been established<sup>23, 24</sup>. This association could be due to the increased hunger and appetite as well as increased gastrointestinal side effects after the start of ART shown in a study in Kenya<sup>25</sup> which is as a result of eating less expensive foods or eating foods of limited variety in the face of food insufficiency leading to inadequate intake of required nutrients<sup>26</sup>. Some people may decide to miss daily doses of medication<sup>27</sup> leading to adverse effects on their health. In Atlanta Georgia, a study showed that individuals who were food insecure and taking ART requiring food indicated significantly greater HIV symptoms, Lower CD4 cell counts and poorer HIV suppression<sup>28</sup> and another study among US women had a similar outcome. Food insecurity was associated with higher viral load and lower CD4+ cell count<sup>29</sup>. Therefore, the success of ART treatment is limited in the absence of food security<sup>30</sup>, consequently food-based interventions can play a supportive role in improving ART adherence. Severe food insecurity is found to be associated with common mental health indicators such as perceived stress, depressive symptoms, suicidal ideation and lower quality of life<sup>21, 31, 32</sup>. Maternal stress among HIV-positive mothers has been associated with persistent household food insecurity, thus it has been suggested that mental health should be an integral part of addressing maternal care in community affected by the HIV-Food insecurity syndemic<sup>33</sup>. Also recommended maternal and infant health services for PMTCT were 14 percent less likely to be completed by women who reported severe food insecurity compared to food secure women<sup>34</sup> leading to adverse effects on their health. In a study in Uganda, severe food insecurity among PLHIV was found to be associated with worse physical health summary, opportunistic infections and increased hospitalization in resource-poor settings<sup>9</sup>. HIV affects the productivity of PLHIV as such they are unable to perform tasks needed to provide food for the family<sup>35</sup>. These households become food insecure leading to inadequate

intake of the required nutrients<sup>26</sup> resulting in malnutrition. Children under five who live in HIV-affected households are more likely to be malnourished due to food insecurity<sup>36</sup>. A study in Ethiopia found out that some of the factors associated with undernutrition in PLHIV were unemployment and food insecurity<sup>37</sup> as other studies have reported. Addressing food insecurity of PLHIV is paramount to ensuring good health outcomes and good quality of life.

## 1.2 HIV contributes to malnutrition, and increased energy requirement simultaneously

HIV has profound consequences on nutritional status. This is exacerbated for households that already suffer from food insecurity and are malnourished prior to infection. The disease becomes a cause of malnutrition in its own right through its effect on the infected individual's metabolism, hampering their ability to ingest food and digest. It also disrupts livelihoods as PLHIV often lose the ability to work and generate income, thus creating a vicious cycle of food insecurity and lack of means of livelihood for themselves and their households. Furthermore, where significant stigma is associated to the disease, PLHIVs are often also excluded from informal community-based safety nets.

HIV leads to increased energy requirements – PLHIVs in low-resource settings are frequently malnourished prior to HIV infection. In addition, the HIV virus puts them at high risk of disease-induced weight loss and wasting. Once infected with HIV, the body mounts an immune response that requires energy above and beyond the usual needs, beginning with 10 percent at the asymptomatic stage and increasing to 30 percent for adults at later stages of the disease. Symptomatic HIV-positive children have a 50 to 100 percent increase of calorie needs compared to HIV-negative children<sup>38</sup>. Beyond imposing a financial burden on families, young children often struggle to consume the double amount of calories, especially when they do not have access to energy-dense foods.

If increased energy demands are not met, PLHIV begin to lose both fat and muscle tissue. Low body mass index (BMI) is one strong risk factor for HIV disease progression and mortality, independent of immune system performance<sup>39</sup>.



While energy needs go up, certain symptoms of HIV reduce the client's food intake and/or can interfere with the body's ability to absorb and utilize nutrients<sup>40</sup>. HIV can create a paradoxical situation where people reduce their nutrient intake, just as their bodies require an increase. This makes nutritional support a critical component of HIV treatment.

### 1.3 Food insecurity, negative coping strategies and increased exposure to HIV—

Food insecurity decreases the ability to sustain livelihoods. It causes individuals and households to adopt coping strategies. Coping strategies can have undesired, negative and often irreversible consequences. Strategies such as selling assets, taking children out of school, migrating and engaging in transactional sex may bring short-term relief, but increases the risk of exposure to the virus<sup>41</sup>.

Studies have shown that every additional year a child spends in school reduces the likelihood of contracting HIV; this shows the important role of education in giving young people the tools to understand and manage risk. Mobile populations, including those who migrate to deal with food insecurity, give up their habitual social context and often become more vulnerable to HIV. Destitution and despair brought on by negative coping behaviour may increase the risk that a person will resort to trading unprotected sex for food<sup>20,41</sup>.

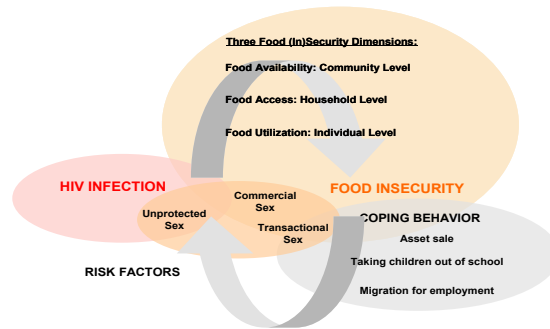
Food insecurity is a problem of low earning capacity and poor financial situation in the household. PLHIV may resort to negative coping strategies to provide food for themselves and their families<sup>42</sup>. Some of the strategies are selling family assets, de-enrolling children from school, renting out part of cultivable lands, using children in income generating activities<sup>43</sup> some women going hungry to reserve the available food for their children<sup>42</sup>, and limiting portion sizes and reducing meal frequency<sup>2</sup>.

HIV-affected households adopt severe coping mechanisms in a situation of food insecurity<sup>42</sup>. In some food insecure households, to cope with food insecurity, they provide casual labour, changing the food they eat or cutting back on food they eat. A woman may go hungry to reserve the available food for her children or feed her family just cassava<sup>44</sup>. Some women living with HIV often engage in transactional sex and sex work in order to provide food for their families<sup>24</sup>. Some women engage in transactional sex which increase their exposure to HIV<sup>24</sup>. Food insecurity and hunger directly contributes to a woman's decision to have sex or initiate sex work in exchange for resources and food increasing her exposure to HIV<sup>45, 46</sup>. Food insecurity may result in coping strategies which will lead to increased exposure to HIV in the sense that higher food insecurity levels were associated with lower likelihood of condom use on a given day among PLHIV<sup>46, 47</sup>.

Other HIV-affected households limit portion sizes, reduce meal frequencies<sup>2</sup>, eat less expensive foods<sup>2,26</sup> or eat foods that are of limited variety as a result of food insecurity<sup>26</sup>. Families that have large number of AIDS-orphaned children, adopt strategies like selling family assets, renting out parts of cultivatable lands for extra cash and de-enrolling children from school and putting them in income generating activities to earn money for the family<sup>43</sup>. A study in Kenya showed how some HIV-affected and care giving children coped with food insecurity. They established friendship groups which helped each other through sharing of food as well as securing food in times of hardship<sup>48</sup>. HIV-affected households with fewer assets are more likely to engage in negative coping strategies than households with more assets because they are vulnerable to food insecurity as a results of low income and fewer income generating assets<sup>2</sup>. Figure 1.2 Summarizes the above argument in a framework to capture the complex causal dynamics that lead from HIV to food insecurity and often from food insecurity to HIV.



Figure 1.2 HIV infection leads to food insecurity and food insecurity can increase the risk of getting infected with HIV



Source: WFP HIV and AIDS Policy, 2010: Policy # EPC10/2010/B

## 1.4 HIV and vulnerability to food insecurity

HIV-affected households are usually vulnerable to food insecurity compared to non-HIV-affected households<sup>42</sup>. Household food insecurity among PLHIV was nearly double that of the general population in Ethiopia<sup>31</sup>. This is evidence that PLHIV are vulnerable to food insecurity. A number of factors predisposes PLHIV to food insecurity. PLHIV are unable to perform the task needed to secure food needed by the family due to low productivity of the HIV-infected working adult<sup>44</sup>. Also, high number of dependents as a result of taking on orphans and having chronically ill adults in resource poor settings makes HIV-affected households vulnerable to food insecurity<sup>2,42,44</sup>. A regression model indicated in Kenya that each additional child to a household was associated with a 1.10-unit increase in the household food insecurity access score ( $p < 0.01$ )<sup>25</sup> meaning large family size with high dependency ratio lead to vulnerability to food insecurity<sup>42</sup>. HIV-affected households which are headed by women are likely to be food insecure<sup>42</sup> because they are usually widowed, single or not receiving financial support from a bread winner<sup>25</sup>. Lower educational status among PLHIV could make them vulnerable to food insecurity<sup>35, 49</sup> because they do not have the opportunity to get high earning jobs. In a study, PLHIV who were economically insecure, i.e. less income, fewer assets and worse financial situation were more food insecure than their peers who had high income, more assets and better financial situation<sup>49</sup>. Other factors making PLHIV vulnerable to food insecurity are ongoing impacts of HIV/AIDS, unreliable livelihoods<sup>44</sup> and old age. In a study, PLHIV described how difficult it is to complete agricultural labour and therefore producing food as they grow older<sup>25</sup>.

## 1.5 HIV, household asset poverty, and effective dependency rate

PLHIV who own household assets appear to have a better quality of life<sup>31</sup>. Owning assets plays an important role in decreasing risk of food insecurity and negative coping strategies<sup>2, 49</sup>. Asset-poor households tend to experience severe and more frequent food insecurity compared to asset rich households and they have better coping strategies<sup>2,49</sup>. Some PLHIV may sell their assets to earn cash to feed and nourish themselves<sup>49</sup>. A high number of dependents in HIV-affected households makes it difficult to attain household food security and it puts a lot of pressure on the healthy working adult. Elderly households caring for orphaned children and female-headed households have a high dependency ratio since only one adult was mostly present and responsible for the basic needs of all the household members<sup>44</sup>. The national effective dependency rate of Ghana is 48.5 percent<sup>2</sup>.

## 1.6 Survey objectives

This follow up survey aims to:

- Describe the basic profiles of HIV-affected households in selected regions of Ghana
- Assess the extent of food insecurity and vulnerability faced by these households,
- Asses the nutritional status of some members of these households, and thereby
- Improve the understanding of the key factors underlying vulnerability in these households





# CHAPTER TWO

## 2.0 METHODOLOGY

### 2.1 Design and Methodology

As in the previous study, a cross-sectional design using solely quantitative data collection techniques was adopted.

#### 2.1.1 Study population and setting

The study population include adults in a household caring for an HIV sero-positive person in the indicated regions of Ghana. Thus adults (aged 18 years or older) in households with HIV-infected or affected persons were eligible to participate in the study. This study adopts the DHS definition of a household – “as a person or group of persons who live and eat together”.

#### 2.1.2 Sample size computation

The sample was calculated based on the regional vulnerability prevalence estimated from an earlier study commissioned by the United Nations World Food Programme and the Ghana AIDS Commission (WFP/GAC 2011). In the current survey, four, instead of 10 administrative regions of the country were selected. Recognizing the distinct ecological zonation and HIV transmission dynamics/burden, the purposively chosen regions were: Northern (representing low HIV transmission and Savannah Ecological Zone), Brong Ahafo and, Eastern (representing high transmission and the Forest Zone) and Central region (representing Medium transmission and the Coastal Belt). The minimum sample size (N) per region (strata) was determined using the classic sample size formula:

$$N = \frac{Z^2 * (p) * (1-p)}{C^2}$$

Where

Z = Normal standard deviate/Z value: 1.96 for 95 percent confidence level.

P = regional vulnerability prevalence expressed as decimal

C = confidence level, expressed as decimal

For this assessment, the following data from the 2011 survey (WFP/GAC, 2011) were used:

Z = 1.96; P = (30 percent for Eastern, 35 percent for Northern, 57 percent for Brong Ahafo and 7.5 percent for Central Region), C = 5 percent. A total survey sample of 1157 participants was computed. The computed minimum sample size is approximately 1157. Given that simple random sampling was not deployed in the selection of study participants, the computed sample size was subjected to a design effect of 1.4. Second, to cater for possible data losses via recording errors, or participants’ declining to respond to specific questions in the questionnaire, the minimum sample size of 1157 was upwardly adjusted by 1 percent, (based on experience from the 2011 baseline survey; WFP 2011). This gives an overall sample size of 1638, which was rounded up to 1640. At the end of the study, field enumerators completed 1700 surveys, 34 of which were not usable. The final sample of 1,666 households was used in the data analysis.

#### 2.1.3 Sampling/data collection

The Primary Sampling Unit (PSU) in this study is the household. However, only one individual/



adult (of either sex) per household served as the main respondent. Therefore, the total number of households surveyed equals the total number of individual respondents.

Sixteen enumerators and four supervisors (four enumerators and one supervisor for each region) were recruited and trained to undertake the study. The supervisors managed the survey on site; ensured that the enumerators conducted the interviews and collected data effectively. The Consultant coordinated and harmonized the outputs of the four teams.

To ensure that all PLHIV on ART had the same chance to be selected, the samples were randomly selected from the national ART database – with the ART register serving as the sampling frame. Selected PLHIVs were approached (in person, or via phone) to schedule household interviews. With a few exceptions, interviews took place in the respondent's home.

The actual implementation of the surveys was done using an innovative mobile technology. An app belonging to the Open Data Kit (ODK) family of software (*Ona Collect*), which works on mobile devices was employed. The ODK suite is made up of three tools that are used at the different steps of the mobile data collection system. ODK Build is used to create forms that can be displayed on mobile phones. ODK collect is the application that runs on Android Smart Phones or tablets with mobile sim-capability and allows data collectors to conduct interviews and record responses on the phone. ODK Aggregate is used to create a central server to which finalized questionnaires are sent using cellular data networks and aggregated at different levels. With this technology, data were collected at household levels through a network of trained research assistants. Once data collectors transferred data by phone to a central server via a GPRS network, data was harvested in excel format in real time and initial validation checks done prior to data analysis.

## 2.2 Interview tool

The questionnaire specifically designed for this assessment is appended (Appendix 1). It was adapted from the earlier survey conducted in 2011. Food security and vulnerability to food insecurity were the key issues in the assessment. These attributes were measured using indicators commonly used by WFP as outlined below. These indicators were the coping strategy index (CSI) and the food consumption score (FCS).

## 2.3 Computation of coping strategies

The CSI questionnaire is a standard WFP tool used to assess how much stress a household is under in terms of food security. It allocates scores to the responses given for the 12 questions on coping strategies and computes a total score (which can in theory, reach 406, but in practice will never reach this high). A higher figure implies greater stress in terms of food insecurity. The procedure for calculation of the index was exactly as in CARE/WFP (2003). A set of questions are asked, and the answers to these questions allow an assessment of the frequency as well as the severity of actions. The questions on coping strategies fall into two categories (see Appendix 1). Firstly, they address the recurrent situation faced by the household, and the coping strategies adopted to deal with food insecurity. It also considers changes in household strategies in response to recent difficulties, for example by asking whether the household has recently reduced the number of meals consumed per day or purchased lower cost ingredients.

An illustration of how responses were calculated is shown below. It shows the relative frequency score, the severity weight, the individual score and the total household score of a randomly selected household from the 2011 survey with I.D. # 1415. The total household score ( $\sum A \times B$ ); or the summation of the products of each raw score/relative frequency score and the severity weight for each strategy) is defined as the CSI for that particular household – 17.0 in the case.





Table 2.1 Randomly selected household with I.D. # 1415 from the 2011 survey for illustration

<b>E. Coping Strategies</b>								
In the past three months, how frequently did your household resort to using one or more of the following strategies in order to have access to food? <b>CIRCLE ONLY ONE ANSWER PER STRATEGY.</b>								
		Never	Seldom (1-3 days/ month)	Some- times (1-2 days /week)	Often (3-6 days a week)	Daily		
	Relative Frequency Score (A)	0	0.5	1.5	4.5	7.0	Severity weight (B)	Score (AxB)
<b>E1</b>	Skip entire days without eating?	1	2	3	4	5	8.0	0
<b>E2</b>	Limit portion size at mealtimes?	1	2	3	4	5	2.0	9
<b>E3</b>	Reduce number of meals eaten per day?	1	2	3	4	5	2.0	1
<b>E4</b>	Borrow food or rely on help from friends or relatives?	1	2	3	4	5	4.0	0
<b>E5</b>	Rely on less expensive or less preferred foods?	1	2	3	4	5	2.0	1
<b>E6</b>	Purchase/borrow food on credit?	1	2	3	4	5	4.0	6
<b>E7</b>	Gather unusual types or amounts of wild food / hunt?	1	2	3	4	5	8.0	0
<b>E8</b>	Harvest immature crops (e.g. green maize)?	1	2	3	4	5	8.0	0
<b>E9</b>	Send household members to eat elsewhere?	1	2	3	4	5	4.0	0
<b>E10</b>	Send household members to beg?	1	2	3	4	5	8.0	0
<b>E11</b>	Reduce adult consumption so children can eat?	1	2	3	4	5	6.	0
<b>E12</b>	Rely on casual labour for food?	1	2	3	4	5	2.0	0
	<b>TOTAL HOUSEHOLD SCORE</b>	$= \sum_{k=0}^n AxB=17.0$						



## 2.4 Computation of Food Consumption Score

Food consumption scores were used as another proxy measure for food security by using both the frequency of food intake and its variety. A 7-day dietary recall approach was used to collect data on food intake, quantity and food types according to their nutritional density. The score can technically reach 217, if all food types are eaten every day. A higher score signifies better household food security in terms of frequency and diversity of consumption. Upon calculating the FCS, thresholds for FCS profiles were adapted from a previous reports commissioned by the WFP, in 2008, and 2011. The typical thresholds are as follows: Poor (FCS 0-21); Borderline (FCS

21.5 - 35); and Acceptable (FCS > 35). Research has shown that dietary diversity and frequency are a good proxy measure of food security. Thus, using a 7-day dietary recall, information on the variety and frequency of different foods and food groups was collected to calculate a weighted food consumption score. The guiding principle for determining the weights is the nutrient density of the food groups. The highest weight was attached to foods with relatively high energy, good quality protein and a wide range of micro-nutrients that can be easily absorbed. Details are provided in the table below.

1

**Table 2.2 Food groups and weights**

	FOOD ITEMS (examples)	Food groups	Weight	Justification
1	Maize, maize porridge, rice, sorghum, millet pasta, bread and other cereals Cassava, potatoes and sweet potatoes, other tubers, plantains	Main staples	2	Energy-dense/usually eaten in larger quantities, protein content lower and poorer quality (PER 17 less) than legumes, micro-nutrients (bound by phytates).
2	Beans, Peas, groundnuts and cashew nuts	Pulses	3	Energy-dense, high amounts of protein but of lower quality (PER less) than meats, micro nutrients (inhibited by phytates), low fat.
3	Vegetables, leaves	Vegetables	1	Low energy, low protein, no fat, micro-nutrients.
4	Fruits	Fruit	1	Low energy, low protein, no fat, micro-nutrients.
5	Beef, goat, poultry, pork, eggs and fish	Meat and fish	4	Highest quality protein, easily absorbable micro-nutrients (no phytates), energy dense, fat. Even when consumed in small quantities, improvements to the quality of diet are large.
6	Milk yogurt and other dairy	Milk	4	Highest quality protein, micro-nutrients, vitamin A, energy. However, milk could be consumed only in very small amounts and should then be treated as a condiment and therefore re-classification in such cases is needed.
7	Sugar and sugar products, honey	Sugar	0.5	Empty calories. Usually consumed in small quantities
8	Oils, fats and butter	Oil	0.5	Energy dense but usually no other micro-nutrients. Usually consumed in small quantities
9	spices, tea, coffee, salt, fish power, small amounts of milk for tea.	Condiments	0	These foods are by definition eaten in very small quantities and not considered to have an important impact on the overall diet.

Source: WFP, 2008



## 2.5 Computation of household asset wealth

Asset wealth is assessed in the survey through questions on the type of asset owned by the household – these assets fall into two general categories, one describing the standard of living of the household (assets such as chairs, tables), and the other associated with income earning possibilities (items such as pop-corn machines, telephone booths or hairdryers); the full list can be seen in the questionnaire in Appendix 1. Households were split into three broad classes, according to how many different types of asset they own – “asset poor”; “asset medium”; and “asset rich”.

## 2.6 Classification of vulnerability to food insecurity

Households were grouped into four categories according to the degree of vulnerability to food insecurity. A combination of CSI, defined as the stress upon the household due to food insecurity; FCS (an indicator of dietary quality and diversity); and asset wealth (denoting how many different types of assets a household owned) were used to generate these four categories. Together these provide an indication of vulnerability of a household in terms of its food security. The groups were identified through a statistical technique called the Interactive Cluster Analysis Procedure (ICAP). This process allows data to be grouped neutrally without resulting to predetermined thresholds or algorithms. The four groups of vulnerability that were created were in a neutral manner are: ||The “worst off” || The “vulnerable” || Those who are “acceptable” || The “better off” ||

## 2.7 Computation of effective dependency rate

The effective dependency rate measures the share of total household members that are below or above working age plus those of working age who are chronically ill. For every household, the numbers of these three categories of members were subtracted from the total household size and expressed as a percentage. It is worthy of note that, the rate provides an indication of the minimum burden imposed by the age structure and health status of the household members; it does not address the actual employment status of the members.

## 2.8 Ethics considerations

The study protocol adheres to both local and international standards for protecting the rights and safety of human subjects in research. The study procedures and tools were subjected to ethical review by the Ghana Health Service Ethical Review Committee (GHS ERC).

Prior to data collection, appropriate community entry procedures which included submission of introductory letters from the Consultant, and the Ghana AIDS Commission to the key stakeholders and institutions notifying them about the study. In each district, the Ghana AIDS Commission’s Regional Technical Support Unit (TSU) was invaluable to this community entry processes. Thus permission to implement the study was obtained from health leadership (Regional, and District Directors of Health Services), as well as political leadership (District/Municipal/Metropolitan Assemblies) in the eight districts where data collection took place. Further, among households which were selected to participate in the survey, eligible individual participants/main respondents were given sufficient information about the project and also given ample opportunity to ask questions they may have prior to participation in the study – as part of the informed consent process. Their rights to voluntary participation or termination of the interview at will, was explained to them.

### 2.8.1 Informed Consent

A study-specific informed consent form was developed for use - in accordance with all applicable regulations. The consent form included the purpose of the study, a description of the types of questions in the tool, and elaborations/clarifications potential risks and benefits to participants. Prospective respondents were given the opportunity to ask questions and to exchange information freely with the study investigators.

### 2.8.2 Privacy and confidentiality

The measures instituted by the study team to ensure that participants’ confidentiality is maintained included the following. Personal identifiers were not be included in any study reports. All study records are secured to the extent provided by local regulations. Data



collection forms were identified by codes; all records containing names or other personal identifiers, such as informed consent forms were stored separately. The local database is secured with a password-protected access system. Participants' study information will not be released without their written permission, except as necessary for monitoring.

Regarding privacy, all study procedures were conducted in private and every effort was made to protect participant's privacy to the highest extent possible.

## **Data Transfer/Data Sharing**

We deployed a tried and tested app that enables data encryption and File Transfer Protocols (FTPs) that address data security and confidentiality issues. Following the initial round of data cleaning, the data (including identifiers) was transferred to the Consultant. The data will be transferred to study partners, physically on a CD-ROM or Flash Drive. Email is not deemed a secure mode of data transmission.

### **2.9.1 Benefits and Risks**

It was explained to the prospective respondent that, there will be no direct benefits to the enrolled participants in the meantime. At the same time, clarifications were provided to them that there are no clear or known risks identified with participation in this survey. All the study procedures were non-invasive such as administration of questionnaires. The questions were deemed not to cause discomfort as no sensitive health information was requested. Nevertheless, it was explained to prospective respondents that, in the case they are uncomfortable answering questions they may choose not to answer them or withdraw consent completely. No social, emotional, or financial risks associated with participation in this study was anticipated.

### **2.9.2 Compensation**

No compensation was provided for participation in this survey interview. However, a non-monetary incentive (of 10 cedis worth of airtime/talk time) was provided for their time.

## **2.10 Conflict of Interest**

The investigators, and study team declare that they have no conflict of interest

## **2.11 Data management and analysis**

As described earlier, surveys were conducted using an innovative mobile app (ONA Collect). Collected data were harvested in excel format in real time and initial validation checks were done. Thereafter, the captured data were exported into IBM SPSS Statistics for Windows, Version 21.0 where another session of cleaning was done before data analysis. The exploratory diagnostic analysis was conducted to check for data irregularities, test of assumptions, and outliers prior to the actual analysis. We used univariate analysis to generate descriptive tabulations for key variables. Continuous data are presented as means or medians, along with their corresponding measures of dispersion (range, interquartile range, standard deviations) while discrete data are presented as frequencies and percentages. Bivariate analyses (such as Chi Square test of proportions) produced unadjusted associations between food consumption groupings, vulnerability categories, and some selected household background, demographic or health attributes. For continuous outcomes (such as CSI, FCS, BMI etc) and explanatory variables (such as age, dependency rate), Pearson Product Moment Correlations, t-test, ANOVA/Kruskal-Wallis tests produced unadjusted associations. Two-sided test of statistical significance was performed and P value <0.05 was used to denote statistical significance. Computations of FCS, CSI, household asset wealth, and effective dependency rate are detailed earlier with this report. All analyses were performed using IBM SPSS Statistics for Windows, Version 21.0. Statistics presented with accompanying 95 percent confidence intervals are derived from such descriptive analysis.



# CHAPTER THREE

## 3.0 RESULTS

### 3.1 Profiling HIV-affected households in selected regions of Ghana

### 3.2 Background and socio-demographic attributes

Table 3.1 presents the background and socio-demographic characteristics of the main respondents and other members of the 1,666 households included in the analysis. The survey participants who responded to the household level survey questions were equally spread among the four participating regions. When distributed among the eight participating districts, one out of five these respondents (20 percent) reside in the Tamale metropolis of the Northern region. Save East Mamprusi district, the remaining 80 percent were distributed equally among the remaining six districts - Dormaa, Lower Manya, Mfantseman, New Juaben, and Sunyani.

Whilst most of the main respondents were female (80 percent), the proportion of female-headed households was comparable to male-headed households (52 percent vs 48 percent; Table 3.1). Two-thirds of the household heads were in their productive era – aged 30 – 59 years, although a substantial proportion had never been to school or completed primary level. This compares with the proportion of the main respondents who had attained at most primary level education (67 percent). A few of the main respondents were in their teens (0.3 percent) and 9.3 percent were above 60 years. More than 60 percent of the main respondents (most of them female) were either widowed, divorced or never married. Related details are provided in Table 3.1.

The relative contributions of the various communities within which the individual interviews took place to the overall study sample are presented in Appendix 2. Aside from the textual depictions of the communities, the relative sizes relate to the number of household interviews conducted in these communities. Thus, DormaaAhenkro, Penkwaase, Nalerigu, Peadu, Atua, Odumase and Mankesim with most interviews (Appendix 2).



**Table 3.1 Background and socio-demographics of study respondents and other household members**

(n =1,666 unless otherwise indicated)

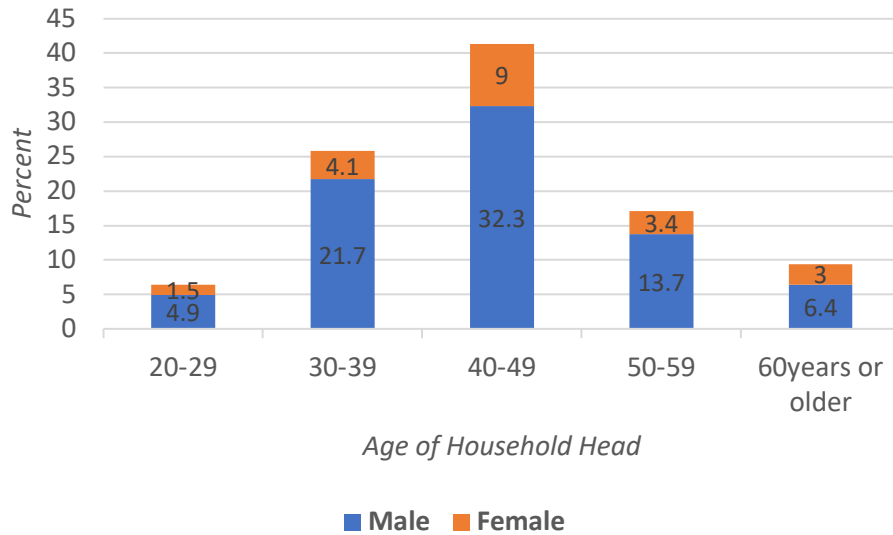
<b>Attribute</b>	<b>Frequency</b>	<b>Percent</b>
Surveyed region		
Brong Ahafo	422	25.3
Eastern	420	25.2
Central	404	24.2
Northern	420	25.2
Surveyed district		
Cape Coast Metropolis	159	9.5
Dormaa Municipality	211	12.7
East Mamprusi District	84	5.0
Lower Manya Municipality	210	12.6
Mfantseman District	245	14.7
New Juaben Municipality	210	12.6
Sunyani Municipality	211	12.7
Tamale Metropolis	336	20.2
<i>Sex of household head (Female)</i>	<i>880</i>	<i>52.8</i>
<i>Sex of main respondent (Female)</i>	<i>1340</i>	<i>80.4</i>
Age of main respondent (n =1661)		
19 years or younger	5	.3
20-29	188	11.3
30-39	486	29.3
40-49	516	31.1
50-59	312	18.8
60years or older	154	9.3
Age of household head (n=591)		
20-29	38	6.4
30-39	152	25.7
40-49	244	41.3
50-59	101	17.1
60years or older	56	9.5
Marital status of main respondent		
Married /cohabiting	592	35.5
Widowed	360	21.6
Divorced/separated	419	25.2
Single/never married	295	17.7
Education level of main respondent		
Never been to school	457	27.4
Primary	667	40.0
Secondary	448	26.9
Tertiary	94	5.6
Education level household head (n=592)		
Never been to school	154	26.0
Primary	180	30.4
Secondary	201	34.0
Tertiary	57	9.6



Figure 3.1 details the age structure of household heads by sex. Overall, more than two thirds (83 percent) of the household heads were within the ages 30 to 59 years. The proportion of household heads in the age brackets of 20-29, and over 60 years were few, and comparable (6.4 percent vs 9.4 percent). Across all age brackets,

household heads are predominantly males, and are in the productive age brackets. Across all age groups, female-headed households were about 20 percent. We found no statistically significant association between age structure and sex of household head (Chi sq = 7.012; p = 0.135).

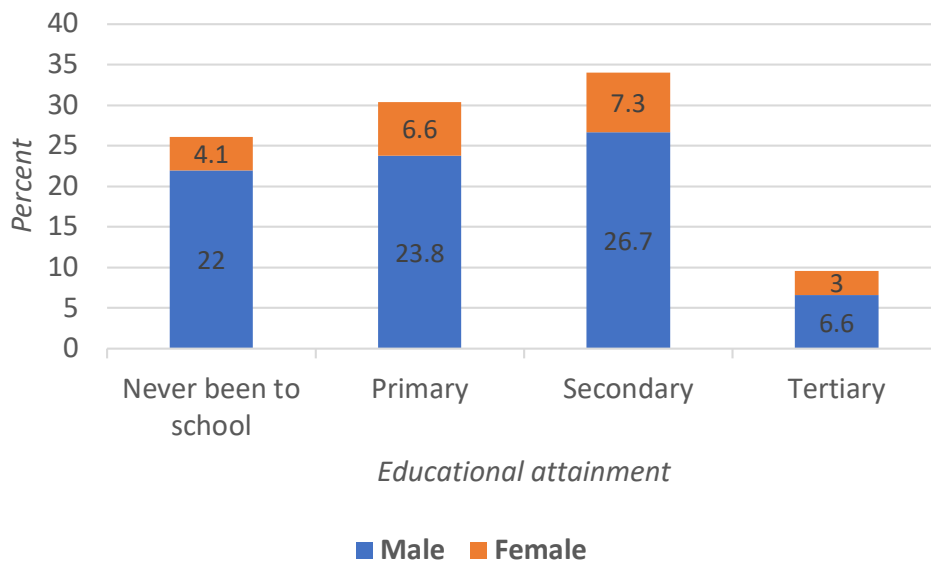
Figure 3.1 Age structure of household head by sex



The distribution of the household heads by their educational level and sex is presented in Figure 3.2. There were observed differences with respect to the educational level attained by male and female heads of the HIV-affected households. Across all educational levels, household heads are significantly male. Of 68

percent of household heads who have attained some level of formal education, 57 percent were male. As with the relationship with household headship and age, we found no association between household headship and education level (Chi sq = 6.646; p = 0.084).

Figure 3.2 Educational level of household heads by sex



Chi sq 6.646; p value 0.084

**Table 3.2 Mean and median household size stratified by sex of household head and district**

(n= 1666)

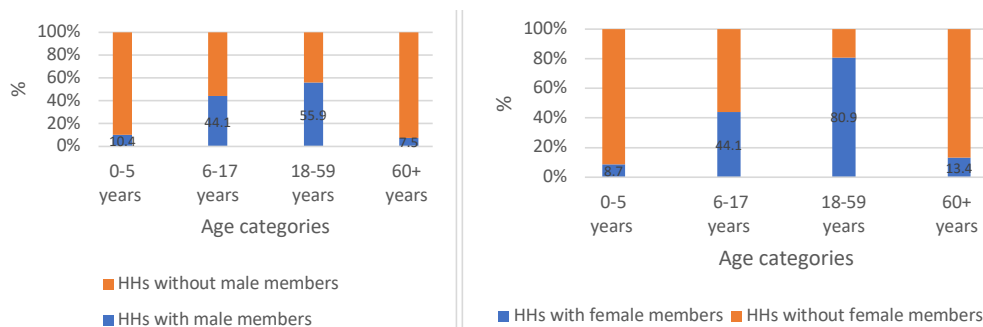
Household size	N	Mean	Median	IQR	Range
Household size by sex of household head					
Male	786	4.1	4.0	2-5	1-23
Female	880	3.3	3.0	2-4	1-9
Total (male +female)	1666	3.7	3.0	2-5	1-23
Household size by surveyed district					
Sunyani Municipality	211	4.0	4.0	3-5	1-13
Dormaa Municipality	211	4.1	4.0	3-5	1-13
Total (Brong Ahafo)	422	4.0	4.0	3-5	1-13
New Juaben Municipality	210	3.2	3.0	2-4	1-9
Lower Manya Municipality	210	3.3	3.0	2-4	1-9
Total (Eastern)	420	3.3	3.0	2-4	1-9
Cape Coast Metropolis	159	3.2	3.0	2-4	1-9
Mfantseman District	245	2.9	3.0	2-4	1-10
Total (Central)	404	3.0	3.0	2-4	1-10
Tamale Metropolis	336	4.4	4.0	3-6	1-23
East Mamprusi District	84	4.5	4.0	3-6	1-10
Total (Northern)	420	4.5	4.0	3-6	1-23

IQR (Interquartile Range); where indicated, data from Sunyani Municipality, and Dormaa-Ahenkro represent Brong Ahafo (n=422); data from New Juabeng and Lower Manya represent Eastern (n=420), data from Cape Coast Metro, and Mfansman District represent Central (n=404), and data from Tamale Metro and East Mamprusi District represent Northern (n=420)

In Table 3.2 above, we present the median household size stratified by sex of household head and by district. Overall, the median household size was three persons (mean is four persons). Male-headed households were on average, one member more than female-headed households. Household membership ranged

from one individual to 23. Of note, a male-headed household from the Tamale metropolis recorded the highest number of members – 23 individuals. Median household sizes in the Northern region were comparable to that in the Brong Ahafo region, and so were those from the Eastern, and Central regions.

**Figure 3.3 Household composition stratified by sex and age of household members (n=1666)**



Nearly 20 percent of the households had at least one child under five years of age (10 percent of these households declared male children, while nine percent were female children). Of all households harboring children aged 6-17

years, 44 percent apiece were male and female children. All the households with adults aged 18-59 predominantly harbored males. Quite a few household had members aged 60 years of age (see Figure 3.3).



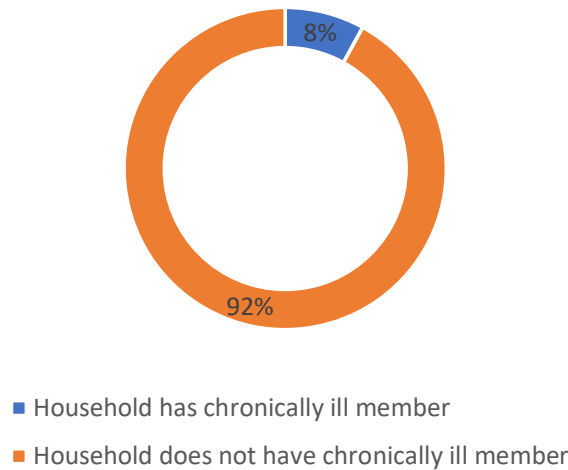


### 3.2 Chronic ailments and orphanhood

Of 1,666 household that contributed data to this analysis, 134 of them (8 percent) reported caring for a chronically ill member - 92 percent had no chronically ill member. Of this 8 percent, half

were adults aged 18 years or older. It is worth noting that, of adults who were chronically ill, 64 percent of them were household heads (data not shown). The remaining 3.5 percent of households had child chronically ill persons – 2 percent in the ages 5-17years, and 1.5 percent under five years of age (See Figure 3.4).

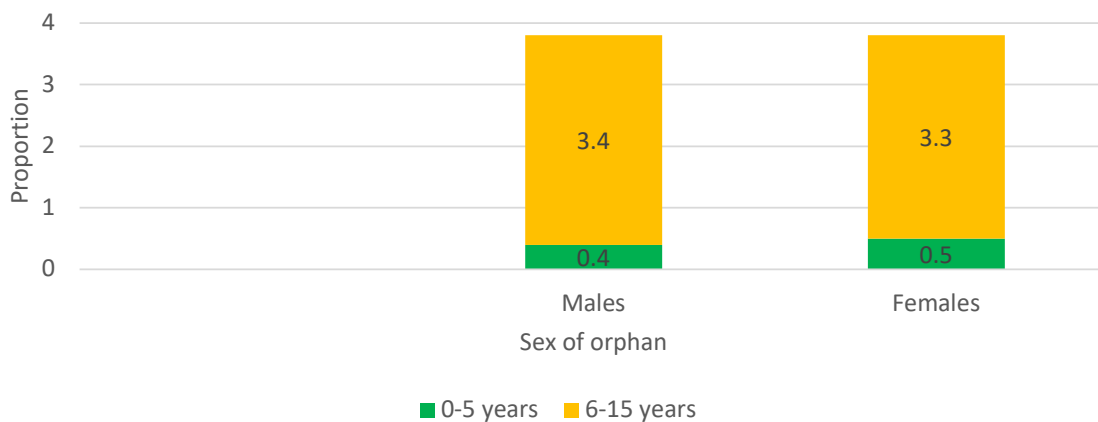
Figure 3.4 Distribution of chronic illness in households (n=1,666)



When the 134 households (8 percent) hosting at least one chronically ill member were stratified by sex and age, it was observed that irrespective of age, males, more than females were chronically ill. There was however no household with more than 2 chronically ill members (data not shown).

Figure 3.5 presents information on the proportion of households caring for orphans stratified by sex (of an orphan), and age. Overall, 93 households (6 percent) of the 1,666 HIV-affected households interviewed were hosting at least one orphan, most of them aged between 6-15 years. We observed no association when the statistic is compared by sex (of orphan).

Figure 3.5 Proportion of households with orphans stratified by age and sex (n=1666) – overall 93 (6%)





### 3.3 Dependency rate and recent mortality

Tables 3.3 and 3.4 respectively present effective dependency rate and reported recent mortality. Overall, the median effective dependency rate was 50 percent. The effective dependency rate measures the share of total household members that is below or above working age plus those of working age who are chronically ill. It is worthy of note that, the rate provides an indication of the minimum burden imposed by the age structure and health status of the household members, but it does not address the actual employment status of the members. Taking into

consideration the widespread unemployment in Ghana, the effective dependency rate should really be seen as a minimum burden, since it is likely that the employed will support the working age unemployed in addition to the young and the old.

When compared by sex of household head, the effective dependency rate was slightly higher in male-headed households – 56 percent compared to 50 percent (Table 3.3). The rates were similar (50 percent) across six of the sampled eight districts. The districts of Dormaa (57 percent), Lower Manya (67 percent) had slightly higher rates.

**Table 3.3 Median dependency rate stratified by sex of household head and region (n=1666)**

Median dependency rate	N	Median	IQR	Range
	1666	50	37.5-85.7	0-100
Median dependency rate by sex of household head				
Males	786	56.3	40.0-80	0-100
Females	880	50.0	33.3-100	0-100
Median dependency rate by surveyed region				
Sunyani Municipality	211	50.0	40-75	0-100
Dormaa Municipality	211	57.1	40-75	0-100
Total (Brong Ahafo)	422	51.9	40.0-75	0-100
New Juaben Municipality	210	50.0	33.3-100	0-100
Lower Manya Municipality	210	66.7	40-100	0-100
Total (Eastern)	420	60.0	37.5-100	0-100
Cape Coast Metropolis	159	50.0	33.3-100	0-100
Mfantseman District	245	50.0	33.3-100	0-100
Total (Central)	404	50.0	33.3-100	0-100
Tamale Metropolis	336	50.0	33.3-74	0-100
East Mamprusi District	84	50.0	35-67	0-100
Total (Northern)	420	50.0	33.3-67	0-100

Of the 1,666 HIV-affected households included in the analysis, a total of 26 households reported some level of mortalities occurring within three of the survey. Most of the reports came from the districts of Northern (15 of the

26 households) and Brong Ahafo (7 of the 26 households) regions. The 26 household in total reported 32 deaths (22 of whom were adults). It is worth noting that, 10 out of 22 adult deaths were household heads (Table 3.4).

**Table 3.4 Recent mortality by region (number of households reporting individual deaths)**

	HHs reporting death (n=households)	U5 (n=individuals)	5-17 (n=individuals)	18+ (n=individuals)	Total
Brong Ahafo (n=422)	7	4	0	3	7
Eastern (n=420)	1	0	1	1	2
Central (n=404)	3	1	0	2	3
Northern (n=420)	15	0	4	16	20
Total	26	5	5	22	32

N = 1,666; Total number of U5 = 194. Overall 32 individual deaths; 22 adults; 10 out of 22 adult deaths were household heads.



### 3.4 Dwelling characteristics, household durable asset wealth, and sources of livelihood (n = 1666)

#### 3.4.1 Dwelling characteristics

Table 3.5 contains data pertaining to dwelling characteristics, household tenure status, household source of drinking/cooking water, and related sanitary disposal facilities. A significant percentage of households lived in compound house. About 36 percent of the households interviewed lived in their own properties with

piped water (60 percent) contributing to a significant source of drinking or cooking water. Pit or VIP latrines are the most commonly used source of sanitary facilities. About 17 percent own a flush toilet facility whilst 13 percent do not have any source of sanitary facility, and thus resort to open defecation. Of note only 10 households (0.6 percent of the 1,666 household) had used the Community Approaches to Total Sanitation (CATS) method. At their core, CATS rely on community mobilization and behaviour change to improve sanitation and integrate hygiene practices. They are demand-driven and community-led, and emphasize the sustainable use of safe, affordable, user-friendly sanitation facilities.

**Table 3.5 Dwelling characteristics and facilities**

Type of dwelling		
Detached	351	21.1
Flat	86	5.2
Semi-detached	164	9.8
Backyard brick cottage/traditional	280	16.8
Backyard shack structure	14	.8
Compound houses	771	46.3
Tenure status of the household		
Owner	593	35.6
Tenant – written agreement	565	33.9
Lodger – No agreement	80	4.8
Staying with family	402	24.1
Institutional accommodation	19	1.1
Other (friend, caretaker, kiosk, in-laws, ink-kind)	7	.4
Household main source of drinking/cooking water		
Piped water inside the house	466	28.0
Piped water outside the house	529	31.8
Communal tap	273	16.4
Borehole/protected well	330	19.8
Unprotected well	55	3.3
River/dam	13	0.8
Sanitary disposal facilities in household		
Pit latrines	473	28.4
VIP latrine	337	20.2
Flush toilets	287	17.2
Shared latrines	339	20.3
CATS method	10	0.6
Bucket	4	0.2
No facility (bush, river e.t.c)	216	13.0



### 3.4.2 Household durable asset wealth

Asset wealth is assessed in the survey through questions on the type of asset owned by the household – these assets fall into two general categories, one describing the standard of living of the household, and the other associated with income earning possibilities. Principal Component Analysis (PCA), grouped the households into asset brackets – “asset poor”; “asset medium”; and “asset rich”. Overall, 25 percent of all the households surveyed fall into the asset poor bracket; 57 percent in the asset medium category, and 18 percent in the asset rich bracket. When analyzed by sex of household head, fewer male-headed households were in the asset poor class (34 percent) compared to 66 percent for female-headed households. On the

contrary, more male-headed households were classified as asset rich (61 percent) compared to female-headed households (39 percent). Further analysis confirmed a statistically significant association between sex of household head and asset poverty (Chi sq = 50.44;  $p < 0.001$ ). The trends across the eight districts were not easily perceptible. A careful inspection, however, reveals that Tamale metropolis, and New Juaben municipality account to nearly 40 percent of the household classified as asset poor. In the asset medium class, five of the eight districts account for about three-quarters of the households – details of which can be found in Table 3.6. The relationship observed between asset poverty and district of residence is statistically significant ( $p < 0.001$ ).

**Table 3.6 Characterization of households by asset wealth by district**

Household Asset Wealth	N 1666 (100%)	Poor 24.7	Medium 57.4	Rich 17.9	Chi (p value) N/A
Asset Wealth by sex of household head					
Male	786	34.2	48.5	60.7	50.44 (p < 0.001)
Female	880	65.8	51.5	39.3	
Total	1666	100	100	100	
Asset wealth by surveyed district					
Sunyani Municipality	211	10.9	13.7	11.7	132.90 (p < 0.001)
Dormaa Municipality	211	14.3	13.5	7.7	
New Juaben Municipality	210	20.4	12.0	3.7	
Lower Manya Municipality	210	17.5	13.0	4.7	
Cape Coast Metropolis	159	8.3	9.0	13.1	
Mfantseman District	245	7.8	16.2	19.5	
Tamale Metropolis	336	18.7	16.9	32.6	
East Mamprusi District	84	2.2	5.6	7.0	
Total	1666	100	100	100	

*Sex of household head, Chi sq 50.44, p value < 0.001; Surveyed district Chi sq 132.90; p value < 0.001*

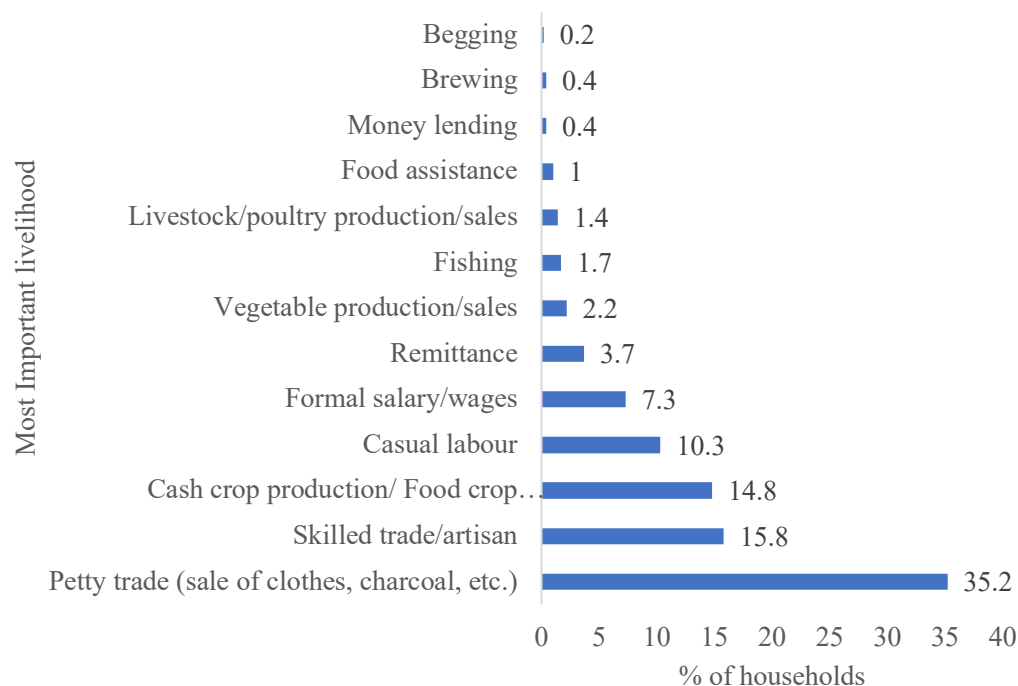
### 3.4.2 Household livelihood types

Figure 3.6 provides data on the most important sources of livelihood among household members. Petty trading stood out as the predominant primary source of livelihood among household members. This was followed

by skilled trade and cash crop production. Other sources of livelihood activities that contributed to household income include salaries and remittances, vegetable production, casual labor and fishing. Of note, a few (0.2 percent) of the household disclosed that begging was their most important source of livelihood.



Figure 3.6 Household most important sources of livelihood



In the table below (Table 3.7), we present the distribution of household livelihood categories by district of residence. From the onset, it is worthy of note, that row percentages (that is percentages within the livelihood categories) are used here. As an exemplar, of all households that reported “formal salary/wages” as their primary source of livelihood, nearly 30 percent were from Tamale metropolis, 16 percent from Sunyani municipality, and six percent

each from Cape Coast metropolis, and East Mamprusi district. Household from Dormaa Ahenkro and Sunyani Municipality engage predominantly in cash crop farming (22.7 percent vs 19.8 percent). Of the few who beg for a living (only four households), one household (25 percent) was from Mfantseman district, one (25 percent) from East Mamprusi district, and two (50 percent) from Tamale metropolis.

Table 3.7 Most important household livelihood by district

	Cape Coast Metro	Mfantseman	Sunyani	Dormaa-Ahenkro	Tamale Metro	East Mamprusi	New Juabeng	Lower Manya Krobo	
Formal salary/wages	5.7	10.7	15.6	13.9	27.9	5.7	10.7	9.8	
Money lending	0.0	28.6	14.3	0.0	28.6	28.6	0.0	0.0	
Cash crop production/ Food crop production/sales	5.7	9.3	19.8	22.7	17.0	3.6	12.1	9.7	
Casual labour	7.0	16.3	9.9	12.2	35.5	8.7	3.5	7.0	
Begging	0.0	25.0	0.0	0.0	50.0	25.0	0.0	0.0	
Livestock/poultry	0.0	0.0	8.3	20.8	33.3	12.5	12.5	12.5	
Skilled trade/artisan	4.9	10.6	13.6	10.6	28.0	6.1	14.4	11.7	
Petty trade (sale of clothes, charcoal, etc.)	13.8	17.9	9.5	6.6	14.7	4.1	16.0	17.4	
Brewing	0.0	0.0	50.0	33.3	0.0	0.0	0.0	16.7	
Remittance	8.2	16.4	36.1	26.2	9.8	3.3	0.0	0.0	
Vegetable production/sales	5.4	2.7	13.5	64.9	5.4	2.7	0.0	5.4	
Food assistance	0.0	0.0	0.0	12.5	12.5	0.0	37.5	37.5	
N	159	245	211	211	336	84	210	210	1666



### 3.4.3 Arable land ownership and use

Figure 3.7 provides information on land ownership and capacity for household agricultural production. About 80 percent of the households who participated in the survey reported some kind arable land ownership with majority being family or individual land. About 30 percent of households with arable land cultivated more than two acres of the land the previous season. However, when the extent of arable land use was compared, a significant

proportion of households (45 percent) indicated that they cultivated larger acreage of land the current season as in the previous farming season. There were those who cultivated the same size of arable land (25 percent). Others cultivated less size of arable land (Figure 3.7). Further analysis compared arable land ownership by sex of household head (Figure 3.8). It is observed here that male-headed households have significantly greater access to arable land in comparison with female-headed households (55 percent vs 45 percent;  $p < 0.001$ )

Figure 3.7 Ownership and cultivation of arable land during previous and current farming seasons

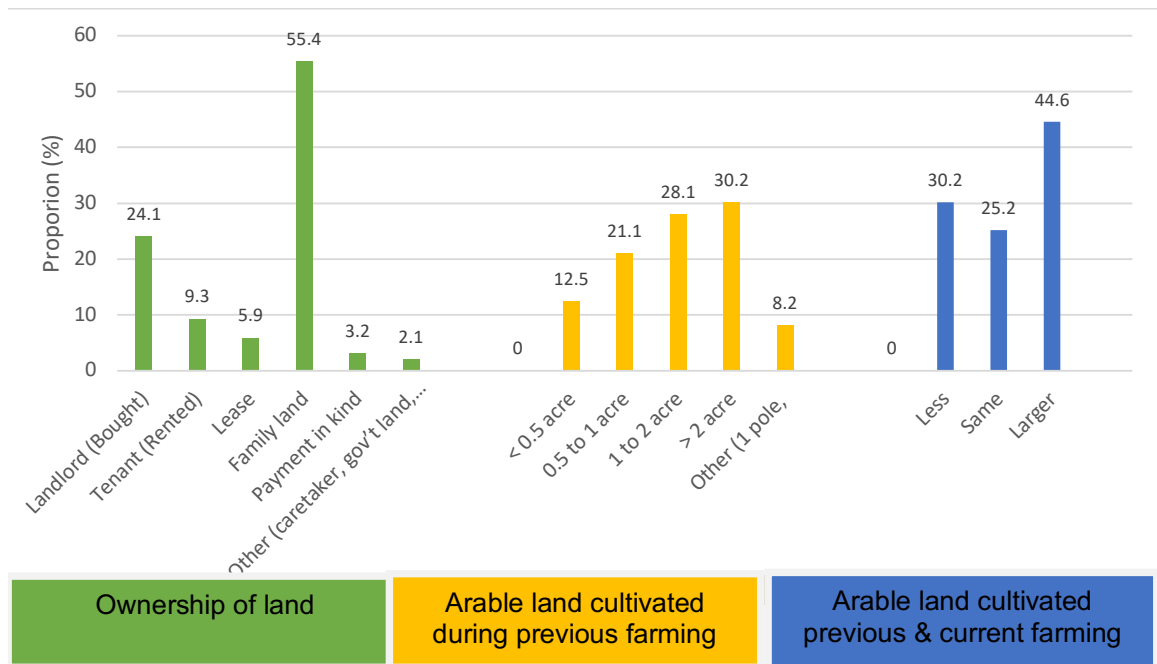
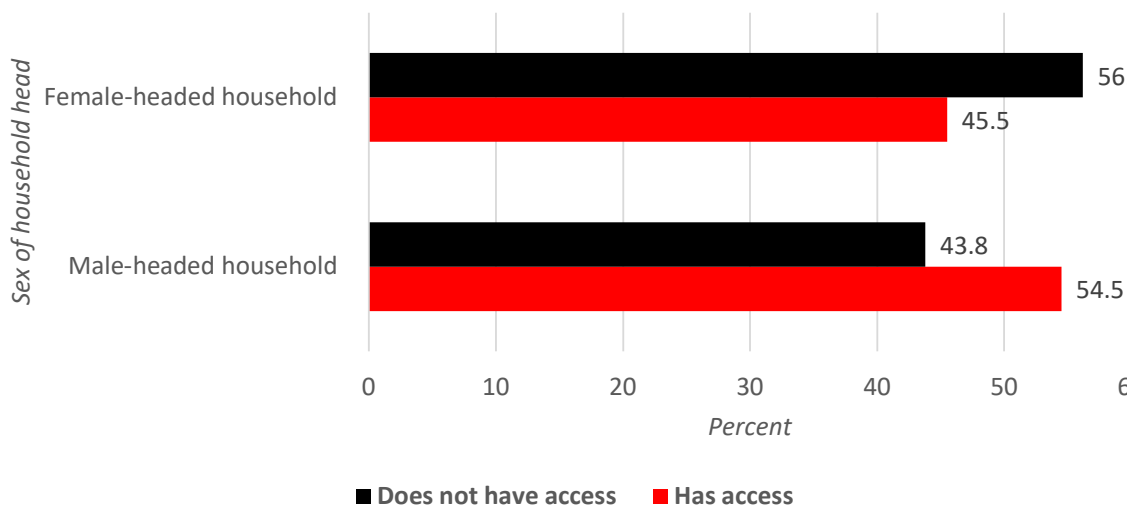


Figure 3.8 Access to arable land by sex of household head



Chi sq 16.935 P value < 0.001



### 3.4.5 Household income and expenditure

We present in Tables 3.8 data on household income and expenditure. Overall – irrespective of sex of household head, and across all eight districts, the median monthly household was GH¢300 (1USD is equivalent to 4.8 GH¢ as of July 2018 when the survey was implemented). The statistic ranges from no income at all to GH¢8,500. On average, we observed higher median income in male-headed households (Table 3.8a). By district, the monthly median income was generally comparable, with four districts recording a median of about GH¢200, three recording GH¢300, and one recording GH¢400. As regards household expenditure, overall – irrespective of sex of household head, and across all eight districts, the median

monthly household was GH¢310 (ranging from no expenditure at all to a largest expenditure of GH¢15,440. Of note, the interquartile range (IQR)/midspread – a measure of where the “middle fifty” is in the data set was GH¢170.0- GH¢580. As with income, male-headed households on average, spent more than female-headed households. The highest median expenditure of GH¢423 was recorded in the Lower Manya Krobo, and the lowest of GH¢225 in Cape Coast. Table 3.8c below summarizes household savings (self-reported) stratified by sex of household head and by district. Irrespective of sex of household head, or district of residence, the median monthly savings was GH¢0.00 (ranging from GH¢0- GH¢8,500), with an IQR range of 0-200.

**Table 3.8 Median household income, expenditure, and savings (GH¢) stratified by sex of household and by district**

Median household income	n	Household median in GH¢					
		Income	IQR	Expenditure	IQR	Savings	IQR
	1666	300.0	150-500	310.0	170.0 - 580	0.0	0-200
Median household income by sex of household head							
Male	786	300.0	150-600	330.0	184.7 - 641.3	0.0	0-200
Female	880	250.0	100-500	281.5	165.0 - 530.0	0.0	0-150
Median household income by surveyed district							
Sunyani Municipality	211	400.0	220-600	376.0	180-685	0.0	0-250
Dormaa Municipality	211	300.0	200-500	310.0	130-640	0.0	0-180
New Juaben Municipality	210	200.0	100-381.23	393.0	254-685	0.0	0-112.5
Lower Manya Municipality	210	200.0	95-500	424.5	211.5 - 794	0.0	0-277.5
Cape Coast Metropolis	159	200.0	100-400	225.0	155-410	0.0	0-120
Mfantseman District	245	300.0	150-450	246.0	172.5 - 412	20.0	0-165
Tamale Metropolis	336	300.0	150-548.8	280.0	140.0 - 466.5	0.0	0-160
East Mamprusi District	84	255.0	150-592.5	245.0	146.3 - 563.8	0.0	0-150



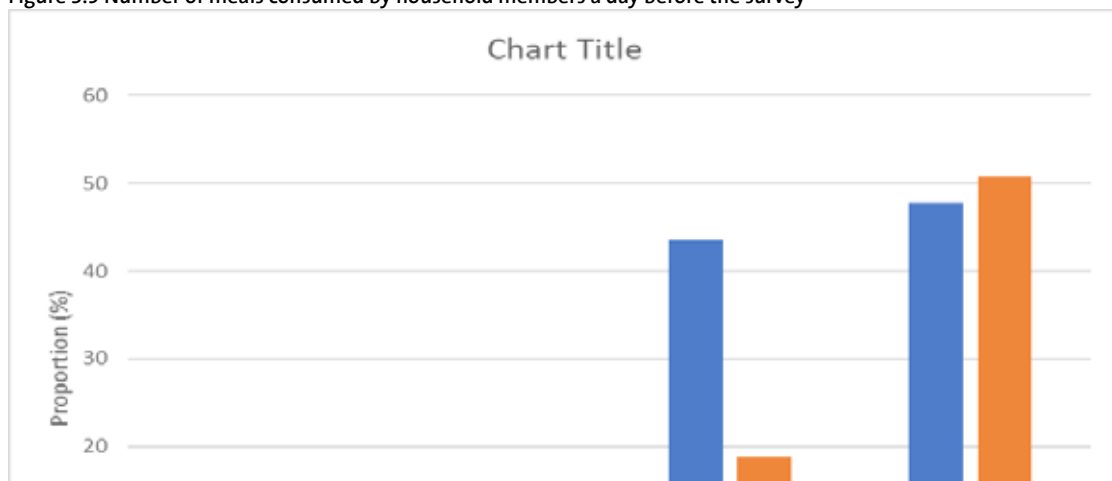
### 3.5 Food insecurity, coping strategies and the extent of vulnerability

This subsection presents information on the extent of food insecurity and vulnerability including factors contributing to vulnerability experienced by HIV affected households in the eight districts sampled. Two key measures of food insecurity are used, the Coping Strategies Index (CSI) and the Food Consumption Score (FCS) also known as the weighted dietary diversity and food frequency score. Figure 3.9 shows the food consumption patterns of adults (18+ years) and children (6-17 years) a day before the survey was undertaken. The survey showed that about 5 percent of adults and 12 percent of children went to bed without food

on this day (Figure 3.9). These results seem to show a decrease from the results of a related nationwide study carried out in 2011 in Ghana which revealed that about 14 percent of adults and 18 percent of children went to bed without food a day before the survey was conducted<sup>50</sup>. Although a decrease in this statistic is observed when the 2011 and 2018 surveys are compared, it is instructive to note that, the current study sampled only 8 districts in four out of the ten regions of Ghana. Second, a more engaged, and deliberative qualitative research may provide elucidation on the unusual finding where more children than adults going to bed hungry endured.

### 3.6 Food security

Figure 3.9 Number of meals consumed by household members a day before the survey



In Table 3.9, we present by district, the proportion of both adults (18+ years) and children (6 -17 years) who did not consume any food a day before the survey. Of those who did not eat any meal a day before the survey (N = 239), New Juaben (adult: 61.6 percent, children: 25.9 percent) and Lower Manya Krobo (adult: 31.5 percent, children: 24.7 percent) both of Eastern region of Ghana, recorded the highest rates among the districts (Table 3.9). In contrast, Tamale Metro and Sunyani Municipality recorded that there were no adults who did not eat food the day prior to the survey while about 6 percent and 17 percent of children respectively did not eat any food the day prior to the survey in those districts. The observed relationships between adult/child meal consumption and district of residence was statistically significant ( $p < 0.001$  in either case).

In the same table, we present meal skipping (skipping an entire day's meal) statistic by district of residence. Tamale metropolis recorded the highest proportion of households that sometimes skipped an entire day's meal (23.3 percent). Aside this, meal skipping patterns were comparable in the East Mamprusi (6.8 percent), and Lower Manya Krobo districts (5.1 percent); Cape Coast metropolis (10.1) and New Juaben (8.1 percent). Of note, meal skipping is a popular food consumption coping strategy. Two recent studies in Ghana and South Africa reported substantial prevalence of this behavior<sup>2</sup>, In the study by Pienaar et al<sup>51</sup>, that assessed household food security and HIV status in rural and urban communities in the Free State Province, South Africa, it was observed that 29 percent of respondents cut the sizes of children's meals or skipped meals because there was not enough





money to buy food. Laar et al<sup>2</sup> presented data that show that Ghanaian households affected by food insecurity employ different short-term behavioral responses to manage food shortages in the household. The frequency with which households adopted various coping strategies

ranged from 5.6 percent (sending household to beg) to 61.3 percent (reduction of portions sizes). The proportion of households that sometimes skipped an entire day's meal was 13 percent. The authors observed that most households do not use a single strategy, but a combination of strategies<sup>2</sup>.

**Table 3.9 Meal consumption statistics of adults (18+ years) and children (6 -17 years) a day before the survey by district**

	Cape Coast Metro	Mfantse-man	Sunyani Municipality	Dor-maa-Ahen-kro	Tamale Metro	East Mam-prusi	New Juabeng	Lower Manya Krobo	Chi sq
Adults 18+									
Did not eat any meal a day before the survey	1.4	2.7	0.0	1.4	0.0	1.4	61.6	31.5	214.87***
Ate at least one meal a day before the survey	9.9	15.3	13.2	13.2	21.1	5.2	10.4	11.7	
Total N	158	243	211	210	336	83	165	187	
Children 6-17									79.92***
Did not eat any meal	4.2	10.8	16.9	9.0	6.0	2.4	25.9	24.7	
Ate at least one meal	10.1	15.1	12.2	13.1	21.7	5.3	11.1	11.3	
Total N	159	245	211	211	336	84	210	210	
Household meal skipping									67.35***
Sometimes skips entire day's meal	10.9	17.3	12.9	15.8	23.3	6.8	8.1	5.1	
Never skips entire day's meal	8.9	13.5	12.5	11.2	18.7	4.2	14.7	16.2	
Total N	101	153	142	127	212	48	167	183	

We further examined this coping strategy of meal skipping by sex of household head (Figure 3.10). The data show that male headed households had a greater proportion of adults who did not eat any food a day before the survey. This statistic was comparable among adults – irrespective of sex of household head. In a

related study conducted in three urban areas in Zambia, it was observed that in two out of the three areas that, male-headed households had a higher mean coping strategy index as compared with female-headed households<sup>52</sup>. We report on coping strategy index later in this report.

**Figure 3.10 Proportion of both adults (18+ years) and children (6 -17 years) who did not consume any food a day before the survey by sex of household head**

Overall, 21.4 percent of the 1,666 households were assessed and categorized in the poor category of food consumption grouping (a proxy measure of food insecurity); 30.1 percent of the households were in the borderline category, whilst 48.5 percent of them had acceptable scores. In Table 3.10, these data are unpacked by district of residence. Among the eight districts sampled, Tamale metropolis recorded the

highest proportion of households categorized as food insecure (23.8 percent); a statistic which compares favorably with the proportion of households in the metropolis who sometimes skip an entire day without eating (23.3 percent; Table 3.9). shows that there was a significant association between the food consumption groupings and the various districts sampled. A similar study in 2011 showed that among the ten regions of Ghana, the Upper West region had the greatest proportion of households that belonged to the poor food consumption grouping<sup>50</sup>.

**Table 3.10 Distribution of food consumption groupings by district**

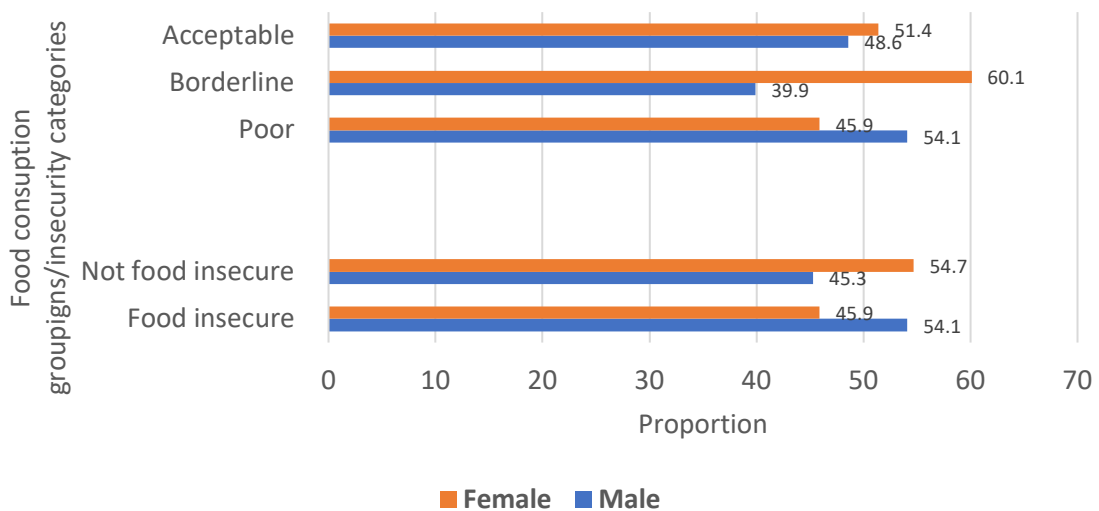
Food consumption Grouping	Cape Coast Metro	Mfantseman	Sunyani Municipality	Dor-maa-Ahenkro	Tamale Metro	East Mamprusi	New Juabeng	Lower Manya Krobo	Chi sq
Poor	10.1	11.5	7.6	11.8	23.8	4.5	15.7	15.1	69.69***
Borderline	14.2	19.2	10.8	8.6	18.8	5.0	10.4	13.2	
Acceptable	6.4	13.4	16.1	15.6	19.4	5.3	12.6	11.1	
Total N	159	245	211	211	336	84	210	210	

\*\* p < 0.001

Figure 3.11 shows an association between food insecurity groupings and sex of head of household. Food insecurity was higher in male headed households (54 percent) than in female headed households (46 percent). However, when the analysis included those households in the borderline category are included in the comparison, a different picture is painted

showing that a greater proportion of the female headed households are food insecure as compared with the male headed household. And such analysis are relevant as the borderline category are an important group. Interventions of frank food insecure families need to take cognizance of the borderline category and their probability of slipping into the food insecure category is precariously high.

**Figure 3.11 Distribution of food consumption groupings by sex of household head**



P < 0.05 in either case



Figure 3.12 shows the relationship between food security groupings and household size. In linking food insecurity categories to household size (a continuous variable), the Analysis of Variance statistical technique with appropriate Post-Hoc test was deployed. The data show that food insecure households had significantly larger household sizes ( $p < 0.001$ ). To ensure validity of the test, a more robust test of equality of means (the Welch F statistic) was used. This affirmed the hypothesis that significant differences exist in mean household size across the three food consumption groupings ( $F =$

7.808;  $p$  value  $< 0.001$ ). Confirm exactly where the difference were, Post-Hoc Test (whose choice was motivated by the violation of homogeneity of variance assumption) was performed. In this case, the Gaemes-Howell test was chosen. This test confirmed that the Food Consumption categories whose household sizes differed significantly were the “poor” vs. acceptable ( $p = 0.002$ ) This was once again observed in a 2015 study carried out in Senegal where it was observed that smaller household sizes were not severely food insecure ( $p=0.07$ )<sup>53</sup>.

Figure 3.12 Food security groups and household size

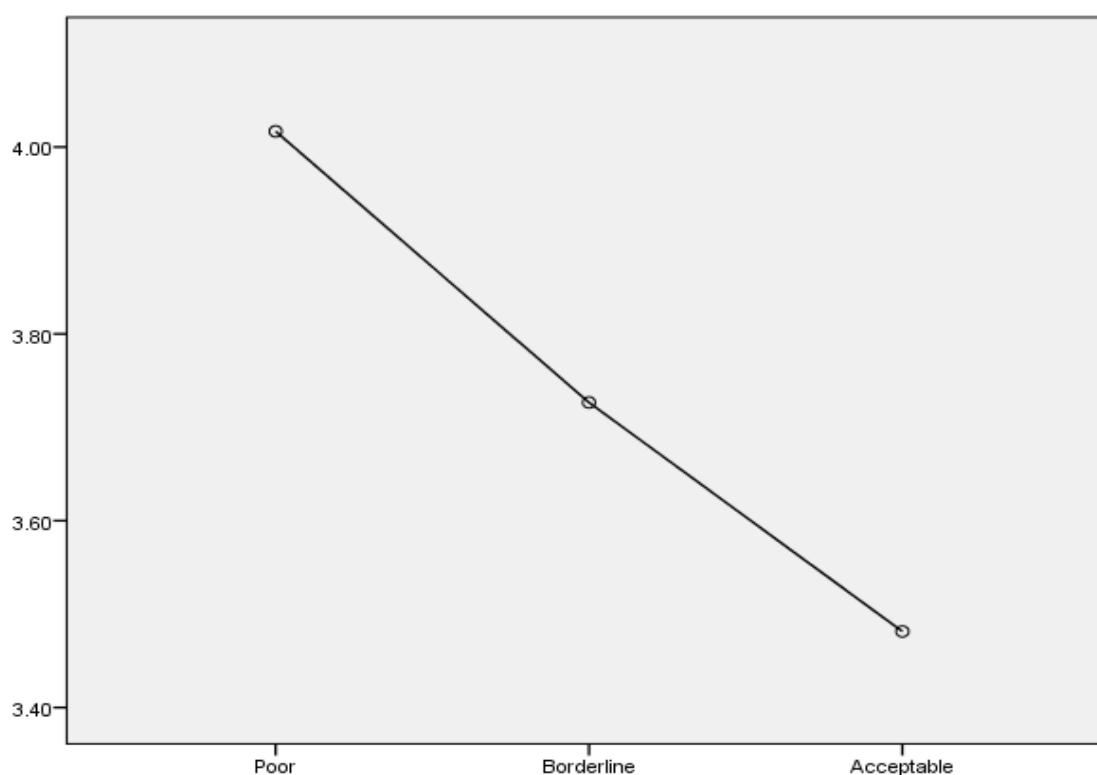


Table 3.11 shows the relationship between food insecurity and some selected attributes of households. Statistically significant differences in the rates of food insecurity were observed in relation to access to arable land, hosting a sick person for at least three months, dependency rate and asset wealth ( $p < 0.001$  in each case). Intriguingly, we observed that whilst caring for a chronically ill person in a household was

significantly associated with food consumption groupings, caring for a sick person in the household for less than a month was not ( $p = 0.390$ ), and so was household reporting a recent death ( $p = 0.346$ ) or caring for an orphan ( $p = 0.492$ ). Of note, all of these were rare events among the sampled 1,666 households.



**Table 3.11 Food security groups and selected household attributes**

Household food security groupings	Poor	Borderline	Acceptable	Pearson Chi-Square	Asymp. Sig. (2-sided) = p value
Access to arable land					
Household has access to arable land					
Has access to arable land	138 (26.2)	178 (33.8)	211 (40.0)	23.04	<0.001
Does not have access to arable land	219 (19.2)	323 (28.4)	597 (52.4)		
Sex of household head					
Male	193 (24.6)	200 (25.4)	393 (50.0)		P <0.001
Female	164 (18.6)	301 (34.2)	415 (47.2)		
Hosting a sick person (≥3months)					
Yes	117 (27.7)	106 (25.1)	199 (47.2)	15.30	<0.001
No	240 (19.3)	395 (31.8)	609 (49.0)		
Hosting a sick person (<1month)					
Yes	93 (22.4)	114 (27.4)	209 (50.2)	1.90	0.390
No	264 (21.1)	387 (31.0)	599 (47.9)		
Recent death in the household					
Experienced a recent death	8 (30.8)	5 (19.2)	13 (50.0)	2.120	0.346
No recent death	349 (21.3)	496 (30.2)	795 (48.5)		
Household hosting an orphan					
Has at least one orphan	341 (21.7)	474 (30.1)	758 (48.2)	1.42	0.492
No orphan	16 (17.2)	27 (29.0)	50 (53.8)		
Dependency rate					
50% or less	180 (20.8)	301 (34.8)	383 (44.3)	20.30	<0.001
50% or more	177 (22.1)	200 (24.9)	425 (53.0)		
BMI of main respondent of household					
Underweight	87 (22.9)	109 (28.7)	184 (48.4)	4.97	0.548
Normal	149 (21.2)	203 (28.9)	351 (49.9)		
Overweight	61 (22.7)	83 (30.9)	125 (46.5)		
Obese	18 (18.2)	38 (38.4)	43 (43.4)		
Asset wealth					
Poor	84 (20.4)	140 (34.0)	188 (45.6)	23.10	<0.001
Medium	187 (19.6)	301 (31.5)	468 (49.0)		
Rich	86 (28.9)	60 (20.1)	152 (51.0)		
Region					
Brong Ahafo	69 (16.4)	97 (23.0)	256 (60.7)	57.19	<0.001
Eastern	110 (26.2)	118 (28.1)	192 (45.7)		
Central	77 (19.1)	167 (41.3)	160 (39.6)		
Norther	101 (24.0)	119 (28.3)	200 (47.6)		

Where indicated, data from Sunyani Municipality, and Dormaa-Ahenkro represent Brong Ahafo (n=422); data from New Juabeng and Lower Manya represent Eastern (n=420), data from Cape Coast Metro, and Mfantseman District represent Central (n=404), and data from Tamale Metro and East Mamprusi District represent Northern (n=420)



### 3.7 Coping strategies

Figure 3.13 represents coping strategies of households affected by HIV. The strategies range in order of frequency, from limiting portion size at mealtimes (61.9 percent), reducing number of meals eaten per day (59.9 percent), relying on less expensive or less preferred foods (57.6), borrowing food or relying on help from friends or relatives (36.5 percent) to sending household members to beg (5.7 percent). These data compare favorably with the work of Laar et al<sup>2</sup> whose data that show that Ghanaian households affected by food insecurity employ short-term different behavioral responses to

manage food shortages in the household. The frequency with which households adopted various coping strategies ranged from 5.6 percent (sending household to beg) to 61.3 percent (reduction of portions sizes). The proportion of households that sometimes skipped an entire day's meal was 13 percent. The authors observed that most households do not use a single strategy, but a combination of strategies<sup>2</sup>. Related studies conducted in South Africa and Uganda found that about 63 percent and 74 percent respectively of respondents resorted to asking family members for monetary or food assistance as a coping strategy when

faced with a food shortage<sup>51, 54</sup>.

**Figure 3.13 Coping strategies of households affected by HIV (n=1666)**

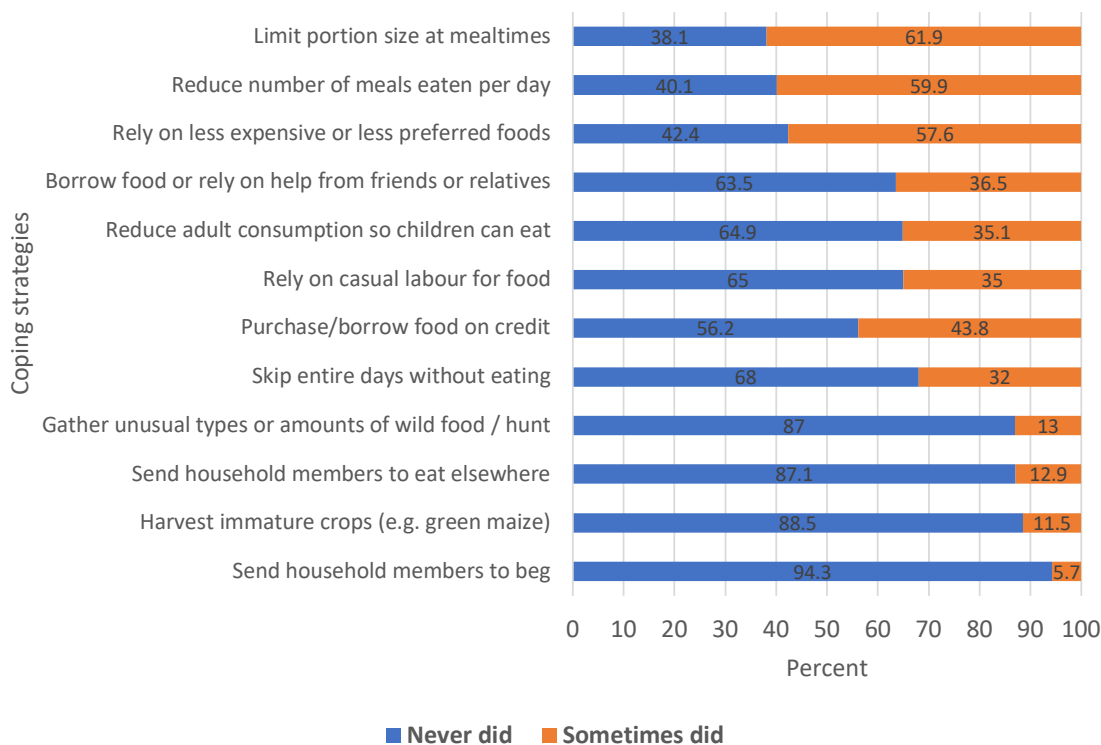




Table 3.12 below is a correlation matrix relating FCS, and CSI to selected continuous explanatory variables. As expected, we observed a negative correlation between FCS and CSI. Also, negative and significant correlations were observed

between EDR and CSI, EDR and FCS, HH\_expenditure and CSI, BP and FCS, age of household head and FCS, as well as asset wealth and CSI. Asset wealth is, however, correlated positively with FCS (Table 3.12).

**Table 3.12 Correlation matrix**

		CSI	FCS	EDR	HH_expenditure	HH_size	Blood Pressure	Asset wealth	BMI	Age (head)
CSI	r <sup>2</sup>	1								
	N	1666								
FCS	r <sup>2</sup>	-.001	1							
	N	1666	1666							
EDR	r <sup>2</sup>	-.064**	-.092**	1						
	N	1666	1666	1666						
HH_expenditure	r <sup>2</sup>	-.131**	.003	-.040	1					
	N	1666	1666	1666	1666					
HH_size	r <sup>2</sup>	.022	.233**	-.285**	.212**	1				
	N	1666	1666	1666	1666	1666				
Blood Pressure	r <sup>2</sup>	-.008	-.075**	-.036	.096**	-.019	1			
	N	1666	1666	1666	1666	1666	1666			
Asset wealth	r <sup>2</sup>	-.174**	.126**	-.022	.120**	.294**	-.011	1		
	N	1666	1666	1666	1666	1666	1666	1666		
BMI	r <sup>2</sup>	-.064*	-.036	.017	.096**	.023	.104**	.050	1	
	N	1459	1459	1459	1459	1459	1459	1459	1459	
Age (head)	r <sup>2</sup>	.051	-.115**	-.140**	.019	.107**	.193**	.004	.039	1
	N	591	591	591	591	591	591	591	527	591

\*\* Correlation is significant at the 0.01 level (2-tailed).| \* Correlation is significant at the 0.05 level (2-tailed).  
CSI- coping strategy index; FCS – food consumption score; EDR – effective dependency rate; HH\_expenditure – household expenditure; HH\_size - household size; BMI – body mass index; Age (head) – age of household head

Using computational algorithms developed by WFP and partners, the series of questions (12 of them) presented above – regarding how households manage to cope with a shortfall in food for consumption results in a simple numeric score (the coping strategy index or CSI). Lower scores reflect better household food security situation. The median, mean, and other relevant descriptive statistics of this numeric

score are presented in Table 3.13. Overall the median CSI is 14, ranging from 0 – 261, and was higher in female-headed households. Some of the sampled districts had comparable CSIs. With the exception of Tamale metropolis and East Mamprusi district (15 vs 10), the CSI was comparable in both the rural and urban districts of a region. The Cape Coast metropolis had the highest median CSI (Tale 3.13).

**Table 3.13 Median Coping Strategy Index by district and sex of household head**

Median Coping Strategy Index	n	Mean	Median	IQR	Range
	1666	25.3	14.0	2-33	0-261
Male-headed households	786	22.3	11.2	1-28	0-255
Female-headed households	880	28.0	17.0	3-39	0-261
Sampled district					
Sunyani Municipality	211	31.9	14.0	2-41	-225
Dormaa Municipality	211	27.7	12.0	2-39	0-203
New Juaben Municipality	210	18.9	10.0	1-27	0-167.0
Lower Manya Municipality	210	16.2	9.0	.75-18.25	0-261
Cape Coast Metropolis	159	32.1	25.0	9-43	0-174
Mfantseman District	245	26.7	21.0	3-38	0-129
Tamale Metropolis	336	25.2	9.5	.25-27.8	0-255
East Mamprusi District	84	24.8	14.5	1.25-28.5	0-201



Table 3.14 presents average CSI by selected household attributes. Households without arable land, female-headed households, households hosting a sick member for more than three months, or has at least one orphan had higher Mean CSI. With the exception of arable land ownership, the observed associations were statistically significant (Table 3.14). That caring for an orphan increases the food consumption-

related stress upon the household; that hosting and caring for a chronically ill member does same, is almost axiomatic. Several studies including the nationwide survey of food insecurity and vulnerability of Ghana HIV-affected households conducted in 2011 reported similar relationships<sup>50</sup>.

**Table 3.14 Mean Coping Strategy Index and selected household attributes**

Median CSI	N	Mean	Std error	Mean Difference	95% CI of the Difference		P value
Household has access to arable land							
Has access to arable land	527	23.97	1.58	-1.93	-5.57	1.71	0.299
Does not have access to arable land	1139	25.89	1.03				
Sex of household head							
Male	786	22.26	1.24	-5.73	-9.11	-2.35	0.001
Female	880	27.99	1.20				
Hosting a sick person (≥3months)							
Yes	422	30.94	1.88	7.57	3.70	11.45	<0.001
No	1244	23.37	0.96				
Recent death in the household							
Experienced a recent death	26	24.08	6.87	-1.23	-14.88	12.43	0.860
No recent death	1640	25.30	0.87				
Household hosting an orphan							
No orphan	1573	24.39	0.86	-16.12	-23.45	-8.79	<0.001
Has at least one orphan	93	40.51	4.98				
Dependency rate							
50% or less	864	27.00	1.23	3.56	0.18	6.95	0.039
50% or more	802	23.44	1.21				

In Figure 3.14, we extend the comparison of mean CSI by beyond the binary household-level explanatory variables to three selected categorical variables (region of residence, household asset wealth, and household size). Overall, mean CSI decreases with increasing asset wealth. This is predictable, as asset wealth is linked to household income levels, resilience, and therefore better coping. This suggests that food security could be addressed through a policy focusing on assets underlying household wealth. On the contrary we observed a directionally proportional/positive correlation between CSI and household size; CSI increases with increasing household size. By region of residence, Eastern has the lowest mean CSI while that of Brong Ahafo, Central, and Northern regions were comparable. All of the observed associations were statistically significant ( $p < 0.001$  for asset wealth and region of residence;

$p = 0.017$  for household size). In comparing the means across these groups, the Kruskal-Wallis test (a non-parametric analogue of the ANOVA) was used, as the CSI was not normally distributed. We conducted Post-Hoc tests (multiple comparisons analysis) that showed that mean CSI between Brong Ahafo, and Eastern, Central and Eastern, as well as NR and Eastern were all statistically significant. Differences between Brong Ahafo, and Northern, or Brong Ahafo and Central, or Northern and Central were not significant. As noted earlier, where indicated, data from Sunyani Municipality, and Dormaa-Ahenkro represent Brong Ahafo ( $n=422$ ); data from New Juabeng and Lower Manya represent Eastern ( $n=420$ ), data from Cape Coast Metro, and Mfantseman District represent Central ( $n=404$ ), and data from Tamale Metro and East Mamprusi District represent Northern ( $n=420$ )



Figure 3.14a-c Median CSI and asset poverty, household size, region

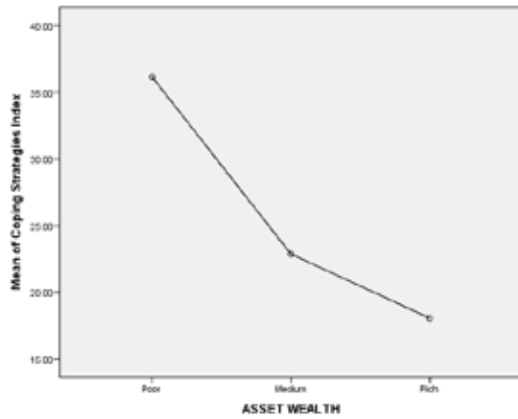


Fig.3.14a (Post-Hoc: Poor-Med; Rich-Poor; Rich-Med significant)

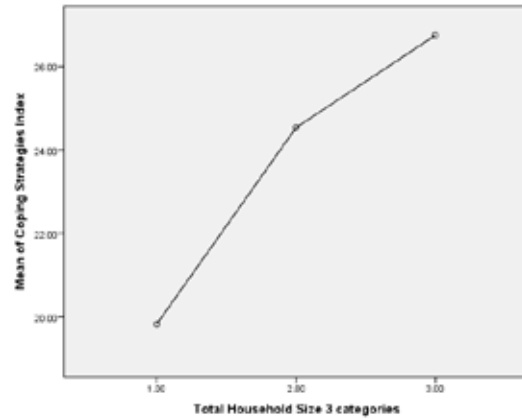


Fig.3.14a (Post-Hoc: only 1member vs >3members)

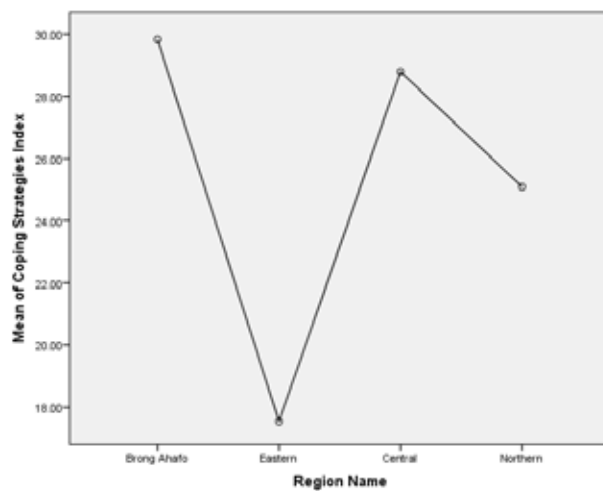


Fig.3.14x (Post-Hoc: Brong Ahafo-Eastern; Central-Eastern; Northern-Eastern all significant)

### 3.8 Classifications, and extent of vulnerability to food insecurity

This section presents findings on the various vulnerability classifications in relation to demographic composition of households, dependency rates, presence of a chronically sick member in a household, sex of household head, main sources of livelihood, income and expenditure.

Measures of degree of vulnerability were calculated as in the 2011 survey using CSI (a measure of the stress imposed on the household due to food insecurity); and the FCS (an indicator of dietary quality and diversity). The four degrees

of vulnerability that have been identified<sup>2</sup> in a neutral manner are:

- The “worst off”,
- The “vulnerable”,
- Those who are “acceptable”, and
- The “better off”.

From a policy perspective, the most “at risk” groups are those at the bottom end of the scale (the worst off, and vulnerable), where interventions are most necessary and have the largest potential impact. The global distribution of this outcome is presented in Figure 3.15). Following this are distributions by sex of household head (Figure 3.16), and by district of residence (Table 3.15).

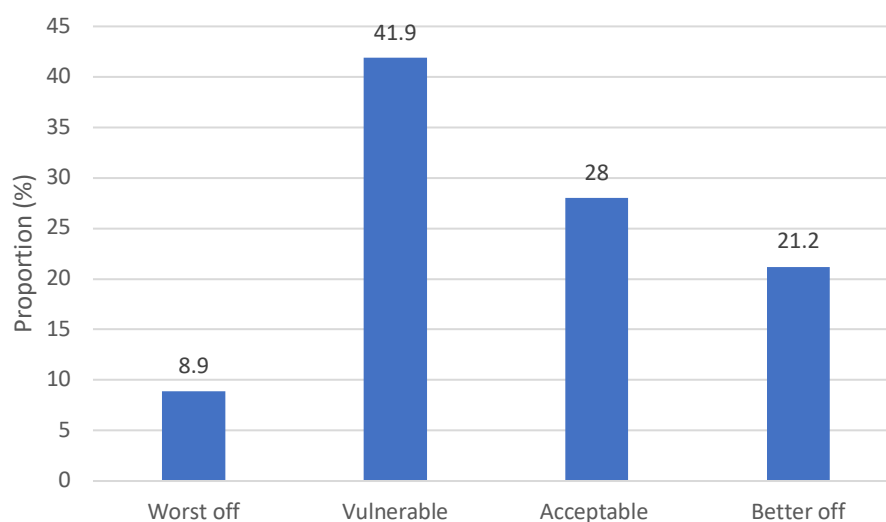




Overall, about 9 percent of the households fall into most vulnerable category (worst off), while 42 percent are classified as vulnerable. These two large groups of households vulnerable and worst-off groups comprise over 50 percent of the the households 1,666 households sampled. A usual policy objective target both the vulnerable and worst off so as to prevent them (the vulnerable) from slipping into the worst-off group.

The acceptable and better off groups do not need immediate food security-promoting interventions. However continuous monitoring of all these groups is required as cross-carpeting among these groups is non-linear and can be transitory. We observe an increase in the “at risk” group households when we compared the current data to those of the 2011 survey. The earlier survey reported 5.3 percent and 32 percent “worst off” and “vulnerable” rates respectively. Overall, both Ghanaian surveys compare with that conducted in Zambia by USAID, the Government of Zambia Central Statistical Office and World Food Program Zambia in (2008). In the Zambian study, the “worst off” group was the smallest (6 percent), while the “ok” (34 percent) – referred to as “acceptable” in the Ghanaian case.

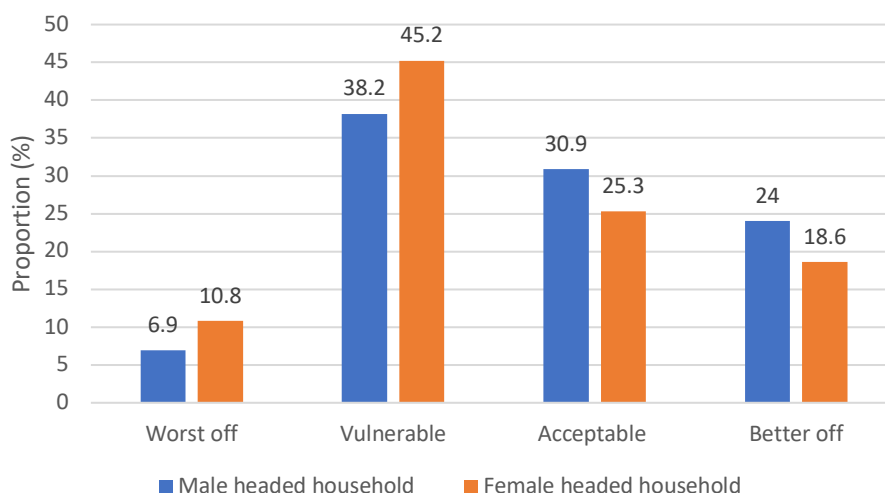
**Figure 3.15 Classification of vulnerability to food insecurity (global distribution of vulnerability groups)**



Households were assessed to find out whether or not the sex of the head of the household was associated with household’s vulnerability to food insecurity. We present this in Figure 3.16. Although there were variations in the data, more

households (56 percent) with female heads were found in the “at risk” groups of worst-off and vulnerable compare to male-headed households (45 percent). Similar results were reported in the 2011 survey referred to above.

**Figure 3.16 Vulnerability to food insecurity by household headship**





As stated above, the distribution of the vulnerability groupings by district can be found in Table 3.15. Households from the urban areas of Brong Ahafo region – Sunyani municipality, and Northern region – Tamale metropolis recorded the highest proportion of worst-off groups (about 20 percent) East Mamprusi recorded the lowest number of households in this category.

About a quarter (26 percent) of the households who were found to be in the “acceptable” group were from Tamale metro, while Cape Metro had the least number of households in this category. A significant difference was observed for the vulnerability categories across the various districts (p-value <0.001).

**Table 3.15 Vulnerability to food insecurity by district**

Vulnerability Grouping	Cape Coast Metro	Mfantseman	Sunyani Municipality	Dor-maa-Ahenkro	Tamale Metro	East Mamprusi	New Juabeng	Lower Manya Krobo	Chi sq
Worst off	14.1	14.8	20.8	16.1	19.5	4.0	6.0	4.7	114.888***
Vulnerable	13.2	20.2	10.9	11.3	17.2	5.3	11.6	10.3	
Acceptable	5.8	10.1	12.0	12.0	26.2	6.4	12.2	15.2	
Better off	5.4	9.9	13.6	14.7	18.4	3.1	17.8	17.0	

\*\*\* denotes p value < 0.001

Table 3.16 below presents the associations between various household attributes and vulnerability to food insecurity.

Access to arable land could potentially impact on a household’s food security. For most rural households, production of own food tends to hold a central role as a source of food and income (Kumba et al., 2015). As expected, a household’s access to arable land was found to have an effect on its vulnerability to food insecurity in this study (p-value 0.007). More households (52.6 percent) that did not have access to arable land were found in the groups that need interventions (“worst off” and “vulnerable”) than in the “acceptable” and “better off” groups. This was also the case in the 2011 study commissioned by the WFP and GAC.

Household assets are strongly linked to food security. It was therefore not surprising to find that asset wealth was significantly associated with degree of vulnerability for the households (p-value<0.001). Households classified as rich are more likely to have more access to food than those classified as poor. About 65.6 percent, 48.5 percent and 33.3 percent of the households that were classified as poor, medium and rich respectively were found in the “at risk” groups.

Duration of a household hosting a sick person had an impact on its vulnerability to food security. Caring for a chronically-ill person increases the burden on household resources and places additional stress on households. In order to meet the health demands of the sick person, households have to resort to

budget adjustments, reduced food intake and modifications in types of foods served. (Seligman et al., 2009). No significant difference (p-value 0.081) was found between the vulnerability groupings for households which had hosted a sick person for less than 1 month. However, more households which had hosted chronically-ill persons (for more than 3 months) were found in the “worst off” and “vulnerable” groups (58.5 percent). A significant difference was observed between these groups, with a p-value <0.001.

Household size and the number of dependents on a household’s income and resources also affect how well the household thrives. About 43 percent of the households with one member were classified as “worst off” or “vulnerable”, compared to 55.5 percent and 51.4 percent for households with two and three or more members respectively. This difference was statistically significant, with a p-value of 0.013. Households with more dependents were also more vulnerable to food insecurity. A significant difference was observed between the households with less than 50 percent dependents and those with 50 percent or more of the household being dependents (p-value 0.015). About 67 percent of the households which included at least one orphan were also susceptible to food insecurity, compared to 49.8 percent of those with no orphan. The difference was found to be significant, with a p-value of 0.022. The earlier study<sup>50</sup> commissioned by WFP and GAC in 2011 also had similar findings, where household size was found to be associated with food security, with food insecurity increasing as the number of family members increases.



Poor rural households that have lost a member, especially a household head, are particularly slow to recover from the financial impacts of an HIV-related death<sup>55</sup>. However, with a p-value of 0.802, recent death in a household was not statistically associated with its vulnerability to food insecurity from this current study. More households (50.9 percent) which had not experienced any recent deaths were rather found in the groups that were more susceptible

to food insecurity and more (53.8 percent) of households who had experienced a recent death were in the “acceptable” and “better off” groups. Although it was presumed that the BMI of the main respondent of a household would be reflective of the household’s degree of vulnerability, no particular trend was observed among the households’ degree of vulnerability, with respect to their main respondent’s BMI.

**Table 3.16 Vulnerability groupings and selected household attributes**

Household attributes	Worst off	Vulnerable	Acceptable	Better off	Pearson Chi-Square	p value
Household has access to arable land						
Has access to arable land	46 (8.7)	201 (38.1)	142 (26.9)	138 (26.2)	12.01	0.007
No access to arable land	103 (9.0)	497 (43.6)	324 (28.4)	215 (18.9)		
Sex of household head						
Male	54 (6.9)	300 (38.2)	243 (30.9)	189 (24.0)	22.44	<0.001
Female	95 (10.8)	398 (45.2)	223 (25.3)	164 (18.6)		
Hosting a sick person (≥3months)						
Yes	54 (12.8)	193 (45.7)	104 (24.6)	71 (16.8)	18.68	<0.001
No	95 (7.6)	505 (40.6)	362 (29.1)	282 (22.7)		
Hosting a sick person (≤1month)					6.71	0.081
Yes	49 (11.8)	178 (42.8)	106 (25.5)	83 (20.0)		
No	100 (8.0)	520 (41.6)	360 (28.8)	270 (21.6)		
Recent death in the household						
Experienced a recent death	3 (11.5)	9 (34.6)	9 (34.6)	5 (19.2)	.998	0.802
No recent death	146 (8.9)	689 (42.0)	457 (27.9)	348 (21.2)		
Household hosting an orphan						
No orphan	134 (8.5)	650 (41.3)	446 (28.4)	343 (21.8)	14.44	0.022
Has at least one orphan	15 (16.1)	48 (51.6)	20 (21.5)	10 (10.8)		
Dependency rate						
50% or less	84 (9.7)	381 (44.1)	241 (27.9)	158 (18.3)	10.43	0.015
50% or more	65 (8.1)	317 (39.5)	225 (28.1)	195 (24.3)		
BMI of main respondent of household						
Underweight	45 (11.8)	154 (40.5)	103 (27.1)	78 (20.5)	10.93	0.281
Normal	58 (8.3)	300 (42.7)	200 (28.4)	145 (20.6)		
Overweight	19 (7.1)	120 (44.6)	71 (26.4)	59 (21.9)		
Obese	6 (6.1)	37 (37.4)	37 (37.4)	19 (19.2)		
Asset wealth						
Poor	60 (14.6)	206 (50.0)	83 (20.1)	63 (15.3)	62.10	<0.001
Medium	70 (7.3)	394 (41.2)	292 (30.5)	200 (20.9)		
Rich	19 (6.4)	98 (32.9)	91 (30.5)	90 (30.2)		
Household size						
1member	16 (6.3)	92 (36.5)	73 (29.0)	71 (28.2)	16.20	0.013
2members	24 (7.7)	149 (47.8)	85 (27.2)	54 (17.3)		
≥3members	109 (9.9)	457 (41.5)	308 (27.9)	228 (20.7)		

### 3.9 Estimated and extrapolated populations of food insecure, and vulnerable households/PLHIV in the four focus regions

Table 3.17, we present the estimated number of food insecure and vulnerable HIV+ patients on ART in the regions of Northern, Brong Ahafo, Eastern, and Central – using both data from the current survey and treatment uptake data from the National HIV/STI Control Programme (NACP). The survey found that 21.4 percent (357) of the sampled 1,666 to be food insecure. Extrapolations based on the entire number of PLHIV on ART in the focus regions (36,586 PLHIV) take the numbers who are food insecure to 7,778 PLHIV. Based on an average household size of four members<sup>3</sup> (current survey, estimated mean is 4.0; and median is 3.0), this means that altogether 7,778 x 4 (31,112) persons infected and affected by HIV need to be targeted for assistance. Related estimations and extrapolations are made for vulnerability classes of worst-off and vulnerable (See Table 3.17 below).

**Table 3.17 Food insecure and vulnerable households/PLHIV**

A	STUDY SAMPLE			EXTRAPOLATIONS			STUDY SAMPLE			EXTRAPOLATIONS			
	B	C	D	E	F	G	H	I	J	K	L	M	
Regions	Food Insecurity	# of study households that are food insecure	% food insecure	ART uptake	Total PLHIV likely food insecure	Vulnerable to food insecurity	% vulnerable	# of worst-off households [only]	% worst-off	Total Pop. of HIV+ patients in the region	Immediate need [worst off]	Total PLHIV likely vulnerable to food insecurity (vulnerable only)	N = (L +M)
Brong Ahafo	422	69	16.4		2287	155	36.7	55	13.0	"see col. E"	1,813	5118	6,931
Eastern	420	110	26.2	13,944	3727	153	36.4	16	3.8	"see col. E"	540	5178	5,718
Central	404	77	19.1	5,229	999	233	57.7	43	10.6	"see col. E"	554	3018	3,572
Northern	420	101	24.0	3,190	765	157	37.4	35	8.3	"see col. E"	265	1194	1,459
All 4 regions	1,666	357	21.4	36,586	7,778	698	41.9	149	8.9	"see col. E"	3,257	15,330	18,587

<sup>#</sup>Source: NACP, June 2018. Where indicated, data from Sunyani Municipality, and Dormaa-Ahenkro represent Brong Ahafo (n=422); data from New Juabeng and Lower Manya represent Eastern (n=420), data from Cape Coast Metro, and Mfantseman District represent Central (n=404), and data from Tamale Metro and East Mamprusi District represent Northern (n=420)

<sup>3</sup> The average number of household size using data from the 2010 National Population and Housing Census is 4.



## 3.10 Nutrition and health/clinical profiles of selected household members

### 3.10.1 Nutrition and health of household members

Weight and height measurements of the main respondents were taken. These measurements were used to compute body mass index (BMI) for each respondent. Apart from BMI, which is the most commonly-used nutritional status indicator in adults, mid-upper arm circumference (MUAC) measurements were taken for main respondents who were pregnant. About 26 percent of the respondents from all the districts were found to be in a state of chronic energy deficiency (underweight). BMI results were then compared between the study districts. The

distribution is shown in Table 3.18. Apart from Tamale metro, which came close (23.2 percent) to the global prevalence of chronic energy deficiency (26.2 percent), all other districts had lower prevalence of respondents with BMI < 18.5kg/m<sup>2</sup> compared to the national average, with the lowest recorded in East Mamprusi (4.5 percent) and Cape metro (6.8 percent). A significant difference was observed for the districts (p-value 0.004), but not by age of respondent (date not shown for BMI and age groupings). In Table 3.19, the distribution of the 44 pregnant respondents included in the MUAC analysis is presented. Of note, for this group, a MUAC < 23.0cm is usually preferred over BMI as indicator of poor nutrition outcomes. In the current survey, the median MUAC was 31cm, ranging from 24-60cm. It is worth noting that the stability of the estimates may be unreliable owing to the small numbers.

**Table 3.18** Main respondents' anthropometric indices by [district]

BMI	Cape Coast metro	Mfantseman	Sunyani	Dormaa-Ahenkro	Tamale metro	East Mamprusi	New Juabeng	Lower Manya Krobo	Chi Sq
Underweight	6.8	10.3	15.0	12.6	23.2	4.5	14.2	13.4	42.431***
Normal	9.5	15.1	11.9	15.6	20.2	5.8	10.8	11.0	
Overweight	11.2	19.3	12.6	10.0	19.3	2.6	13.8	11.2	
Obese	3.0	19.2	12.1	9.1	17.2	6.1	13.1	20.2	

\*\*\* denotes p value < 0.001

**Table 3.19** Median MUAC of pregnant respondent stratified by sex of household head and by region

Median MUAC (overall)	n	Median	IQR	Range
	44	31.3	29-34	24-60
Median MUAC by sex of household head				
Male-headed households	28	30.5	28.1-33.5	24-42
Female-headed households	16	32.0	31.0-34.0	26.6-60
Median MUAC by surveyed district				
Sunyani Municipality	3	31.5	28.8-42.0	28.0-40.2
Dormaa Municipality	5	30.4	25.0-32.3	24.0-33.6
New Juabeng Municipality	1	28.4	28.4-28.4	28.4-28.4
Lower Manya Municipality	5	30.5	24.2-30.0	24.2-34.0
Cape Coast Metropolis	4	30.5	25.5-33.3	24-34
Mfantseman District	10	31.5	29.2-32.7	26.6-36.0
Tamale Metropolis	13	32.5	29.0-35.0	28.0-39.0
East Mamprusi District	5	36.0	32.0-48.5	31.0-60

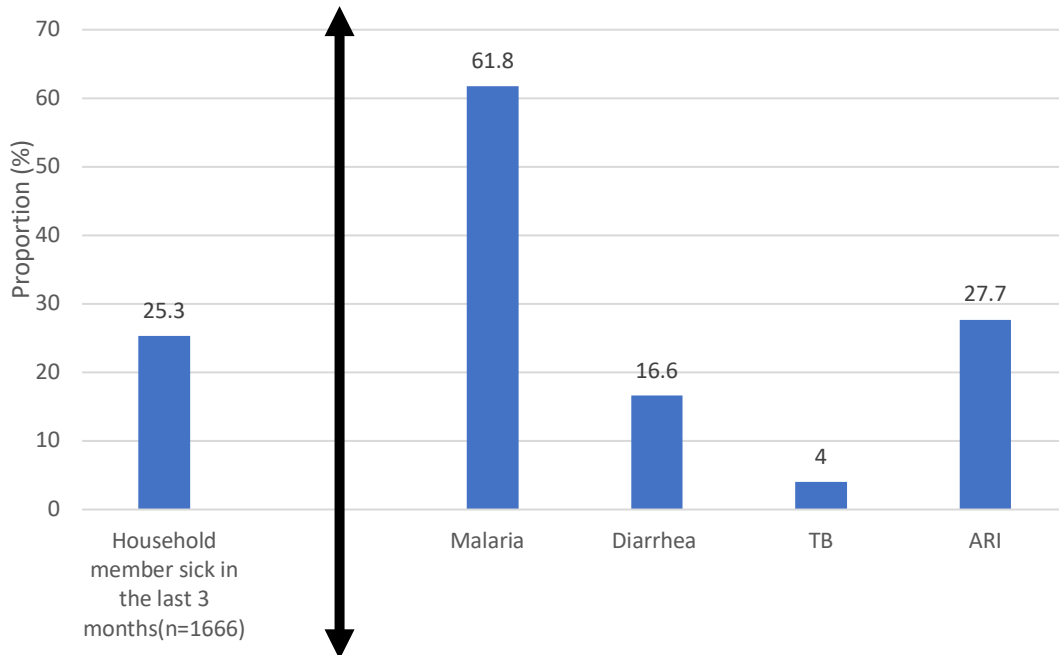


### 3.10.2 History of ill health and health seeking behavior of sick household members

Figure 3.17 shows the history of ill health among surveyed household members three months preceding the study. Of the 1,666 households contacted, about 25 percent of them experienced members of their households falling sick in the last three months prior to the study. There

were variations in case statistics for the various reported illnesses with malaria cases (62 percent) being the highest (Figure 3.17). This trend is consistent with results from the 2016 GHS Annual report showing malaria as the topmost disease reported during OPD visits<sup>56</sup>. Comparing this to the baseline survey in 2011, there seemed to have been a reduction in prevalence of ill health among surveyed households<sup>50</sup>.

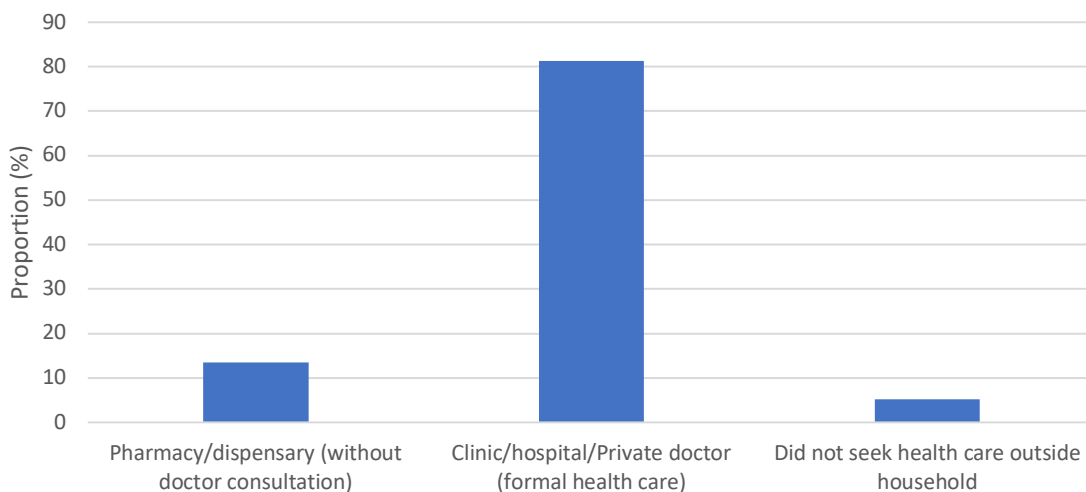
Figure 3.17 History of ill health among household members three months preceding the survey



In Figure 3.18 data representing places sick households members sought healthcare indicate are presented. Formal health care from clinics/hospitals is the most preferred source, representing about 81 percent of their choices. Other sick members also preferred care from the pharmacy/dispensary. Almost 5 percent of the households expressing ill health do not resort to

seeking health care service outside their households. Reasons given for failing to seek health care included no money to pay for treatment, they believed their illness were minor, cost and means of transportation and other preferred not to seek any treatment because of their religious and cultural believes.

Figure 3.18 Places healthcare was sought for the sick





### 3.10.3 Hypertension indices of main respondents

The research team asked main respondents whether they ever had their blood pressure measured by a health worker and a significant

majority representing 93 percent responded in the affirmative. Fourteen percent of this group self-reported their hypertension status. However, BP measurements conducted by trained research team members estimated 24 percent of them to be hypertensive (see Figure 3.19).

Figure 3.19 Hypertension indices of main respondents

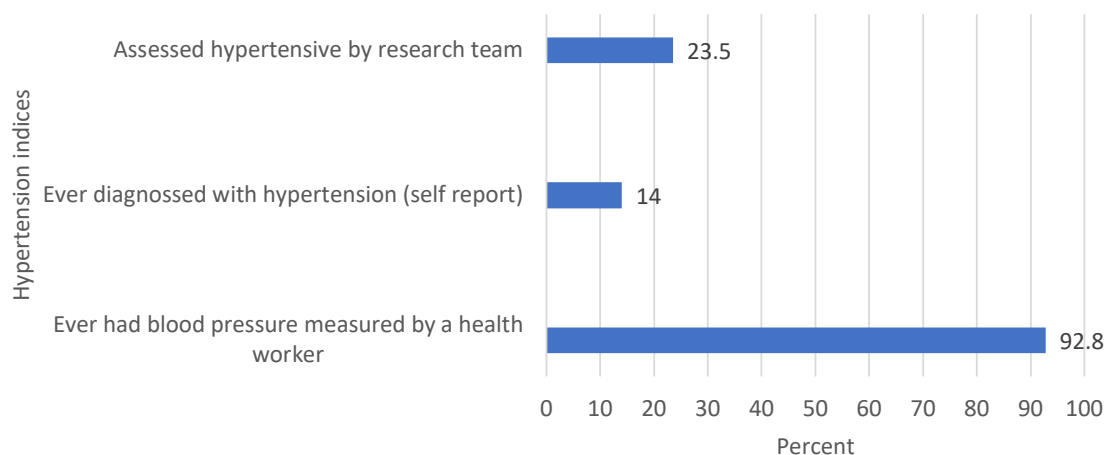


Table 3.20 shows hypertension indices by the surveyed districts. All surveyed districts showed a lower percentage of self-reported hypertension compared to measured prevalence. Both self-reported prevalence and measured prevalence of hypertension was highest in the New Juabeng (self-reported 22.4 percent vs. 30 percent measured) and Lower Manya Krobo (self-reported 20.3 percent vs. 33.3 percent measured) districts. The between groups (districts) differences both in self-reporting (Chi q = 34.810) and research team assessment (Chi q = 33.571) were

highly significant (both p-values = <0.001) We note with intrigue, the comparability of the hypertension statistics of the Lower Manya Krobo district in the current survey to earlier surveys conducted in the district. Two recent surveys (2015, and 2018) conducted by a team of researchers from the University of Ghana and London School of Hygiene and Tropical Medicine in the same Lower Manya district reported district-wide hypertension prevalence of 33.4 percent in 2015, and 33.1 percent in 2018.<sup>57,58</sup>

Table 3.20 Regional distribution of PLHIV by year ART was initiated

Hypertension indices	Cape Coast Metro	Mfantseman	Sunyani Municipal	Dor-maa-Ahen-kro	Ta-male Metro	East Mam-prusi	New Juabeng	Lower Manya Krobo	Chi sq	P value
Ever diagnosed to be Hypertensive	18.4	11.7	10.0	10.3	8.4	14.9	22.4	20.3%	34.810a	<0.001
Never diagnosed to be Hypertensive	81.6	88.3	90.0	89.7	91.6	85.1	77.6	79.7%		
Hypertensive (current measurement)	26.4	24.1	23.7	18.5	17.3	11.9	30.0	33.3%	33.571a	<0.001
Normotensive (current measurement)	73.6	75.9	76.3	81.5	82.7	88.1	70.0	66.7%		



### 3.11 Antiretroviral therapy

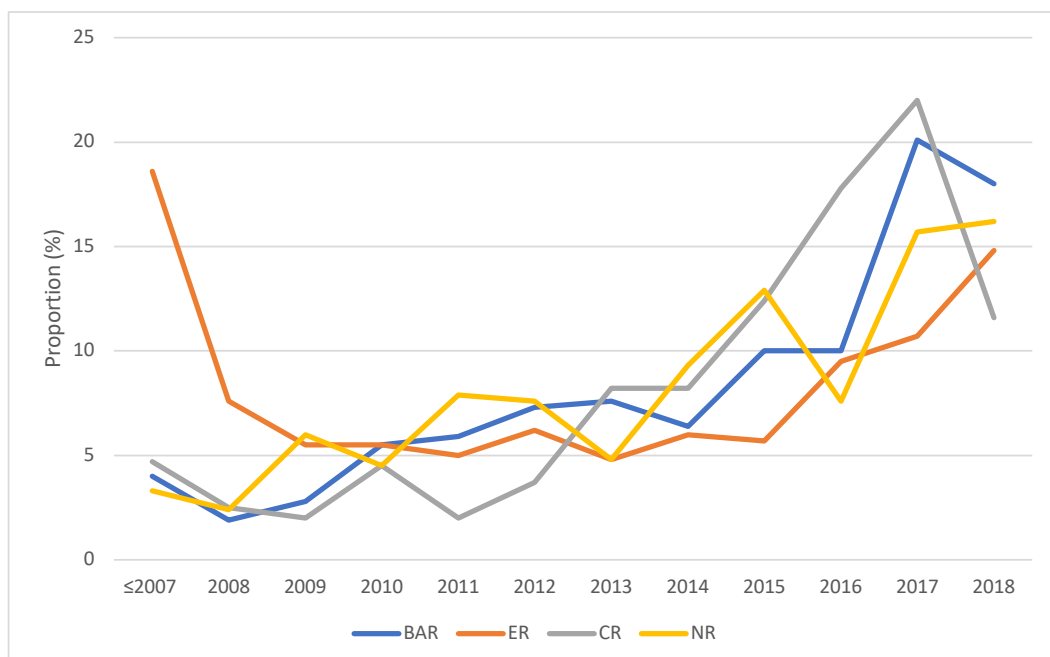
Figure 3.20 is a graphical representation of PLHIV ART initiation. Among the surveyed regions, at 2017 and earlier, eastern region recorded the highest proportion of PLHIV who initiated treatment. All regions from beginning form the year 2008 experienced a rise in number of PLHIV initiating ART till year 2017. This highest

leap is observed in year 2016. There seems to have been a general decrease in the numbers of new enrollees in all four regions between years 2017 and 2018. Of note, the Central region (represented here by Cape Coast Metropolis, and Mfantseman district) had a significant dip in ART enrollment from year 2017 to 2018, something our data is unable to explain. As indicated earlier, some of the findings from this quantitative study would require further in-depth qualitative study with relevant stakeholders to fully

appreciate the *whys* and *hows*.

Figure 3.20 Regional distribution of PLHIV by year ART was initiated

Figure 3.20 Regional distribution of PLHIV by year ART was initiated



Where indicated, data from Sunyani Municipality, and Dormaa-Ahenkro represent Brong Ahafo (n=422); data from New Juabeng

and Lower Manya represent Eastern (n=420), data from Cape Coast Metro, and Mfantseman District represent Central (n=404), and data from Tamale Metro and East Mamprusi District represent Northern (n=420)

A nested study focusing on only HIV-Positive members of the various households was conducted as part of the main survey. PLHIV were contacted to discuss issues concerning adherence to their antiretroviral regimen. As presented in Fig 3.12, over 96 percent of these HIV-Positives reported taking correct doses of ARVs and other prescribed medications given them as directed. However, only 91 percent of them were able to take their medications at the right time and also with the appropriate food.

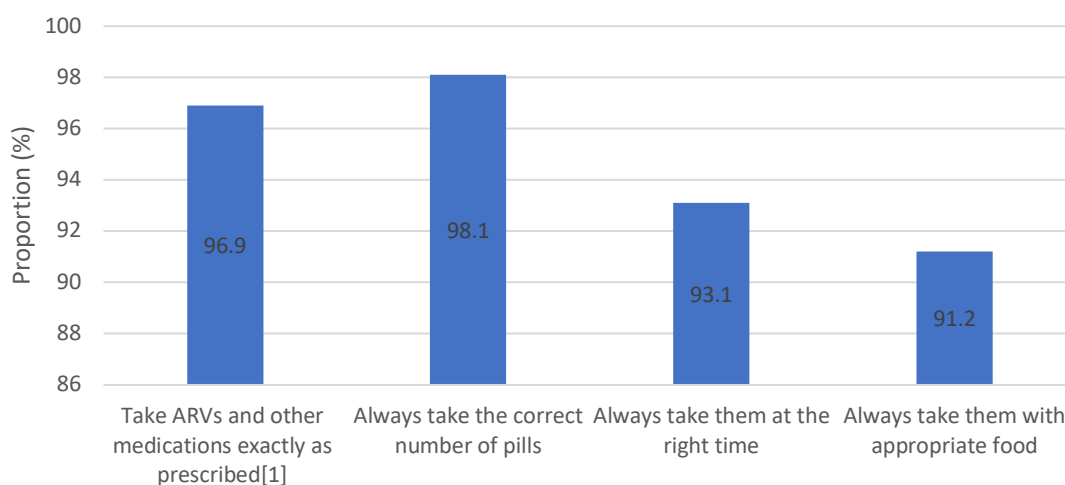
Although the proportions appears higher in this 2018 survey, the same distribution proportion pattern was reported compared to the same study conducted in 2011 with highest proportion self-reporting taking their pills correctly<sup>50</sup>. Of note Paterson et al suggested that at least 95 percent adherence to unboosted protease inhibitors (PIs) was required for virologic suppression<sup>59</sup>. This 95 percent adherence cut-off point, based on what may now obsolete therapy, has been widely used as the level of optimal adherence. Among those who couldn't adhere to their medications cited various reasons; no drugs, no money, side effects, distance to facility, stigma, forgetfulness, no food, too sick, spiritual reasons assigned to illness among others. Among all the





various reasons, Lack of money was the most prominent reason given (see Table 3.21).

**Figure 3.21 Medication adherence indicators**



**Table 3.21 Self-reported reasons for ARV medication non-adherence**

Reasons for not taking ARVs as prescribed			Reasons for not taking correct number of pills			Reasons for not taking ARVs at the right time			Reasons for not taking ARVs with appropriate food		
Reason	N	%	Reason	N	%	Reason	N	%	Reason	N	%
No drugs	5	9.6	No drugs	5	16.1	Forgot	37	32.2	Lack of money	94	64.8
No money	10	19.2	Forgot	11	35.5	Side effects	17	14.8	Not aware	17	11.7
Side effects	9	17.3	Side effects	6	19.4	Time inconvenient	38	33.0	Lack of appetite	24	16.6
Distance to facility	3	5.8	Not aware	1	3.2	Lack of food	14	12.2	Other	10	6.9
Stigma	9	17.3	Other	8	25.8	Not aware	1	.9	Total	145	100.0
Other	16	30.8	Total	31	100.0	Other	8	7.0			
Total	52	100.0				Total	115	100.0			

### 3.12 Survey limitations

As is the usual in the assessment of food security and vulnerability, the collection of market data are very critical, especially in settings characterized by instability/high food and fuel prices. Ghana like many other countries in the sub-region fit this characterization. This phenomenon can impact negatively on household food security. The inability of the current survey to capture market data and subsequently provide necessary adjustments during the analysis is a limitation. Seasonality of food insecurity is a major problem in most part of the country. Commonly referred to as the “lean season” and “harvesting season”, respectively denote deterioration and amelioration of household state of vulnerability

to food insecurity. Given that the data collection exercise was carried out during the course of the harvesting season (July 2018), the level of food security could have been underestimated. In other words, households who were identified in this survey to be food insecure or vulnerable to food insecurity during this period of the year could easily slip into worse off state during the lean season. Monetary indicators are sometimes criticized as insufficient markers of need. It is therefore worth noting as a limitation our measurements of income and expenditure as reported. As a consequence, the results of this assessment should be cautiously interpreted with these issues in mind. These notwithstanding, it is unlikely that these limitations will significantly alter the survey’s main conclusions and recommendations.





# CHAPTER FOUR

## 4.0 CONCLUSIONS AND RECOMMENDATIONS

### 4.1 Conclusions

The key findings emerging from the assessment are summarized below:

1. The data suggest that food insecurity is a problem for thousands of HIV-affected households in the four focus regions of Ghana. About 21 percent of the 1,666 households are food insecure (highest in the Northern region – 24.0 percent and lowest in Brong Ahafo region – 16.4 percent). Also 30 percent of the 1,666 are classified as being on the edge of food insecurity (the borderline group). Extrapolations based on the entire number of PLHIV on ART in the focus regions (36,586) take the numbers who are food insecure to 7,778 PLHIV. Based on an average household size of four members, this means that altogether 7,778 x 4 (31,112) persons infected or affected by HIV need to be targeted for assistance.
2. Various coping strategies were instituted by the HIV-affected households ranging from limiting portion sizes at mealtimes (61.9 percent), reducing number of meals eaten per day (59.9 percent), relying on less expensive or less preferred foods (57.6 percent), to harvesting immature crops, to sending out a household member to beg (5.7 percent).
3. As in previous surveys, the current study presents data on four different categories of vulnerability: The “worst off” (8.9 percent); and the “vulnerable” (41.9 percent); need

some form of intervention, while those in the “acceptable” (28 percent); or “better off” (21.2 percent) do not. For planning and programming purposes, the 8.9 percent translate into 3,257 of the total 36,586 PLHIV on ART in the four focus regions requiring immediate targeting for assistance. Such planning should take cognizance of the vulnerable as well – in which case, a total of 15,330 PLHIV on ART in the four focus regions would require some form of assistance. Consideration of other household members take these numbers to 3,257 x 4, and 15,330x4 respectively.

4. Further statistical analysis reveals significant associations among food insecurity/vulnerability categorizations and several variables – as summarized below:
  - a. Apart from Tamale metropolis and East Mamprusi district (15 vs 10), the CSI was comparable in both the rural and urban districts of a selected region. The Cape Coast metropolis had the highest median CSI.
  - b. Households headed by females, households hosting a sick member for more than three months or has at least one orphan had significantly higher CSI.
  - c. Overall, mean CSI decreases with increasing asset wealth; and this is predictable, as asset wealth is linked to household income levels, resilience, and therefore better coping. On the contrary we observed a directly proportional/positive correlation between CSI and household size; CSI increases with increasing household size.



- d. We also observed statistically significant differences in the rates of food insecurity and access to arable land, hosting a sick person for at least three months, dependency rate, and asset wealth
  - e. Intriguingly, we observed that whilst caring for a chronically ill person in a household was significantly associated with food insecurity, caring for a sick person in the household for less than a month was not
  - f. Access to arable land was found to be significantly associated with vulnerability to food insecurity
  - g. Households with more members and dependents were more vulnerable to food insecurity.
5. Taking data from the four focus regions (or eight districts) together, 26 percent of the main respondents were classified as being chronically energy deficiency (BMI < 18.5kg/m<sup>2</sup>).
  6. The practice of blood pressure measurement by health workers is prevalent among the study respondents - 93 percent of the 1,666 had ever had their blood pressured measured. Fourteen percent of whom self-reported their hypertension status. However, BP measurements conducted by the research team estimated 24 percent of them to be hypertensive
  7. Findings on adherence to antiretroviral therapy reveal a reasonably high indicators of medication adherence over 96 percent of these HIV-positives reported taking correct doses of ARVs and other prescribed medications given them as directed. However 91 percent of them were able to take their medications at the right time and also with the appropriate food. Among those who couldn't adhere to their medications, cited reasons include "no drugs, no money, side effects, distance to facility, stigma, forgetfulness, no food, too sick, spiritual reasons assigned to illness among others".
2. Alternatively, if interventions are dictated by vulnerability categorization, then the "worst off" (8.9 percent); and the "vulnerable" (41.9 percent), the 8.9 percent translate into 3,257 of the total 36,586 PLHIV on ART in the four focus regions requiring immediate targeting for assistance. While the 41.9 percent translate into a total, of 15,330 PLHIV on ART in the four focus regions requiring some form of assistance. Consideration of other household members take these numbers to 3,257x4, and 15,330x4 respectively. In either case, intervention could comprise social protection conditional household support (in the form of food transfer of cash transfer) or more sustainable capacity building interventions, with exit triggers and strategies outlined.
  3. As the role of optimal nutrition in treatment success is undisputed, addressing the dehumanizing food consumption coping strategies documented in this study will contribute to the realization of the third of the 90-90-90 targets. The risks posed by these negative coping strategies may be reduced through appropriate safety nets. For instance, the Government of Ghana in line with their policy on LEAP may include food insecure PLHIV households deploying such dehumanizing negative coping strategies as beneficiaries of LEAP or other social protections interventions. In this regard, those assessed to be food insecure, or "worst off", or "vulnerable" may be targeted
  4. As the key variables of household size, households hosting chronically sick individuals, household asset wealth, and those with high number of dependents are associated with both vulnerability to food insecurity or frank food insecurity, it may be prudent to use these attributes as proxy indicators when targeting vulnerable households susceptible to food insecurity, especially for conditional household support or HIV impact mitigation interventions. For such an assistance to be sustainable, however, measures that aim at improving

edge of food insecurity (borderline). The 21 percent translate into 7,778 of the total 36,586 PLHIV on ART in the focus regions being food insecure. With an average household size of four members, this means that altogether 31,112 persons infected or affected by HIV in these four regions may need support to improve their food and nutrition security.

## 4.2 Recommendations

1. About 21 percent of the 1,666 households are food insecure, and 30 percent are on the



capacity to earn a regular income – through livelihoods support and acquisition of a productive asset, or income generating activities such as petty trading or small business activities, should be encouraged or supported.

5. The sex of the household head may be of policy interest. Given that there were more female-headed households in the food insecure or borderline groups, female-headed households could be prioritized when designing and deploying interventions to address food insecurity and vulnerability to food insecurity.
6. While proxy indicators of medication adherence reveal appreciably high level of adherence to ARV regimen, the documented challenges of “no drugs, no money, side effects, distance to facility, stigma, forgetfulness, no food, too sick” need to be addressed.
7. To ensure efficient programming and roll out of the interventions suggested above, an updatable register which keeps record of all such vulnerable and food insecure households in each district or treatment center may be needed
8. The GAC, WFP, and its partners should consider undertaking annual food security and vulnerability profiling of PLHIV households in order to inform both policy and programmatic decisions aimed at improving food and nutrition as well as health outcomes of PLHIVs. This is important because, the households classified as acceptable and better off groups do not need immediate food security-promoting interventions. However the various categories of vulnerability or food insecurity status are not only transitory progression/retrogression from one step to the other can be non-linear

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# APPENDICES

## Appendix 1. Study questionnaire

### ASSESSMENT OF FOOD SECURITY AND VULNERABILITY OF SELECTED HOUSEHOLDS IN GHANA” (Version Locked July 13 2018)

Region Name: \_\_\_\_\_ District Name: \_\_\_\_\_

Community Name: \_\_\_\_\_ Facility name -----

Unique ID of PLHIV \_\_\_\_\_

Enumerator Name: \_\_\_\_\_ Date of Interview: |\_\_|\_|\_|\_|\_|\_|\_|\_|(DD/MM/YY)

A. Household Demographics				
<b>A1</b>	<b>Sex</b> of main head	<b>1</b> = Male	<b>2</b> = Female	__
<b>A2</b>	<b>Sex</b> of main respondent	<b>1</b> = Male	<b>2</b> = Female	__
<b>A3</b>	<b>Year started ART</b>			
<b>A4</b>	<b>Weight of main respondent (Kg)</b>			
<b>A5</b>	<b>Height of main respondent (cm)</b>			
<b>A6</b>	<b>MUAC of main respondent (cm) if MR is a pregnant woman</b>			
<b>A7a</b>	of main respondent (single years)	.....		
<b>A7b</b>	<b>Age</b> of main respondent (years)	<b>1</b> = Up to 15years years <b>4</b> = 40 to 59 years or older	<b>2</b> = 16 to 19 years <b>3</b> = 20 to 39 years <b>5</b> = 60 years	__
<b>A8</b>	<b>Marital</b> status of main respondent	<b>1</b> = married /cohabiting - go to Q A9  <b>2</b> = widowed go to Q A12 <b>3</b> = divorced <b>4</b> = separated <b>5</b> = single		__
<b>A9</b>	<b>Age</b> of Spouse (years)	<b>1</b> = Up to 15years years <b>4</b> = 40 to 59 years or older	<b>2</b> = 16 to 19 years <b>3</b> = 20 to 39 years <b>5</b> = 60 years	__



<b>A10</b>	What is the education level completed by the main respondent?	<b>1 = Never been to school</b> <b>2 = Primary</b> <b>3 = Secondary</b> <b>4 = Tertiary</b>				__
<b>A11</b>	What is the education level completed by the spouse?	<b>1 = Never been to school</b> <b>2 = Primary</b> <b>3 = Secondary</b> <b>4 = Tertiary</b>				__
<b>A12</b>	Indicate the number of school going children in the range of grades indicated?	<b>class</b>	Primary	1-6	JHS 1-3	SHS 1-3
		<b>Male</b>	__	__	__	__
		<b>Female</b>	__	__	__	__
<b>A13</b>	<b>Household Size</b> – how many people by age groups eat and stay in the household permanently?	<b>male</b>				
		<b>Females</b>	0 to 5:  __	6-17:  __	18-59:  __	60+  __
<b>A14</b>	How many of these persons are <b>chronically (for three months or more) unable</b> to work for <b>health</b> or <b>disability</b> reasons?	<b>Males</b>	0 to 5:  __	6-17:  __	18-59:  __	60+  __
		<b>Females</b>	0 to 5:  __	6-17:  __	18-59:  __	60+  __
<b>A15</b>	Number of <b>orphaned children</b> (defined as “ <b>both</b> parents lost” and “less than 15 years of age”) in the household.	<b>Males</b>	0 to 5:  __	6-17:  __		
		<b>Females</b>	0 to 5:  __	6-17:  __		
<b>A16</b>	Number of school children by sex who <b>dropped out</b> of school in the last 6 months <i>go to question B1 if no children dropped out</i>	<b>M a l e s</b>  __ __	<b>Females</b>  __ __			
<b>A17</b>	Three main reason (s) for dropping out of school for <b>boys</b>	<b>1= Family can't afford fees/costs</b> <b>2= Work outside home for food or cash</b> <b>3= Help with household activities</b> <b>4= Care for sick family member</b> <b>5= Hunger</b> <b>6= Not interested/Bad pupil</b> <b>7= Damaged Roads/Bridges</b> <b>8= Collapsed School Buildings</b> <b>9 = Ill health</b> <b>10 =Other, specify</b>				



<b>A18</b>	Three main reasons for dropping out of school for <b>girls</b>	<p><b>1</b> = Family can't afford fees/costs</p> <p><b>2</b> = Work outside home for food or cash</p> <p><b>3</b> = Help with household activities</p> <p><b>4</b> = Care for sick family member</p> <p><b>5</b> = Hunger</p> <p><b>6</b> = Not interested/Bad pupil</p> <p><b>7</b> = Damaged Roads/Bridges</p> <p><b>8</b> = Collapsed School Buildings</p> <p>9 = Ill health</p> <p>10 = Pregnancy</p> <p>11 =Other, specify _____</p>
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## B. Household Asset Ownership

<b>B1</b>	How many of the following assets are owned by your household?	1. Sewing Machine  __ __  2. Hair drier  __ __  3. Wheel barrow  __ __  4. Hoe/cutlass  __ __  5. generator  __ __  6. Bicycle  __ __  7. Fridge  __ __  8. Car  __ __  9. Cell Phone  __ __	10. Furniture  __ __  11. Computer  __ __  12. Bed  __ __  13. Television  __ __  14. Radio  __ __  15. Cooker  __ __  16. Other, specify
<b>B2</b>	Type of cooking fuel used by the household for lighting and cooking	1 = Electricity 2 = Fire wood 3 = Charcoal 4 = Kerosene stove 5 = LPG (Gas)	
<b>B3</b>	Type of lighting used by the household	1 = Electricity 2 = Fire wood 3 = candle/Bobo 4 = Kerosene lantern 5. = Gas lamp/rechargeable lamps 6. Solar panels 7. Torch lights	



<b>B4</b>	How many of the following live-stock do your household own?	1. Donkeys	_ _
		2. Pigs	_ _
		3. Goats	_ _
		4. Sheep	_ _
		5. Poultry	_ _
		6. Cattle	_ _
		7. Dogs/cats	_ _

**C. Household Income and Expenditure in the last three months**

<b>C1</b>	What are your household most important Livelihood sources?	<b>C1.1</b> First	_ _
		<b>C1.2</b> Second	_ _
		<b>C1.3</b> Third	_ _

<b>Livelihood source codes:</b>		
1 = formal salary/wages	6 = livestock/poultry production/sales	11 = remittance 12 = fishing
2 = Money lending	7 = skilled trade/artisan	13 = vegetable production/sales
3 = Cash crop production/ Food crop production/sales	9 = petty trade (sale of clothes, charcoal, etc.)	14 = Food assistance
4 = casual labour	10 = brewing	15 = Other, specify ---- -----
5 = begging		

<b>C2</b>	What is the percentage contribution of each of the identified livelihood sources to the total household income? (Use proportional pilling to derive the % estimates)	<b>C2.1</b> First	_ _
		<b>C2.2</b> Second	_ _
		<b>C2.3</b> Third	_ _

<b>C3</b>	How much money did the household earn last month? (Please include both formal and informal incomes)	
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<b>C4</b>	What was the estimated amount of money spent on the following household items during the <b>last month</b> in Ghanaian Cidi	1. Food	_ _ _ _ _ _ _ _ _
		2. Rent	_ _ _ _ _ _ _ _ _
		3. Transport	_ _ _ _ _ _ _ _ _
		4. Alcohol & Tobacco	_ _ _ _ _ _ _ _ _
		5. Electricity, Charcoal, Fuel (wood, paraffin, etc.)	_ _ _ _ _ _ _ _ _
		6. Household items (soap, cosmetics etc.)	_ _ _ _ _ _ _ _ _
		7. Medical expenses/health care	_ _ _ _ _ _ _ _ _
		8. Clothing, shoes	_ _ _ _ _ _ _ _ _
		9. Debt repayment	_ _ _ _ _ _ _ _ _
		10. Education, fees, uniforms	_ _ _ _ _ _ _ _ _
		11. Celebrations, funerals, social functions	_ _ _ _ _ _ _ _ _

<b>C5</b>	How much savings have you made in the last 3 months?	_ _ _ _ _ _ _ _ _ .
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**D. Agricultural Production**

<b>D1</b>	Does your household have access to any arable land (back yard or field)? If <b>No</b> go to section <b>E</b> .	<b>1</b> = Yes <b>2</b> = No	_
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<b>D2</b>	What type of ownership do you have on the land you have access to?	1 = Landlord (Bought) 2 = Tenant (Rented) 3 = Lease 4. Family land 5. Payment in kind 6. other specify -----
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<b>D3</b>	If response to Q D1 is yes, how much of this arable land was cultivated during the last year farming season?	<b>1</b> = <0.5 acre <b>2</b> = 0.5 to 1 acre <b>3</b> = 1 to 2 acre <b>4</b> = > 2 acre 5. Other, specify -----	_
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<b>D4</b>	Compared to last year farming season , how much of this arable land has been cultivated this farming season ?	<b>1 = Less</b> <b>2 = Same</b> <b>3 = Larger</b>	__
<b>D5</b>	If response to Q D3 is "Less or Same", what was the main reason for not cultivating part and/ or the whole field? <b>Indicate response by ticking (✓)</b>	1. Planned Fallow 2. Lack of labour 3. Pest problems 4. Illness in the household 5. Lack of inputs (fertilizer and seed) 6. Could not access land 7. Climate related causes (drought, floods etc ) 8. Field rented out 9. Other specify	__   __   __   __   __   __   __
<b>D6</b>	In the past 2 months, where did your household primarily obtain its staples/cereal from? <b>Indicate response by ticking (✓)</b>	1. Own Harvest 2. Casual labour 3. Borrowing 4. Gift 5. Purchases 6. Food Assistance 7. Barter system 8. other, specifying	__   __   __   __   __   __   __



### E. Coping Strategies

In the past three months, how frequently did your household resort to using one or more of the following strategies in order to have access to food? **CIRCLE ONLY ONE ANSWER PER STRATEGY.**

		Never	Seldom (1-3 days/ month)	Sometimes (1-2 days / week)	Often (3-6 days a week)	Daily
<b>E1</b>	Skip entire days without eating?	1	2	3	4	5
<b>E2</b>	Limit portion size at mealtimes?	1	2	3	4	5
<b>E3</b>	Reduce number of meals eaten per day?	1	2	3	4	5
<b>E4</b>	Borrow food or rely on help from friends or relatives?	1	2	3	4	5
<b>E5</b>	Rely on less expensive or less preferred foods?	1	2	3	4	5
<b>E6</b>	Purchase/borrow food on credit?	1	2	3	4	5
<b>E7</b>	Gather unusual types or amounts of wild food / hunt?	1	2	3	4	5
<b>E8</b>	Harvest immature crops (e.g. green maize)?	1	2	3	4	5
<b>E9</b>	Send household members to eat elsewhere?	1	2	3	4	5
<b>E10</b>	Send household members to beg?	1	2	3	4	5
<b>E11</b>	Reduce adult consumption so children can eat?	1	2	3	4	5
<b>E12</b>	Rely on casual labour for food?	1	2	3	4	5





## F. Food Consumption

1.1	F1	How many meals did the adults (18+) in this household eat <b>yesterday</b> ?	_		<b>NUMBER OF MEALS</b>
1.2	F2	How many meals did the children 6 to18 years in this household eat <b>yesterday</b> ?	_ _		<b>NUMBER OF MEALS</b>
IF NO CHILDREN IN THE HH, WRITE 98 for N/A					
<input type="checkbox"/> Over the last seven days, how many days did you consume the following foods?					
<input type="checkbox"/> What was the main source(s) of the food?					
		Number of days (0 to 7)	1.2.0.0.1		Source(s)
1.	Maize, maize porridge	_	1.2.0.0.2	_	1.2.0.0.3  _
2.	Other cereal (rice, sorghum, millet, bead, pasta etc)	_	_		
3.	Roots and Tubers (cassava, potatoes, sweet potatoes)	_	_		
4.	Sugar or sugar products	_	_		
5.	Beans and peas	_	_	_	
6.	Groundnuts and cashew nuts	_	_		
7.	Vegetables (including relish and leaves)	_	_		
8.	Fruits	_	_		
1.2.0.0.4	9. Beef, goat, or other red meat and pork	_	_		
1.2.0.0.5	10. Poultry and eggs	_	_		
11.	Fish	_	_		
12.	Oils/fats/butter	_	_	_	
13.	Milk/yogurt/other dairy	_	_		
14.	CSB	_	_		
<b>Source codes:</b>	1 = Own production	2 = Casual labour			
	3 = Borrowed	4 = Gift			
	5 = Purchases	6 = Food assistance			
	7 = Barter	8 = Hunting/gathering/catching			



## Housing, Water and Sanitation

G. HOUSING, WATER AND SANITATION		
<b>G1</b>	How many rooms are occupied by the household?	_ _
<b>G2</b>	What is the tenure status of the household?	<b>1</b> = Owner <b>2</b> = Tenant – written agreement <b>3</b> = Lodger – No agreement <b>4</b> = Staying family <b>5</b> = Institutional accommodation <b>6</b> = Other;
<b>G3</b>	Type of dwelling	<b>1</b> = Detached <b>2</b> = Flat <b>3</b> = Semi- detached <b>4</b> = Backyard brick cottage <b>5</b> = Traditional <b>6</b> = Backyard shack structure <b>7</b> = Compound houses
<b>G4</b>	What is the main source of drinking and cooking water	<b>1</b> = Piped water inside the house <b>2</b> = Piped water outside the house <b>3</b> = Communal tap <b>4</b> = Borehole/protected well <b>5</b> = Unprotected well <b>6</b> = River/dam
<b>G5</b>	What is the distance to the water source?	<b>1</b> = On premises <b>2</b> = Less than 500m <b>3</b> = 500m to 1 km <b>4</b> = More than 1 km   _
<b>G6</b>	What type of sanitary disposal facilities does your household use?	<b>1</b> = Pit Latrines <b>2</b> = VIP Latrine <b>3</b> = Flush Toilets <b>4</b> = Shared Latrines <b>5</b> = CAT Method <b>6</b> = Bucket <b>7</b> = No facility (bush, river e.t.c)  _
<b>G7</b>	How many people share the sanitary facility that the household use??	_ _



H. HEALTH		
<b>H1</b>	Did anyone in the household get sick over the last month?	<b>1=</b> Yes - go to Q H2 <b>2=</b> No - go to Q H4
<b>H2</b>	How many household members suffered from any of the following disease(s) in the last 3 months?	1. Malaria <input type="checkbox"/> <input type="checkbox"/> 2. Diarrhea <input type="checkbox"/> <input type="checkbox"/> 3. Tuberculosis <input type="checkbox"/> <input type="checkbox"/> 4. Bilharzias <input type="checkbox"/> <input type="checkbox"/> 5. ARI ( cough, asthma etc) <input type="checkbox"/> <input type="checkbox"/> 6. other, specify -----
<b>H3</b>	Where did they go for formal health care? (Multiple answer allowed)	<b>1=</b> Did not seek health care outside household <b>2=</b> Pharmacy/dispensary (without doctor consultation) <b>3=</b> Clinic/hospital/Private doctor (formal health care)
<b>H4</b>	If someone was sick and did NOT seek FORMAL health care, what was the MAIN reason?	<b>1=</b> No money to pay for treatment (fees and drugs) <b>2=</b> No transport, too far, or too expensive to get there <b>3=</b> Poor quality of service (no drugs/staff)/lack of confidence <b>4=</b> Prefer not to go - religious or cultural reasons <b>5=</b> Illness was minor <b>6.=</b> Traditional Healer/Faith Healer
<b>H5</b>	How many children under 5 years old in the household have been ill for more than 3 months during the last 6 months? <i>(Please refer to members that keep getting sick over and over,</i>	<b>1=.</b> One <b>2.=</b> Two <b>3.=</b> Three or more <b>4=.</b> None were chronically ill <input type="checkbox"/> <input type="checkbox"/>
<b>H6</b>	How many children (5-17 years) in the household have been ill for more than 3 months during the last 6 months? <i>(Please refer to members that keep getting sick over and over, i.e. chronically ill)</i>	<b>1=.</b> One <b>2.=</b> Two <b>3. =</b> Three or more <b>4=.</b> None were chronically ill <input type="checkbox"/> <input type="checkbox"/>
<b>H7</b>	How many adults (18+ years) in the household have been ill for more than 3 months during the last 6 months? <i>(Please refer to members that keep getting sick over and over, i.e. chronically ill)</i>	<b>1 =.</b> One <b>2.=</b> Two <b>3.=</b> Three or more <b>4=.</b> None were chronically ill <input type="checkbox"/> <input type="checkbox"/>



<b>H8</b>	If not the head of household, Is the head of household among those who have been ill for more than 3 months during the last 6 months?	<b>1</b> = Yes <b>2</b> = No     __
<b>H9</b>	Did you have any deaths in the Household in the last 3 months	<b>1</b> = Yes <b>2</b> = No - go to Q H12  __
<b>H10</b>	How many children under 5 years old died in the last 6 months after being ill for more than 3 months?	<b>1</b> = .One <b>2</b> = Two <b>3</b> = Three or more <b>4</b> = . No children died   __
<b>H11</b>	How many children (5-17 years) died in the last 6 months after being ill for more than 3 months?	<b>1</b> = .One <b>2</b> = Two <b>3</b> = Three or more <b>4</b> = . No children died   __
<b>H12</b>	How many adults (18+ years) died in the last 6 months after being ill for more than 3 months?	<b>1</b> = . One <b>2</b> = Two <b>3</b> = Three or more <b>4</b> = . No children died   __
<b>H13</b>	If not head of household Was the head of household one of the people that died?	<b>1</b> = Yes <b>2</b> = No   __



Adherence to ARV regimen [PLHIV -ONLY]		
<b>J1</b>	Do you take your medications exactly as you are supposed to?	<b>1 = yes</b> <b>2 = no</b>  __
<b>J2</b>	If no. Why?	1. <b>No drugs</b> 2. <b>No money</b> 3. <b>Side effects</b> 4. <b>Distance to facility</b> 5. <b>Stigma</b> 6. <b>Other specify -----</b>  __
<b>J3</b>	Do you always take the correct number of pills?	<b>1 = yes</b> <b>1 = no</b>  __
<b>J4</b>	If no, Why?	1. <b>No drugs</b> 2. <b>Forgot</b> 3. <b>Side effects</b> 4. <b>Not aware Other</b> 5. <b>Other</b>  __
<b>J5</b>	Do you always take them at the right time?	<b>1 = no</b> <b>2 = yes</b>  __
<b>J6</b>	If no, why?	1. <b>Forgot</b> 2. <b>Side effects</b> 3. <b>Time inconvenient</b> 4. <b>Lack of food</b> 5. <b>Not aware</b> 6. <b>Other specify</b>
<b>J6</b>	Do you always take them with appropriate food?	<b>1 = yes</b> <b>2 = no</b>  __
<b>J7</b>	If no, why?	1. <b>Lack of money</b> 2. <b>Not aware</b> 3. <b>Lack of appetite</b> 4. <b>Other specify -----</b>
Food Assistance (PLHIV – ONLY)		
<b>K8</b>	Have you ever received any form of food assistance from any organization or agency in the last five years.	1. <b>= yes</b> 2. <b>= no</b>
<b>K9</b>	If yes, to K8, indicate source – if possible.	1. <b>WFP/GAC/GHS</b> 2. <b>Other sources</b>
<b>K10</b>	If yes, to K8, do you still benefit from these interventions?	1. <b>= yes</b> 2. <b>= no</b>





Child Name	Has child got bilateral Oedema 1 = Yes 2 = No	Take Weight and height measurements of each child in the household	
		Weight	Height
1	_	_ _ .  _ _  Kg	_ _ .  _ _  cm
2	_	_ _ .  _ _  kg	_ _ .  _ _  cm
3	_	_ _ .  _ _  kg	_ _ .  _ _  cm
4	_	_ _ .  _ _  kg	_ _ .  _ _  cm
5	_	_ _ .  _ _  kg	_ _ .  _ _  cm

**ADDITIONAL QUESTIONS: SECTION B: AWARENESS AND KNOWLEDGE OF DISEASES**  
**SECTION. BLOOD PRESURE ASSESSMENT (OF MAIN RESPONDENT)**

NO	QUESTIONS AND FILTERS	RESPONE/CODING CATEGORIES
<b>A = BLOOD PRESSURE</b>	Blood pressure (mmHg)	Systolic  _ _ _  Systolic  _ _ _  Systolic  _ _ _  Diastolic  _ _ _  Diastolic  _ _ _  Diastolic  _ _ _



## Appendix 2. Relative contributions of communities visited by study team to overall study sample











