Review of the Evidence:

Linkages between Livelihood, Food Security, Economic Strengthening, and HIV-Related Outcomes

Khou Xiong, MEASURE Evaluation

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FHI 360's LIFT project is a USAID associate award under the FIELD-Support Leader with Associates and supports the design and implementation of programs that strengthen the livelihoods of vulnerable households by linking them to food security interventions and sustainable, market-led economic activities.

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Contents

List of Acronyms

AIDS	acquired immunodeficiency syndrome
ART	antiretroviral therapy
AIDSSTAR	AIDS Support and Technical Assistance Resources
BRAC	Bangladesh Rural Advancement Committee
CCT	conditional cash transfer
CDC	U.S. Centers for Disease Control and Prevention
CGAP	Consultative Group to Assist the Poor
ES/L/FS	economic strengthening, livelihood, and food security
FANTA	Food and Nutrition Technical Assistance project
FAO	Food and Agriculture Organization
FIELD-support	Financial Integration, Economic Leveraging, Broad-based Dissemination and Support (USAID cooperative agreement)
HAART	highly active antiretroviral therapy
HFIAS	Household Food Insecurity Access Scale
HIV	human immunodeficiency virus
IFPRI	International Food Policy Research Institute
IHLP	integrated HIV and livelihood program
JLICA	Joint Learning Initiative on Children and HIV/AIDS
LWA	leaders with associates
LIFT	Livelihood and Food Security Technical Assistance project
NACS	nutrition, assessment, care, and support

NuLife	NuLife Food and Nutrition Interventions for Uganda
OHA	Office of HIV/AIDS (USAID)
OVC	orphans and other vulnerable children
PEPFAR	U.S. President's Emergency Plan for AIDS Relief
PLHIV	people living with HIV
Save	Save the Children USA
SILC	savings and internal lending communities
SLA	savings and loans associations
UNAIDS	United Nations Joint Programme on HIV/AIDS
USAID	U.S. Agency for International Development
USDA	U.S. Department of Agriculture
VCT	voluntary counseling and testing

1.0 INTRODUCTION

1.1 Purpose

The purpose of this literature review is to assess the linkages between poverty, livelihood, food security, economic strengthening, and HIV/AIDS-related outcomes. The literature review is intended to inform a logic model for FHI 360's Livelihood and Food Security Technical Assistance (LIFT) project by: determining the extent to which household food security and livelihood status are associated with HIV/AIDS-related outcomes; examining the evidence related to the impact of a variety of food security, livelihoods and economic strengthening interventions on HIV/AIDS-related outcomes; and identifying gaps in the evidence. This review of the state of the evidence and identification of gaps will feed into the development of LIFT's research agenda to explore these issues in greater depth.

1.2 LIFT project

The LIFT project was initiated by the U.S. Agency for International Development (USAID)'s Office of HIV/AIDS (OHA) to provide technical assistance and strategic support to U.S. government agencies, their implementing partners, and other public, private, and civil society partners to improve the food and livelihood security of vulnerable households, with a particular focus on people living with HIV/AIDS (PLHIV), orphans and other vulnerable children (OVC), and their caregivers. In addition, LIFT aims to provide global leadership and strategic learning to the field of economic strengthening through development of guidelines, trainings, and other tools to help vulnerable households – and those who serve them – engage in activities that enhance their economic and nutritional security.

Launched in 2009 as a five-year associate award under the Financial Integration, Economic Leveraging, Broad-Based Dissemination and Support (FIELD-Support) Leaders with Associates (LWA) Cooperative Agreement, LIFT is managed and led by FHI 360 (formerly led by AED, a nonprofit organization acquired by FHI 360 in 2011) and implemented with the support of CARE International and Save the Children USA (Save). The goal of the LIFT project is to build the continuum of care for people living with HIV/AIDS and other vulnerable households by increasing their access to high quality, context appropriate, market-led economic strengthening, livelihood and food security (ES/L/FS) opportunities that improve their economic resilience and lead to better health. An essential component of LIFT's approach is establishing links to integrate economic strengthening and food security activities within HIV/AIDS nutrition, assessment, care, and support (NACS) programs and health systems. (See the LIFT conceptual framework in Annex 1 for more detail.)

LIFT meets the customized needs of USAID and other U.S. government agencies by undertaking assessments that provide concrete recommendations for strengthening existing ES/L/FS programs as well as identifying strategic opportunities for new investments. LIFT works with implementing partners to strengthen their capacity to design and implement livelihood and food security interventions that sustainably improve the economic resiliency and health of their beneficiaries. Through these approaches, LIFT aims to heighten the impact and sustainability of

investments made by USAID, the U.S. President's Emergency Plan for AIDS Relief (PEPFAR), Feed the Future, the U.S. Department of Agriculture (USDA), the U.S. Centers for Disease Control and Prevention (CDC), and the Peace Corps, as well as local governments, civil society, and the private sector.

One of LIFT's key approaches is to create linkages between economic strengthening and food security support and NACS services, which currently are provided primarily in health facilities. Referrals between facility and community-based services and receipt of referred services is expected to improve clients' access to food security support or economic strengthening so that the impact of facility-based NACS services can be sustained once clients recover nutritionally and no longer require NACS services.

2.0 METHOD

2.1 Research parameters

LIFT and MEASURE Evaluation developed a draft logic model to document the pathways by which LIFT interventions will improve the economic and food security status of households and contribute to improved nutritional status of PLHIV and OVC (the draft logic model appears in Annex 2). Using the model as a starting point, research parameters were set for this literature review to include the following key words and relationships:

- food security and HIV
- poverty and HIV
- economic strengthening and food security
- NACS referral systems
- monitoring of referral systems
- self-esteem
- poverty and nutrition
- food Security and nutrition
- NACS services health facilities
- best practices for NACS

Although the results presented at the top of LIFT's logic model (above the dotted line in Annex 2) represent what is expected to be reasonable within the manageable interest of the LIFT project, this search extended beyond that to inform understanding of the potential long-term impacts of LIFT's activities on nutritional status, HIV/AIDS-related outcomes, and overall health and well-being of NACS clients and their households. The research parameters were considered in the context of HIV, though there is an understanding that linkages exist between food security, household economic status, and economic resilience, as well as other areas of health. Potential sources for the literature review were identified and the Web sites of the following organizations were searched for additional grey literature resources: AIDS Support and Technical Assistance Resources (AIDSTAR), the International Food Policy Research Institute (IFPRI), Food and Nutrition Technical Assistance (FANTA) project, the World Bank, and USAID.

2.2 Method

Publications were searched in the PubMed search engine, using key words mentioned in the section above. Initial consultations with LIFT and USAID, identified specific authors who were known to have published relevant work; as a result, the names of these individuals were also researched. A Google Scholar search identified literature that might otherwise be excluded from PubMed searches. Each publication was initially skimmed for relevance. Publications that resulted from author searches were narrowed down to the relevant subject parameters. Literature was excluded if the study targeted exclusive populations that were not relevant to our purposes, such as populations with mental illnesses or a diabetes-focused study. Those found to be potentially relevant were set aside for a more thorough reading, and those not relevant were discarded. As noted above, Web sites of organizations addressing food security, livelihood, and economic strengthening were scanned for grey literature such as reports, tools, and resources to be included in the literature review. When possible, individuals from the organizations mentioned in the research parameters were contacted to seek out additional information. Primary conclusions and discussion points were identified from each publication and then thematically organized for appropriate critique and discussion. The findings were also identified as quantitative or qualitative to help determine the strength of each publication and these findings were linked back to the logic model through numbered pathways. (See Literature Review Resource Matrix in Annex 3.) In some cases, research cited in this review did not state the possible confounding factors that were controlled in the study. In these cases, the assumption of the writers of this literature review is that, unless otherwise stated, these factors were likely not controlled.

2.3 Organization of paper

The remainder of this paper is organized based on the themes that were identified from the literature review. Section 3 discusses findings related to the relationship between poverty and HIV/AIDS. Section 4 explores the relationship between food insecurity and HIV/AIDS, including the bi-directional relationship of food insecurity and some HIV indicators and program data on food security interventions. Section 5 discusses the livelihood/economic strengthening and food security relationship, with a focus on the impact of economic strengthening interventions. Section 6 discusses the impact of economic strengthening interventions on poverty, whereas section 7 focuses on the impact of the interventions on HIV/AIDS. Section 8 reports on the available evaluations of nutrition assessment, counseling and support services. Lastly, section 9 presents conclusions and introduces LIFT's logic model, based on the literature review findings.

3.0 POVERTY AND HIV/AIDS

A large majority of the literature loosely associates poverty with negative HIV/AIDS related outcomes, usually doing so in the introductory paragraphs or as justification for an intervention or research study. However, the studies that sought to assess quantitatively the impact of poverty on HIV/AIDS revealed mixed conclusions. Earlier reports, such as Ainsworth and Semali's 1998 study in Tanzania, tended to conclude that higher poverty levels were directly

associated with HIV infection; while more recent studies, such as De Walque and colleagues 2005 study in Uganda, showed that wealthier populations have had higher HIV prevalence. In a multi-country study, researchers performed quantitative bivariate and regression analysis of nationally representative Demographic and Health Surveys (Kenya, Malawi, Lesotho, Cameroon, Ghana, and Burkina Faso) and two AIDS indicator surveys (Tanzania and Uganda), which found that HIV prevalence tended to be much higher for both men and women in the wealthiest 20% of households than in the poorest 20% of households (Mishra et al., 2007). HIV prevalence was higher for both sexes among wealthier households, but most notably among women, with odds of acquiring HIV between two to five times greater (Mishra et al., 2007). It is important to also note, however, that strong association between wealth and HIV prevalence in this study diminished when other factors were accounted for, such as urban or rural residence and overall community wealth (Mishra et al., 2007). Overall, there does not seem to be agreement in the literature nor strong statistical evidence that poverty increases exposure to HIV. The mixed conclusions from literature is evidence in itself that HIV/AIDS is a complex problem with many dynamic contributing social, cultural, and health factors. It is perhaps unfair to categorically define HIV as an infection driven by poverty.

While the evidence of poverty's contribution to HIV risk is conflicting, one study identified an association between income inequality and HIV prevalence (Gillespie, Kadiyala, & Greener, 2007). Using national level economic data from a 2006 United Nations D Development Programme report and national HIV prevalence data from the United Nations Joint Programme on HIV/AIDS (UNAIDS), Gillespie et al. (2007) were able to determine that there was a positive association between income inequity and HIV prevalence among most sub-Saharan African countries.

The downstream impact of HIV/AIDS on poverty is much better understood than poverty's impact on HIV/AIDS. There is general agreement that HIV could contribute to poverty at the individual and household levels, which in turn may result in poor HIV-related outcomes. An analysis of HIV and poverty conducted in Botswana in 2000 using a national household income and expenditure survey predicted that HIV-related deaths would cause a decrease in income for a quarter of all households while dramatically increasing the number of households with no income through the following decade (Greener, Jefferis, & Siphambe, 2000). In addition, HIV/AIDS was expected to cause a decrease of approximately 10% in per-capita income (Greener, Jefferis & Siphambe, 2000). Because of these projections, Greener and colleagues urgently recommended interventions to promote sustainable livelihoods, services for human capability development, and policies to create and protect social safety nets.

While the overall impact of poverty on HIV/AIDS remains unclear, there is some evidence that HIV-related outcomes are more detrimental among those who are already poor. For example, households that were considered food insecure (defined in study as continual lack of access to adequate quantity and quality of food) were often associated with higher economic vulnerability and an increased risk of HIV due to risky survival strategies as opposed to those who were food secure (Ivers et al., 2009).

4.0 FOOD INSECURITY AND HIV/AIDS

USAID has defined food security as "when all people at all times have both physical and economic access to sufficient food to meet their dietary needs for a productive and healthy life" (USAID, 1992). The Food and Agriculture Organization of the United Nations (FAO) proceeds to list the dimensions of food security as food availability, food access, utilization, and stability (FAO, 2006). Research over the past five years has produced abundant evidence to support food security's critical role in HIV/AIDS-related outcomes. The majority of the research around the food security-HIV/AIDS relationship is unidirectional, emphasizing the impact of HIV/AIDS on food security and with less available data on food security's contribution to HIV/AIDS. Those studies that sought to understand food security's impact on HIV/AIDS were primarily studies where HIV was already present, or studies that sought to understand food security's impact on sexual behaviors associated with higher risk of HIV infection.

Weiser et al. (2011) listed three primary HIV acquisition and progression pathways that are negatively affected by food insecurity: nutritional, mental health, and behavioral. These linkages are presented in their conceptual framework, illustrated in figure 1.

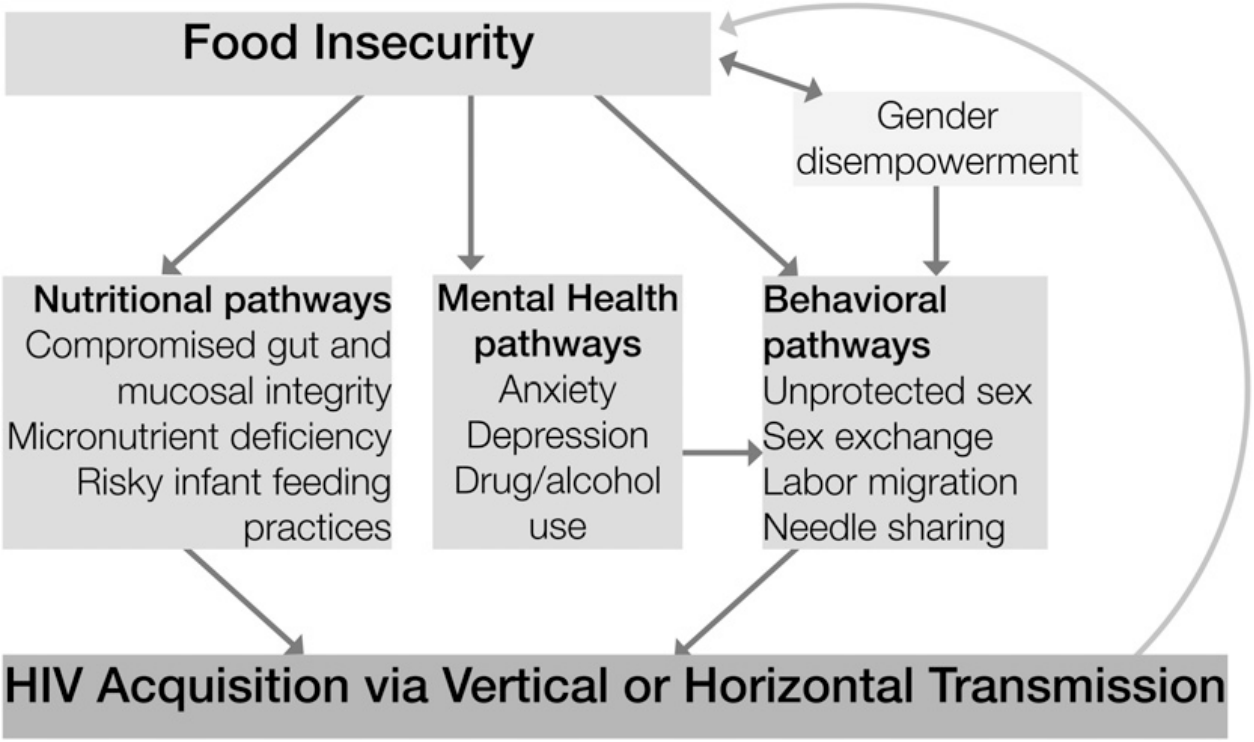

Figure 1: Food insecurity and HIV acquisition (from Weiser et al., 2011, reproduced with permission).

The following sections discuss some of the ways that food insecurity affects different elements within these pathways that ultimately impact HIV/AIDS-related outcomes.

4.1 Impact of food insecurity on high-risk behaviors

Different quantitative and qualitative research studies have investigated behaviors that can be categorized into the "behavioral" acquisition pathway, including commercial sex (Oyefara, 2007), intergenerational sexual relationships (Weiser, et al., 2007), unprotected sex (Weiser et al., 2007) (Tsai, Hung & Weiser, 2012), inconsistent condom usage (Ivers et al., 2009; Oyefara, 2007), lack of control in sexual relationships (Miller et al., 2011), and migration for work opportunities (Ivers et al., 2009). All of these studies reported a positive association between food insecurity and an increase in the high-risk behavior, with an ultimate assumption that the high-risk behaviors will also increase their exposure to and risk of acquiring HIV. Food insecurity has historically reduced work and education opportunities, which forced mobility among individuals and households in search of jobs; substantially increased mobility and migration have been shown to play a detrimental role in spreading HIV in many parts of sub-Saharan Africa (Lagarde et al., 2003).

Previous literature reviews and summation reports have agreed that the lack of food contributes to risky coping strategies (Ivers et al., 2009) and increased transmission risk (Anema et al., 2009; UNAIDS, 2008).

The evidence associating food insecurity and HIV acquisition via mental health pathways is relatively thin and based mostly on qualitative methods. There is evidence of a correlation between food insecurity and poor mental health, feelings of helplessness, shame, humiliation, and depression (Weiser et al., 2011). Though Weiser's model suggests that food security affects HIV acquisition via mental health pathways, most of the literature relating to mental health and HIV explores the relationship between mental health and other HIV/AIDS-related outcomes, such as adherence to treatment. These are described more fully in the section below.

The mental health pathways are important when discussing the cycle of HIV, because it influences the behavioral pathways, as illustrated in figure 1. Multiple studies (Tucker et al., 2003; Ammassari et al., 2004), have verified that depression reduces adherence among PLHIV. Integrated HIV and livelihood programs (IHLPs) were implemented in Uganda to address food insecurity; in-depth interviews of the service providers reported that the program helped the recipients rebuild their confidence, self-esteem, and self-worth (Yager, Kadiyala & Weiser, 2011). Service providers described that the programs helped the male recipients "feel like a man" because they were able to provide food for their families (Yager, Kadiyala & Weiser, 2011).

4.2 Impact of food insecurity on health and/or HIV/AIDS outcomes

International organizations and programs agree that food security and nutrition are essential elements that need to be incorporated into HIV prevention and treatment interventions, as exemplified by a joint policy statement by the World Food Programme, World Health Organization, and UNAIDS (UNAIDS, 2008). These advocacy and technical guidance efforts for food and nutritional programs in HIV/AIDS care are warranted because of the overwhelming findings that support food security's impact on HIV/AIDS outcomes among PLHIV. In addition, evidence suggests that food insecurity is prevalent among HIV-positive populations (Normen et al., 2005; McMahon, Wanke, Elliott, Skinner & Tang, 2011).

Research conducted among PLHIV has shown that limited access to appropriate foods is associated with negative health outcomes. In a longitudinal study of 458 people living with HIV in Uganda, Weiser and colleagues (2012) found that severe food insecurity (as measured by the Household Food Insecurity Access Scale) was associated with negative overall physical health summaries (the Medical Outcomes Study-HIV Physical Health Summary was used to determine the physical health-related quality), especially among PLHIV who were older, female, married, or underweight. The quantitative Weiser study also revealed that severe food insecurity was associated with increased opportunistic infections, which supports qualitative evidence from Ivers and colleagues (2009) that food insecurity lowers immunity, thereby increasing vulnerability to infectious diseases.

In relation to adherence to HIV/AIDS treatment regimens, food insecure individuals were found to be more likely to miss their antiretroviral therapy (ART) doses than individuals who were considered food secure (Weiser et al., 2009). A study of household insecurity among PLHIV in Kenya also found that adherence was negatively influenced by hunger, with respondents reporting to skip ART doses because they were too hungry, did not have food available, or were working for wages to obtain food (Nagata, Magerenge, Young, Oguta, Weiser & Cohen, 2012). This finding supports an earlier qualitative case study, also done in Kenya, which assessed short-term food supplementation incorporated into ART in 2005-2006; the study participants self-reported increased adherence, along with decreased drug side effects (Byron, Gillespie & Nangami, 2008).

Food insecurity was also found to influence the utilization of healthcare services and facilities. Mild food insecurity was associated with missed clinic visits, while individuals who were severely food insecure had more hospitalizations (Weiser et al., 2012). In their report on food insecurity and HIV/AIDS, Anema and colleagues (2009) summarized that food insecurity is a clear barrier to accessing healthcare in both rich and poor areas; among individuals on ART, food insecurity was associated with poor clinical outcomes.

A 2011 study has been able to provide evidence that food insecurity is associated with CD4 changes among people living with HIV/AIDS on ART. McMahon and colleagues (2011) concluded from their prospective cohort study spanning over a 10-year period of 592 people on ART that those who were food insecure at least once during the study period experienced more modest increases in CD4 counts while on ART. On average, gains in CD4 count among those that were food insecure were 100 cells fewer than gains in CD4 counts of clients who did not report food insecurity ($P<0.001$). This may potentially increase the risk for opportunistic infections and other complications. It is important to note, however, there was not a difference in CD4 count between food secure and food insecure individuals at baseline; the finding that food insecurity was associated with more modest changes in CD4 counts needs to be better understood.

The effect of food insecurity is most obvious when considering HIV/AIDS-related mortality. A study of more than 1,000 clients on highly active antiretroviral therapy (HAART) aimed at understanding the association between food insecurity and mortality concluded that those who were food insecure and underweight were two times more likely to die, compared to those

participants that were not food insecure or underweight (Weiser et al., 2009). Food insecurity was a strong determinant of mortality among PLHIV, independent of the client's nutritional status.

4.3 Impact of HIV on food security and/or nutritional status

Tang describes the relationship between nutritional status and HIV infection as a spiral (figure 2) (Tang, 2012). Insufficient dietary intake of food, malabsorption, diarrhea, impaired storage of nutrients and altered metabolism are ways that HIV infection can escalate malnutrition, which in turn prevents the body from fighting off infection and increases risk to further infection. Tang states that this cyclic spiral quickly progresses when an individual is already malnourished or has a compromised immune system.

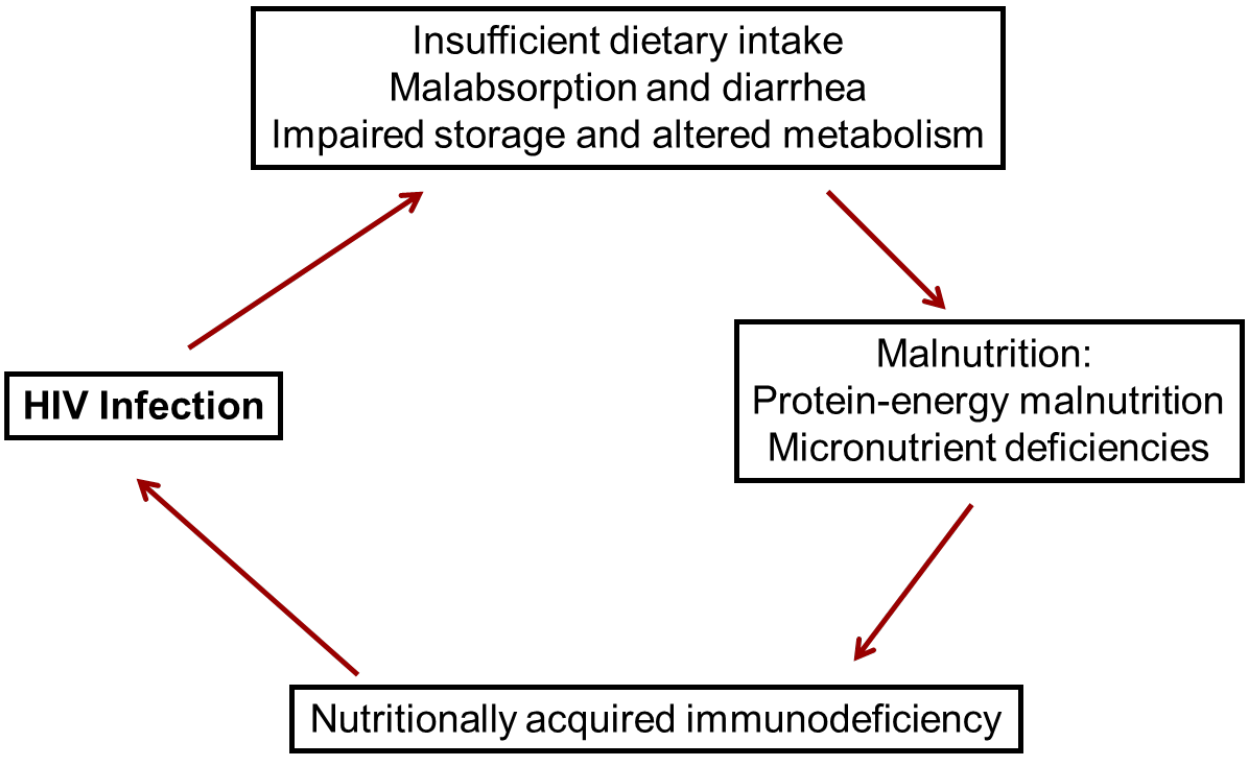

Figure 2: HIV-nutrition spiral (from Tang, 2012, reproduced with permission)

Research among PLHIV provides evidence that HIV has severe negative impacts on food security and the nutritional status of not just the PLHIV, but other household members as well. The consequences of an individual having HIV/AIDS can reduce the food security of the entire family, especially if the infected individual is a primary income earner. Research conducted in Kenya (Nagata et al., 2012) concluded that among PLHIV, those with larger family sizes are more likely to be food insecure, with each additional child in the family increasing the Household Food Insecurity Access Scale (HFIAS) by 1.10 units. The HFIAS measures were developed by USAID's Food and Nutrition Technical Assistance project, with a scoring range of 0 to 27 (Coates, Swindale & Blinsky, 2007). The Kenyan study also concluded that PLHIV without a spouse had a 3.41 higher HFIAS score than those with a spouse. On the contrary,

gender, education, and ART usage were not signigicanly associated with HFIAS scores. (Nagata et al., 2012).

4.4 Program data on the effect of food security programs on health and/or HIV/AIDS outcomes

There is some evidence of the linkages between HIV and food security, though these need to be further explored and better understood. Overall, minimal effort has been put into integrating nutritional and food security programs into HIV prevention programming (Jumbe, 2007). However, it is encouraging that there has been a recent increase in food security interventions being incorporated into HIV/AIDS treatment programs (Gerberg & Stansbury, 2009; Bergmann & Stone-Jimenez, 2011). While quantitative research evidence is still needed to fully support the effectiveness of food security interventions, a few studies do exist that reveal improved HIV/AIDS outcomes as a result of food security programs. For example, a case-control study in Zambia comparing four home-based adherence support programs that incorporated food supplementation with four that did not concluded that food assistance among PLHIV led to improved ART adherence (Cantrell et al., 2008). However, the study did not show any significance association with clinical health outcomes (i.e., weight gain, CD4 cell count). The previously mentioned assessment of a nutrition intervention in Kenya also provided qualitative support of self-reported weight gain, recovery of physical strength, and less hunger as a result of the intervention (Byron, Gillespie & Nangami, 2008).

4.5 Other

Multiple studies have recommended that cost effectiveness analyses need to be incorporated into future evaluations of food intervention programs (Weiser et al. 2012; Ivers et al., 2009; Yager, Kadiyala & Weiser, 2009). Scalability and sustainability measures were also missing components of previous food security interventions and need to be prioritized in future programs (Weiser et al., 2011). Because HIV is such a complex issue that is influenced by many external factors, researchers emphasize the need for a collaborative approach by health, agricultural, and economic experts (Weiser et al., 2011). In a 2007 policy review in Malawi, Jumbe (2007) noted that policy coordination was a major challenge in addressing HIV and called upon government officials and health experts to coordinate their efforts for programmatic interventions.

5.0 ECONOMIC STRENGTHENING AND FOOD SECURITY

The mandate of LIFT to provide livelihood and food security technical assistance is acknowledgment that livelihood and food security successes are dependent on each other. Strong recommendations from researchers have supported that food supplementation interventions are not sufficient, and that livelihood and economic strengthening programs need to be intimately linked with comprehensive and integrated food security interventions for long term success of HIV/AIDS care (Weiser et al., 2011; Leatherman, Metcalfe, Geissler & Dunford, 2012). The following sections discuss livelihood and economic strengthening elements and its contribution to food security in the context of HIV/AIDS.

5.1 Impact of economic strengthening interventions on diet and nutritional status

A review of the impact of 30 agricultural interventions (e.g., home gardening, livestock, mixed garden and livestock, cash cropping, and irrigation) on nutritional status concluded that the interventions did not necessarily improve nutrition or health status within the households (Berti, Krasevec & FitzGerald, 2004). However, the authors were able to determine from the review that the interventions which incorporated home gardening had a better success rate of improving nutrition than the other interventions, that nutrition education was critical for nutrition improvement, and that those interventions which had 4-5 types of capital investments (physical, natural, financial, human and social) had a higher likelihood of improving nutritional status (Berti, Krasevec & FitzGerald, 2004).

Studies conducted by the World Bank in rural Bangladesh provided evidence that credit programs and income generating support at the household level had significant impact on the children in the households (Peace & Hulme, 1994; Pitt, Khandker, Chowdhury, & Millimet, 1997), with significant nutritional improvements in "height-for-age" and "mid-upper arm circumference" during a one year period (Pitt, Khandker, Chowdhury, & Millimet, 1997). These improvements were attributed to "women" recipients of the economic strengthening programs; there were no significant improvements with children's health when males were the recipients of the economic strengthening programs (Pitt, Khandker, Chowdhury, & Millimet, 1997).

Much of the HIV-related literature regarding livelihood and economic strengthening interventions' impact on the diet and nutritional status has focused on OVC. A five country, country-level, evaluation of food insecurity that involved over 2,000 OVC concluded that OVC with no parent were most likely to be food insecure; those without a male parent were the next most likely to be food insecure, documenting that the loss of productive household members threatened food security (Senefeld, Farmer, Ahmed & Lee, 2008). OVC with both parents reported the lowest levels of food insecurity; OVC who did not disclose the status or cause of parents' deaths most often reported that they consistently did not have enough to eat (Senefeld et al., 2008). However, among all the OVC in the study, those who received livelihood training and support (agricultural training, farming inputs, or supported with home or community gardens) reported higher frequencies of having adequate food (Senefeld et al., 2008). Economic strengthening programs for adults in households with OVC also proved to be successful at improving food security for the OVC. Taoka and colleagues's comparison study (Taoka, Baggaley, Hughes & Masila, 2008) of two Kenyan communities with savings and loans associations (SLA), where adult participants pooled money, borrowed, and paid back loans with interest, reported that the SLA programs statistically improved the diversity of foods (p-value = 0.005; CI = 5.02,29.04), frequency of eating foods (p-value = 0.018; CI = 2.40,25.66), and the nutritional status of OVC (p-value = 0.002; CI = -30.29,-6.55), as opposed to comparison sites that did not offer SLA programs.

5.2 Impact of livelihood/economic strengthening interventions on economic resilience

Throughout all literature, experts are recommending that livelihood and economic strengthening interventions be incorporated into HIV/AIDS care. However, few studies have done a thorough analysis of the effectiveness of such interventions, while advocacy organizations have

indicated positive results from program interventions. Save the Children conducted a desk review of the impact of microfinance programs on children and reported findings (from multiple studies in different geographical locations) of increased diversification of income resources, increased home ownership, increased food security among microfinance participants, and increased educational spending (Gammage & Williams, 2007).

A qualitative study involving in-depth interviews with HIV/AIDS care-related service providers in Uganda to assess the successes of integrated HIV/AIDS and livelihood programs revealed that the programs were successful at generating income and increasing food security (Yager, Kadiyala, & Weiser, 2011). Successful IHLP programs were attributed to the strong involvement of community leaders and local and national governments, diversification of income generating activities, and integration of the programs with HIV/AIDS programs (Yager, Kadiyala, & Weiser, 2011).

6.0 ECONOMIC STRENGTHENING AND POVERTY

The Joint Learning Initiative on Children and HIV/AIDS (JLICA) reported that families and communities bear 90% of the financial costs related to HIV/AIDS impact on children (Irwin, Adams, & Winter, 2009). Many of the community members that affected families rely on are often equally poor; economic strengthening interventions are needed as core HIV-care components to enable families and communities to afford food as a part of HIV treatment (Irwin, Adams, & Winter, 2009). Most importantly, however, JLICA urges governments to adopt policies and economic strengthening programs that will relieve economic stress of the poor, emphasizing a need-based approach instead of prioritizing the HIV and/or orphan status (Irwin, Adams, & Winter, 2009).

While vulnerable groups exist and require special attention to address specific issues surrounding their unique circumstances, studies are revealing that livelihood and economic strategies need to be implemented at a community level and target those in most financial need. This is supported by Sebstad and Cohen's findings from their synthesis study on microfinance, risk management, and poverty (2000). They report that microfinance programs excluded the "extreme poor" and were not utilized by the poorest 5% to 10% because of the loan requirements and risks involved. To address this problem, the Consultative Group to Assist the Poor (CGAP) and the Ford Foundation initiated a program to pilot the graduation model developed by the Bangladesh Rural Advancement Committee (BRAC), which focuses on the extreme poor in eight different countries (Hashemi & de Montesquiou, 2011). The model is based on the elements of targeting, consumption support, savings, skills training and regular coaching, and asset transfer, with the ultimate goal of moving communities from extreme poverty into sustainable livelihoods (Hashemi & de Montesquiou, 2011). Early qualitative findings (the pilot project was still in progress as this paper was being written) indicate that there has been a decrease in food insecure households, an increase in asset ownership, an increase in school enrollment, and an increase in healthcare utilization (Hashemi & de Montesquiou, 2011). In an attempt to also address the exclusion of the extreme poor, Devereux and colleagues (Devereux, Marshall, MacAskill & Pelham, 2005) advocated for cash transfer programs, arguing that such a critical response is needed to address the increasing dire needs of the extreme poor in a high HIV prevalence

context. This recommendation resulted from a study that incorporated a literature review on cash transfer programs, qualitative interview surveys of 180 respondents in Africa and in the United Kingdom, and four case studies of programs in Ethiopia, Lesotho, Mozambique, and Zambia (Devereux et al., 2005).

Unexpected financial emergencies are often health related, and consequences of such crises are more catastrophic for the poor than the rich. For example, a study in Ghana assessed the reach of Malaria treatment among the poor, and found that the cost of malaria treatment accounted for only 1% of a wealthy household's income while accounting for 34% of a poor household's income (Barat, Palmer & Basu, 2004). Field studies involving microfinance programs found that diversification of income generating activities helped to reduce financial shock and financial stress in cases of emergencies (Sebstad & Cohen, 2000). The diversification of activities and consolidating or building up assets can include savings, stocking food, investing in land, and building social networks (Sebstad & Cohen, 2000).

In Rwanda, Catholic Relief Services introduced the savings and internal lending communities (SILC) method of microfinancing to the OVC (youth age) program in conjunction with some form of vocational training (Mukankusi, Mayson, Caso & Rowe, 2009). A qualitative evaluation found that the youth enrolled in the program had strengthened their own financial skill set (i.e., financial literacy and developing healthy financial behaviors of repaying back loans) and increased productive assets (i.e., making home repairs, purchasing tools to expand labor services) (Mukankusi et al., 2009). Most importantly, 90% of OVC youth who participated in the SILC program were able to pay into the Rwanda national health insurance scheme, which the government requires of every household but is often a major financial burden for the poor (Mukankusi et al., 2009).

7.0 ECONOMIC STRENGTHENING AND HIV/AIDS

Evidence of the relationship between livelihood and economic strengthening and HIV/AIDS is thin. There seems to be broad understanding that livelihood choices and economic insecurities contribute to HIV acquisition, but no studies were found that provided evidence of the strength of the relationship or the extent of impact of livelihood and economic insecurity on HIV/AIDS. There are studies that did seek to analyze the relationship between livelihood/economic strengthening and HIV/AIDS outcomes in situations where HIV/AIDS was already present or among PLHIV.

7.1 Impact of economic strengthening programming on HIV risk

In an exploratory study in Uganda and Ethiopia, focus group discussions and key informant interviews of young men and women often cited a lack of livelihood opportunities as the reason for moving from rural areas to higher HIV prevalent urban areas (Loevinsohn, Tadele, & Atekyereza, 2012). Most were unlikely to get a job because of their lack of skills and networks, and many women resorted to high-risk options, such as sex work, for survival (Loevinsohn, Tadele, & Atekyereza, 2012). The conclusion that better livelihood opportunities can decrease HIV transmission is supported by Weiser and colleagues' recommendation for livelihood interventions to be implemented to reduce HIV transmission (Weiser et al., 2007).

However, one study indicated one form of economic strengthening is not effective at HIV prevention. A prospective study in rural Malawi that sought to determine a conditional cash transfer (CCT) program's influence on risky sexual behavior (inconsistent condom usage) concluded that no significant associations could be made among the 1,312 enrolled adult participants who were randomly assigned into three different groups (control group that received no incentive, a medium incentive group, and a high incentive group) after one year (Kohler & Thornton, 2012).

7.2 Impact of increased economic security on health and or HIV/AIDS outcomes

There seems to be unanimous agreement in the limited existing literature that integrating economic strengthening activities into HIV/AIDS care positively influences health and HIV/AIDS outcomes.

A randomized clinical study conducted in Uganda to assess ownership and health among 267 AIDS-orphaned adolescents enrolled in a program called *SUUBI* (which means "hope" in one of Uganda's local languages) found that adolescents who received an economic intervention, which incorporated education on asset-building and future planning, life options mentoring, and a savings account for the purposes of school, vocational training, or small businesses, had better mental health than those AIDS-orphaned adolescents who did not receive the intervention (Ssewamala, Han, & Neilands, 2009). The economic empowerment program emphasized asset ownership; home ownership was specifically found to be positively associated with the positive self-esteem changes among SUUBI participants (Ssewamala, Han, & Neilands, 2009). In addition, the study concluded that higher self-esteem impacted self-reported overall physical health, with intervention recipients being twice as likely to report good or excellent health (OR = 2.15).

Researchers conducted a case study of four economic strengthening programs that provided a variety of services (including vocational training, savings, loans and credit, community banking, and provision of transport stipends) in India, Bangladesh, and Cambodia to better understand the impact of increased economic security on children affected by HIV/AIDS and found that there were indications of improved health and HIV/AIDS outcomes among the program recipients (Zaveri, 2008). Zaveri (2008) reported that the program recipients indicated they were able to spend more money on quantity and quality of food, contributing to better overall health. They also stated that the increased income also allowed for increased mobilization, increasing their access to antiretroviral treatment centers.

At the community level, there is evidence that economic strengthening can help facilitate HIV programs and increase testing uptake. A case study of an income-generating and OVC care program that was introduced at a community level in Danane reported a high success rate of the program's ability to facilitate counseling and testing services, identify OVC, and administer HIV treatment (Bossou et al., 2008). A voluntary counseling and testing (VCT) center in the community reported a five-fold increase of individuals seeking to know their status (Bossou et al., 2008). However, operationally, donors and implementers alike need to pay close attention to

the do no harm philosophy in light of the possibility still of unintended negative effects of programs on participants.

7.3 Impact of HIV/AIDS on economic security

There are expected financial implications on a household when an income-earning member is infected with HIV/AIDS. While livelihood options (or lack thereof) can contribute to HIV acquisition, HIV can also be a direct cause of livelihood insecurity. Case and his colleagues (Case, Paxon & Ableidinger, 2004) defend that children suffer many financial effects from the illnesses and death of a parent with AIDS, including the lack of opportunity for school. As previously mentioned, HIV/AIDS can cause already poor households to be more poor and ultimately more vulnerable to economic stresses.

8.0 NUTRITION, ASSESSMENT, CARE, AND SUPPORT

Anema and colleagues conducted a cross-sectional survey of 336 HIV care and treatment sites in nine sub-Saharan countries to determine the availability of nutritional support services among International Center for AIDS Care supported sites (Anema et al., 2011). Using site assessments and facility staff interviews, they determined that 90% of those sites had at least one form of nutritional support service, even though they were not able to capture the percentage of patients who utilized the services at each site. Though nutrition assessment, care and support services encompass more than nutritional supplementation, the most available nutrition "service" was vitamin A and Iron supplementation at 64% of the sites, and food rations available at 31% of the sites (Anema et al., 2011). Availability of treatment for severe malnutrition was associated with sites that had the following characteristics: an ART program that had been functional for over two years, a nutritionist on staff, and available weight-for-height evaluations. It was recommended that nutritional counseling be incorporated into all HIV/AIDS treatment protocols (Anema et al., 2011).

As recommended by multiple aid agencies and research experts, nutrition assessment and counseling services are being incorporated into HIV/AIDS care. However, we were not able to find any existing literature that evaluated the effectiveness and impact of nutrition interventions. NuLife Food and Nutrition Interventions for Uganda (NuLife) and Food by Prescription in Kenya are two nutrition and counseling interventions that have been incorporated into HIV/AIDS care in recent years. Assessments of NuLife and Food by Prescription were performed in 2011 and 2009, respectively, but the assessments focused on the delivery methods and the staff and recipient perceptions of the programs (Bergmann & Stone-Jimenez, 2011; Gerberg & Stansbury, 2009). While the assessments were qualitative in nature, evidence from focus group discussions and interviews indicated that there were some positive effects from the interventions. In Uganda, respondents reported that the NuLife program helped them to identify small practical steps to improve their nutritional health (Bergmann & Stone-Jimenez, 2011). Recipients of the Food by Prescription program in Kenya reported improved responses to antiretroviral treatments, reduced side effects, and weight gain (Gerberg & Stansbury, 2009). While the qualitative evidence is positive support for NACS interventions in developing countries, quantitative studies to evaluate the outcomes of the programs are necessary to better determine their effectiveness.

9.0 CONCLUSION

This literature review sought to understand the linkages between poverty, livelihood and economic strengthening, food security, nutrition and HIV/AIDS and related outcomes. There were varying degrees of literature available for each of these topics.

In the areas of poverty and HIV/AIDS, there exists primarily qualitative evidence that indicates a loose association exists between poverty and HIV/AIDS. Existing literature with quantitative analysis of poverty and HIV/AIDS produced conflicting evidence. The cross-sectional study with the strongest quantitative methods concluded that a direct association between wealth and HIV was no longer significant when controlled for other factors like age, community level wealth, and education. There was a larger amount of literature addressing the downstream impact of HIV/AIDS on poverty, with general agreement that HIV contributed to higher poverty.

There was abundant research that explored the area of food security and HIV/AIDS, with the majority of the evidence correlating food insecurity and HIV/AIDS among individuals or communities where HIV was already present. The literature review revealed that earlier studies were qualitative in nature but had transitioned to more quantitative approaches in recent years to capture statistical evidence of food security's impact on HIV/AIDS-related outcomes, such as missed appointments, hospitalizations and mortality. There seems to be enough evidence to conclude that food security interventions can potentially increase positive HIV/AIDS-related outcomes, specifically increased adherence and reduced HIV/AIDS mortality. More evaluations are needed to measure quantitatively the effectiveness of existing food security interventions.

Literature on the impact of economic strengthening interventions on health outcomes was relatively thin. The majority of the literature found on economic strengthening interventions' impact focused on vulnerable groups, like OVC. Though most of the studies found on economic strengthening were qualitative in nature, there was general agreement that the lack of livelihood opportunities escalated HIV risk and negative health and HIV/AIDS-related outcomes. A few studies provided some quantitative evidence of successful economic strengthening interventions. Among these studies, a comparison study of two communities in Kenya provided the strongest evidence, with data showing that a savings and loans intervention statistically improved the quantity and quality of nutritional intake for OVC in the community hosting the intervention.

It is important to note that the researchers in the food security and economic strengthening areas almost always recommended that economic strengthening interventions be incorporated into HIV/AIDS care, as a solution to food insecurity and other poverty-driven HIV/AIDS outcomes. Economic strengthening strategies were considered to be more sustainable and cost-effective than food ration handouts. In addition, food security and economic strengthening were often discussed interchangeably when highlighting gaps in HIV/AIDS care.

NACS services were included in the literature review in an effort to identify and learn from programs that are showing promising impact. However, these services are relatively new to HIV/AIDS care and support programming, and no literature was found that evaluated the effectiveness and impact of such programs. Two assessments of nutrition and counseling

interventions were reviewed, but these focused on delivery methods of the program and the perceptions of the program by clinical staff and program recipients.

The qualitative data suggesting that food insecurity, hunger, and the need to earn money are barriers to care and treatment of PLHIV are supported by more rigorous methods that quantify the strength of these associations. These provide sufficient evidence to suggest that food security and economic strengthening interventions linked with HIV/AIDS treatment care and support services may improve the health outcomes of PLHIV and household food security for OVC. Several pathways by which this might occur have been proposed in the literature. However, the data on which of the many food security and economic strengthening interventions have the biggest impact on health outcomes of PLHIV or their families are limited. The inclusion of these interventions as part of care packages have only recently become a priority for large-scale HIV/AIDS initiatives such as PEPFAR and the Global Fund to Fight AIDS, Tuberculosis and Malaria. This shift provides an opportunity for operations research and/or evaluation designs to add to the knowledge base. Only one source reviewed touched on the cost-effectiveness of these types of interventions and the outcome of interest in that case was household food security. None of the available data described the cost-effectiveness of programs aimed at improving household level economic resilience or food security compared with other HIV/AIDS care and support interventions, using HIV/AIDS outcomes such as retention in care, rate of new opportunistic infections or adherence to ART regimens as the measures of interest.

This research was unable to identify evidence related to whether and how technical assistance can be utilized to strengthen networks of providers. This is particularly important to understand as LIFT aims to improve linkages between health facility-based NACS services and community-based food security and economic strengthening programs, with the aim of extending the continuum of care for PLHIV and their families.

Finally, the logic model describes the pathways by which LIFT aims to improve household food access and ultimately food security, by increasing any or all of these: household economic status and resilience,[1] household food purchases, and/or household food production. Most of the literature reviewed provided proxy or composite measures of household food security, most notably the HFIAS and Household Hunger Scale. The literature did not describe which of these aspects of food security are most sensitive to program interventions within the context of HIV/AIDS care and support. Neither did it describe which of these factors contributed most to household food insecurity among PLHIV households.

[1] Economic status was considered here in the context of household assets, income, saving and spending behaviors.

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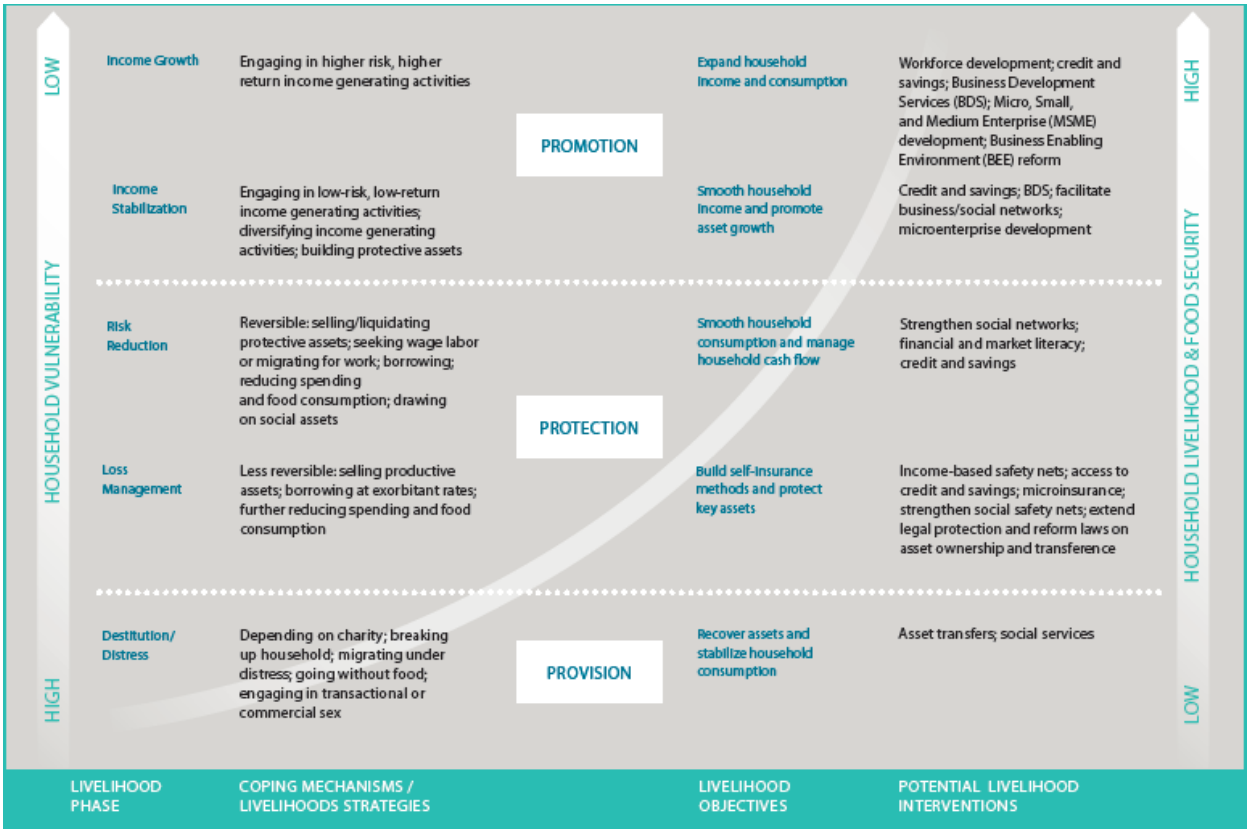
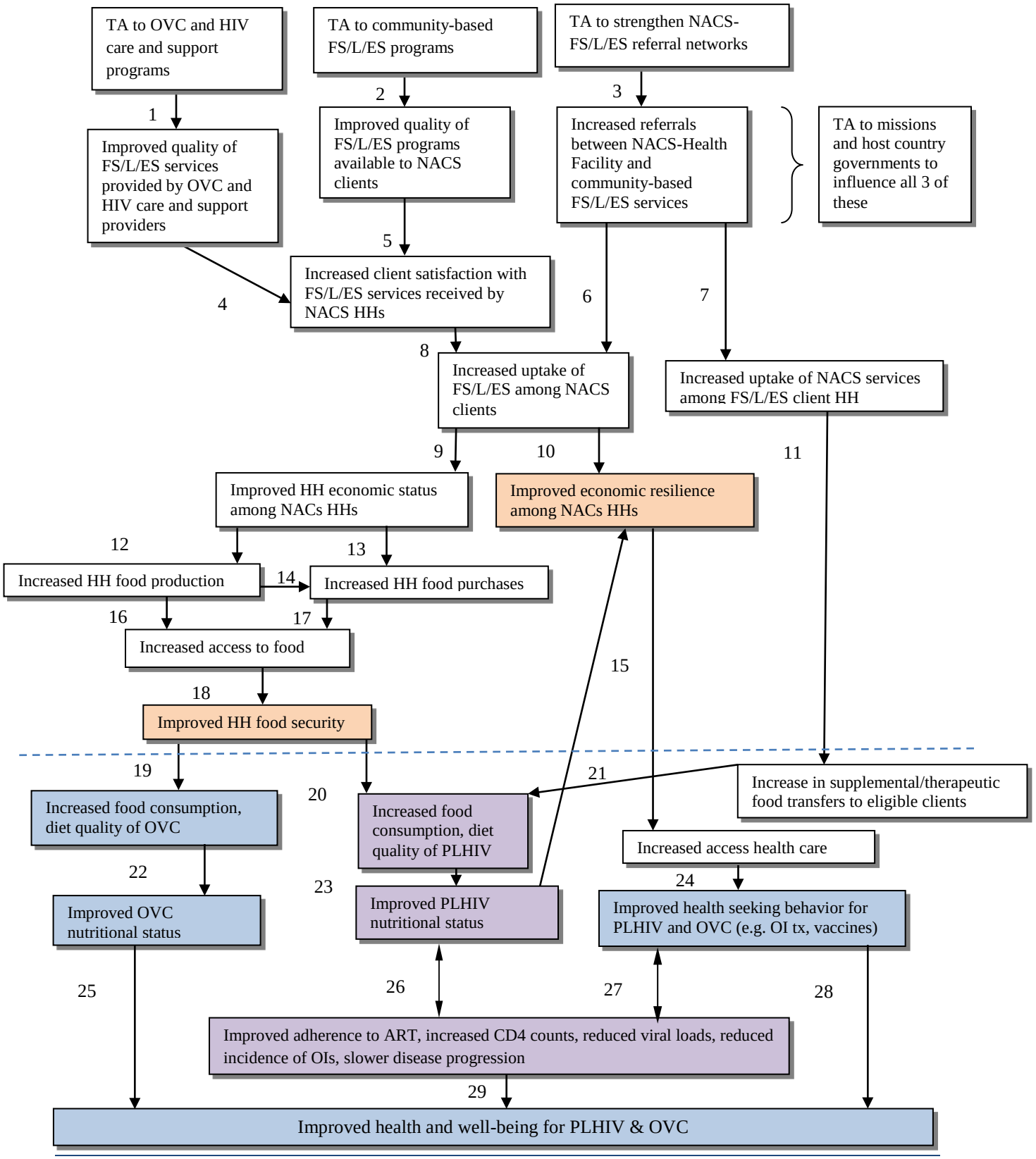
Annex 1: LIFT Conceptual Framework



Annex 2: Draft LIFT Logic Model



Annex 3: `Literature Review Resource Matrix

CITATION	YEAR	MAJOR RELEVANT FINDINGS	SRENGTH OF STUDY	LINK TO MODEL
			Determined by Sample Size, Evidence Type, and Study Design	
Ainsworth, M., & Semali, I. (1998). Who is most likely to die of AIDS? Socioeconomic correlates of adult deaths in Kagera Region, Tanzania. In Ainsworth, M., Fransen, L., & Over, M. (Eds.). *Confronting AIDS: Evidence from the Developing World.* Brussels: The World Bank and European Commision.	1998	• HIV associated with poverty	NA	15
Ammassari, A., Antinori, A., Aloisi, M. T., Murri, R., Bartoli, l., Monforte, A. W., & Starace, F. (2004). Descriptive symptoms, neurocognitive impairment, and adherence to highly active antiretroviral therapy among HIV-infected persons. *Psychosomatics, 45*(5), 394-402.	2004	• Depression reduced adherence among PLHIV	Average	N/A
Anema, A., vogenthaler, N., Frongillo, E., Kadiyala, S., & Weiser, S. (2009). Food Insecurity and HI/AIDS: Current Knowledge, Gaps, and Research Priorities. *Clinical Infectious Diseases, 49*, 1096-1102.	2009	• Lack of food contributed to increased transmission risk • Food insecure individuals had more hospitalizations	Weak	20
Anema, A., Zhang, W., Wu, Y., Elul, B., Weiser, S.D., Hogg, R.S., Montaner, J.S., El Sadr, W., & Nash, D. (2011). Availability of nutritional support services in HIV care and treatment sites in sub-Saharan African countries. *Public Health Nutrition, 15*(5), 938-947. Epub 2011 August 2.	2011	• 90% of sites offered at least one form of nutritional support • Nutritional supplementation included mostly vitamin A and Iron, available at 64% of sites • Food rations were available at 31% of site	Weak	11

Barat, L., Palmer, N., & Basu, S. (2004). Do malaria control interventions reach the poor? A view through the equity lens. *American Jornal of Tropical Medicine and Hygiene, 71*, 174-178.	2004	• Studies examining the relationship between malaria incidence and SES yielded contradictory results. • The poorest suffered the most severe consequences of malaria due in part to more limited access to preventative and curative treatment.	Weak	N/A
Bergmann, H., & Stone-Jimenez, M. (2011). *NULIFE - Food and Nutrition Interventions for Uganda.* Task Order 1, USAID's AID Support and Technical Assistance Resources, AIDSTAR-One. Arlington, VA: USAID.	2011	• NULIFE helped to identify small practical steps to better nutritional health	Weak	21
Berti, P., Krasevec, J. & FitzGerald, S. (2004). A review of the effectiveness of agriculture interventions in improving nutrition outcomes. *Public Health Nutrition, 7*(5):599-609.	2004	• Agricultural interventions did not necessarily improve household nutritional status • Home gardening interventions had best success rates • Nutrition education critical to nutrition improvements • Interventions that incorporated 4-5 additional types of capital investments had higher success of improving nutritional status	Average	12, 16
Bossou, S., Gbaguidi, A., Djahan, Y., Kouassi, H., N'zian, L., & Irie, B. (2008). *Income generating activities to overcome stigma and discrimination.* Abstract, AIDS 2008-XVII International AIDS Conference.	2008	• Economic strengthening program helped facilitate counseling and testing services, identify OVCs, increase testing at VCTs, and administer HIV treatment	Average	15

Byron, E., Gillespie, S., & Nangami, M. (2008). Integrating nutrition security with treatment of people living with HIV: lessons from Kenya. *Food Nutrition Bulletin, 29*(2).	2008	• Intervention participants self-reported increased adherence, decreased drug side effects, weight gain, recovery of physical strength, and less hunger as a result of the intervention	Weak	21, 23, 26
Cantrell, R.A., Sinkala, M., Megazinni, K., Lawson-Marriott, S., Washington, S., Chi, B.H; Tambatamba-Chapula, B., Levy, J., Stringer, E.M., Mulenga, L., & Stringer, J.S.A. (2008). A pilot study of food supplementation to improve adherence to antiretroviral therapy among food-insecure adults in Lusaka, Zambia. *JAIDS, 49*(2), 190-195.	2008	• Food assistance among PLHIV led to improved ART adherence	Strong	21,23, 26
Case, A., Paxon, C., & Ableidinger, J. (2004). Orphans in Africa: parental death, poverty, and school enrollment. *Demography, 41*(3), 483-508.	2004	• Orphans were less likely to be enrolled in school than non-orphans. • Outcomes for orphans were associated with relatedness of orphans to head of household	Strong	N/A
Coates, J., Swindale, A., & Blinsky, P. (2007). *Household Food Insecurity Access Scale (HFIAS) for Measurement of Household Food Access: Indicator Guide (v.3).* Washington, DC: Food and Nutrition Technical Assistance Project, Academy for Educational Development.	2007	• Household Food Insecurity Access Scale Guide	NA	N/A
De Walque, D., Nakiyingi-Mijro, J., Busingye, J., & Whitworth, J. (2005). Changing Associationg between Schooling Levels and HIV-1 Infection Over 11 Years in a Rural Population Cohort in Southwest Uganda. *Trop Med Int Health, 10*, 993-1000.	2005	• Advocated for cash transfer interventions, arguing that it reached the extreme poor	Weak	N/A
Devereux, S., Marshall, J., MacAskill, J., & Pelham, L. (2005). *Making Cash Count: Lessons from Cash Transfer Schemes in East and Southern Africa for Supporting the Most Vulnerable Children and Households.* London: Save the Children UK, HelpAge International, Institute of Development Studies.	2005	• Wealthier populations had higher HIV prevalence	3. Strong	N/A

FAO. (2006). *Food Security* [policy brief]. Rome, Italy: Food and Agriculture Organization. Retrieved May 23, 2012, from ftp://ftp.fao.org/es/esa/policybriefs/pb_02.pdf	2012	• Provided definitions of food insecurity, statistics, and policy priorities to alleviate food insecurity	NA	N/A
Gammage, S., & Williams, S. (2007). *Economic Opportunities. Impact of Microfinance Programs on Children: An Annotated Survey of Indicators.* Westport, CT: Save the Children.	2007	• Save the Children economic strengthening programs increased diversification of income resources, home ownership, food security, and educational spending	Average	9, 10
Gerberg, L., & Stansbury, J. (2009). *Food by Prescription in Kenya.* Task Order 1, USAID's | AIDSTAR-ONE Project, Arlington, VA: USAID.	2009	• Recipients reported improved responses to ARV treatments, reduced side effects, and weight gain	Weak	21, 23, 26
Gillespie, S., Kadiyala, S., & Greener, R. (2007). Is poverty or wealth driving HIV transmission? *AIDS, 21*(suppl 7), S5-S16.	2007	• Stated association between income inequality and HIV prevalence • National level economic data from UNDP reports and HIV prevalence data determined that there was a positive association between income inequality and HIV prevalence	Average	N/A

Greener, R., Jefferis, K., & Siphambe, H. (2000). The impact of HIV/AIDS on overty and inequality in Botswana. *South African Journal of Economics, 68*(5), 889-915.	2000	• HIV-related deaths would cause a decrease in income for a quarter of all households while dramatically increasing the number of households with no income through the following decade • HIV/AIDS expected to cause a decrease of approximately 10% in per-capita income • Recommended for interventions to promote sustainable livelihoods, services for human capability development, and policies to create and protect social safety nets.	Average	N/A
Hashemi, S. M., & de Montesquiou, A. (2011). Reaching the poorest: lessons from the graduation model [focus note no. 69]. Washington: CGAP. Retrieved May 23, 2012 from http://www.cgap.org/gm/document-1.9.50739/FN69.pdf	2011	• Early qualitative studies showed decrease in food insecure households, increase in asset ownership, increase in school enrollment, and increase in healthcare utilization	Weak	17, 18
Irwin, A., Adams, A., & Winter, A. (2009). *Home Truths. Facing the Facts on Children, AIDS, and Poverty.* Boston, MA: Joint Learning Initiative on Children and HIV/AIDS.	2009	• Families and communities born 90% of costs related to AIDS impact on children • Affected families relied on equally poor community members • Urged for governments to adopt policies and economic strengthening programs that will relieve economic stress of the poor	NA	15

Ivers, L., Cullen, K., Freedberg, K., Block, S., Coates, J., & Webb, P. (2009). HIV/AIDS, undernutrition, and food insecurity. *Clin Infect Dis, 49*(7), 1096-1102.	2009	• Food insecure households often associated with higher economic vulnerability as opposed to those that were food secure • Food insecurity associated with inconsistent condom usage, migration for work opportunities • Food insecurity lowered immunity, increased vulnerability to infectious diseases	Weak	15, 17
Jumbe, C.B. (2007). *Food Security in the Era of HIV and AIDS, A Policy Analysis of Food Securtiy and HIV and AIDS in Sub-Saharan Africa: The Case of Malawi.* Lusaka, Zambia: Panos South Africa.	2007	• Minimal overall effort had been put into integrating nutritional and food security programs into HIV prevention programming • Policy coordination was a major challenge in addressing HIV	Weak	6, 7
Kohler, H.-P., & Thornton, R. (2012). Conditional cash transfers and HIV/AIDS prevention: unconditionally promising? *The World Bank Economic Review, 26*(2), 165-190. doi:doi: 10.1093/wber/lhr041	2012	• CCTs were ineffective in preventing risky sexual behaviors (inconsistent condom usage)	Strong	N/A
Lagarde, E., van der Loeff, M.S., Enel, C., Holmgren, B., Dray-Spira, R., Pison, G., Piau, J.P., Delaunay, V., M'Boup, S.M., Ndoye, I., Coeuret-Pellicer, M., Whittle, H. & Aaby P, for the MECORA group. (2003). Mobility and the spread of human immunodeficiency virus into rural areas of West Africa. *Journal of the International Epidemiological Association, 32*(5), :744-752. Doi:10.1093/ije/dyg111.	2003	• Food insecurity reduced work and education opportunities and forced mobility and migration in search of jobs, which increased HIV risk	Strong	N/A

Leatherman, S., Metcalfe, M., Geissler, K., & Dunford, C. (2012). Integrating microfinance and health strategies: examing the evidence to inform policy and practice. *Health Policy and Planning*, 27:85-101. doi:10.1093/heapol/czr014	2012	• Livelihood and economic strengthening programs need to be linked with food security interventions for long term success of HIV care	NA	12, 13
Loevinsohn, M., Tadele, G., & Atekyereza, P. (2012). *Livelihood and economic strengthening in communities confronting HIV and AIDS.* Retrieved April 17, 2012, from Stop AIDS Now at http://www.stopaidsnow.org/documents/Livelihoods_Research2012_Livelihoods%20and%20economic.pdf	2012	• Lack of livelihood opportunities forced movement from rural to urban cities; most unable to get jobs because they lacked skills and networks • Many women resorted to high-risk options, like sex work	Average	N/A
McMahon, J., Wanke, C., Elliott, J., Skinner, S., & Tang, A. (2011). Repeated assessments of rood security predict CD4 change in the setting of antiretroviral therapy. *J Acquir Immune Defic Syndr, 58*(1), 60-63.	2011	• HIV prevalence high among PLWHA • Those who were food insecure had a CD4 count increase that was 100 cells less than those that were food secure (P<0.001)	Strong	20, 23, 26
Miller, C., Bangsberg, D., Tuller, D., Senkungu, J., Kawuma, A., Frongillo, E., & Weiser, S. (2011). Food insecurity and sexual risk in an HIV endemic community in Uganda. *AIDS Behav, 15*, 1512-1519.	2011	• Food insecurity led to increased sexual vulnerability among women, including less control over condom use and engaging in transactional sex	Weak	N/A

Mishra, V., Assche, S.B.-V., Greener, R., Vaessen, M., Hong, R., Ghys, P.D., Boerma, J.T., Van Assche, A., Khan, S., & Rutstein, S. (2007). HIV infection does not disproportionately affect the poorer in sub-Saharan Africa. *AIDS, 21*, S17-S28. doi:10.1097/01.aids.0000300532.51860.2a	2007	• HIV prevalence tended to be much higher for both men and women in the wealthiest 20% of households as compared to the poorest 20% of households • HIV prevalence was higher for both sexes among wealthier households, but most notably among women • The strong association between wealth and HIV prevalence diminished when other factors were accounted for, such as urban or rural residence and overall community wealth	Strong	N/A
Mukankusi, A., Mayson, M., Caso, T., & Rowe, W. (2009). *Empowering Rwanda youth through savings-led microfinance.* Baltimore. MD: Catholic Relief Services.	2009	• Youth enrolled in intervention strengthened their own financial skill set and increased productive assets • 90% of OVC youth that participated were able to pay into the Rwanda national health insurance scheme	Weak	15, 17
Nagata J.M., Magerenge R.O., Young S.L., Oguta J.O., Weiser S.D., & Cohen C.R. (2012). Social determinants, lived experiences, and consequences of household food insecurity among persons living with HIV/AIDS on the shore of Lake Victoria, Kenya. *AIDS Care, 24*(6), 728-736. Epub 2011 Dec. 7.	2011	• Food insecurity negatively influenced adherence • Respondents reported skipping ART because they were too hungry, did not have food available, or were working for wages to obtain food	Average	20, 23, 26

Normen, L., Chan, K., Braitstein, P., Anema, A., Bondy, G., Montaner, J., & Gogg, R. (2005). Food Insecurity and Hunger Are Prevalent among HIV-Positive Individuals in British Columbia, Canada. *Journal of Nutrition, 135*, 820-825.	2005	• Food insecurity highly prevalent among HIV-positive populations	Strong	N/A
Oyefara, J. (2007). Food Insecurity, HIV/AIDS pandemic and sexual behavior of female commercial sex workers in Lagos metropolis, Nigeria. *SAHARA J, 4*, 626-635.	2007	• There was a significant relationship between poverty, food insecurity and consistent use of condoms by female sex workers	Strong	N/A
Peace, G., & Hulme, D. (1994). Microenterprise and children ─ what are the intra-household impacts of income generating programs? *Small Enterprise Development, 5*(1), 21-29.	1994	• Income generating support at the household level had significant impact on the children in the households	NA	19, 22
Pitt, M., Khandker, S., Chowdhury, O., & Millimet, D. (1997). *Credit Programs for the Poor and the Nutritional Status of Children in Rural Bangladesh.* Washington DC: World Bank.	1997	• Credit programs with female recipients had significant impact on the children in the households, with significant nutritional improvements in "height-for-age" and "mid-upper arm circumference" during a one year period • Improvements were not found when credit recipients were men	Strong	19, 22
Sebstad, J., & Cohen, M. (2000). *Microfinance, Risk Management, and Poverty.* Washington, DC: Management Systems International.	2000	• Microfinance programs excluded the "extreme poor" and not utilized by the poorest 5-20% because of loan requirements and risks involved • Diversification of income generating activities helped reduce financial shock and financial stress in cases of emergency	Weak	10

Senefeld, S., Farmer, M., Ahmed, S., & Lee, C. (2008). Food and nutrition security of orphans and vulnerable children: programmatic implications resulting from a five-country evaluation [abstract]. Paper presented at the XVII International AIDS Conference, Mexico City, Mexico, 3-8 August 2008.	2008	• OVC with no parent were most likely to be food insecure • OVC without male parent were most next likely to be food insecure • OVC with both parents had lowest food insecurity among all OVC, those that received livelihood training and support reported higher frequencies of having adequate food	Strong	N/A
Ssewamala, F., Han, C., & Neilands, T. (2009). Asset ownership and health and mental health functioning among AIDS-orphaned adolescents: findings from a rancomized clinical trial in rural Uganda. *Social Science & Medicine, 69*, 191-198.	2009	• Participants in intervention group (received economic intervention) had better mental health than those that did not • Home ownership, specifically found to be associated with positive self-esteem changes • Higher self-esteem impacted self-reported overall physical health; intervention recipients twice as likely to report good or excellent health (OR - 2.15)	Strong	15, 17
Tang, A. (2012). Getting the knack of NACS: nutrition implications of HIV and ART [slide presentation]. Washington, DC: Alice Tang, Tufts School of Medicine.	2012	• HIV-Nutrition Spiral	NA	23, 26

Taoka, S., Baggaley, R., Hughes, K, Ndondoo, E., Masila, J., & Wambua, N. (2008). *D*o Savings and loans associations (SLAs) improve diets and nutritional status of orphans and vulnerable chilren (OVC)? [abstract]. Paper presented at the XVII International AIDS Conference, Mexico City, Mexico, 3-8 August 2008.	2008	• Communities involved in savings and loans interventions statistically improved diversity of foods (P=0.005), frequency of eating foods (P=0.018), and the nutritional status (P=0.002) of OVCs, compared to communities that were not	Strong	12, 13, 15, 19
Tsai, A., Hung, K., & Weiser, S. (2012). Is food insecurity associated with HIV risk? Cross-sectional evidence from sexually active women in Brazil. *PLoS Med*, *9*(4), e1001203.	2012	• Food insecurity was associated with unprotected sex	Strong	N/A
Tucker, J., Burnam, M., Sherbourne, C., Kung, F., & Gifford, A. (2003). Substance abuse and mental health correlates of nonadherence to anti-retroviral medications in a sample of patients with human immunodeficiency virus infection. *American Journal of Medicine 114*(7), 573-580.	2003	• Depression, generalized anxiety disorder, and panic disorder reduced adherence among PLWHA • Non-adherence was associated with use of cocaine, marijuana, amphetamines, or sedatives in the previous month	Strong	N/A
UNAIDS. (2008). *HIV, Food Security, and Nutrition* [policy brief]. Geneva, Switzerland: UNAIDS.	2008	• Lack of food contributed to increased transmission risk • Encouraged for food security and nutrition to be incorporated into HIV prevention and treatment interventions	NA	20, 26
USAID. (1992). *USAID Policy Determination: Definition of Food Security* [policy determination]. Washington: USAID. Retrieved May 23, 2012, from http://www.usaid.gov/policy/ads/200/pd19.pdf	1992	• Definition of food security	NA	N/A

Weiser, S.D., Leiter, K., Bangsbert, D. R., Butler, L. M., Percy-de Korte, F., Hlanze, Z., Phaladze, N., Vincent Iacopino, V., & Heisler, M. (2007). Food Insufficiency is associated with high-risk sexual behavior among women in Botswana and Swaziland. *PLoS Med, 4*(10), e260.doi:10.1371/journal.pmed.0040260.	2007	• Positive association between food insecurity and intergenerational sexual relationships and unprotected sex • Better livelihood opportunities can decrease HIV transmission	Strong	N/A
Weiser, S.D., Fernandes, K.A., Brandson, E.K., Lima, V.D. Anema, A., Bangsberg, D.R., Montaner, J.S., & Hogg, R.S. (2009). The association between food insecurity and mortality among HIV-infected individuals on HAART. *JAIDS, 52*(3), 342-349.	2009	• Food insecure individuals were more likely to miss ART doses than those considered food secure • Food insecure and underweight individuals were 2xs more likely to die, compared to participants that were not food insecure or underweight	Strong	20, 23, 26, 29
Weiser, S., Tsai, A., Gupta, R., Frgongillo, E., Kawuma, A., Senkungu, J., Hunt, P.W., Emenyonu, N.I., Mattson, J.E., Martin, J.N., & Bangsberg, D.R. (2012). Food insecurity is associated with morbidity and patterns of healthcare utilization among HIV-infected individuals in a resource-poor setting. *AIDS, 26*(1), 67-75.	2012	• Food insecurity associated with negative overall physical health summaries • Severe food insecurity associated with increased opportunistic infections • Mild food insecurity associated with missed clinic visits • Severe food insecurity associated with increased hospitalizations	Strong	20, 23, 26, 29

Weiser, S., Young, S. C., Tsai, A., Tien, P., Hatcher, A., Frongillo, E., & Rangsbert, D. (2011). Conceptual framework for understanding the bidirectional links between food insecurity and HIV/AIDS. *The American Journal of Clinical Nutrition, 94*, 1729S-1739S.	2011	• HIV Acquisition Pathway (nutritional, mental, and behavioral) • Evidence of correlation between food insecurity and poor mental health • Livelihood and economic strengthening programs need to be linked to food security interventions for long term success of HIV care	NA	6, 7, 15, 17
Yager, J., Kadiyala, S., & Weiser, S. (2011). HIV/AIDS, food supplementation and livelihood programs in Uganda: a way forward? *PLoS ONE, 6*(10), e26117.	2011	• Livelihood interventions helped rebuild confidence, self-esteem, and self-worth • Intervention successful at generating income and increasing food security	Weak	12, 13, 15, 17
Zaveri, S. (2008). *Economic Strenthening and Children Affected by HIV/AIDS in Asia: Role of Communities.* Retrieved April 18, 2012, from JLICA: http://www.jlica.org/userfiles/file/JLICAEconomic%20Strengthening%20and%20OVC%20in%20AsiaFinal.pdf	2008	• Increased economic security improved health and HIV outcomes • Program recipients spent more money on quantity and quality of food, which contributed to better overall health • Incomes also provided for transportation to access ARV centers	Average	12, 13, 15, 19, 20