EFFECTS OF HIV/AIDS ON HOUSEHOLD FOOD SECURITY:
A STUDY CONDUCTED IN MUKUYU DIVISION, MURANG’A
SOUTH DISTRICT, KENYA

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REG. NO. 157/12649/2005

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE AWARD OF THE DEGREE
OF MASTER OF PUBLIC HEALTH IN THE SCHOOL OF
HEALTH SCIENCES OF KENYATTA UNIVERSITY

OCTOBER 2009
DECLARATION

Declaration by the candidate

This thesis is my original work and has not been presented for degree in any other university.

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Declaration by the supervisors

We certify that the work reported in this thesis was carried out by the candidate under our supervision as University supervisors.

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DEDICATION

I dedicate this work to my loving husband William, whose encouragement and support has given me a lot of confidence, and to Charles, Deborah and Clement my babies. They are my treasured friends.
AKNOWLEDGMENTS

I sincerely appreciate my supervisors Dr. Isaac Mwanzo and Dr. Augustine Afullo for their patience and tireless guidance through the long journey of doing this work. It is with their support that I have made it.

I am grateful to all the administrators, local leaders, Community Health Workers, and the community of Makuyu Division who greatly assisted me in the process of data collection. My gratitude also goes to the management and staff of World Vision Makuyu ADP, for giving me the entry point to Makuyu community. I appreciate the selfless labour of my research assistants Robert Wandiri and Jimmy Wangure.

I thank my precious family members, William, Charles, Deborah and Clement for their priceless encouragement and support as I did this work. They sacrificed a lot for me and it is to them I dedicate this work.

I am grateful to all my classmates and especially Tony, Maina and Gitau who helped me in understanding statistics.

Above all I give all the glory to God my Father for enabling me accomplish this work.
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OPERATIONAL DEFINITIONS

Food security
In this study, food security refers to all of the three characteristics listed below;

❖ Access by a household to at least three meals in a day, seven days a week. These meals should be well balanced and nutritionally adequate.
❖ An assured ability to purchase enough food for the household
❖ Stability in household food production

Food insecurity
In this study, food insecurity refers to uncertain access to nutritious and safe food manifested in all of these characteristics:-

❖ Inability to access a balanced diet meal which is nutritionally adequate for at least three times in a day, seven days a week for all household members
❖ Insecurity about the adequacy and sustainability of food supplies (food anxiety).

Food availability
This term is used in this study to refer to food production, food purchasing power and adequacy of food to all household members.
**Nutrition security**

This term is used to refer to consumption of an adequate balanced healthy diet (consisting of carbohydrates, proteins, and vitamins) which is vital for health and survival. In this study it was determined by food consumption pattern for past one week.

**Household**

This term is used in this document to refer to a family unit that lives together, sharing a common source of food.

**Households directly affected by HIV/AIDS**

This term refers to households with any of the following characteristics:-

- There is a household member who is known to be chronically ill with AIDS related complications
- A household head or member has died of AIDS related complications
- A household that is fostering AIDS orphans

**Households not affected by HIV/AIDS**

This term refers to those households within the sampling frame which are not in any of the three categories.
Household HIV/AIDS status

This term is used to mean whether or not a household is directly affected by HIV/AIDS or not affected at all.

Focused Group Discussions

These are discussions held with groups of respondents who are well versed with the topic of study and can therefore provide reliable information. There are questions formulated to guide such discussions to keep them focused. In this study, such discussions were conducted among Community Health Workers and Home Based Caregivers.
### ABBREVIATIONS AND ACRONYMS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>ADP</td>
<td>Area Development Program (commonly used by World Vision)</td>
</tr>
<tr>
<td>AIDS</td>
<td>Acquired Immunodeficiency Syndrome</td>
</tr>
<tr>
<td>ARVs</td>
<td>Anti-retroviral drugs</td>
</tr>
<tr>
<td>ART</td>
<td>Anti-retroviral Therapy</td>
</tr>
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<td>CACC</td>
<td>Constituency AIDS Control Council</td>
</tr>
<tr>
<td>CBO</td>
<td>Community Based Organization</td>
</tr>
<tr>
<td>CHWs</td>
<td>Community Health Workers</td>
</tr>
<tr>
<td>DAO</td>
<td>District Agricultural Office</td>
</tr>
<tr>
<td>DFID</td>
<td>Department for International Development</td>
</tr>
<tr>
<td>DDP</td>
<td>District Development Plan</td>
</tr>
<tr>
<td>FAO</td>
<td>Food and Agricultural Organization</td>
</tr>
<tr>
<td>FGDs</td>
<td>Focused Group Discussions</td>
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<tr>
<td>GDP</td>
<td>Gross Domestic Production</td>
</tr>
<tr>
<td>HIV</td>
<td>Human Immunodeficiency Virus</td>
</tr>
<tr>
<td>KAIS</td>
<td>Kenya AIDS Indicators Survey</td>
</tr>
<tr>
<td>KATSO</td>
<td>Kenya AIDS Treatment and Support of Orphans and Vulnerable Children</td>
</tr>
<tr>
<td>KDHS</td>
<td>Kenya Demographic Health Survey</td>
</tr>
<tr>
<td>KNASP</td>
<td>Kenya National HIV/AIDS Strategic Plan</td>
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<tr>
<td>MDG</td>
<td>Millennium Development Goals</td>
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MOH - Ministry of Health
NACC - National AIDS Control Council
OV C - Orphans and Vulnerable Children
PLHA - People Living with HIV/AIDS
PRSP - Poverty Reduction Strategy Plan
SPSS - Software Package for Social Sciences
UNAIDS - United Nations Joint Program on HIV/AIDS
VCT - Voluntary Counseling and Testing
WFP - World Food Program
WHO - World Health Organization
ABSTRACT

In Kenya, the high level of food insecurity is related to poverty and a reduction in agricultural production. HIV/AIDS reduces a household’s ability to produce and purchase food. Adults with HIV/AIDS are less able to work on their land or earn income from other livelihood activities. Increased healthcare costs decrease household food purchasing power and the coping mechanisms reduce household resilience. Kenya National HIV/AIDS Strategic Plan 2005/6-2009/10 has recommended for impacts studies of HIV/AIDS on the society as a basis of addressing them. This study was aimed at contributing to this purpose. In Makuyu division perennial food insecurity has led to reliance on relief food for many years with average food production falling below the expected rates by 33%. HIV/AIDS prevalence in this area is 6.9% hence the need to establish the relationship between HIV/AIDS and food insecurity. The main objective of this study was to investigate the effects of HIV/AIDS burden on household food security in Makuyu Division. This was a cross-sectional comparative study covering the entire Makuyu Division. A sample size of 383 households, both affected and non-affected was randomly selected from the three location of Makuyu Division. Research tools used included structured interview guides administered to the households, 20 key informants interviews done to community leaders, and 7 focused group discussions conducted among 40 Community Health Workers. A combination of these enabled the collection of information on the households’ HIV/AIDS status, food security and nutrition security. Data entry and analysis was done using SPSS Version 11.50. Households that were directly affected by HIV/AIDS formed 32.1% of 383 while those not affected formed 67.9%. Only 13.3% of the households that were directly affected by HIV/AIDS were food secure as opposed to 76.4% of the unaffected households. A higher proportion (86.7%) of the households affected directly by HIV/AIDS was found to be food insecure as compared to the 23.6% of those that were not affected. A significant relationship was established between household HIV/AIDS status and food security ($\chi^2 = 129.33$, d. f = 1, P value = 0.000), AIDS – related chronic illness and food security ($\chi^2 = 67.31$, d. f = 1, p value = 0.000), AIDS related death of a household member and food security ($\chi^2 = 69.26$, d. f = 1, p value = 0.000), as well as fostering AIDS orphans and food security ($\chi^2 = 34.87$, d. f =1, p value = 0.000). This study concludes that HIV/AIDS affected food security due to reduced labour and asset base erosion among others. The study makes the following recommendations; expansion of ART to include nutrient supplementation and provision of assistance to the households affected by HIV/AIDS in kind, to improve their food and nutrition security. These recommendations can be useful to NACC, Ministry of Special Programs and the Ministry of Public Health, as well as other community-oriented Development Agencies. The community would greatly benefit from this study should the suggested recommendations in the study be fully implemented.
CHAPTER 1: INTRODUCTION

1.1 Background Information

Food security involves: (a) availability of nutritious foods; (b) reliable access to that food (through production of food; ability to purchase food; or support from safety-net programs or from other people); and (c) appropriate use of that food within the home (FAO 2007). It also encompasses the proper utilization of food in an individual including intake of the right quantity and quality. To assure a household’s food security, food needs to be locally available, accessible and affordable. Household food security is the application of this concept to the family level, with individuals within households as the focus of concern. Food insecurity on the other hand refers to limited or uncertain access to nutritious, safe foods necessary to lead a healthy lifestyle. Households that experience food insecurity have reduced quality or variety of meals and may have irregular food intake. In different communities, various factors such as soil infertility, low rainfalls, traditional beliefs and practices among others have been associated with food insecurity.

HIV/AIDS depletes both human resources and capital, leading to a reduction in land area cultivated, changes in crop patterns, decline in food yields and human nutritional status. HIV/AIDS creates significant economic stress on households and communities, affecting both nutritional status and long-term food security, the physical, social and economic access to sufficient food for a healthy and

In short–term, it impoverishes households through loss of labour in agriculture and other livelihood activities; increased cost of health care and funerals; diminished capacity to care for other vulnerable individuals; and erosion of the asset base. HIV/AIDS increases long-term vulnerability through its systemic impact on social and economic systems and institutions in hard hit countries, as it leads to adoption of irreversible coping strategies. Some of the strategies include disposal of resources such as land and domestic animals, failure to till the land or plant in good time due to sickness in the family, or complete abandonment of farming after the death of a household head who may have previously been the sole food provider in a family. Untimely death of adults suddenly cuts the household cash flow and renders the household poor. It reduces the inter-generational transfer of skills and knowledge of agriculture and livelihood while at the same time eroding the human resource base of institutions required to address the sectoral and cross-sectoral impacts of the pandemic (Save the Children, 2002). HIV/AIDS therefore reduces the availability of labour, resources, and knowledge, which in turn affect household access to food.

A significant proportion of the populations of the countries most affected by HIV/AIDS depends on agriculture for their subsistence and food security (FAO,
Since HIV/AIDS is having a dramatic impact on agricultural production and rural livelihoods, all dimensions of food security – availability, stability, access to, and utilization of food – are affected, particularly where the prevalence of HIV is high. Gross agricultural production is also affected by labour shortages. The agricultural sector has an important role to play to ensure availability and access to food, as well as to reduce rural households' vulnerability to the long-term effects of the epidemic. A successful mitigation strategy must address the diverse impacts of the HIV/AIDS epidemic ranging from illness to food insecurity. There is therefore a need to recognize and integrate the expertise and knowledge of the food security and agricultural sectors into the mainstream AIDS discourse and response, not only to assist in addressing the impacts of HIV/AIDS on the lives of people, but also to contribute towards the prevention of further transmission and future AIDS-related impacts.

The linkage between HIV/AIDS and food security is bi-directional (figure 1.1): HIV/AIDS is a determining factor of food insecurity as well as a consequence of food and nutrition insecurity (FAO, 2003). As a determining factor, HIV/AIDS related illness and consequent death renders a household vulnerable to food insecurity. As a consequence, food insecurity in turn may lead to the adoption of livelihood strategies that increase the risk of contracting HIV as well as rendering the household more and more vulnerable as the disease progresses.
It is important to recognize the relationship between HIV/AIDS and food security in order to address food emergencies among HIV/AIDS affected populations. As noted by Piot (2002), vicious synergies are at work from the individual to macroeconomic and societal levels. HIV/AIDS has significant nutrition-related implications and consequences for individuals, families, and communities. This study seeks to establish whether HIV/AIDS has affected food security in Makuyu Division.
1.2 Problem Statement

Food insecurity has been a major setback to development in Makuyu Division as noted in the Murang’a South District Strategy Reduction Plan (2001 - 2004). The most active people in agricultural production are aged between 15-49 years, the same age bracket which is vulnerable to HIV infection (NACC, 2005). According to the Murang’a South District Agricultural Office (DAO) Field Assessment (2006), approximately 58% of the residents of Mukuyu Division continually depended on relief food donation. This is a reflection of the food insecurity situation in that area. A Poverty Reduction Strategic Plan (PRSP) consultative forum identified Makuyu as one of the three divisions in Murang’a South District with persistent reliance on famine relief for basic survival, especially in times of drought (Republic of Kenya, 2001). A mid-term Evaluation of a World Vision Program in the area indicated that food insecurity was a major problem (World Vision, 2006).

The HIV prevalence in Murang’a South District was 6.9%, which was higher compared to the rest of Central province rated at 4.9% (MOH 2005). The study was done in Makuyu Division as it was the most food insecure in the entire District, so as to establish whether the HIV/AIDS burden affected food availability in households affected directly.
1.3 Justification

Kenya National HIV/AIDS Strategic Plan (KNASP) 2005/6- 2009/10 has recommended for impacts studies of HIV/AIDS on the society as a basis of addressing them. This study aimed at contributing to this purpose. As noted by David M. et al., (2004), there is need for further research to establish whether AIDS-related mortality results in severe labor constraints and increased poverty rates since this has only been an assumption in many discussions.

It aimed to highlight a new dimension in the fight against food insecurity in Makuyu Division. Identifying the specific ways in which the HIV/AIDS pandemic affects food security will form a basis for tailor-made sustainable solutions.

Food production in Makuyu Division is low with the average production falling below the expected level by at least 33% (Divisional Agricultural Office, Makuyu). Previously, the focus has been on other factors associated with this low production such as unreliable rainfall pattern, lack of inputs due to poverty and small land parcels. Thus, the compounding effect of HIV/AIDS on food security in the area has not been given sufficient prominence, hence the relevance of this study.
1.4 Research Questions

What is the association between AIDS related deaths/ chronic illness and food insecurity in a household?

1. What is the association between fostering of AIDS orphans in a household and its food security status?

2. What is the difference in food security status between HIV/AIDS affected households and those which are not?

1.5 Null hypothesis

HIV/AIDS burden does not affect food security status among households in Makuyu Division.

1.6 Objectives of the Study

The main objective of this study was to investigate the effects of HIV/AIDS burden on household food security in Makuyu Division.

Specific objectives are:
To establish the association between AIDS related death/chronic illness and household food security status.

To determine the association between the fostering of AIDS orphans in a household and its food security status.

To compare the food security status between HIV/AIDS affected households and those which are not affected.

1.7 Anticipated Output and Significance

The study was expected to clearly identify how HIV/AIDS contribute to household food security status, which translates to community food security status. This will form the basis for recommendations that are useful to policy makers in laying down strategies for sustainable solutions to food insecurity in similarly affected areas. This is required because studies have shown that donor funds account for the largest portion of HIV expenditure (Piot et al, 2002), which raises questions of sustainability and highlights the need for increased home–grown solutions. The findings will also be useful to the Maragua Divisional Agricultural office in the formulation of strategies to address the problem of food insecurity in the area. Local NGOs and CBOs concerned with issues of food insecurity in the area will find the findings and recommendations of this study useful.
1.8 The Livelihoods Conceptual Framework

HIV/AIDS, agriculture, food security, and rural poverty form a complex matrix of inter-relationships and competing forces. The success of any HIV mitigation strategy would depend upon its ability to recognize this wider environment in designing interventions. The livelihoods contextual framework (figure 2.1) presents the main factors that affect people’s livelihoods, their relative importance, and the way in which they interact to form survival strategies.

![Sustainable Livelihoods Framework](image)

**Figure 2.1 The Sustainable Livelihoods conceptual framework**


Households are seen to possess five sets of livelihood assets essential to their livelihood strategies: human capital, natural capital, financial capital, social capital
and physical capital. Utilizing these assets, households adjust to their physical, social, economic and political environments through a set of livelihood strategies designed to strengthen their well-being. The contexts in which households operate involve threats that render them vulnerable to negative livelihood outcomes. These threats can include periodic droughts, floods, pest infestations, crop and livestock shocks, economic shocks, conflict and civil unrest, as well as the illness and death of household members.

In reference to figure 1.2, HIV/AIDS represents a potentially devastating shock to the household, represented in the box, vulnerability context. The illness or death of one or more household members can affect each of the livelihood assets resulting in a reduction in the ability of the household to adjust to future shocks. This situation, combined with unfavourable structures and processes, represented to the right of the asset pentagon, could result in livelihood strategies that are not sustainable and outcomes that impact a household’s ability to respond and maintain long-term food security.
2.1 HIV / AIDS Transmission

The Human Immunodeficiency Virus (HIV), which causes Acquired Immune Deficiency Syndrome (AIDS), principally attacks T-4 lymphocytes, a vital part of the human immune system (Bartlett et al., 2001, MOH 2008). As a result, the body’s ability to resist opportunistic viral, bacterial, fungal, protozoal, and other infection is greatly weakened. HIV is transmitted sexually, through contact with contaminated blood, and from mother to child during birth or breast-feeding. Full-blown symptoms of AIDS may not develop for more than 10 years after infection and one may not even be aware of their status unless they take an HIV test. Compromised immunity, which is the worst effect of HIV infection in human body, leads to opportunistic infections and consequently death. This generally compromises the patient’s functionality as well as strains families’ resources in medical care.

2.2 Effects of HIV / AIDS on Individuals’ Nutrition

In infected individuals, HIV contributes to, and is affected by nutritional status. Consequences of HIV infection include inability to absorb nutrients from food, changes in metabolism, and reduction in food intake due HIV-related symptoms. People living with HIV/AIDS have increased nutritional requirements: up to 50% greater for protein and 15% for energy (MOH, 2006). AIDS strains already meager
diets and pushes many into a vicious circle: failure to maintain nutritional status weakens immunity and increases susceptibility to opportunistic infections, which in turn undermine nutritional status. People suffering from AIDS-linked illness have reduced capacity to participate in productive activities. Poor nutrition increases the vulnerability to and the severity of, opportunistic infections as well as reducing medication efficacy and adherence, and can accelerate the progression of disease. This progression of the disease and the worsening nutritional status reinforce each other in a series of unforeseen health complications that leads to death (Loevinsohn & Gillespie, 2003).

2.3 Direct impact on household food security

HIV/AIDS poses a direct threat to household food security as it affects the most productive household members. When a person is sick, the household not only has to manage without their labour inputs but with the loss of labour from those who have to care for the sick. A series of unpredictable economic, social and emotional problems of the household begins when the first adult in a household falls ill (Piot, 2002). There is increased spending for health care, decreased productivity and higher demands for care, all which can affect food security. Once savings are gone, the family seeks support from relatives, borrows money or sells its productive assets. One study in Uganda showed that 65 percent of the AIDS-
affected households were obliged to sell property to pay for medical care (Government of Uganda, 2003).

Frequently, children are forced to discontinue schooling, as family needs help and cannot pay school expenses. Time dedicated to childcare, hygiene, food processing and preparation is sacrificed. (Jayne et al., 2004). As more adults are infected, the effect starts to manifest at community level with food production and income dropping dramatically. This not only reduces food productivity and food availability in markets, but also makes food less affordable.

When the AIDS patient dies, expenditures are incurred for the funeral and the productive capacity of the household is reduced, particularly in our African culture. According to a study in Tanzania, funeral expenses represented about 60% of the direct cost associated with an AIDS victim (Beegle, K. 2003). Another research in Tanzania found a 15% decrease in per capita food consumption in the poorest households, following the death of an adult (Topouzis and Guerny 2002).

In the next stage, as the partner becomes sick, requiring medical attention, home-based care and other related expense, the household’s struggles only accelerates. The household is eventually reduced to impoverished elderly people and children. These individuals may have limited decision-making power and access to resources, as well as less knowledge, experience and physical strength which are
required to maintain a household. Households fostering AIDS orphans often suffer food insecurity due to the added burden in food consumption with sudden decrease income as well as food production (Yamba, 2003).

AIDS related deaths are premature hence breaking the chain of intergenerational transfer of knowledge, practices and skill in agricultural production at household level (Jayne et al, 2004). Consequently, orphaned children lack the skills to cultivate crops or tend livestock. The family is likely to switch to less labour-intensive crops and farming systems, which may reduce food availability. FAO has estimated that since 1985, in the 27 most affected countries, over 7 Million farmers have died of AIDS (Günter H. 2003). Households lose not only the income and food production of sick individuals but also the economic contribution of family members who care for them.

At macro level government expenditure increases with increased bed occupancy due to increased opportunistic infections (MOH, 2006). Frequent loan defaults as a result of illness and death reduces credit availability and use hence impacting on overall economic growth (White & Robinson, 2000).
2.4 Effects of HIV/AIDS on Food Production

HIV/AIDS is having a dramatic impact on agricultural production and rural livelihoods.

All dimensions of food security – availability, stability, access to, and utilization of food – are affected, particularly where the prevalence of HIV is high (Topouzis, 2003). Emergency situations, especially food emergencies, exacerbate the risk of HIV transmission. On small farms, cash crops may be abandoned because there is not enough labor for both cash and subsistence crops. The reported reduced cultivation of cash crops and labour intensive crops by small farmers also affect food availability at national level (Günter, 2001). On large scale, loss of seasonal workers can compromise plantation farming. At the same time, protracted morbidity and mortality of the employees have high financial and social costs for businesses, especially as skilled and experienced employees are lost.

The fall in productivity and competitiveness results in decreased employment and local economic spin-offs. Thus, at macro level HIV/ADS can affect healthy people’s livelihood, as some economic activities may no longer be viable. This impacts negatively on economic production and consequently, food security.

HIV/AIDS poses a direct threat to household food security as it affects the most productive household members. When a person is sick the household not only has to manage without their labour inputs but with the loss of labour from those who...
have to care for the sick. AIDS is characterized by recurrent periods of sickness, and so loss of labour, which eventually erodes agricultural production and food security. Much of rural agricultural production is highly labour dependent and often labour demands are concentrated in specific periods of the year. For instance, sickness or funeral attendance may mean that the planting season is missed and with it, a full crop.

2.5 Decreasing nutritional status

The natural history of untreated HIV infection is characterized by a period of time following infection with the virus during which the patient remains relatively well. The duration of this period of “clinical latency” varies between patients but on average lasts between 8-10 years from the time of infection with HIV (MOH, 2008). Despite the apparent wellness of patients during this period, there is continued HIV replication and an increasing rise in the amount of the HIV particles in the body (viral load). Persistent HIV replication results in a progressive destruction of the CD4+ T lymphocytes (CD4 cells). The viral load determines the rate of CD4 cell decline and, because of the centrality of these cells in the overall functioning of the immune system, the rate of destruction of the immune system.

It is the impairment of the immune system that results in PLHA becoming ill with repeated, more frequent and increasingly severe infections. In the early phase of
HIV disease the conditions afflicting PLHA are no different from those commonly seen in HIV-negative individuals; as the immune suppression becomes more profound, unusually severe or recurrent forms of common infections or more atypical infections and conditions, begin to present in PLHA. Many of these conditions are rarely seen in patients without HIV infection.

A balanced diet adequate in calorific (energy) requirements is essential for all individuals, including PLHA, to maintain their health and wellbeing. Malnourished individuals who become HIV-infected are more susceptible to secondary infections. Once infected, malnutrition is a risk factor for development of and increasing the severity of various illnesses including infections such as TB (MOH, 2008).

HIV/AIDS has direct impacts on nutrition of the individual, the household and the community (Günter 2003). For the individual, HIV infection, compounded by inadequate dietary intake, rapidly leads to malnutrition. PLHA have higher than normal nutritional requirements; approximately, 50 percent more protein and 10-15 percent more energy per day is needed (Academy for Educational Development, 2001). Malnutrition may hasten the onset of AIDS and ultimately death, and may increase the risk of vertical HIV transmission from mother to child (Gillespie et al., 2001). Adequate nutrition is necessary to maintain the immune system, manage opportunistic infections, optimize response to medical treatment,
sustain healthy levels of physical activity, and support optimal quality of life for a PLHA. Therefore nutritional requirements of PLHA are likely to be even higher during periods of illness. Good nutrition may contribute to slowing the progression of the disease (Castleman et al., 2004).

PLHA are more likely to have inadequate intake of food due either to illness or an inability to obtain adequate food. Their reoccurring periods of sickness strain the availability of farm labour, food production and ultimately the nutritional status of other household members.

2.6 The Situation in Africa.

In Africa, where the pandemic is currently the most serious, the impact of HIV/AIDS has been facilitated by extreme poverty, hunger, conflict, and inadequate infrastructure. Looking at the epidemic as a long wave disaster, one can distinguish four waves that follow on to each other and even overlap (Barnett, 2002). The first the wave of HIV infection, without any signs of illness. Second the wave of TB infection, despite progress in treatment of TB with DOTS, one sees an increase in TB prevalence in countries where HIV/AIDS is highly prevalent. In many of the sub-Saharan countries, it takes only 4-5 years before the third wave of full-blown AIDS illness and opportunistic infections arrives. That is the third wave. Finally, the fourth wave of impact which includes household
poverty, orphaning, and changes to farming systems, impacts the flow of
development, reduces economic growth and leads to a breakdown of formal and
informal institutions and culture.

HIV/AIDS continues to devastate the Africa Region, which has 11% of the
world’s population but 60% of the people with HIV/AIDS (WHO, 2006). A
UNAIDS report (2002) indicates that of the 5 million new infections recorded
globally in 2005, 3.2 million (64 per cent) were in sub-Saharan Africa. The vast
majority of people living with HIV/AIDS in Africa are between the ages of 15 and
49 – in the prime of their working lives (David et al., 2004). Through its impacts
on the labour force, households, and enterprises, HIV/AIDS can act as a
significant brake on economic growth and development. HIV/AIDS is the single
greatest threat to the security and development of much of Africa, making it
impossible to attain many of the globally agreed Millennium Development Goals.
More than one-third of the gross national product of the worst affected African
countries comes from agriculture (UNAIDS, 2006).

World Bank has estimated that HIV/AIDS has reduced the annual rate of Africa’s
per capita GDP growth by 0.7 percent (White, 2000). AIDS related deaths
undermine Africa’s ability to feed itself, leaving children and the elderly to work
on the land. Food insecurity is increasing in Africa, in part because of the impact
of HIV/AIDS on agricultural production. By 2000, the agricultural workforces in
12 high – prevalence African countries were between 3% and 10% smaller than
they would have been in the absence of AIDS, according to FAO estimates (2003). The loss of assets and productive workers severely affects household capacities to produce and purchase food.

Evidence from Namibia shows widespread sale and slaughter of livestock to support the sick and provide food for mourners at funerals (Engh et al., 2000). This jeopardizes the livestock industry, as well as communities’ long-term food security and survival options. In badly affected areas, many households take in sick relatives and foster orphans, which reduces the amount of food available for each household member. As a result, nutrition levels tend to drop and people’s health is compromised further. Labour-intensive farming systems with a low level of mechanization and agricultural input are particularly vulnerable to the epidemic. AIDS has killed around 7 million agricultural workers since 1985 in the 25 worst hit African countries. It is estimated that the epidemic could claim as much as 25% of the agricultural labour force in badly affected countries by 2020.

An assessment in South Africa indicates that HIV/AIDS directly contributes to, and is compounded by, food insecurity and that HIV/AIDS - food insecurity linkages may be many and long-lasting (FAO, 2003). In six countries most affected by the Southern Africa food crisis, namely Zimbabwe, Malawi, Zambia, Lesotho, Swaziland, and Mozambique about 15 Million people were identified as in need of food assistance. In the same countries, UNAIDS (2002) estimates that in 2001 close to half a million people died as a result of AIDS-related diseases,
leaving 2.5 million orphans. Examples from Tanzania and Zimbabwe, tell the story of reduced crop production and shifts to less labour-intensive cropping systems (Rugalema, 1999).

HIV and AIDS more heavily affect Sub-Saharan Africa than any other region of the world. An estimated 24.5 million people were living with HIV at the end of 2005 and approximately 2.7 million new infections occurred during that year (David et al., 2004). A study carried out in Uganda showed that food insecurity and malnutrition were foremost among the immediate problems faced by female-headed AIDS-affected households (FAO, 2003). Some studies have conjectured that HIV/AIDS is bringing about important changes in farming systems. Particular emphasis has been put on the recent shift in area cultivated from maize to roots and tubers, which has been observed in several African countries. For example, the proportion of crop area devoted to cassava and sweet potato in Malawi has risen from 4 percent to 10 percent over the past two decades. In some provinces of Zambia, Cassava production has also risen dramatically in recent years (Govereh et al., 2006).

2.7 Situation in Kenya

One of the challenges the Kenyan government faces in its endeavor to achieve eradication of poverty and hunger is the impact of HIV/AIDS on agricultural
labor and its adverse effect on agricultural productivity and production (MDG report, 2005). About 47% of the Kenyan population is food insecure without secure access to food resources to adequately meet their daily needs (MOH, 2006). At the same time, nutrition security is low with about 31% of children under five years old stunted (too short for age) and about 20% underweight. Rates of underweight and stunting are approximately 10% higher in rural areas than in urban areas. In addition, anaemia affects three out of every four children under five years; one out of every two women of reproductive age; and one man out of every five men. The high level of food insecurity is related to poverty and a reduction in agricultural production. HIV/AIDS reduces a household’s ability to produce and buy food. Adults with HIV are less able to work on their land or earn income from other activities. Increased health costs require household money that is needed for food (MOH, 2006).

According to the Kenya AIDS Indicator Survey (KAIS) (NACC and NASCOP, 2008), the overall prevalence rate for the country is estimated to be 7.8% for Kenyans ages 15-49 and 7.4% for those ages 15-64. This means that about 1.4 million Kenyan adults aged 15-64 are living with HIV. As shown in table 2.1, more women are infected with HIV (8.7%) compared to men (5.6%). The KAIS shows that 7.8% of adults age 15-49 were infected with HIV in 2007 compared to 6.7% in the 2003 KDHS. KAIS shows that urban areas have a higher HIV prevalence than rural areas. The HIV/AIDS prevalence in ages 15 -64 in urban
areas is 8.9% (10.8% and 6.2% among females and males respectively) and 7.0% in rural areas (8.7% and 5.6% among females and males respectively).

Table 2.1 HIV Prevalence by Gender in Different Places

<table>
<thead>
<tr>
<th></th>
<th>National</th>
<th>Urban</th>
<th>Rural</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Prevalence</td>
<td>7.4%</td>
<td>8.9%</td>
<td>7.0%</td>
</tr>
<tr>
<td>Male</td>
<td>5.6%</td>
<td>6.2%</td>
<td>5.6%</td>
</tr>
<tr>
<td>Female</td>
<td>8.7%</td>
<td>10.5%</td>
<td>8.7%</td>
</tr>
</tbody>
</table>

While prevalence rates remain higher in urban areas, it has risen in rural areas since 2003. Comparing the KAIS and the 2003 KDHS shows that, in urban areas, HIV prevalence among 15-49 year-olds has declined from 10.0% in 2003 to 8.4% in 2007. Conversely, among the same age group in rural areas, HIV prevalence has increased from 5.6% in 2003 to 7.4% in 2007 (Table 2.2).

Table 2.2 Changes in HIV Prevalence in age bracket

15 - 49 from 2003 to 2007

<table>
<thead>
<tr>
<th></th>
<th>National</th>
<th>Urban</th>
<th>Rural</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year 2007</td>
<td>7.8%</td>
<td>8.4%</td>
<td>7.4%</td>
</tr>
<tr>
<td>Year 2003</td>
<td>6.7%</td>
<td>10.0%</td>
<td>5.6%</td>
</tr>
</tbody>
</table>
Provinces with the highest HIV rates include Nyanza (15.3%), Nairobi (9.0%), Coast (7.9%), and Rift Valley (7.0%). Western has a prevalence of 5.1%, Eastern 4.7% and Central 3.8%. North-Eastern province has the lowest HIV prevalence with less than 1% of the population infected (Table 2.3)

Table 2.3 HIV Prevalence by Provinces

<table>
<thead>
<tr>
<th>Province</th>
<th>HIV Prevalence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nyanza</td>
<td>15.3%</td>
</tr>
<tr>
<td>Nairobi</td>
<td>9.0%</td>
</tr>
<tr>
<td>Coast</td>
<td>7.9%</td>
</tr>
<tr>
<td>Rift Valley</td>
<td>7.0%</td>
</tr>
<tr>
<td>Western</td>
<td>5.1%</td>
</tr>
<tr>
<td>Eastern</td>
<td>4.7%</td>
</tr>
<tr>
<td>Central</td>
<td>3.8%</td>
</tr>
<tr>
<td>North Eastern</td>
<td>&lt;1%</td>
</tr>
</tbody>
</table>

Since over three quarters of Kenyans (78.5%) live in rural areas, the burden of HIV (total number of people living with HIV) in rural areas remains higher than in urban areas. Among adults, the decreased average life expectancy from 57 years to 49 years has a serious implication on overall productivity. Women face
considerably higher risk of HIV infection than men, and also experience a shorter life expectancy due to HIV/AIDS (USAID, 2003). As noted in a UN special session on HIV/AIDS (UN, 2001), rural communities bear heavy burden of HIV/AIDS as many HIV/AIDS infected urban dwellers tend to return to their rural communities when they fall ill. A survey by Yamano and Jayne (2004), found that relatively poor households in rural areas do not recover quickly when the head of family dies. Over the three – year life of the survey, reduced crop production and non-farm incomes did not return to pre-death levels. There is need for further investigation on specific effects of HIV/AIDS and how each of them reduces a household’s ability to produce and buy food.

Kenya has an estimated burden of approximately a million orphans and vulnerable children (OVC) as a result of HIV/AIDS (NACC and NASCOP, 2009). The increased occurrence of opportunistic infections has resulted in 45% to 70% of beds in public hospitals being occupied by PLHA. By striking people in the prime of their working and parenting lives, AIDS hinders knowledge and expertise from being passed on to subsequent generations. A study in Kenya has shown that only 7% of farming households headed by orphans have adequate knowledge of agricultural production (Yamano, 2003).

It is worth noting that there has been no strategy in place to ensure sustainable solution to food insecurity occasioned by the HIV/AIDS pandemic. This study
contributed to impact studies recommended under mitigation of socio-economic impact of HIV/AIDS, one of the three priority areas in Kenya National HIV/AIDS strategic plan (KNASP) 2005/6-2009/10 (Republic of Kenya 2005).

2.8 Situation in Makuyu Division

Some of the major challenges to development in Murang’a South District are HIV/AIDS and poverty, characterized by food insecurity. Reliance on famine relief by 27.2% of the Murang’a South District population to top-up the little produced (Republic of Kenya 2002) due to low food production is an indicator of perennial food insecurity. District poverty assessment report (2000) shows that Makuyu Division is the hardest hit with 60% poor; the most affected being young orphans, old people, children and women. The other divisions namely Kandara, Kigumo and Maragua have 35%, 25% and 40% poor respectively.

Various strategies are in place to fight food insecurity at community level but the effect of HIV/AIDS has not been addressed. HIV/AIDS is no longer exclusively health sector issues but cuts across all sectors (O’Rourke, 2005; Smith, 2005). Its effects in Makuyu Division have been identified as increased workload for the family members caring for the sick, reduced family income, increased family stress, poor work performance leading to reduced production, increased poverty due to reduced production and increased expenditures (Maragua DDP 2002-2008).
There was a need to find out whether HIV/AIDS also affects food security, and how this happened.

2.9 Synopsis

Studies had shown that HIV/AIDS affects food security in diverse ways in different communities. Given the diversity in food production methods in all these different areas there was need to investigate at what point HIV/AIDS affects food security in Makuyu Division for more specific intervention. It was not enough to base solution to food insecurity on a study done elsewhere as it may not work effectively.
CHAPTER 3: METHODOLOGY

3.1 Study Area

The study was conducted in Makuyu Division, Murang’a South District of Central Province of Kenya (Appendix 3). The Division borders Kandara and Maragua Divisions to the west Machakos District to the East, to the north part of Maragua Division and Thika District to the south. It lies in the rural areas where, according to 1997 welfare monitoring survey done by the government of Kenya, 51% are food poor (PRSP, 2001 – 2004). According to the 1999 census, Makuyu Division has a population of 58,273 within an area of 203 square Kms. It is found in the lower zones of Murang’a South District where the extent of poverty is estimated at 75% (PRSP Consultation Report 2001 – 2004). Agriculture forms the mainstay of the Murang’a South District economy, providing employment to over 80% (Republic of Kenya, 2002).

3.2 Research design

This was a cross-sectional comparative study covering the entire Makuyu Division. Food security status of households directly affected by HIV/AIDS was compared with those not affected.
3.3 Variables

Dependent variable in the study was household food security status measured by:-

- Level of food production; This was established by finding out how much maize was produced per acre in every household studied. Since none of them attained the expected production level of 10 bags/acre, classification was done according to the number of bags produced per acre. Comparison in production was then done between households directly affected by HIV/AIDS and those not affected.

- Food composition and consumption patterns (i.e. balanced diet or not balanced); This was studied using 24 hour recall method to find out what food was consumed for one continuous week. The respondents were asked to describe in details the types of foods, drinks, and snacks prepared and consumed within the household for the past one week. This exercise was guided by the table in question 45 of interview schedule (Appendix 1). Packed lunch eaten away from home (in schools and places of work) but carried from home was also considered. The variety and quality of food consumed was used to determine nutrition security of a household.

- Food anxiety checklist; this was adopted from the United States Department for Agriculture (Bickel et al, 2000). It was included in the questionnaires to gather information on the household’s certainty of food availability. Households whose response to half of the questions indicated
anxiety in food availability were rated as food anxious. The rest were rated as not food anxious.

Independent variable was household HIV/AIDS status as determined by:-

- AIDS related death of a household head or member; This was found out by establishing from household head whether she/he had been on ART before death, with the help of CHWs who were in charge of home based care of PLHA. CHWs are area residents who have been trained by World Vision in partnership with Ministry of Health. There are at least 10 CBOs in Makuyu Division, within which these CHWs operate in training other community members.

- HIV/AIDS related illness of a household head or member; This was established by obtaining information from the patient that she/he was on ART at the time of study.

- Fostering of AIDS orphans in a household; This information was obtained by finding out if there were orphans being fostered in a household at the time of study, whose parent had died of AIDS related complications. The household head and CHWs would confirm that she/he had been on ART under their care.
3.4.1 Inclusion Criteria

Two categories of households were included in this cross-sectional study. The first category consisted of all households that were directly affected by HIV/AIDS. In this category, only those people and households whose HIV status was well known by the Community Health Workers and Home Based Caregivers were considered. These included all those affected households that were receiving their care at the time of study, 2007. No HIV tests were to be done during the research. The second one included those households within the sampling frame which were not directly affected by HIV/AIDS. The households qualified only if they had been living in the area for the last six months prior to the study, so that, in the case of farmers, they had been cultivating for at least one season.

3.4.2 Exclusion Criteria

Households, which had not lived in the area for a minimum of 6 months, were not included in the study. In the case of HIV/AIDS affected households, those whose status were not clearly known to Community Health Workers and home based care givers were not considered as affected, to avoid speculation. The same case applied to PLHA who were not on ART.
3.5.1 Study Population

The study population consisted of all the households in Makuyu Division where the study was being carried out. Makuyu Division has approximately 13,947 households according to a survey by KATSO, a project of World Vision, in collaboration with Makuyu Health Centre (Home Based Care records at Makuyu Health Centre).

3.5.2 Target Population

The target population includes rural Kenyan households which bear the burden of HIV/AIDS and experience food insecurity. At least 47% of all Kenyan households are food insecure (MOH, 2006).

3.6 Sampling techniques and Sample size

3.6.1 Sampling techniques

Multistage sampling was used to select respondents from the three locations of Makuyu Division, namely Makuyu, Kamahuha and Kambiti. Households were randomly selected from the chosen sub-locations. HIV/AIDS affected households were identified through the assistance of Community Health Workers (CHWs) and Home Based Caregivers who work within the Division. These are volunteers from various local Community Based Organizations (CBOs), trained and working with
the ministry of health, Constituency AIDS Control Council (CACC) and World Vision, Makuyu Area Development Program.

3.6.2 Sample size

Sample size was determined using the formula as used by Fisher et al (1998).

\[ n = \frac{Z^2 pq}{d^2} \]

\( Z = 1.96 \) at 95% confidence interval (C. I)
\( P = 0.47 \), the estimated percentage of population that is food insecure in Kenya (MOH, 2006), hence \( q = 1 - 0.47 = 0.53 \)
\( d = \) degree of accuracy which is 0.05

Therefore \( n = \frac{(1.96^2 \times 0.47 \times 0.53)}{0.05^2} \)
\[ = \frac{(3.8416\times0.2491)}{0.0025} \]
\[ = 382.78 \]

The study was conducted in 383 households but there was non-respondence in 9 households, occasioning analysis of results for 374 households.
3.7 Construction of research instruments

The data was collected using structured interview guides, key informers’ interview and focused group discussions. They were are designed to gather information to answer the research questions of the study.

3.7.1 Structured interview guides

These were administered to the household heads. They were objectively designed to answer questions on household income level, food security, and whether a household was directly affected by HIV/AIDS or not. Observations were made on the type of domestic animals kept. (See appendix 6.1)

3.7.2 Key Informant Interviews

These were objectively designed to gather specific ideas on the general trends of food security and HIV/AIDS in the area. They were held with government officers in the Divisional Agricultural Office and local health centre, local and administrative leaders, World Vision workers and CBO leaders. A total of twenty interviews were conducted. Divisional agricultural officers were selected because of their knowledge in food production, food security and any challenges encountered by the farmers in the area. Health workers and CACC officer were targeted due to their knowledge in matters of HIV/AIDS within the area. Local leaders were asked questions regarding the general trends of food production, food
security and HIV/AIDS burden. There was also a question on whether there was any relationship between food security and HIV/AIDS, and possible recommendations (See Appendix 6.2).

3.7.3 Focus Group Discussions (FGDs)

These mainly yielded qualitative data to support the quantitative data obtained from the Interview schedules and were conducted to the CHWs and HBCs from all the locations. They were designed to answer questions on their perception on food security in the area, HIV/AIDS as a problem facing the area residents, difference in food security between affected and non-affected households and recommendations on dealing with food insecurity.(See appendix 6.3).

3.7.4 Validity

This is the ability of a research instrument to measure precisely what it is intended to measure, to obtain the exact intended information. The supervisors thoroughly checked the research instruments and approved as fit to collect the information required to answer the research questions. The research instruments were then tested during the pilot study to find out whether they would obtain information on household food security and whether a household was directly affected by HIV/AIDS. All the questions were clearly understood by the respondents so that
they gave the required responses as intended. The research instruments were therefore found to be valid in that they were able to obtain the required information.

3.7.5 Reliability

This is the ability of an instrument to measure accurately and consistently (repeatability), obtaining the exact information from different research subjects. During the pilot study, the reliability of the research instruments was established, as there was consistence in the information obtained using them.

Appropriate measures put in place to ensure the reliability of data obtained were:-

- Scheduled interviews were conducted in the households, using the language that was well understood by the respondents. A proper introduction of the researcher was done and the purpose of the study clearly explained at the start of every session.

- Enumerators were trained to be friendly to ensure the respondents would be at ease during the interview, for maximum cooperation in giving the required information.

- The respondents were encouraged to be honest and answer all the questions to the best of their knowledge. Where necessary the Community Health Workers (CHWs) would confirm the information given from their records.
Pre-testing of the research tools was done before the actual research, in two of the sub-locations which were not to be included in the study.

Data collected was cleaned and entered at the end of every data collection session.

3.8 Data collection Techniques

Multistage sampling was used to select respondents from the three locations of Makuyu Division, namely Kamahuha, Makuyu, and Kambiti locations. Households were selected randomly from each sub-locations thus selected. Structured interview guides were administered to all the randomly selected households to obtain data on their HIV/AIDS and food security status. At least one Community Health Worker (CHW) accompanied the researcher in all households visited. Introduction of the researcher by the CHWs to the household members made it possible for those who were sick with HIV/AIDS related complications to openly disclose and discuss their status. Being on ART was used as evidence for positive HIV status. In households which had lost a member to AIDS related illnesses, respondents confirmed that the deceased had been on ART before their death.

Food production level was measured against secondary data on average food production available in the Division Agricultural Office, Makuyu. Data on
quantity and quality of meals taken per day was obtained by asking about the usual family feeding pattern.

Seven Focused Group Discussions (FGDs) were conducted among 40 Community Health Workers (CHWs) and 20 Home Based Caregivers (HBCs) who served the entire Division. To achieve this, two FGDs were conducted in each of the three sub-locations where data was collected, then one involving all CHWs and HBCs was conducted during their monthly divisional meeting. These FGDs provided information on the magnitude of effects of HIV/AIDS among the affected households as far as food security is concerned. They also elicited information on the view of the CHWs and HBCs on possible ways of addressing the plight of the affected households.

Key informant interviews were conducted among 20 key community, religious, and opinion leaders of the area. These included CACC coordinator Makuyu Division, Divisional Agricultural Officer, Divisional Home Economics Officer, five (5) CBO leaders, one (1) pastor and HIV/AIDS project coordinator at World Vision Makuyu ADP. They provided information on the perceived prevalence of HIV/AIDS among households in the area and different ways in which the pandemic affected them. Makuyu Division CACC Coordinator and the Officer in charge of VCT in Makuyu health centre particularly gave an accurate documented information on the HIV/AIDS prevalence in the area. Further information on the level of food security was obtained in the interviews as well as the possible factors
contributing to the food insecurity witnessed in the area. Being the key community leaders, they provided a lot of information on the possible ways in which the food insecurity could be addressed, especially among the HIV/AIDS affected households.

3.9 Data Analysis

Data collected was cleaned, coded and entered into the computer at the end of each data collecting session. It was stored in hard copies as well as in soft form in flash disk, CDs and hard disk to ensure none of it would be lost. Data entry was done using statistical package of social sciences (SPSS Version 11.50). Chi-square statistical test was used to test association between variables and significance of relationships. Difference in means was established using t-test. Presentation of results was done using tables and graphs. Dependent variable in the study was household food security status measured by, the level of food production, food anxiety checklist, food composition and consumption patterns (i.e. balanced diet or not balanced). Independent variable was household HIV/AIDS status as determined by the presence of AIDS related death of a household head or member, HIV/AIDS illness of a household head or member, and fostering of AIDS orphans in a household.
3.10 Ethical Considerations

Clearance for the study was obtained from Kenyatta University’s Ethics Committee. Research permit was obtained from the Ministry of Higher Education, Science and Technology. Further permission was also sought from the District Commissioner’s and the District Officer’s offices, as well as the area Chiefs. World Vision Makuyu ADP Manager gave the permission for the staff to be interviewed.

Informed consent was obtained from all the respondents as required in the Code of Research Ethics. Confidentiality was ensured in regard to any information obtained from the respondents. After the CHW introduced the researcher, he/she was not required to participate in the interview except at the request of the respondent. Any information collected remained a secret, to be used only for the purposes of the study or counseling the respondent. Any case requiring medical attention was given the appropriate advice and referred to the hospital through the Community Health Workers and Home Based Caregivers.
CHAPTER 4: RESULTS

4.1 Demographic Information

4.1.1 Family size

The findings of this study showed that the family sizes ranged from 2 to 12 members with 59 of the families (15.8%) having an average of 4 members (Table 4.1).

Table 4.1 No. of family members

<table>
<thead>
<tr>
<th>No. of family members</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>21</td>
<td>5.6</td>
</tr>
<tr>
<td>3</td>
<td>45</td>
<td>12.0</td>
</tr>
<tr>
<td>4</td>
<td>59</td>
<td>15.8</td>
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<tr>
<td>5</td>
<td>58</td>
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<tr>
<td>9</td>
<td>20</td>
<td>5.3</td>
</tr>
<tr>
<td>≥10</td>
<td>27</td>
<td>7.2</td>
</tr>
<tr>
<td>Total</td>
<td>374</td>
<td>100.0</td>
</tr>
</tbody>
</table>
There was a total of 1225 females in the study area as, forming 57.8% of the population studied. The males were 931, forming 43.2% of the study population (Figure 4.1).

![Figure 4.1 Gender Proportion](image)

**Figure 4.1 Gender Proportion**

Most of the households, 102 (27.3%) had 3 females while 6 (1.6%) of the households had 7 of them. As shown in table 4.2, in 128 (34.3%) of the households studied there were at least 2 males while 6 (1.6%) of the households had none.
Table 4.2 Gender distribution in the households

<table>
<thead>
<tr>
<th>No. of males in households</th>
<th>Frequency</th>
<th>Percentage</th>
<th>No. of females in households</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
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<tr>
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<tr>
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<tr>
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<td>3</td>
<td>0.8</td>
<td>Total</td>
<td>1225</td>
<td>100.0</td>
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<tr>
<td>Total</td>
<td>931</td>
<td>100.0</td>
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</tbody>
</table>

4.1.2. Household Head

The study revealed that 247 (66%) of the households were male-headed and 85 (22.5%) of them female-headed. It was further found out that 30 (8.0%) were headed by grandparents (most of whom were taking care of AIDS orphans whose parents had been on ART before they died). As shown on figure 4.2, 12 (3.5%) of the households were headed mainly by AIDS orphans.
Figure 4.2 Household heads

4.1.3. Adults in the family

The number of adults in a household was an important indicator of whether the number of people who were economically productive. It was found out that more than a half of the households (206, 55.1%) had at least two adult members. The study further revealed that 71 (19%) had only one adult while 4 (1.1%) of the households did not have any adult, as shown in table 4.3.
Table 4.3 Adults in the household

<table>
<thead>
<tr>
<th>No. of adults</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
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<tr>
<td>≥5</td>
<td>23</td>
<td>5.9</td>
</tr>
<tr>
<td>Total</td>
<td>374</td>
<td>100.0</td>
</tr>
</tbody>
</table>

4.1.4. Occupation and Livelihood

It was found that 121 (32.4%) of the households engaged in farming as their main occupation while 95 (25.4%) relied on casual labour for survival. Another 66 (17.6%) and 55 (14.7%) relied on business and formal employment respectively. A meager proportion of 37 (9.9%) combined farming and casual labour (figure 4.3).
Figure 4.3 Occupation

4.1.5 Household income

The finding of the study indicated that 241 (64.4%) of the household had an income of less than Ksh.100 per day while 97 (25.7%) had an income ranging from Ksh.100 to Ksh.500 per day (figure 4.4). Only 36 (9.9%) had an income of more than Ksh.500 per day, consisting mainly of those whose household heads had a formal employment.
Figure 4.4 Household income

4.1.6. Bread winner

The study revealed that 124 (33.2%) of the households had both mother and father as bread-winners. Children and grandparents constituted 14 (3.7%) and 26 (7.0%) respectively (figure 4.5).
4.2. Food Security

In this study, food security was determined using a combination of three variables namely:

- level of food production
- food anxiety checklist
- number of meals taken in a household in a day
- Nutrition security
4.2.1. Source of food

From all the households studied, 164 (43.9%) obtained food from both farming and market, while 144 (38.5%) depended on farming alone. A further while 63 (16.8%) purchased food from the local market. It was found that 3 (0.8%) of the households were not able to obtain their own food and had to beg their neighbours for food donation as shown in figure 4.6.

![Source of Food](image)

**Figure 4.6. Source of food**

The study revealed that 217 (58.0%) of the population kept domestic animals while 157 (42.0%) had none. Of those who kept animals, 34% (130) kept cows
only, 13.4% (50) kept goats only, 3.5% (14) kept chicken only, and 6.1% (13) kept a mixture of animals (Figure 4.7).

![Figure 4.7. Domestic Animals Kept](image)

### 4.2.2. Level of Food Production

The household heads were asked to indicate the amount of maize produced in the last three consecutive season. The average was computed and considered as the their level of production. Maize production was used to analyze level of food production as it is the main food crop grown in the area. The findings have been summarized in figure 4.8.
Figure 4.8. Level of food production

4.2.3 Number of meals per day

In analyzing data on the number of meals consumed per day, households were categorized as either having one, two or three meals per day. As indicated in figure 4.9, 240 (64.2%) of the households had the required three meals per day, while 29.9% (112) had two. The rest 5.9% (22) had one meal per day.

Figure 4.9. No. of meals taken in a day
4.2.4 Nutrition Security

Nutrition security refers to consumption of an adequate balanced healthy diet (consisting of carbohydrates, proteins, and vitamins) which is vital for health and survival. In this study, it was assessed by considering the households’ food intake for the past one week, which was meant to represent their food consumption habits. The variety and types of food reported to have been consumed was used to determine whether it was a balanced diet or not. A balanced diet consisted of foodstuff that provide the body with carbohydrates, proteins and vitamins (Bickel et al., 2001). Those who consumed a balanced diet in at least three meals in a day were rated as completely nutrition secure. Those who had a balanced diet in 50% or less of their meals were rated as moderately food secure. Those who did not have a balanced diet in at least 25% of their meals were considered completely nutrition insecure. The study showed that less than a half of the population, 162 (43.3%) were found to be completely nutrition insecure while 107 (28.6%) households were rated as moderately secure. Only 105 (28.1%) of all the households studied were found to be completely nutrition secure (Figure 4.10).
4.2.5 Food Anxiety

Data on food anxiety was analyzed by rating the summary of the responses given in the food anxiety section (appendix 1 questions 44 – 57). Those whose response to half of the questions indicated anxiety in household food availability were rated as food anxious. From all the households studied 157 (42.0%) were found to be food anxious while slightly over a half, 217 (58.0%) were not (figure 4.11).
4.3. Household HIV/AIDS burden

In total, 120 (32.1%) of the households were directly affected by HIV/AIDS while 254 (67.9%) were not affected (figure 4.12).
4.3.1 HIV/AIDS Related Illness

The study showed that 55 (14.7%) of all the households had at least one member chronically sick with HIV/AIDS related illness. These were on ART at the time of the study. Among the sick household members, 25 (42.6%) were the mothers and 13 (20%) fathers. Adult daughters formed 8 (14.8%) of the cases, children 3 (5.5%), and adult sons 3 (5.5%). In 3 other cases (5.5%), it was a relative of either of the parent who was being nursed within the household (figure 4.13).

![Figure 4.13 Sickness distribution](image)

4.3.1.1 Occupation of the sick person

It was observed that among the people who were ailing with AIDS related complications, 24 (45.3%) relied on farming for their livelihood, 13 (24.5%) on
casual jobs while 8 (15.7%) relied on both. Another 8 (15.7%) were business people (Figure 4.14).

![Figure 4.14 Occupation of those who were sick](image)

### 4.3.1.2 Economic Productivity and Loss of Production of the Sick Person

Economic productivity was determined by the number of days in a month that a person was able to work during the time of sickness as compared to the number of days they used to work during their moments of good health. It was found out that more than half, 33 (60%) of the sick people were working for an average of 6 days in a week before sickness. Another 19 (34.5%) worked for 5 days in a week. Only a mere 3 (5.5%) never worked as they were children. During the sickness 22 (40.1%) of the patients could not work at all, 19 (34.5%) worked for only a day while 13 (23.6%) worked for 2 days in a week. Only 1 person (1.8%) worked for 3
days in a week (figure 4.15). A comparison of the means of the number of days worked showed that the difference in economic production of the sick people before and during the sickness was statistically significant \( t = 7.71, \text{df} = 54, p\) value = 0.000). This implied that being sick contributed to reduced economic productivity.

![Figure 4.15.](image)

**Figure 4.15. Economic Productivity and Loss of Production of the Sick Person**

### 4.3.1.3 Effect of Individual Economic Productivity on Food Security

The study revealed that in 52 (94.4%) of the affected families, there was reduction in the number of days worked by the sick member, which contributed to reduced economic productivity or loss of production (Figure 4.16).
Figure 4.16 Effect of illness on individual economic productivity

The reason given for this reduction was that they could no longer work as hard or as efficiently as they did before falling sick. This and the time taken by caretakers away from their normal duties may have contributed to a reduction in food production that was recorded in 53 (96.4%) of the households with only 2 (3.6%) not having been affected (Figure 4.17).

Figure 4.17 Effect of sickness on Food production
The study moreover showed that food produced before a household member fell sick was higher than after the onset of sickness (figure 4.18). It was found out that majority of the households, 37 (67.3%), produced 2 bags per acre before sickness as compared to a meager 7 (12.7%) who produced the same during the period of sickness. It further emerged that just about a quarter, 14 (25.5%) of these affected households produced a bag of maize per acre prior to having a sick member as compared to a huge proportion of 48 (87.3%) who produced an equal amount in the time of sickness. Production of 3 bags/acre was found to have been in merely 4 (7.3%) of the households, and only before sickness struck in.

![Figure 4.18 Comparison in food production before and during the sickness](image)

**Figure 4.18 Comparison in food production before and during the sickness**

Comparison in food production before and during the sickness of a household member showed a statistically significant difference ($t = 24.86$, df = 54, p value =
0.000) implying that having a sick member of the household may have contributed to reduction in food production. The combination of loss of labour and reduced economic productivity by both the sick person and the caregiver contributed to household food insecurity among the affected households. A chi-square test revealed a significant relationship between household food insecurity and having a chronically ill member ($\chi^2 = 67.31$, d. f = 1, p value = 0.000).

4.3.1.4 Household Income

The study showed that income in the households where there was a sick person had changed as a result of the sickness. Before sickness slightly more than half, 32 (58.2%) had an income of between Ksh. 100 and 500 per day, 18 (32.7%) of them earned less than Ksh. 100 while a mere 5 (9.1%) earned above Ksh 500. During the time of sickness an overwhelming majority, 42 (76.4%) had an income of less than Ksh. 100 per day. Those earning between Ksh.100 and 500 had reduced to 12 (21.8%) with only one household having an income of above Ksh. 500 (figure 4.20).
Figure 4.19 Comparison of household income before and during the time of sickness of a household member

The average household income was found to have reduced in 53 (96.4%) of the households which had a sick member (figure 4.20). Only in a mere 2 (3.6%) of the cases had it remained the same. A comparison in average household income before and during the period of sickness revealed a significant reduction in the affected households

\[ t = 19.38, \text{ df } = 54, \text{ p value } = 0.000 \]. This implied that having a sick household member may have contributed to the reduction in household income. This was further confirmed by a chi-square test which revealed a significant relationship between household income and whether or not the household was directly affected by the pandemic or not \( \chi^2 = 19.21, \text{ df } = 2, \text{ p value } = 0.000 \). This meant that the
household income was affected by HIV/AIDS related chronic sickness and death of a adult household member.

![Figure 4.20 Effect of sickness on household income](image)

### 4.3.1.5 Home - based Care

It was observed that all the sick people had received home based care at some point during the period when they were indisposed. The study revealed that in 28 (50.9%) of the households where there was a sick person, a family member took care of him/her, while in the rest 27 (49.1%) others had volunteer Community Health Workers (CHWs) providing home based care (Figure 4.21).
In the cases where home based care was entirely being provided by a family member, 25 (89.3%) of the caregivers were female adults while 3 (10.7%) were adult men (figure 4.21).

Figure 4.21 Home Care Giver

Figure 4.22 Family members home based care givers
Economic productivity of the home-based homecare giver was found to have reduced in 27 (96.4%) of households (figure 4.2) as compared to 1 (3.6%) of the cases where it remained the same.

![Economic productivity of family member home based caregivers](image)

**Figure 4.23 Economic productivity of family member home based caregivers**

This was measured by comparing the mean number of days in a month that a caregiver worked before and during the time when he/she was taking care of the sick person. The difference in the two means was statistically significant ($t = 6.9$, $df = 27$, $p$ value $= 0.000$). This means that a caretaker spent less days in economic activities, which indicates that caring for the sick person reduced the number of caretaker’s working days, hence his/her economic productivity. A huge percentage, 26 (92.5%) of them worked for an average of 6 days per week while only 2 (7.1%) of them worked for an average of 5 days. The situation changed when they began taking care of their sick family members as seen in figure 4.23. It was found out that slightly over a half, 15 (53.6%) of them worked for an
average of 1 day per week, while a quarter, 7 (25%) were not able to work at all. There was only a mere one (3.6%) of them who worked for an average of 3 days per week.

![Graph](image)

**Figure 4.23** Comparison of home-based caretaker's productivity prior to and during the sickness

### 4.3.1.6 Medical Expenses

In all the households where there was a sick person, the family had incurred medical expenses. In 29 (52.8%) of the cases, money had been spent to cater for referral and purchase of drugs, in 7 (13.2%) on buying drugs only, in 5 (9.5%) in paying hospital bills, while 15 (24.5%) spent money on a combination expenses (figure 4.24).
4.3.1.7 Coping mechanisms

To meet the increased medical expenses, it was found out that 15 (27.3%) of the families relied on support of relatives. Those who combined disposing foodstuff and domestic animals with borrowing money formed 14 (25.5%) of households. A smaller percentage of 12 (21.8%) sold domestic animals, 8 (14.5%) sold their foodstuffs, and 10.9% (6) borrowed money (figure 4.25).
Figure 4.25 Mechanisms of Coping with Expenses

4.3.2 Death from AIDS Related Complications

Out of all the 374 households studied, 82 (21.9%) had lost at least one member to AIDS related complications as shown in figure 4.26. This was verified by the CHWs records which showed all the people they attended to, and who had been on ART before their death.
Figure 4.26. Households where a member had died of AIDS related complications

Of the households that had lost a member, nearly half, 36 (43.9%) had lost an adult daughter, 19 (23.2%) had lost a father, 12 (14.6%) a mother and 6 (7.3%) had lost both father and mother. A further 5 (6.1%) had lost an adult son, while 3.7% (3) had lost a relative who had been living with them in the time of his/her sickness (Figure 4.27).
Figure 4.27 Family Members Lost to AIDS related complications

4.3.2.1 Effect of Death on Food Production

The study found out that among the households which had lost a household member, slightly over a half, 42 (51.2%) of them produced 2 bags/acre, 36 (43.9%) produced 1 bag/acre while a mere 4 (4.9%) produced 3 bags/acre before the death (figure 4.28). After the death, an overwhelming majority of the households, 76 (92.7%), produced 1 bag/acre with only 5 (6.1%) of them producing 2 bags/acre. 1 (1.2%) of the households abandoned farming altogether after the parents died.
Figure 4.28 Comparison in household food production before and after the death of a household member

A t-test further showed a significant difference in the mean food production before and after the death of a household member ($t = 35.5$, df $= 81$, p value $= 0.000$). This indicated that household food production had reduced as a result of the death of a household member. This reduction was found to have been experienced in a huge proportion of the households, 65 (79.3%) as compared to 17 (20.7%) of the households that had not experienced any changes in food production (figure 4.29). There was a significant relationship between having lost a household member to
AIDS related sickness and food insecurity as revealed by chi-square test ($\chi^2 = 69.26$, d. f = 1, p value = 0.000).

![Figure 4.29. Effect of Death on food Production](image)

### 4.3.2.2 Reduction in Household Income

The study showed that before death slightly over a half, 42 (51.2%) of the households earned between Ksh. 100-500 per day on average while just about 28 (34.1%) of them got above Ksh. 500 per day (figure 4.30). A mere 12 (14.6%) made less than Ksh. 100 each day. The study further confirmed that after losing a family member a huge proportion, 68 (82.9%) of the households got less than Ksh. 100 per day as a meager 12 (14.2%) of them earned between Ksh. 100-500 per day. Households earning more than Ksh. 500 after losing a family member were only 2 (2.4%).
Figure 4.30 Reduction in Household income

The difference in mean household income in these two periods was found out to be statistically significant (t = 23.7, df = 81, p value = 0.000). This meant that death of a household member might have contributed to this reduction in household income.

It was found out that an overwhelming majority of the households 80 (97.6%) had experienced a gradual reduction in household income as presented in figure 4.31.
4.3.3 Fostering AIDS Orphans

The study showed that 49 (13.1%) of the households studied were fostering orphans whose parents had died of AIDS related illnesses as they had been on ART before their death. It was further observed that 41 (83.7%) of these orphans were living with their grandparents and 6 (12.2%) with other relatives. In two households (4.1%), the orphans were living with their elder brothers (figure 4.32).

Figure 4.31. Effect of AIDS related deaths on Household income

Figure 4.32. Guardians of AIDS orphans
There was a statistically significant relationship between fostering AIDS orphans and household food security ($\chi^2 = 34.87$, d. f=1, p value = 0.000). A statistically significant relationship was established between breadwinner and food security ($\chi^2 = 74.33$, df = 5, P value = 0.000), with the most food insecure households being those headed by either children or grandparents. This means that household food security was also determined by who the head was so that this in turn affected the economic activities in which they were likely to engage.

4.4. HIV/AIDS and Food Security

A comparison between households that were directly affected by HIV/AIDS and those not affected was done in food anxiety, nutrition security and overall food security.

4.4.1 Comparison in Food Anxiety

Households directly affected by HIV/AIDS formed 62.4% of those who were food anxious as compared to 37.6% of food anxious households not affected. Among those households found not to be food anxious, 89.9% of them were not directly affected by HIV/AIDS as compared to a mere 10.1% of affected ones (figure 4.33).
Figure 4.33 Food anxiety Comparison

It was further established that there was a significant relationship between food anxiety and whether or not a household was directly affected by HIV/AIDS ($\chi^2 = 114.3$, df = 1, p value = 0.000). This meant that being directly affected by HIV/AIDS affected household food security status.

4.4.2 Comparison in Nutrition Security

Chi-square test revealed a significant relationship between number of meals taken per day and the household being directly affected by HIV/AIDS ($\chi^2 = 69.43$, d. f = 2, p value = 0.000). This meant that household HIV status affected the number of meals a household could afford. There was also a significant relationship between
household nutrition security and whether or not it was directly affected by HIV/AIDS ($\chi^2 = 90.17$, d. f = 2, p value = 0.000), indicating that the effects of HIV/AIDS contributed to household nutrition status. A further comparison between the households affected directly by HIV/AIDS and those not affected showed that the former were more nutrition insecure (figure 4.34).

![Nutrition Security Comparison](image)

**Figure 4.34. Nutrition Security Comparison**

Number and type of domestic animals kept was considered to imply that their products, if consumed within the family, may have added to the households’ nutrition intake. Households affected by HIV/AIDS seemed to have fewer domestic animals as medical expenses had eroded the asset base (figure 4.35).
A chi-square test further revealed a statistically significant relationship between domestic animals kept and whether or not a household was directly affected by HIV/AIDS ($\chi^2 = 15.60$, df = 4, p value = 0.004). This meant that those households directly affected by HIV/AIDS were less likely to easily obtain animal products. At the same time it is a reflection of erosion of asset base characterizing affected households due to medical expenses.
4.4.3 Comparison in food security

It was noted that 76.4% (194) of the unaffected households were food secure as contrasted with 13.3% (16) of the households directly affected by HIV/AIDS. As seen in figure 4.3, 86.7% (104) of the households affected directly by HIV/AIDS were found to be food insecure as compared to the 23.6% (60) not affected.

![Figure 4.3. Comparison of food security between directly affected and unaffected Households](image)

There was a strong relationship between HIV/AIDS affected households and food security, \( \chi^2 = 129.33, \text{ df } = 1, \text{ P value } = 0.000 \) with the HIV/AIDS affected households having higher percentage of food insecurity than the unaffected ones.
Other factors that were found to have generally contributed to food insecurity in the area included unreliable rainfall pattern, small portions of land, and failure to embrace technologically advanced farming methods such as irrigation. Poor use or lack of farm inputs such as fertilizers coupled with failure to use certified seeds was found to worsen the situation. The Divisional Agricultural officer cited lack of funds and transport facilitation as limiting the provision of services of Agricultural Extension Workers to the farmers. All these notwithstanding, households directly affected by HIV/AIDS were found to be more food insecure than the others as the disease complicated the situation further.
5. CHAPTER 5: DISCUSSION, CONCLUSION, AND RECOMMENDATIONS

5.1 Discussion

The purpose of the study was to find out the effects of HIV/AIDS on household food security in Makuyu Division, by comparing households directly affected by the pandemic and those not affected. The need to carry out this study was based on an anthropological approach to human life where it is seen as one whole consisting of different aspects that are all inter-related. These aspects include economic, social, political and belief systems, physical environment and human behaviour. None of the them may be considered entirely on its own or in isolation to others, as they all affect and depend on one another. HIV/AIDS is mostly contracted and transmitted because of human behaviour, but its effects on the health cause reduced economic productivity while at the same time straining the family resources, resulting in household food insecurity.

Affected households consisted of those which either had a member chronically sick with AIDS related illnesses, had lost a member due to AIDS related complications or were fostering AIDS orphans. Only the people on ART during the time of study were considered as sick. As for those who had died of AIDS related ailments, household members confirmed that they had been on ART in their time of sickness and CHWs verified that they had been under their care in the
Home-based care program. Food security in this study meant accessibility of adequate nutritious food, assured ability to purchase enough for the household and stability in food production. It was measured using three parameters namely level of food production, nutrition security and food anxiety checklist.

The number of household member ranged between 2 to 12 members, majority (59%) of the households having 4. Most of those with more than 6 members had other relatives living with them, and not just the children born in those families. This denotes a trend of the modern day homes where family planning has been embraced. Most of the households (66%) were male-headed, but 8% and 3.5% of them were headed by grandparents and orphans respectively. This is especially because the real parents of the children in these households were said to have been on ART before their death, implying that these were AIDS orphans.

It has been demonstrated that (32.4%) of the study subjects depended on farming as their main source of livelihood with a further 9.9% combining it with casual labour. In terms of source of food, 38.5% of the study population relied on farming alone, 43.9% combined farming and buying food. This forms 82.4% of the population, whose main source of food is farming, qualifying it as the backbone of food security in Makuyu. This is no wonder, as 70% of African populations are known to engage in agriculture (Liere, 2002). This implies that any interference with people’s ability to engage in agricultural activities would have a direct impact on the area’s food security and ultimately their health.
The study showed that 14.7% of all the households had at least one member chronically sick with HIV/AIDS related illness. A further 21.9% of them had lost at least a household member to AIDS related complications, 13.1% were fostering AIDS orphans while AIDS orphans headed 2.7%. All these formed 32.1% of the studied population. These figures consists of only those people whose statuses were well known by the CHWs, meaning there could have been more who were and are still silent for fear of stigmatization. Worse still, it is likely many others did not yet know their statuses, going by the recent submission by KAIS report that out of the 1.4 million Kenyans living with the HIV, 80% do not know their statuses (NACC and NASCOP, 2008).

The research findings revealed the level of food production to be lower than expected by at least 33% according to the Divisional Agricultural Office’s statistics. None of the households studied has been able to produce up to the expected levels of 25 of maize per acre. However, a comparison between the affected households and those not affected showed that food production was much lower in the former. The significant relationship between food security and whether or not a household was directly affected ($\chi^2 = 15.79$, df = 3, p value = 0.001) meant that the effects of the pandemic may have affected household food security. This means that the effect of HIV/AIDS in a household contributed to reduced food production hence food insecurity. The study identified several
factors as the reasons for this decrease in food production households directly affected.

Firstly, among the households where there was a sick member, productivity of the sick person was found to have reduced \( (t = 7.71, \ df = 54, \ p \ value = 0.000) \). This in turn lowered their input in household food production especially given that 44.2% of all the sick people were farmers. At the same time productivity of the family members who took care of the sick was decreased \( (t = 6.9, \ df = 27, \ p \ value = 0.000) \) further lowering the level of food production. This agrees with a household study in Tanzania on impact of HIV/AIDS on food security, which found a clear difference in food sufficiency and food consumption between households with and without a chronically ill member (TENESA 2002).

In some households, farming had been totally neglected in favor of casual jobs in an attempt to get quick money to cater for medical expenses, a step which grossly reduces food production. Information gathered from the Focused Group Discussions with the home based caregivers (HBCs) indicated that these changes contributed highly to food insecurity among these households. A similar study in South Africa revealed that such households experienced a reduction in quality of labour, and generally tended to rely more on low-value-added economic activities (such as casual labour and natural resource extraction) compared to non-affected households (Ngwira et al., 2001).
Secondly, loss of a household member to AIDS related difficulties was found to have contributed to the reduction in food production in 79.3% of all the households affected (t = 35.5, df = 81, p value = 0.000). This was partly as a result of drastic reduction of agricultural labour, especially in cases where the deceased was the household head or one who contributed significantly to food production. In some cases, farming had been abandoned altogether following the death of parents, as the people who were left behind turned to casual labour survival. The findings concurs with a study in three districts in Central Malawi (Shah et al., 2001) which found that the loss of adult labour leads to a suite of changes in affected households’ use of land and other resources.

In other cases, a gradual reduction in food production since the time of sickness contributed to food insecurity especially where the deceased was a household head or an adult. For example, where an adult son or daughter had supported the household with farm inputs or labour prior to his/her sickness, the loss experienced as a result of his death was only a continuation of what had began at the onset of sickness. AIDS related death of a household member affects food security due to the gradual erosion of resources in the time of sickness prior to the death (Gillispie and Kadiyala 2005). By contrast, where food was obtained from the market,
sickness or death of a breadwinner was found to reduce its affordability hence resulting in household food insecurity.

In some other situations, it was found out that there had been job specialization with the mother or the father being the only one endowed with proper farming skills. After her/his demise, food production was hampered in that farming would be abandoned altogether or reduced significantly. Should the surviving spouse also be ailing, the situation would only become worse.

Thirdly, AIDS orphans-headed households were particularly food insecure as a result of loss of intergenerational transfer of agricultural skills leading to low food production with no other form of supplementation. A strong relationship was established between breadwinner and food security ($\chi^2 = 74.33$, df = 5, P value = 0.000) with more vulnerable households being those with a grandparent or child for breadwinner.

Food insecurity was also evident in households headed by old grandparents fostering AIDS orphans without any external assistance. There was a statistically significant relationship between fostering AIDS orphans and household food security ($\chi^2 = 34.87$, df=1, p value = 0.000). This meant that fostering AIDS orphans may have contributed to household food insecurity. This in a few cases was as a result of loss of labour, farm input, or food, which the real parent of the orphan used to provide while she/he was still alive and strong. In other cases it was
due to low productivity of the grandparents as a result of their age. Other households experienced food insecurity because of addition in the number of consumers with no addition in food supplies. This is reflected in a study by Yamba (2006) which highlights malnourishment among AIDS orphans due to household food insecurity.

Taking care of AIDS orphans was found to be a major challenge to the community as most households lacked the social stamina of extended family. Grandparents who were fostering these orphans admitted struggling to feed these children and meeting their other basic needs, as there was no external support to this end. A few confided that they had benefited from the World Vision program which provided school uniforms to the orphans, but no help from the larger community. Among the 12 (3.5%) households headed by orphans, the situation was worse as they found themselves torn between looking for food and trying to acquire education. They too lamented of the aloofness of the larger community in responding to their plight.

A significant relationship was established between household income and HIV status ($\chi^2 =19.21$, do = 2, p value = 0.000). This means that HIV/AIDS affected household income and consequently it capability to acquire sufficient food, hence decreasing it food security. This situation was occasioned partly by the reduced economic productivity of the sick persons ($t = 7.71$, df = 54, p value = 0.000) and
that of their family member home-based caregivers (t = 6.9, df = 27, p value = 0.000). The mechanisms adapted by different households to cope with the medical expenses further deteriorated the food security status in the area. They included disposal of domestic animals and food stuffs, borrowing money or seeking assistance from relatives. These coping mechanisms left these households poorer and more food insecure. As indicated in a research in South Africa, such coping mechanisms damage households’ resilience to other future shocks, increasing their likelihood to spiral into increased poverty (Ngwira et al., 2001).

Another way in which AIDS related illnesses were found to contribute to food insecurity was by straining the household income and diverting it to non-food items such as medication and other amenities needed by the patients. Death of a household member (especially a household head) drastically cut the flow of the household income (t = 23.7, df = 81, p value = 0.000) while at the same time exerting sudden financial pressure in terms of funeral expenses. This contributed to household food insecurity by reducing its food purchasing power.

Nutrition insecurity was found in nearly half of the study population (43.3%) but more serious among the HIV/AIDS affected households. Chi-square revealed a significant relationship between nutrition security and the household HIV/AIDS status ($\chi^2 = 90.17$, d. f = 2, p value = 0.000). This meant that direct effects of
HIV/AIDS on households affected their nutrition security. This was found to be as a result of three reasons:

Firstly, reduced food production due to AIDS related sickness or death also meant reduction in varieties of food available for family consumption. Therefore, their diets lacked in certain nutrients. Secondly, with the disposal of domestic animals to meet the increased medical expenses, availability of animal products such as eggs, meat and milk in the family diet was reduced. Finally, with a strained household economic status, purchasing nutritious foodstuff that would supplement the ones available was difficult.

Successful efforts to improve the food security and livelihoods of families should reduce the probability of HIV infection, slow the progression of HIV to AIDS and increase the resilience of households trying to recover from HIV-related illness and death. Proper nutritional support can speed recuperation from HIV-related infections, and allow people living with HIV/AIDS to participate directly in their own care. Efforts to reduce the rate of HIV infection in adults and children should, if successful – have a positive impact on people’s food security (Liere, 2002).

According to the national guidelines for HIV/AIDS and nutrition (MOH 2006), the nutritional needs of PLHA are much higher as compared to that of other people. This means that nutrition insecurity in households where they are living is
likely to compromise their life quality. Bota et al., (2001) associates nutrition insecurity among households affected by HIV/AIDS to their inability to grow labor-intensive crops thus compromising on the variety of food available. For those who rely on market for food, their nutrition security depends on their food purchasing power which is often interfered by their inconsistency in economic production, being dictated by their ill health.

The study further showed a particular demographic trend in HIV/AIDS infection where mothers formed 45.5% of those who were chronically sick. This is the same group of people who form the backbone of any economy in terms of labour supply, according to WHO (2006). This was seen to be a major link between HIV/AIDS and food security in that the effect of the interference of their economic productivity by the pandemic directly influenced food production.

Apart from contributing to food and nutrition insecurity, the study revealed other aspects of HIV/AIDS. Medical expenses were found to be burden the affected households to a great extent. According to the CHWs, once a person tested HIV positive, they were supposed to start using ARVS that are only obtained at the Maragua District Hospital, approximately 40 Kms from Makuyu. Travel expenses in some cases were too high for the patients to afford, and some of them nearly gave up safe for the assistance from the CHWs. For those who required constant medical attention, the financial challenge was even bigger thus discouraging many
from seeking medication in good time. Referral expenses, purchasing drugs and paying medical bills was an uphill task for most of the households affected, not to mention the food and nutritional requirement that should go with the medication. Those respondents interrogated on this matter expressed a dire need for support to make life easier.

5.2 Conclusions

The households which were directly affected by HIV/AIDS were found to be more food insecure than those not affected. Therefore, it is clear that HIV/AIDS has contributed to food insecurity in the affected households. Household food security is important as it eventually define community food security and consequently health. Nutrition security is equally important as it determines productivity and eventually food security. From the research findings, the following conclusions have been made:

1. The burden of caring for a household member chronically ill with AIDS related complications or losing one due to AIDS related cause was found to contribute to food insecurity.

2. HIV/AIDS was found to have contributed to household food insecurity in many ways. In households where a member is chronically ill with
HIV/AIDS, not only was food production lowered but also most of the resources tended to be directed towards medical (referral and drugs) expenses and caring for the patients. This is especially because the local Health Centre did not provide adequate medication such ARVs and other essential drugs needed by those suffering from AIDS – related illnesses. Erosion of family resources that would have otherwise enhanced resilience was found in 72.7% of the households studied, hence compromising food security. Gradual erosion of productive assets coupled with reduced productivity was found to be responsible for the impoverishment of households which had lost at least a member to AIDS related complications.

3. The burden of taking care of AIDS orphans poses a perpetual threat to food security as it was found to contribute to this problem in 84% of the households fostering orphans and 90% of those where the orphans lived on their own. It was found out that 13.1% of the population is orphaned, with 95.9% living with grandparents or relatives, and 4.1% on their own.

4. Nutrition insecurity was found to be higher among households directly affected by HIV/AIDS as only 1.3% of them were completely nutrition secure as compared to 26.8% of those who were not directly affected.
Nutrition security is key in enhancing economic productivity of PLHA as malnutrition can aggravate the effects of HIV and hasten AIDS-related illnesses in them.

5. It was observed that unlike many areas in the rural Kenya, Makuyu Division has enjoyed the services of development agencies such as World Vision for more than 10 years. This in conjunction with the government has facilitated the formation of CBOs, and quality training of community members to take up roles, which would have otherwise required specialized skills to accomplish. The community in general has a potential to develop and take a front line to fight the very challenges it is facing and much more.
5.3 Recommendations

The following recommendations were made from the study:

1. CACC should work more closely with the CHWs to create more awareness to the Makuyu population about the need to test and know their HIV status early enough for one to proper medication in good time so as to remain strong and economically productive for longer.

2. The government should endeavor to avail and provide free medical services to PLHA. Local government health facilities should be equipped with the necessary medication including all ARVs regiment to cater for the PLHA.

3. Some of the funds channeled through CACC to households affected by HIV/AIDS should be given in kind, in form of farm inputs, certified seeds, and fortified seeds to improve their food and nutrition security.

4. To address the plight of AIDS orphans, the Ministry of Special Programs and other development agencies should use existing CBOs as entry points for establishing community health insurance funds or social funds to provide care and support to orphans and other children made vulnerable by AIDS.
5. To enhance nutrition security of PLHA, NACC should expand ART to include nutritional supplementation as it has been found to enable PLHA live a near normal life (Edstrom (2007). Nutrition education should also be incorporated in CACC programs and channeled to the community through the existing CBOs.

5.4 Area of further research

There is need for further research to identify the factors contributing to the spread of HIV/AIDS in the area, and possible measures that could be taken to fight it. More light should also be shed on other areas in which the disease affects the households and the community at large, in order to have them addressed more specifically.
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APPENDICES

APPENDIX 1  DATA COLLECTION TOOLS

HOUSEHOLDS’ QUESTIONS SCHEDULE

INTRODUCTION

My name is Mary Wangui from Kenyatta University. I am conducting a research on effect of HIV/AIDS on food security in Makuyu Division for academic purposes. Any information obtained from this study will be handled in confidence and will only be used for the above stated purpose. With your verbal consent I am going to ask you the following questions, and request that you respond as sincerely as possible.

INSTRUCTIONS

All questions will be directed to the household head or any other available adult.

SECTION A: SOCIAL – DEMOGRAPHIC INFORMATION

1. How many members are there in this household? ______________________
   a. How many among them are children? ______________________
   b. How many are adults? ______________________
   c. What are their occupations? ______________________

2. Who is the household(s) head in this family? ______________________
3. Who is the breadwinner in this household? __________________________

4. What is the household daily income? Choose one (1). Less than Ksh.100 (2).

5. What type of house are you living in? Rented_____ Own ____ Other_______

SECTION B: HOUSEHOLD HIV/AIDS BURDEN

6. Is there any household member chronically ill with HIV/AIDS complications?
   Yes _____ No ______ (Not to be asked directly)
   If yes, who is it? Father ___ Mother ___ adult ___ child ___ other_______

7. What is his/her occupation? ________________________________

8. For how long has she/he been sick? ____________________________

9. Are there notable changes in the number of days worked before and during the time of sickness?
   Explain specifically ________________________________

10. Has being sick affected their economic production? Yes ___ No ___
    If yes, how? Explain ________________________________

11. Has this affected household income? Yes ____ No _____
    How? Remained the same_____ Reduced _____ Increased _______

12. Explain the reasons for the changes observed____________
    ________________________________
    ________________________________
    ________________________________

13. Does having a sick person affect food production? Yes _____No _____

14. If yes, how? Reduced ____ Increased _____
Explain reasons for your answer ________________________________________

15. Does the sick receive home based care? Yes _____ No _______

If yes, from whom? ________________________________________________

(Church, World vision trained staff, family member)

16. Who among the family members takes care of him/her? ______________

17. How does this caretaker manage his/her economic activity while still taking care of the sick? _________________________________________

(Forfeiting, delegating duty, working overtime, engaging children, hiring)

18. How has this affected household income? Remained the same _____ Reduced _______ increased ________

Give specific changes experienced ________________________________________

19. Have you as a family incurred any health expenses? Yes ____ No _____

If yes, how? ______________________________________________________

(Referrals, hospital bill, buying drugs, food supplement, paying caretaker)

20. What coping mechanisms have you taken as a family to meet these health expenses? _____________________________________________

(sold household assets, sold foodstuffs, borrowed money, assistance from relatives, abandoned treatment, liquidation of investment, fundraising)

21. Have you lost a household member to AIDS related complications? Yes ____

No ___ If yes, whom? __________________________

22. Did this affect food production in any way? Yes _______ No _____
If yes, how? Reduced ____ Increased

Briefly explain the reasons ________________________________

23. What has the family done to cope with the demise? __________________________

24. Did the death affect household economic status? Yes _____ No _____

25. If yes, how? Remained the same____ Reduced ____ Increased ______

   Explain the reasons for your answer ______________________________________

26. How did you meet funeral expenses? ___________________ (well

   wishers’ contribution, family raised funds, others)

27. How did this affect family economic status? Remained the same ____
   decreased ____ increased _____

28. Are you fostering AIDS orphans in this household? Yes ____ No _____

29. If yes, how many ______________________________

30. How are they related to you? ________________________________

31. For how long have they been under your care? _________________

32. Since adopting them, what changes have you observed in household food
   availability? Remained the same ____ Reduced ____ Increased _____

   Explain ____________________________________________________________

SECTION C: FOOD SECURITY

33. Where do you obtain your food? Farm___ Market__ Donation____ food for
   work_____ others_____________________________________________________

34. If farming, what crops do you grow? ________________________________
35. How much maize did you produce during the last 2 seasons? ______
________________________________________

36. Did you use Manure ____ Fertilizer____ Organic manure____ Nothing ____

37. If nothing, explain why _________________________________

38. What is the size of the land? ____________ Own____ leased ______

39. Do you buy other foodstuffs to substitute what you produce? Yes ___ No __
   If yes, what type of foodstuff do you buy and in what amounts? ______
   (Maize, beans, maize flour, wheat flour, rice, oils, vegetables, peas)

40. Have you received relief donation food in the last 1 year? Yes __ No __

41. If yes, what type _________________________________ and how much _________________________________

42. What criteria was being used to choose beneficiaries? _________________

43. How many meals do you, as a family get in a day? 1____ 2 _____ 3 ______
   other (explain) __________________________

**Nutritional Security Checklist**

44. Mention the foodstuffs consumed in this home for the last 24 hours:
   
   a) Maize, other cereals, ugali, bread, potatoes, arrowroots, rice, chapatti
   
   b) Beans, peas, meat, fish, chicken, pork, milk, soya, amaranth flour,
   
   c) Green leafy vegetables, fruits, carrots, other vegetables

45. What type of meals have you prepared in the last 1 week?
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a) Maize, other cereals, ugali, bread, potatoes, arrowroots, rice, chapatti
b) Beans, peas, meat, fish, chicken, pork, milk, soya, amaranth flour,
c) Green leafy vegetables, fruits, carrots, other vegetables
d) porridge (specify contents), tea, coffee, milk, tea without milk,

Summary: Nutritional secure ________, Nutritional insecure __________

**Food anxiety check list (For the last 6 months).**

46. I worry whether our food will run out before we get more food. Often ________ Rarely ________ Never ________

47. The food we produced is not enough to take us to the next season. Often ___ Rarely _____ Never _______

48. The food that we bought just did not last and we did not have money to get more. Often ________ Rarely ___ Never ________

49. We cannot afford to eat balanced diet. Often ________ rarely ____ Never ________

50. We have a variety of foodstuff to choose from for our daily consumption. Often__________ Rarely ________ Never ________
51. Children were hungry but did not eat because the food was not enough. Often _____ Rarely _____ Never ____________

52. Children skip meals for lack of food. Often _____ Rarely _____ Never ______

53. Children go without a meal for a whole day for lack of food. Often _______rarely _____ Never_______

54. Adults were hungry but did not eat for lack of food.
   Often ____ Rarely ____ Never ______

55. Adults cut the size of their meals because food was not enough.
   Often _____ Rarely _________ Never ____________________

56. Adults skip a meal because there is no enough food.
   Often __________ Rarely ___________ Never _______________

57. Adults go without meals for a whole day because food is not enough.
   Often _______ Rarely ______ Never _________

Summary: Food anxious ____________ Not food anxious ____________

OBSERVATIONS TO BE MADE

1. What type of a house

2. The condition of the house

3. The type of animals kept

4. Any signs of acute malnutrition such as anaemia, wasting, stunting

Action taken such as referrals, counseling, advice.
KEY INFORMERS INTERVIEW

Key informers were;

i) Divisional Agricultural Officer

ii) Divisional Home Economics Officer

iii) Pastor

iv) Makuyu CACC coordinator

v) Makuyu Division Community Development Assistant

vi) Officer in charge of VCT Makuyu Health Centre

vii) Public Health Officer, Makuyu Division

viii) Gakungu Afya Bora CBO Chairman

ix) 4 World Vision Community Development Motivators

x) 5 Board of Trustee members

xi) World Vision manager, Makuyu ADP

xii) HIV/AIDS Project Co-coordinator Makuyu World Vision ADP

xiii) Officer in charge of VCT Makuyu Health Centre

1. What can you comment on the HIV/AIDS prevalence in this area?

__________________________________________________________________________

2. In your opinion, is food security a problem in this area?

Yes_______________  No  _______________

If yes, explain your answer _____________________________________________________________________

3. What is the food production trend in the division? __________________
4. How does that trend relate with HIV/AIDS prevalence over the years?

5. Do you think HIV/AIDS burden affects household food production security? Yes_______ No ______

Explain______________________________________________________________

6. How would you compare food security among households affected by HIV/AIDS and those not affected?

7. What reasons can you give for this comparison?

8. How does HIV/AIDS burden affect food security in this area? ______

9. What would you suggest as possible solution to this problem?

FOCUSED GROUP DISCUSSIONS AMONG 40 COMMUNITY HEALTH WORKERS

1. What are the common health problems encountered in this area?

2. What would you comment on HIV/AIDS as a health problem in this area?
3. What services do you offer to the affected households? _______________
________________________________________

4. How is the food security status among households in this area?
___________________________________________

5. Is there any difference between households affected by HIV/AIDS and those which are not, as far as food security is concerned? ______________
Explain your answer ___________________________________________
What would you say is the reason for this difference? ______________

6. What measures would you recommend to address the problem of food insecurity? ____________________________
APPENDIX 2 MAP OF MAKUYU DIVISION