IMPLICATIONS OF HIV/AIDS ON RURAL LIVELIHOODS IN TANZANIA: THE CASE OF RUNGWE DISTRICT[1]

By

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1. INTRODUCTION

HIV/AIDS is unequivocally the most devastating disease we have ever faced, and it will get worse before it gets better. The scale of the epidemic is enormous, turning back the clock on development. HIV/AIDS is now the number one overall cause of death in Africa, accounting for more than 6 percent of the disease burden in some cities and the fourth greatest cause of death worldwide (Barnett, *et al*., 2000; World Bank, 2000). The epidemic is stretching the capacity of social safety nets to the limit in many developing countries. It strikes the most economically productive members of the society, the young adults, especially women who account for more than 70% of the agricultural labor force and more than 80% of food production (Lamptey, *et al*, 2002; World Bank, 2000; FAO, 2001; Bollinger *et al*, 1999).

The HIV/AIDS pandemic has caused an increased in the number of orphan-headed households and puts pressure on grandparents who struggle to care for their numerous grandchildren (ESRF, 2002; World Bank, 2000). The increasing number of children, female and elderly-headed households is creating a new social system with inherent problems that societies have yet to address (World Bank, 2000). There is also an increase in the number of marginalized people living with HIV/AIDS who have no place to turn to for support (ESRF, 2002; Cogneau and Grimm, 2002; FAO, 1997).

HIV/AIDS has changed the perception of peoples' minds, as originally the epidemic has been considered as an urban problem. In recent years, HIV/AIDS prevalence continues to spread in rural areas at an alarming speed, due to migration patterns, trade, and other rural-urban linkages (White and Robinson, 2000; FAO and UNAIDS, 1999; FAO, 1997). For example a survey conducted in Tamil Nadu in India in 1999 found that 2.1% of the adult population in rural areas had HIV as opposed to 0.7% in urban areas. A similar observation can be found in some Southern African countries like Swaziland, South Africa, Zimbabwe and Botswana. In Zimbabwe for instance, there is little difference in HIV prevalence rates between rural and urban areas among the pregnant women (about 50%) who attended antenatal clinics in 1999 (FAO and

UNAIDS, 1999). In rural Tanzania, the infection rate ranges between 5-30% (National AIDS Control Program, 2000; World Bank, 2000). The growing rate of HIV/AIDS epidemic in rural area is posing serious impediments to development of developing countries. More than 80% of the population lives in rural areas, providing labor force in agriculture, the back borne of the economy, which contributes more than 50% to GDP and over 60% of exports. Therefore, the spread of HIV/AIDS in rural areas will have a large impact at national level.

The misconception of HIV/AIDS as an urban problem has resulted into little efforts to contain its spread in rural areas (FAO and UNAIDS, 1999). Failure of the recognition of HIV/AIDS as a rural problem has resulted in little research conducted to assess the implications of HIV/AIDS on rural livelihoods. The few studies that exist have several limitations. First, there is limited baseline data and empirical analysis on implications of HIV/AIDS on rural livelihoods. Also very little research has been conducted to identify and analyze effective coping mechanisms at the household and community level (White and Robinson, 2000; Mutangandura *et al.*, 1999; Topouzis, 2000; Scicchitano and Whitlock, 2002). As a result information required for the design of rural livelihood programs is missing or inadequate.

Secondly, the existing studies are location-specific and limited to small areas, such as a single village, and emphasize the household as analytical units. For example in Tanzania most of the studies were conducted in villages in the northern western part of the country (Kagera region). Very few similar studies, if any, have been undertaken in the Southern Highlands, where the HIV/AIDS prevalence rate is more than 10%. Generalizing and extrapolating findings from these studies can be misleading and contribute to formulating inappropriate policies and programs for poverty reduction and containing the spread of HIV/AIDS. This is because social-cultural factors have important impacts on the ways in which HIV/AIDS affects communities (FOA, 1997; Topouzis, 2000). The epidemic is likely to affect all segments of the population either directly or indirectly rather than affecting one particular group. In addition, given that HIV/AIDS has a systemic and dynamic nature it is important that studies of this nature should be disaggregated

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into spatial and temporal dimensions in order to monitor and update impacts of HIV/AIDS at the household and community level over time. Poverty reduction strategies and livelihood enhancing policies and programs need to reflect the systemic effects of HIV/AIDS across population groups as well as the entire community (Topouzis, 2000; FAO and UNAIDS, 1999).

This paper is an attempt to contribute to the literature using information from a survey of households in three villages of Rungwe district in Tanzania. The paper addresses three questions: what are the implications of HIV/AIDS on rural livelihoods as it decimates the most productive elements of the population? What strategies do households and the community use to cope with the effects of HIV/AIDS? What are the responses by government and non-governmental institutions to the AIDS epidemic and how effective are these policies? A logistic regression model is used to examine the factors that cause households to become poor, with an emphasis on the role of HIV/AIDS. The empirical question is the following: does HIV/AIDS increase household's likelihood of falling below the poverty line? The findings from this paper has the potential of assisting policy-makers in integrating HIV/AIDS into core poverty reduction strategies, especially agricultural and rural development programs.

2.   IMPACTS OF HIV/AIDS: LITERATURE REVIEW

HIV/AIDS has substantial economic and social impacts on the affected communities. Economic impact occurs when there is a diversion of resources to other uses that would not have been necessary in the absence of HIV/AIDS, and also when production declines due to the disease. The social impact may be defined as any sudden shock or slow-acting and cumulative series of events that disrupts existing systems of social support (UNAIDS, 2000a). The social and economic impacts of HIV/AIDS are transmitted through intermediary economic and social variables which affect households and sectoral economic and social conditions. The aggregate households and sectoral economic and social impacts of HIV/AIDS are ultimately reflected in the national economic performance as well as the overall development of the country.

The impact of HIV/AIDS takes several forms, at the household, community and national level. It stands out among contemporary fatal infectious human diseases and pervades all socioeconomic classes. HIV/AIDS affects Household, children, and community in several ways as illustrated in Table 1. They suffer loss of productive labor, loss of income, loss of food reserves, savings and assets which are diverted to meet health care and funeral costs. Additionally, educational opportunities are reduced as children are withdrawn from school to care for sick or to do odd jobs for extra income. Reduced levels of nutrition have been found in poor households. Labor may be diverted from economically productive activities such as paid employment or cash-crop production to care for the sick individual. Money is needed for medication and to pay funeral costs after the inevitable death (White and Robinson, (2000).

2.1   Impact of HIV/AID at the Household level

The impact on household occurs as soon as a member of the household starts suffering from HIV/AIDS related illnesses until after death where coping to mitigate the impact starts. The most immediate impact of HIV/AIDS is on the human capital base, principally in terms of the availability and allocation of labor. At the household level the HIV-afflicted patient's labor input gradually diminishes as the patient succumbs to sickness, and the labor of other household and extended family members is often diverted to care for AIDS patients during this period, the most critical impact being when the patient becomes incapacitated before death. This affects agricultural and non-agricultural productivity as a result of labor shortages. According to Barnett and Rugalema (2002), the combination of adult morbidity and mortality and the associated reallocation and withdrawal of labor has led to a number of adverse changes which have affected household food and livelihood security, namely; downgraded crops and loss of livestock; loss of farm management resources and skills; inability to earn income; loss of assets; disruption of social network, and increasing dependency as a result affecting food security by reducing households' ability to produce and buy food, by depleting assets, and reducing the insurance

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value of social networks as the household calls in favors. Studies reveal that a woman with a sick husband in Kagera region in Tanzania spent 60 percent less time on agricultural activities than she would normally do (FAO, 1995; Rugalema, 1999; UNAIDS, 2000b).

It is estimated that per year approximately 2 persons of labor are lost by the time one person dies of AIDS, due to their weakening and the time others spend giving care (FAO, 2002; 2001). A study conducted by FAO (1995) in Eastern Africa, including Uganda, Tanzania and Zambia, reveals that cash crops are abandoned due to inability to maintain enough labor for both cash and subsistence crops. A shift has been identified whereby farmers move away from cultivating labor-intensive crops to those that required less labor input, are drought-resistant, and are cultivable throughout the year such as cassava and sweet potatoes, often containing lower nutritional values. Also the FAO study indicates that crop production is highly affected by: reduction in land area cultivated, declining crop yields, and a decline in the range of crops grown (FAO, 1997; 1995). Also it is observed that as some households become more vulnerable to HIV/AIDS, they are less able to afford risks. As a result caregivers switch to less economically productive activities, which are lower-risky and thus lower-profit income generating activities. This further contributes to the deterioration of the household's ability in its future earning potentials.

Poor household economic performance through declining productivity, poses a serious threat to the food and livelihood security in rural areas. For example is some villages in Kagera region in Tanzania food consumption has been reduced by 41% (Isaksen *et al*., 2002; Over, 1998, cited by White and Robinson, 2000) and by 15% in other villages (UNAIDS, 2000c; FAO, 2001).

Following the HIV/AIDS pandemic, more time and financial resources are spent to care for the sick and searching for medical services. HIV/AIDS reduces household' income as family members are drawn away from production and other income-generating activities to care for sick relatives, and as households are forced to divest their incomes, tangible assets and savings for medical care, transportation, funeral expenses, and other immediate expenses, and decreased

remittances (Over *et al.*, 1996; Mutangadura *et al.* 1999). A study by Rugalema (1999) in one village in Kagera region reveals that AIDS leads to accelerated consumption of household cash, mainly in the process of seeking treatment. In addition, a wide variety of assets, are disposed of to generate cash for use in treatment. It is reported by Mutangadura *et al.* (1999) that in east Africa household living with AIDS have been shown to have an overall reduction in assets by 40-60%.

With HIV/AIDS, household expenditures increase due to medical and funeral costs. Tibaijuka, (1997) reports that in Kagera region virtually all households' cash income is used to pay for medical bills due to AIDS. The study further reports that households with an AIDS death spent an average 50 percent more on funerals than medical care. Data from the Kagera region of Tanzania indicate that the average amount households reported spending on deaths was US$ 104, of which US$40 was spent on medical costs, and US$64 on the funeral itself. This expenditure was unequally distributed, with some households reporting zero expenditure, while in other households expenditures were more than US$1000. These amounts are very high, especially for the rural people, whose budget per day fall far below a dollar.

2.2   Impact of HIV/AIDS at the Community level

As HIV/AIDS deepens, increasing the mortality and morbidity rates at the household level, the socioeconomic impacts widen to affect the whole community, resulting in an adverse long-term effect on community structure and function. Mutangandura *et al.* (1999) report that the loss of human resources affects all institutions (NGOs, CBOs) and community structures, and these losses need to be planned for. They further indicate that community problems that arise as a result of HIV/AIDS include the need to support an increasing number of orphans, reduced participation of the community in neighborhood and community structures, increased homelessness and increased crime. In other words, social cohesion in threatened, a situation that in turn increase the risk of HIV transmission.

The number of orphans, homeless children and children living on the street is increasing due to the HIV/AIDS epidemic. The high mortality of prime-aged adults due to AIDS has left behind orphaned children in households with fewer or no breadwinner to support them. Cumulatively, it is estimated that there are about 1.1 million orphans in Tanzania (Isaksen *et al*., 2002). A large number of children orphaned grow up in circumstances less than optimal for their development as limited resources restrict their family's ability to provide sufficient care. This exacerbates the deterioration of the children situation in terms of education and nutrition. A study by NORAD (2002) in Tanzania, indicate that the majority of orphans depended on themselves or on their grandparents, however, there others who depend on other caregivers, including close relatives and foster families.

The conditions for the orphans are difficult in the sense that their likelihood of attending school is very minimal. Isaksen *et al*., (2002) point out that the younger the child is when orphaned, the less the possibility of providing sufficient care to ensure child's development. A study from the hard-hit Kagera region in Tanzania indicates that half of the orphans did lack the most basic necessities (Tibaijuka, 1997). This situation suggest high incidence of abandonment or surviving parent inability to take care for his or her children. As a result, orphans are denied supply of immediate and future needs, such as housing, food and education. Consequently, they are forced to seek help in the streets, begging for money which makes them become vulnerable to abuse. The girls turn into prostitution to survive, and most likely become infected just like their parents thus perpetuating the vicious cycle (Isaksen *et al*., 2002).

HIV/AIDS also tend to disrupt the social capital in many communities. White and Robinson, (2000) argue that because of the systemic nature of HIV/AIDS, families' and communities' social capital become severely strained. In much of the literature related to HIV/AIDS it is reported that as the scale of the epidemic increases, the social assets base collapse irreversibly and traditional coping strategies are no longer viable. Although this may not be an

immediate impact of the epidemic, it is an insidious process that is already having visible results in areas where HIV/AIDS has long been prevalent.

The socioeconomic impact of HIV/AIDS expands from household to community to different parts of the country. The increasing mortality and growth of the number of orphans pose unprecedented social welfare demands for countries already burdened by huge development challenges. AIDS overburdens social systems and hinders health and educational development. The epidemic increases the strain on state institutions and resources, while undermining the social systems that enable people to cope with adversity. As parents and workers succumb to AIDS-related illnesses, the structures and divisions of labor in households, families, workplaces and communities are disrupted, with women bearing especially heavy burden.

HIV/AIDS has severe impact on the education sector performance through declining productivity of teaching staffs. Teachers and students are dying or leaving school, reducing both the quality and efficiency of education systems. In 1999 alone, an estimated 860000 children lost their teachers to aids in sub-Saharan Africa. In Zambia it is reported that more than four teachers died of AIDS each day in 1998-1,300 teacher for the year (UNAIDS, 2001; cited by Lamptey *et al*., 2002). In Tanzania (e.g. Kagera region) the primary enrolment rate in communities that are hard hit by HIV/AIDS is decreasing because children whose parents are sick or died of the pandemic drop out of school due to lack of the capacity to meet school expenses (Kessy *et al*., 2002). In South Africa-KwaZulu-Natal Province, where adult HIV prevalence exceeds 30%, enrollment dropped by 24% in 2000 (Badcock-Walter, 2000; cited by Lamptey *et al*., 2002). Faltering education services is contributing to the diminishing of the human capital in every other sector of the country's economy.

3.   **HIV/AIDS SITUATION IN TANZANIA**

Despite substantial efforts to control the epidemic since 1986, the HIV prevalence rates continue to escalate throughout the country. Currently, the country is faced with rapidly increasing

number of HIV/AIDS infections, AIDS cases, and orphans. Prevalence of HIV is estimated at about 12 % of the sexually active female adult population. HIV prevalence among pregnant women attending ante-natal clinics for the first time ranges from 4.2-32.1 %. HIV prevalence among female blood donors has increased two-fold from 7.2 to 13.3 % during the last ten years (1991-2000). Due to the strong stigma against HIV/AIDS only about 12% of the people infected with HIV have been tested and are aware of the HIV status.

In Tanzania, the HIV epidemic began in the early 1980s. A steady increase in infection levels among the pregnant women in many areas of the country occurred up through the mid 1990. There is evidence of a decline in recent years, since the mid 1990s, HIV sero-prevalence among pregnant women in Dar es Salaam has remained stable around 14%. HIV sero-prevalence among pregnant women in the lakeside town of Bukoba (Kagera region) has fallen from 28% in 1992 to 13% by 1996. In Rukwa region, prevalence remained relatively unchanged over the time period and was 21% in 1997 (MEASURE; URT and Bureau of Statistics, 2001).

HIV sero-prevalence in both urban and rural areas of Mbeya region on the border of Malawi and Zambia has increased among pregnant women since 1988. By 1997, prevalence was 30% in urban areas, 20% in rural areas. UNAIDS estimates indicate that by the end of 2001, there were about 1.5 million people (both adults and children) living with HIV/AIDS in Tanzania, among which 1.3 million were adult 15-49 years, 750,000 were women and 170,000 were children below 15 years. The prevalence rate was estimated to stand at 7.8% among the adults 15-49 years and about 140,000 people died of AIDS leaving an estimated 810,000 orphans in the country (UNAIDS, 2002).

### Sentinel Surveillance

According to the National HIV/AIDS control program, pregnant women attending the antenatal clinic for the first time for a particular pregnancy at a sentinel site constitute the surveillance population (URT, 2001). It is reported that sentinel survey are the best sources of data (Loewenson and Whiteside, 1997). They measure the prevalence in a given population at a given

time, normally estimated from data collected at antenatal clinic attendees. Then data collected is used to develop models to predict the course of the epidemic and most important, the likely number of AIDS cases and deaths, figures vital for assessing impacts. The National HIV/AIDS/STI control program surveillance report indicates that there is an increasing rate of the HIV infection rate. The age specific HIV prevalence among antenatal clinic attendees for the year 1990-2000 was highest in the younger age groups 14-24 years and 25-34 years. However, the prevalence rate continues to fluctuate within sites showing no specific trend (URT, 2001).

Blood donors

An assessment of HIV among blood donors had demonstrated a stead rise from 1992 to 2000 (Tables 2 and 3 and figure 1). The age specific prevalence figures for females are generally higher than those for males. The age groups 25-34 and 35 years and above among females, has the highest prevalence and shows an increasing trend. The prevalence across age groups for males ranges between 5.2 % and 10.9% for the age groups between 15-19 and 35-39 years. For females the range is 7.8% and 16.8% for the age groups 15-24 and 30-34 respectively. The data used for the estimation of HIV prevalence need to be used and interpreted with caution because of underreporting of HIV and AIDS cases. The underreporting is due to the fact that; some people never seek hospital care for AIDS, because most of them seek tradition treatment; people with HIV infection may die of other infections before they are ever diagnosed as having AIDS; and some health care facilities, especially in rural areas, have no facilities to test for HIV infection.

Figure 1: Trend of HIV Prevalence rate among male and female blood donors 1991-2000 (%)
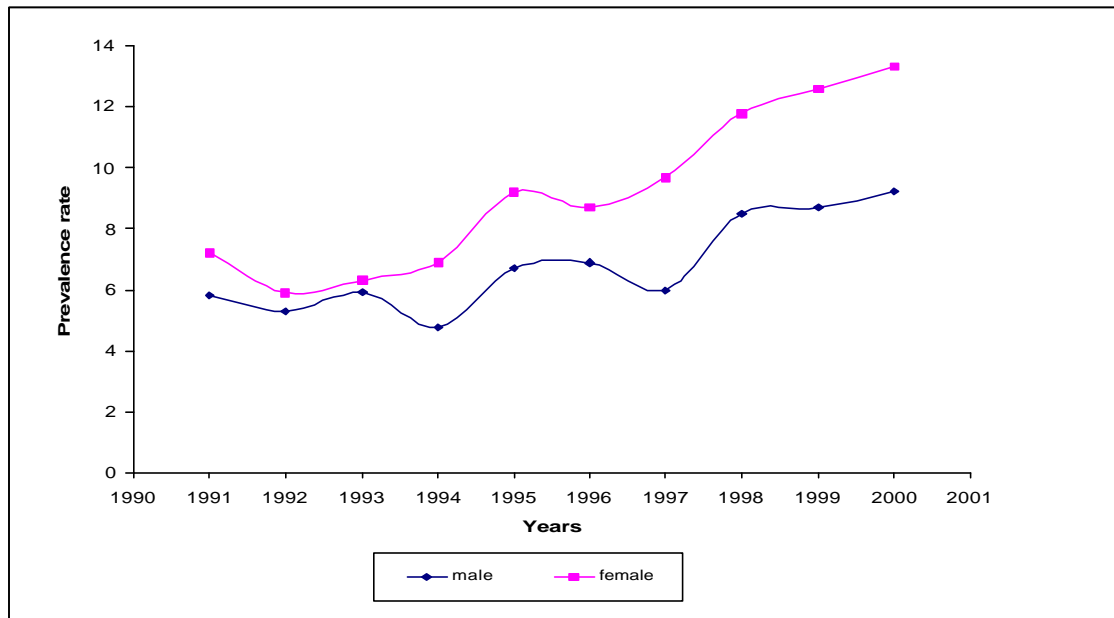
Figure 2 describes the trends of the distribution of reported AIDS cases by age and sex from 1987 to 2000. From the figure it can be observed that there are more women infected at younger ages between 15 to 29 years than their counter parts, who are more infected at the age between 30 to 44 years. The reason for this situation is that older men are having sex with young women. This happen because older men believe that young girls are not infected with HIV virus. But in general both sexes are highly infected between the ages 15 to 59. However, there are roughly high equal numbers of male and female reported AIDS cases between the 15-50 years. The high equal numbers of men and women is attributed to the fact that most transmission is through heterosexual contact. Due to the higher rate of transmissibility from men to women (as opposed to women than men), there is actually more women infected than men. The peak ages for AIDS cases are 25-29 for female and 30-34 for males (Figure 2). A close examination of Figure 2 reveals that there is a significant number of AIDS cases been reported among young children age

0-4. This is due to the fact that most of them have contracted the infection from their mothers either during pregnancy, during birth or through breast feeding.

Figure 2: Distribution of reported cumulative AIDS cases by age and sex 1987-2000
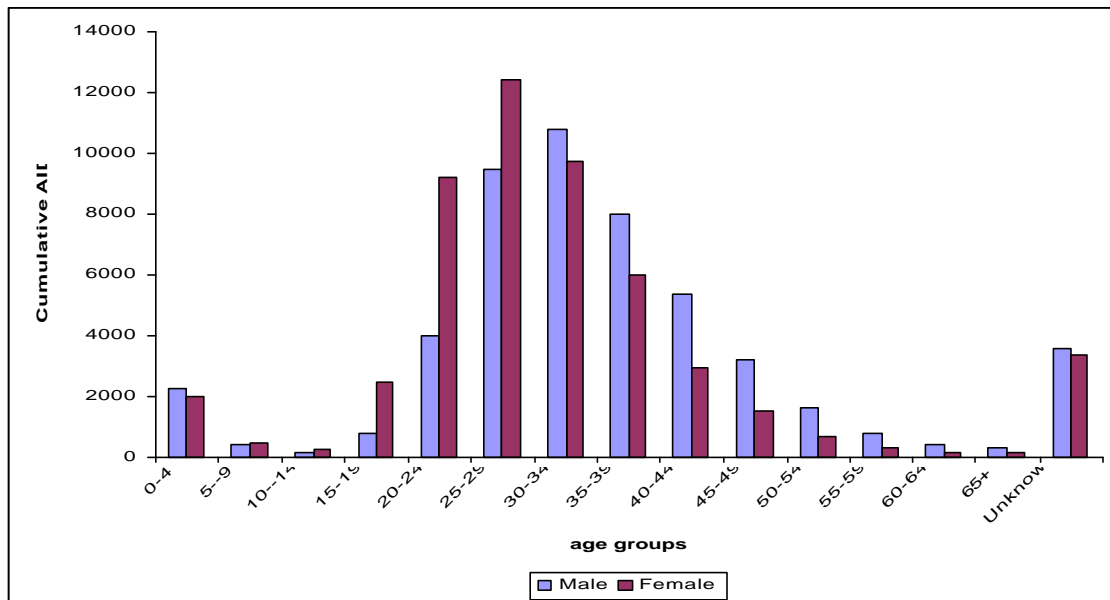
According to MEASURE, URT and Bureau of Statistics, (2001) in all regions there are striking differences by residence, HIV prevalence in larger towns and cities (regional capitals) is often at least three times higher in rural villages. Several small towns or trading centers and roadsides settlements have HIV prevalence levels similar to larger towns and cities, or levels between those of cities and rural villages. The data for Mbeya region depict a typical example in the country (Table 4). There are also a significant number of unknown cases; this could explain the quality of data, reporting systems as well as diagnosis of HIV in health centers in the country. But yet, the data provide useful information which is important for estimating the magnitude of HIV/AIDS pandemic in the country.

Regional comparison of HIV/AIDS situation

This section describes a comparison of HIV/AIDS situation in Tanzania and its neighboring countries. Figure in Tables 5 show that HIV/AIDS in the region are high in terms of HIV prevalence rate, number of AIDS cases and number of orphans. HIV prevalence rates are increasing in all countries, with the exception of Uganda and Tanzania, slightly decreasing in Mozambique and relatively constant in Burundi. Of all countries in the region Democratic Republic of Congo (DRC) comparably has lower prevalence rates. A number of conclusions can be drawn from the figures in Table 5. Firstly, all countries remain severely affected by HIV/AIDS, and the infections continue to escalate further. Secondly, the countries in the region are experiencing high prevalence rate, increasing number of AIDS cases and number of orphans. Thirdly, Uganda shows a decreasing trend in prevalence rates, but the challenges still remains as there are still new infections being reported and more children are orphaned. And finally, there are more women deaths in all countries than men, suggesting that women are exceptionally vulnerable to the epidemic.

4.   HIV/AIDS Programs and policies in Tanzania

Tanzania recognizes the serious threat posed by the HIV/AIDS epidemic on social and development efforts and has taken the necessary steps to intensify multisectoral response to the epidemic. The national response receives strong commitment from the government and international community. In recognition of the threat of HIV/AIDS to social and economic development, the Government of Tanzania has declared HIV/AIDS as a national disaster, requiring concerted action by stakeholders. The need to address HIV/AIDS features prominently in all of the Government's main development frameworks and strategies, including Development Vision 2025, the Poverty Reduction Strategy Paper (PRSP) and sector program financing arrangements through the Public Expenditure Review (PER) and Medium Term Expenditure

Framework (MTEF). All HIV/AIDS activities have been mainstreamed in the budget of all sectors.

The major HIV/AIDS programs that are in place in the country among others include the National Multisectoral Strategic Framework (NMSF) established in October 2002. This framework translates the National policy on HIV/AIDS by providing strategic guidance to the planning of programs, projects and interventions by various stakeholders in the fight against HIV/AIDS, and spells out the basic approaches and principles that guide the National Response and identifies goals, objectives and strategies for the period 2003-2007. The strategy puts special focus on enabling the Local Government Authorities and Communities in rural and urban areas to intensify their responses to the epidemic and close involvement and working with Civil Society Organizations and Private sector.

In June 2001 Tanzania, joined 189 countries under the program of action to fight the HIV/AIDS pandemic through adoption of the United Nations General Assembly Special Session (UNGSAA) Declaration in its national HIV/AIDS. The goal of the declaration is the national response, placing priority on UNGASS targets for reduction of HIV infection among infants and youth adults, improvements in HIV/AIDS prevention, health care and treatment, and increased support to children and communities affected by HIV/AIDS. Tanzania has also initiated programs that involve youth in the designing, implementation and evaluation HIV/AIDS programs, including the national IHSI (a Swahili expression which means "To Live") campaign and publication of successful series of leaflets for youth. The Tanzanian Government has also supported promotion and distribution of condoms for AIDS prevention through public and private channels since the late 1980s. The National HIV/AIDS Control Program (NACP) was established since 1988, under the Ministry of Health, with the responsibility to combat the spread HIV/AIDS in the country.

In order to strengthen the institutional and organizational framework for HIV/AIDS co-ordination, the Government established the Tanzania Commission for AIDS (TACAIDS) in

December 2000. The main emphasis of the commission is the need for a multisectoral approach linking HIV/AIDS programs with community development activities targeting households with infected and affected groups, especially women, children and AIDS orphans.

In order to strengthen all HIV/AIDS programs a national policy on HIV/AIDS/STDs was put into effect in 1995 by the government of Tanzania. The goal is to mobilize and sensitize the community to get actively involved in preventing further transmission of HIV and to cope with the social and economic consequences of HIV/AIDS. The HIV/AIDS policy is intended to create a clear and favorable environment for all aspects of AIDS control and prevention. The aims of the policy are as summarized in Appendix 1.

The national policy on HIV/AIDS/STDs stipulates that HIV/AIDS patients receive the same level of care as other patients. Counseling is expected to be a basic component in the care of HIV/AIDS patients. The government encourages home-based care, where patients can be cared for and nursed by family members, through effective mechanisms to ensure home-based care are safe. The policy also enumerates specific strategies for prevention of HIV/AIDS, including activities 'targeted to those groups involved in high risk behavior', though cultural, religious, and political factors have precluded significant government-supported activities directed at these groups (URT, 2001).

Despite concerted efforts by the Tanzanian Government in the fight against the spread of HIV, programs put in place face a number of challenges which make it difficult to effectively perform its activities in rural areas. Firstly, illiteracy level in Tanzania is increasing, less people can understand written messages, and this makes it very difficult for the programs to disseminate information on HIV/AIDS and related diseases to the population. Secondly is infrastructural bottlenecks-there are no health centers to diagnose HIV, this makes it so difficult to evaluate and monitor the spread of HIV/AIDS; also some rural areas are not accessible in the rainy season, because during this period most of the roads are impassable. Thirdly, because of the budget constraints, resources allocated for HIV/AIDS programs are not enough to fully implement the

identified activities and reach the targets set; Fourthly, poverty-many people in Tanzania-over 50% live below poverty, females are more worse than males-this also contribute to the spread of HIV/AIDS as most of these people can not afford medical services-hence leave some infections untreated. Also very little comprehensive research have been conducted in the country, as a results most programs implemented in the country lack baseline information on which their activities should base.

5.   Empirical Analysis

5.1.   *Study area and sample description*

This paper is based on a survey of 119 households that was conducted in three villages in Rungwe district in Tanzania. Villages were selected to represent two different localities: two villages from the HIV/AIDS High Transmission Areas (HTA), close to the Tanzania-Malawi Highway; and one village selected to represent villages which are far from the HTA. The main purpose of the selection of villages from different localities was to capture the differences in the ways in which HIV/AIDS impacts communities and how these communities respond to HIV/AIDS.

This study examines the determinants that cause households to become poor by emphasizing the role of HIV/AIDS morbidity and mortality. A logistic regression is estimated to determine the probability that a household will be poor. Detailed information on the definition of variables used in the analysis is presented in Appendix 2.

(a)   *Marital Status of the heads of the sample households*

Table 6 summarizes information on marital status by gender of the sample households. The results show that a larger proportion of female headed households were widow, more than 30% as compared to only 4.2% widower. It can be observed in Table 6 also that 19 households

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about 15.9% of female headed household were widow in Masebe village, as compared to 10.9% in Masukulu and 6.7% in Mapandapanda village.

(b)   *Household size*

Table 7 depicts the summary of household food expenditure per adult equivalent and average household size by village and households that had AIDS death and those without death. The results show that households in Masukulu had smaller size (2.75) when compared to Masebe (3.75) and Mpandapanda village (3.92). Disaggregating households in to those which had experienced AIDS death and those without death, the results show that household size in household that experienced AIDS death had smaller household size about 3.32 compared to 3.69 without AIDS death.

(c)   *Household food expenditure per adult equivalent*

Household food expenditure was determined and assessed among the study villages and compared between households that had experienced AIDS death to those which had no AIDS death. The results show that sample households in Masukulu and Masebe spent less on food per adult equivalent as compared to those in Mpandapanda village. On the other hand households which had AIDS death spent less on food than those without AIDS death (Table 7).

(d)   *The incidence of Poverty*

Since the main objective of this paper is to assess the implication of HIV/AIDS on rural livelihoods, particularly on household poverty. This section describes the incidence of poverty among household surveyed. Table 9 gives a summary of the incidence of poverty among the sample households. The results indicate that 56.3% of the sample households were below the poverty line and 43.7% above the poverty line.

5.2. Econometric analysis

(a) Objectives and motivation

The main objective of this paper is to examine how HIV/AIDS may affect households' living standards; specifically tests whether HIV/AIDS increases the odds to fall into poverty as they are affected by illness and death. This is because HIV/AIDS impact on a household begins as soon as a member of the household starts to suffer from HIV-related illness, especially when adult members become ill and later forced to stop working due to reduced physical strength (World Bank, 2000). AIDS-induced young adult morbidity and mortality could exacerbate existing structural problems in the agricultural production systems and the entire rural livelihood security, due to the depletion in the rural labor supply.

This results in the loss of income of the patient, a substantial increase in household expenditure for medical expenses, and other members of the households missing work to care for the sick person. Death results not only in additional expenses for funeral and morning, but also in permanent loss of income from less labor and decreased remittances (White and Robinson, 2000; Mutangandura et al., 1999; Rugalema, 1999). HIV/AIDS very often is transmitted to more than one family member, implying that in a household where one member dies for the disease, it is expected that more member may die from the disease too. As a result, the assets and savings of the families are exhausted leaving the surviving family members without means of support. This is because the female mortality is likely to represent a second death for many households (Mutangandura, 2000). If the death of a woman is the second death within a household, this is likely to have adverse synergistic effects on household coping ability and resilience.

As the ability to produce and accumulate food and income decreases, the household falls into a downward spiral of increasing dependency ratios, poor nutrition and health, increasing expenditure of resources (time and money) on health problems, more food shortages, and sometimes increasing reliance on coping strategies that further disrupts the household livelihood

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security, hence poverty. The effect of HIV/AIDS on rural household livelihoods and the way they fall below poverty is depicted in Appendix 3.

(b)   *Model specification and estimation methods*

In order to investigate the implications of HIV/AIDS at the household and community level, a logistic regression model was estimated, to determine the impact of AIDS on the likelihood that a household falls below the poverty line. The logistic regression model specified is as follows:

P(Y = 1) = G (Xâ)

Where P(Y = 1) is the probability that a households will fall below the poverty line as a result of HIV/AIDS;

X is a vector of determinants of odds of falling below poverty.

Food expenditures are used as a proxy for the standard of living and poverty. Following the methodology used in the 2000/01 Household Budget Survey (HBS), a household is classified as poor if its monthly food expenditures per adult equivalent are below Tsh 5,295. Alternative criteria such as per capita income and basic needs can be used to determine living standards. The regression equation is build up by including all variables that were presumed to affect the households' odds of falling below poverty line and dropping insignificant variables. The following factors were retained:

- Location of household, which equals 1 if the village is far from the Malawi-Tanzania highway and 0 if the village is near to the Malawi-Tanzania highway;
- Sex of the head of household, which equals 1 for female-headed household and 0 for male headed household;

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- Household size;

- Dummy variable for sale of household assets, which takes the value of 1 if the household sold properties and 0 if otherwise;

- Number of people died of AIDS and

- Total amount of money spent on caring AIDS patient, funeral and mourning

6.   Regression Results and discussion

The regression results in Table 11 reveal that HIV/AIDS had a significant contribution to poverty outcomes in households and in the communities surveyed. The results suggest that the death of household members for HIV/AIDS increases the probability of a household falling below poverty. This is indicated by the positive and statistically significant coefficient on the number of AIDS death in a household. A plausible explanation for this is that as soon as one or more member become infected with HIV/AIDS-related conditions income falls as family members' ability to work diminishes, household living expenses increase due to increased costs on medical expenses, and funeral and mourning costs when the patient dies. The results also show that high medical expenses contribute to households' odds of falling below poverty line. This is indicated by the positive and significant coefficient on medical expenses in Table 11.

The results in Table 11 also show that large households are more prone to poverty. This could be due to the fact that HIV/AIDS diminishes the households' ability to produce food, as it takes it death toll mostly among productive adults. That even if labor may be available to participate in income generating activities, much of it is devoted to caring HIV/AIDS patients, less time dedicated to production. In addition, households with larger households are more likely to be poor; this may imply that households with smaller size will spend less on food than larger households.

The coefficient of location is negative contrary to a priori expectation that villages which are far away from the Tanzania-Malawi highway would more likely become poor because they benefit less from income generating activities brought about by traffic. The negative effect could be explained by the fact that the proximity to the highway increases the household risk of infection from HIV/AIDS, which is positively related to the odds of falling below poverty line.

The results indicate that female headed households are more likely to fall below poverty. One plausible explanation is that men compared to women may have less accessibility to productive resources; including land, credit, training, extension services and technology. After a death of her husband, the woman is left without access to the resources that she has gained through the husband. As a result widows' livelihoods are threatened, hence more likely to fall below poverty. In addition women are more likely to be illiterate, of low socioeconomic status and have fewer legal rights, which limit their accessibility to resources and social services. Another explanation is that probably their husbands had died of AIDS, therefore, the likelihood of also being infected is high and chances are that their physical strength may have become weak, which reduces their ability to effectively engage in income generating activities and food production.

The results also show that when household sell their assets to cope with HIV/AIDS, this tends to push them into poverty. In order to determine the overall likelihood of households and communities becoming poor as a result of HIV/AIDS, a further analysis was performed by considering the hypothetical households/community having the characteristics at the mean of the sample. Results in Table 12 show that the predicted incidence of poverty for the average household is of about 75.6%. The incidence of poverty is highest in Masebe (97%) and lowest in Masukulu. From these results we can conclude that HIV/AIDS plays a significant role in determining a household's odds of falling below poverty line. In deed, the Masebe community which has the highest incidence of poverty also has the highest incidence of HIV/AIDS. In

Masebe all household interviewed had reported to have a member died of AIDS. In addition, there were relatively more households headed by widows than in the other two villages.

7.   Summary and Conclusion

This paper provides and forms an integral part of the information required in formulating and designing appropriate policies and programs for poverty reduction and containing the spread of HIV/AIDS. The findings of this study have revealed that social-cultural factors have important implications on the ways in which HIV/AIDS affect households and communities. Therefore, in order to design and implement effective and appropriate policies and programs for poverty reduction and containing the spread of HIV/AIDS need to take into account these factors. However, because of the dearth in the information about the impact of HIV/AIDS at household and community level, comprehensive research need to be carried out in order to provide relevant information that will help policy makers, community-based organizations and stakeholders in fighting against rural poverty and spread of HIV/AIDS.

The findings of this study revealed that households are more likely to fall below poverty when there is high number of AIDS deaths. This is because when one or more member(s) of the household start to suffer from HIV-related illness, there is a substantial loss of income due to increased household expenditure for medical, funeral and mourning expenses. Increased household expenditure is coupled with substantial depletion of household assets and savings which are usually used as household insurance during strife conditions.

Overall, on average, the communities surveyed had high risks of poverty incidences as a result of HIV/AIDS impacts, female-headed households being more likely to be poor than male-headed households. However, the intensity of the risk of poverty status was slightly different across the communities studied. The difference in the odds of being poor is attributed by the differences in their socioeconomic and demographic characteristics.

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Table 1: Potential impacts of HIV/AIDS to the household, children and community

Impacts on Household	Impacts on orphans/children	Impacts on communities
• Loss of labor • Loss of capital • Decline of asset base • Change of the farming system • Downgraded crops and loss of livestock • Loss of income • Decrease in Remittances • Food and livelihood insecurity increases • Loss of opportunities • Increased household expenditures • loss of farm management resources and skills • inability to earn income • forced migration • dissolution • stress • inability to parent and care for children • increased number of multi-generational households lacking middle generation • change in family composition and adult and child roles • diminished productive capacity • development of bad behavior among children	• Withdraw from schools hence loss of educational opportunities • Emergence and increase in orphan/child-headed household • Increased use of child labor • Loss of parental care in cases when both parents die • Child develop antisocial behavior • Increased number of street children • Increased, crime and homelessness • Loss of inheritance • Increased demand for labor • Loss of family and identity • Increased malnutrition, starvation • Depression	• reduced labor • increased poverty • inability to maintain infrastructure • loss of skilled labor, including health workers and teachers • loss of agricultural input and credit • reduced access to health care • increased morbidity and mortality • loss of tradition and indigenous knowledge • increased widow-, orphan- and elderly-headed household • psychological stress and breakdown • inability of marshal resources for community-wide funding schemes or insurance • disruption and breakdown of social bond and support network • increased dependency • loss of market opportunities • wider social impacts-marginalization of youth • loss of usufruct farming rights • problems of extension services

Table 2: Age-specific prevalence (%) of HIV infection among male blood donors from 1991-2000

Age Group	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
15-19	3.2	3.7	3.9	2.4	5.3	4.4	4.5	5.2	5.4	6.0
20-24	5.0	4.9	5.8	2.4	5.8	5.9	4.9	6.8	7.0	7.2
25-29	6.7	6.0	6.1	5.8	7.2	7.4	7.2	8.5	8.8	9.6
30-34	6.4	5.8	6.2	5.4	7.7	7.9	7.3	10.1	10	10.4
35-39	6.1	5.6	6.5	9.8	7.8	7.7	7.4	9.8	9.9	10.9
40-44	4.8	3.9	5.1	0	5.9	6.3	6.6	9.1	9.9	9.2
45-49	4.5	4.2	4.9	7.4	5.8	5.7	5.8	8.4	8.5	9.3
50-54	4.4	2.6	4.3	0	3.5	5.6	4.8	7.1	7.7	9.1
55+	4.0	2.3	5.2	12.5	2.5	4.4	5.9	8.2	5.5	6.8
Total	5.8	5.3	5.9	4.8	6.7	6.9	6	8.5	8.7	9.2

Source: Tanzania, National AIDS Control Program, (2000)

Table 3: Age-specific prevalence (%) of HIV infection among female blood donors from 1991-2000

Age Group	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
15-19	4.9	4.2	2.9	5.6	5.3	6.3	6.7	8.8	7.8	8.2
20-24	7.7	7.2	7.5	5.4	9.4	9.8	10.2	11.3	12.2	11.9
25-29	8.7	6.6	7.2	7.1	11.6	10.1	11.0	13.0	14.5	16.8
30-34	6.5	5.7	6.6	6.9	10.0	9.3	11.0	13.2	14.2	13.6
35-39	4.8	5.7	6.7	10.1	8.8	9.3	12.1	12.5	14.9	15.2
40-44	6.3	3.6	1.7	5.4	7.6	6.0	9.6	10.3	10.0	11.1
45-49	3.4	4.4	3.7	7.5	4.8	5.5	8.2	9.8	10.2	13.6
50-54	5.6	5.4	5.9	6.2	6.3	5.6	11.2	8.8	7.0	9.5
55+	6.7	4.2	5.3	3.3	16.7	7.1	7.6	7.8	8.8	9.7
Total	7.2	5.9	6.3	6.9	9.2	8.7	9.7	11.8	12.6	13.3

Source: Tanzania, National AIDS Control Program, (2000)

Table 4: **Age specific prevalence (%) of HIV infection among antenatal women from 1990-2000**

Location	Age group	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Mbeya urban												
	14-24	17.1	17.3	19.9	18.8	20.5	20.5	17.8	18.9	17.6	16.3	18.4
	25-34	16.0	14.6	14.2	18.3	20.8	21.7	19.9	23.5	17.2	22.2	24.3
	35-49	12.2	7.3	13.2	6.0	7.7	16.7	17.2	5.7	11.8	3.8	10.6
	TOTAL	16.3	15.9	17.7	18.0	19.8	20.7	18.5	19.6	17.3	18.0	20.4
Mbeya rural												
	14-24	9.5	11.3	8.8	9.7	15.6	13.6	13.6	10.6	12.8	14.3	11.7
	25-34	12.5	11.6	11.5	9.6	16.7	21.7	8.6	15.0	12.3	13.9	23.6
	35-49	5.3	0	12.3	6.8	21.4	3.1	11.1	0	9.5	10.8	9.8
	TOTAL	10.1	10.7	10.0	9.5	16.5	15.5	11.5	11.3	12.4	13.7	15.6
Mbeya roadside												
	14-24	17.2	19.4	11.9	13.5	27.8	14.0	16.7	19.7	10.9	10.9	12.5
	25-34	16.1	9.8	11.3	12.4	29.1	11.9	21.4	22.3	16.9	14.4	23.6
	35-49	16.7	5.0	4.1	15.8	20	3.7	6.7	23.8	3.9	16.7	10.0
	TOTAL	16.7	14.7	11.2	13.3	27.6	12.7	17.5	20.9	12.3	12.5	17.3
Mbeya Boarder												
	14-24	23.4	36.0	20.1	30.7	20.5	36.4	26.7	24.5	22.8	27.0	20.2
	25-34	26.3	29.4	36.3	28.8	22.7	30.6	26	28.6	28.9	35.7	25.4
	35-49	6.0	2.0	26.9	13.6	5.0	11.0	8.0	12.5	16.7	3.0	16.7
	TOTAL	25.0	34.1	25.5	29.0	21.7	34.4	25.9	25.0	24.0	29.5	21.6

Source: Tanzania, National AIDS Control Program, (2000)

Table 5: Estimated HIV Prevalence, number of AIDS deaths and Orphans in selected countries 1997-2001

Country	1997			1999			2001		
	HIV Prevalence rate (%)	No. of AIDS death (000)	No. of orphans (000)	HIV Prevalence rate (%)	No. of AIDS death (000)	No. of orphans (000)	HIV Prevalence rate (%)	No. of AIDS death (000)	No. of orphans (000)
Tanzania	9.42	150	730	8.09	140	1,100	7.80	140	810
Uganda	9.51	160	1,700	8.30	110	1,700	5.00	84	880
Kenya	11.64	140	440	13.95	180	730	15.00	190	890
Burundi	8.30	30	160	11.32	39	230	8.30	40	240
Rwanda	12.75	36	120	11.21	40	270	8.90	49	260
DRC	4.35	93	410	5.07	95	680	4.90	120	930
Zambia	19.07	97	470	19.95	99	650	21.50	120	570
Malawi	14.92	80	360	15.96	70	390	15.00	80	470
Mozambique	14.17	83	170	13.22	98	310	13.00	60	420

Source: Extracted from UNAIDS Surveillance reports, 1997, 1999, 2002.

Table 6: Marital Status of sample heads of Household by village

Marital Status	Gender of head of household				Total	
	Male		Female			
	Number	Percent	Number	Percent	Number	Percent
Masukulu						
Single	5	4.2	4	3.4	9	7.6
Married	11	9.2	2	1.7	13	10.9
Widow	0	0	13	10.9	13	10.9
Widower	2	1.7	0	0	2	1.7
Divorced	0	0	3	2.5	3	2.5
Total	18	15.1	22	18.5	40	33.6
Masebe						
Single	1	0.8	1	0.8	2	1.7
Married	14	11.7	0	0	14	11.7
Widow	0	0	19	15.9	19	15.9
Widower	3	2.5	0	0	3	2.5
Divorced	0	0	3	2.5	3	2.5
Total	**18**	**15.1**	**23**	**19.2**	**41**	**34.5**
Mpandapanda						
Single	0	0	3	2.5	3	2.5
Married	20	16.8	5	4.2	25	21.0
Widow	0	0	8	6.7	8	6.7
Widower	0	0	0	0	0	0
Divorced	2	1.7	0	0	2	1.7
Total	22	18.5	16	13.4	38	31.9
All						
Single	6	5.0	8	6.7	14	11.8
Married	45	37.8	7	5.9	52	43.7
Widow	0	0	40	33.6	40	33.6
Widower	5	4.2	0	0	5	4.2
Divorced	2	1.7	6	5.0	8	6.7
Total	**58**	**48.7**	**61**	**51.3**	**119**	**100.0**

Source: Field Survey data, 2003

Table 7: Household size and food expenditure per adult equivalent for sample households and households with AIDS death and those without death

Village	Sample Household food expenditure per adult equivalent				
	Sample size	minimum	maximum	mean	Standard Deviation
Masukulu	40	3149.61	8441.00	4778.00	1188.48
Masebe	41	3649.73	8057.86	4903.88	887.20
Mpandapanda	38	3889.67	16384.18	6389.88	2717.16
All	119	3149.61	16384.18	5336.00	1891.22
With death	90	3149.61	8057.85	4783.65	941.70
Without death	29	4359.15	16383.18	7050.54	2868.69
Sample Household size statistics					
Masukulu	40	1	7	2.75	1.316
Masebe	41	1	8	3.59	1.565
Mpandapanda	38	2	9	3.92	1.323
All	119	1	9	3.41	1.481
With death	90	1	9	3.32	1.510
Without death	29	2	8	3.69	1.390

Source: Field Survey data, 2003

Table 8: Response of Sample Households whether had AIDS death or not

Village	Household with AIDS death		Household without AIDS death	
	Number	Percent	Number	Percent
Masukulu	36	30.3	4	3.4
Masebe	41	34.5	-	-
Mpandapanda	13	10.9	25	21.0
Total	90	75.6	29	24.4

Source: Field Survey data, 2003

Table 9: Sample household falling below the food poverty indicator

Village	Poor		Non poor		Total	
	Number	Percent	Number	Percent	Number	Percent
Masukulu	28	23.5	12	10.1	40	33.6
Masebe	25	21.0	16	13.4	41	34.5
Mpandapanda	14	11.8	24	20.2	38	31.9
Total	67	56.3	52	43.7	119	100.0

Source: Field Survey data, 2003

Table 10: Correlation Matrix for the Variables included in the Logistic Regression

	Constant	AIDS death	Household size	Location of village	Sex of head of household	Total spending on medical care	Sold household assets
Constant	1.000	-0.341	-0.282	-0.214	-0.397	-0.958	-0.406
AIDS death		1.000	0.336	-0.304	0.226	0.161	0.269
Household size			1.000	-0.470	0.057	0.069	0.146
Location of village				1.000	-0.116	0.283	-0.500
Sex of head of household					1.000	-0.363	0.045
Total spending on medical care						1.000	0.311
Sold household assets							1.000

Table 11: Logistic Regression Results: Predictors of household Poverty Status

Variables	Coefficients	Standard errors	Wald	P-Value	Exp(B)	95% CI
AIDS death	1.969	0.738	7.127	0.008	7.164	1.687-30.415
Household size	1.049	0.395	7.064	0.008	2.854	1.317-6.184
Location of village	-2.295	1.044	4.832	0.028	0.101	0.013-0.780
Sex of head of household	2.060	0.845	5.949	0.015	7.845	1.498-41.073
Total spending on medical care	0.785	0.408	3.699	0.054	2.191	0.985-4.875
Sold household assets	1.381	0.806	2.939	0.087	3.979	0.820-19.310
Constant	-13.629	5.410	6.348	0.012	0.000	

Observation = 119
Wald Chi-square = 49.665 (P-Value = 0.000)
Pseudo-R-squared = 0.484
Log likelihood = -47.139

Table 12: Predicted incidence of poverty calculated at the mean of the variables

Variables	Coefficients	Sample Odds	Masukulu Odds	Masebe Odds	Mpandapanda Odds
AIDS death	1.969	2.008	2.127	2.875	0.925
Household size	1.049	3.577	2.885	3.766	4.112
Location of village	-2.295	-0.780	-2.295	0.000	0.000
Sex of head of household	2.060	1.051	1.174	1.112	0.865
Total spending on medical care	0.785	8.573	9.506	8.816	7.960
Sold household assets	1.381	0.331	0.318	0.539	0.110
Constant	-13.629				
Predicted P		0.756	0.521	0.970	0.585

Appendix 1: the aims of the Tanzania National AIDS Policy

- Increasing the community's awareness of HIV/AIDS and its consequences through information, education and communication.

- Preventing further transmission of HIV/AIDS through the use of preventive measures such as safe sex, testing, and counseling.

- Providing infected persons and their caregivers with appropriate social, medical, physical, and spiritual support through the existing health care system and through home-based care.

- Safeguarding the rights and interests of infected persons by preventing discrimination in relation to employment, housing, treatment, travel, education, and other social services.

- Supporting and promoting research activities geared to strengthening the national efforts towards control and prevention of HIV/AIDS/STDs.

- Safeguarding the rights of the community as a whole against infection with HIV/AIDS/STDs.

- Defining and coordinating the role of different players involved in AIDS control and prevention.

- Creating a national institutional framework that will coordinate the mobilization of financial, human, and material resources for AIDS prevention and control.

Appendix 2: Definition of variables used in the logistic regression

Name of Variable	Description of the variable
Location of the village	There are two alternative explanations here. The first is that villages located far away from the Tanzania-Malawi highway, households are likely to fall below poverty which equals 1 and 0 if the village is near to the highway. Alternatively, it is also possible that when a village is close to the highway is likely to be in the high risks of having high HIV/AIDS prevalence. Therefore, one would expect, household close to the road to have high numbers of AIDS death, hence likely to become poor.
Sex of the head of household	Here the hypothesis is the household is headed by a female is more likely to fall below poverty, because women are limited to many opportunities in terms of access and control of productive resources, income, cash crop production and marketing, and decision making. And that, probably their husbands have died of AIDS, therefore there are possibilities that they are also infected with HIV, hence their physical strength have become weak such that they can not fully engage in income generating activities and food production, leading to their diminished earning potential. Female are denoted by a value of 1 and male by a value of 0.
Household size	The hypothesis is that households with larger size will spend more on food, but also it could be thought that these households have more people to work and therefore have more income. But it should also be noted that these household are composed of elders and/or children who are dependants-can generate any income. This may imply that more mouth to feed and are more likely to become poor.
Sale of household assets	If a household sold assets is likely to fall below poverty because it is depleting its household savings. A value of 1 is assigned to household who sold their assets to care for the HIV/AIDS patient and spent on funeral and mourning, 0 is assigned to household who did not sell any asset.
Number of AIDS death in a household	It was presumed that as more people died of AIDS in the household, the more likely the household will fall below poverty.
Total money spent on medical, funeral and mourning	The higher the money spent, the more risky the household becomes poor and vice versa.

Appendix 3: The conceptual framework for the implications of HIV/AIDS on rural livelihoods

| DEATH | HIV/AIDS | ILL-HEALTH |

POVERTY

LOSS/DECREASED HOUSEHOLD INCOME

IMPACTS
- Loss of labor
- Decrease in savings/Loss of capital
- Food insecurity
- Funeral costs
- Loss of opportunities
- Increased child/female headed households
- Loss of indigenous knowledge
- Decreased remittance
- Less labor to work
- Decreased intensity in production
- Decreased productivity

IMPACTS
- Diminished physical strength
- Increased household spending on health care
- Decrease in savings/Loss of capital
- Food insecurity
- Loss of opportunities
- Increased absenteeism
- Less labor time spent on production
- Decreased remittance
- Less labor to work
- Decreased intensity in production
- Decreased productivity

COPING MECHANISMS
- Sales of household assets
- Sales of crop produce
- Sales of labor
- Migration
- Child labor
- School dropouts