The impact of HIV/AIDS on food security and household vulnerability in Swaziland

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Abstract

This study investigated the impact of HIV/AIDS on food security and household vulnerability in Swaziland. Personal interviews with 847 selected farming households revealed an increase in sales of crops and livestock to finance funerals and healthcare, a decrease in expenditure on agricultural inputs, and an increase in expenditure on medical bills and funerals. Most households were vulnerable to food insecurity. The affected households therefore need assistance in order to maintain food production and security, including support in the form of agricultural inputs such as fertilisers and seeds through the markets and special arrangements to allow them access to affordable inputs. Therapeutic feeding and home based care will be needed for the chronically ill in vulnerable households.

Keywords: impact; HIV/AIDS; food security; household vulnerability

1. Introduction

The objective of this study was to quantify the effects of HIV/AIDS on food security in Swaziland and to establish the extent to which farming households are vulnerable to the pandemic. According to the Swaziland Vulnerability Assessment Committee (SVAC, 2004) and the Southern African Development Community/Food, Agriculture and Natural Resources Directorate Vulnerability Assessment Committee (SADC/FANR VAC, 2003), the HIV/AIDS pandemic has a major impact on nutrition and food security in Swaziland. However, it is not clear what the extent of the impact is on the households. All aspects of food security, availability, access and use are affected and it is commonly agreed that HIV/AIDS has contributed to the problems faced by rural households in Southern Africa. What is less understood is the extent of the contribution and how it varies by demographic structure and the mortality and morbidity profile of households. This study was therefore designed to help reduce this information gap.

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Despite the significance of HIV/AIDS, not only in Swaziland but also in the whole world, there remains a relative paucity of empirical research into its effect on household food security. A World Bank report (2000) indicates that its impact in Swaziland is diverse, but not enough data exists on how the pandemic has affected the economy.

The FAO (1997) states that the results and findings of FAO's activities carried out in eastern Africa reveal that the impact of HIV/AIDS on agricultural production systems and rural livelihood cannot be generalised, even within one country, and must be disaggregated into spatial and temporal dimensions. Studies conducted in Uganda, the United Republic of Tanzania and Zambia have shown that HIV/AIDS follows a different pattern in each village and district. Geographic and ethnic factors, religion, gender, age, marriage customs and agro-ecological conditions play a role in the pattern and impact of HIV/AIDS and in people's perception of the disease.

The organisation points out that 'this differentiation is important for the planning and implementation of location-specific intervention strategies. The present study looks at the effects of the HIV/AIDS pandemic in Swaziland from a variety of perspectives, such as changes in household income, expenditure, crop production and level of vulnerability.

1.1 Background of HIV/AIDS prevalence in Swaziland

The first HIV infection in Swaziland was identified in 1987 (Whiteside *et al*., 2003). The government then responded by establishing the National AIDS Prevention and Control Programme (NAPCP), which was later renamed the Swaziland National AIDS/STI Programme (SNAP), with support from the WHO Global Programme on AIDS. By the end of the 1990s a standard package of interventions had been put in place. As in most countries, this was done through the Short-Term Plans, which evolved into Medium-Term Plans (Whiteside *et al*., 2003). The interventions included mandatory screening of all donated blood; information, education and communication (IEC) programmes; condom promotion and distribution; and the establishment of AIDS Information and Support Centres. For the first seven years of the pandemic the main source of data was notified AIDS cases, the numbers of which increased steadily from the first case in 1987 to over 150 in 1993. A national survey

of women attending antenatal clinics was carried out in 1992, and HIV prevalence in this group was found to be 3.9% (Whiteside *et al*., 2003).

Swaziland has high HIV prevalence standing at 42.6% at the end of 2004 (FAO, 2005). According to Whiteside *et al*. (2003), the country is rated as having the second highest national antenatal clinic HIV prevalence in the world, with very little difference between the country's four districts. This indicates population morbidity and close links between rural and urban areas in Swaziland. Table 1 shows that in 2004 the Hhohho and Manzini regions had the highest prevalence. It is clear from Table 1 that since 1994, the Manzini region had been leading in HIV/AIDS prevalence, followed by Lubombo region, then the Hhohho region. However, there was a discrepancy on the trend in the Hhohho region in 2002 and 2004. The Shiselweni region has always had a low prevalence from 2002 to 2004.

Table 1: Swaziland HIV infection percentage trends by region (1994–2004)

Region	HIV prevalence (%)					
	1994	**1996**	**1998**	**2000**	**2002**	**2004**
Hhohho	15.5	26.3	30.3	32.3	36.8	45.1
Lubombo	16.8	26.5	31.5	34.5	38.5	41.9
Manzini	15.6	27.7	34.8	41.0	41.2	42.5
Shiselweni	16.8	23.9	29.6	27.0	37.9	40.3

Source: SVAC (2004)

Table 2 shows the HIV prevalence by age group from 1994 to 2002. Table 2 reveals that from 1994 to 2000 the most affected were the ages 20 to 24, while in 2002 the most affected age group was between the ages 25 to 29 followed by those at the age of 20 to 24 years old.

Table 2: Swaziland HIV prevalence by age group (1994–2002)

Age group	HIV prevalence (%)				
	1994	**1996**	**1998**	**2000**	**2002**
15–19	17.8	24.1	25.6	26.3	32.5
20–24	18.8	32.3	38.4	42.5	45.4
25–29	14.3	27.2	38.0	40.7	47.7
30–34	10.8	21.7	24.8	29.7	29.6
35–39	9.1	11.0	21.8	17.0	23.9
40+	18.3	11.7	25.7	26.9	25.0
Total	16.1	26.0	31.6	34.2	38.6

Source: Whiteside et al. *(2003)*

A study by the SVAC (2004) to determine the links between HIV/AIDS, current demographic status and livelihoods in rural Swaziland revealed that respondents reported high rates of chronic illnesses. It reported that the chronic morbidity rate of HIV/AIDS increased linearly with age. Even at ages where one would expect individuals to be healthy, for example between the ages of 15 and 29, nearly 9% of the rural population was classified as chronically ill. This could be attributed to the impact of HIV/AIDS, given the high HIV prevalence rates (SVAC, 2004). The study further found that 15% of women in the age group 35 to 39 were reportedly suffering from bouts of chronic illness, and that in the age group 45 to 49 nearly a quarter of the women were reported to be chronically ill. The study found high rates of chronic illnesses among those older than 50, which probably relate more to the normal aging process than any single factor. It also found a gender difference, with women being more likely than men to suffer from chronic illness after the age of 50. The unproductive periods caused by these illnesses have significant effects on child care, food production, domestic management and income generation (SVAC, 2004).

2. The impact of HIV/AIDS on food security

According to Bonnard (2003), food security prevails when all people at all times have both physical and economical access to sufficient food to meet their dietary needs for a productive and healthy life. Food security has three distinct variables: food availability measured by food production and food supply; food access measured by the level of income; and food utilisation measured by nutrition, health and care giving. In this study, a household was considered to be food secure if it had access to food either because it produced enough food for its consumption or if it had sufficient income to purchase it. A shift in spending on food items to spending on non-food items such as funerals and hospital bills may be a threat to food security. Similarly, a reduction in household income may threaten the household's purchasing power and thus its food security.

According to O'Donnell (2004), the impact of HIV/AIDS on households can be the result of chronic illness, the death of a household member, or having to support orphans as a result of a death. Chronic illness of an adult member may lead to loss of income and loss of outputs from agricultural activity – a double loss because the sick person is unable to work and because household members have to spend time caring for the sick person. This can make households food insecure, and on top of

this there is need for further expenditure on health care, which may mean reducing the expenditure on food, or selling off assets for cash.

The death of an adult household member may have a variety of effects: the member's contribution to agricultural production and income is permanently lost, there are immediate costs because of the funeral and loss of assets, and there may be orphans to support. In the case of households hosting orphans, there is no clear pattern of effects, since wealthy households may take in orphans without affecting their own food security (O'Donnell, 2004).

HIV/AIDS can no longer be considered only a human health phenomenon; it is also a social, economic and institutional problem. A livelihood analysis by Gillespie *et al*. (2001) of the links between HIV/AIDS and food security shows that the impact is systematic and affects all aspects of rural livelihoods. Whilst drought has been more pronounced as the cause of food insecurity, affecting nutrition and agricultural production in many developing countries, the pandemic has exacerbated the situation through its systematic impact. Gillespie *et al*. (2001) state that where the prevalence of HIV/AIDS is high it affects all dimensions of food security– the availability, stability, access and use of food. The pandemic systematically increases food insecurity by affecting the family's ability to produce food, because productive and skilled members of a household have become ill or died, making the household unable to cultivate land, and its ability to buy food, because members can no longer continue working, hence there is no income, or income is diverted to care for the sick.

The SADC/FANR VAC (2003) examined the impact of HIV/AIDS proxy variables on household incomes and expenditure that directly affect household access to food. The study revealed that in Malawi, while households with chronically ill adults received 4% less income than those without chronically ill adults, in the case of households with two chronically ill adults the decrease was as much as 66%. Using a variety of approaches to examine the potential impact of HIV/AIDS on food access, the study looked at the household purchasing power and expenditure patterns. It was observed that households with an infected person or that have recently experienced death have increased expenditures on non-food items such as health care, transport and funerals. Finally, it was observed that the combined effect of reduced income and increased expenditure on non-food items means less economic access to food. In Zambia, for instance, the study found that

households that had experienced death or illness of an adult member reduced their expenditure by 67%.

The study by Gillespie *et al*. (2001) examined the type of impacts that HIV/AIDS may have on households' and communities' food and nutrition security in the context of their livelihoods, particularly with regard to rural populations dependent on agriculture. The study discovered that HIV/AIDS significantly affects individuals and households by reinforcing the vicious circle of inadequate dietary intake and disease, and by diminishing the capacity to ensure the essential food, health and care preconditions of good nutrition. The impacts on agriculture were related to labour and knowledge losses and institutional weakening.

3. Household vulnerability

According to FANRPAN (2007), there are several methods of measuring the vulnerability of rural households to different phenomena. Several studies (Pritchett *et al*., 2000; Downing *et al*., 2001; Luers *et al*., 2003) argue that the development of measures of vulnerability is complicated by the lack of consensus on the exact meaning of the term, the complexity of the systems analysed, and the fact that vulnerability is not a directly observable phenomenon (FANRPAN, 2007). However, without some ability to measure vulnerability, at least in a relative sense, it will be difficult to operationalise the concept (Luers *et al*., 2003) in assessing the impact of HIV/AIDS. Oyekele (2004), as quoted by FANRPAN (2007), used the fussy set approach to health risk vulnerability analysis to quantify the level of vulnerability to HIV/AIDS in the rainforest belt of Nigeria. The method takes a given population to be represented by vulnerable households and households that are not vulnerable. The vulnerability index proposed measured the degree of vulnerability of a given household as a weighting function of a given set of attributes. The weight attached to each attribute would represent the intensity of vulnerability of that attribute. However, this method has its limitations in that it is static and would not be able to wholly capture the effects of adaptive capacity of the household overtime.

Christiaensen and Subbarao (2004) proposed an approach to measure vulnerability where vulnerability was regarded as an expected poverty similar to the safety risk measures developed by Fishburn (1997). They considered consumption as a measure of well-being. A person's

vulnerability was therefore, measured as the current probability of becoming poor, multiplied by the conditional expected poverty i.e., the product of the probability that a person's consumption falls below the poverty line times the probability-weighted function of relative consumption shortfall. Pritchett *et al*. (2000) also incorporated vulnerability analysis as a component of poverty analysis. They argued that though most poverty measures consider shortfalls in current income or consumption expenditures to determine the poverty line, these measures do not indicate the vulnerable among the population and therefore proposed a vulnerability to poverty line (VPL), which is the level below which a household is vulnerable to poverty. The VPL is calculated by considering differences in vulnerability depending on gender of household head, educational level, urban versus rural, landed versus landless households, and sector of occupation.

The USAID Famine Early Warning System used a set of proxy indicators to quantify vulnerability to food insecurity (USAID-FEWS, 2000). The FEWS program used indices, calculated as weighted averages of selected variables, to measure vulnerability. These studies focus on compiling data in different areas, such as crop risk (e.g. length and variability of growing season), income risk (e.g. income variability, average cash crop production) and coping strategies (e.g. staple food production, access to infrastructure). On the other hand Luers *et al*. (2003) proposed a new approach to measuring vulnerability. They argue that vulnerability assessments should shift away from attempting to quantify the vulnerability of a place and focus instead on assessing the vulnerability of selected variables of concern and to specific sets of stressors. Their methodology considered three issues, i.e. sensitivity and threshold (sensitivity of system to different stressors, threshold of human being at which the system is said to be damaged), exposure (varying magnitudes and frequencies of disturbing forces, and adaptive capacity (extent to which a system can modify its circumstances to move to a less vulnerable condition).

The inclusion of adaptive capacity to vulnerability quantification adds an important dimension to vulnerability assessment. The indicator approach, while valuable for monitoring trends and exploring conceptual frameworks, its application are limited by considerable subjectivity in the selection of variables and their relative weights by the availability of data at various scales, and by the difficulty of testing or validating the different metrics (Luers et al., 2003). This approach lacks a component of dynamism, i.e. it does not put a quantitative measure

on the adaptive capacity of a system to shocks such as HIV/AIDS. However, this study used a modified indicator approach to quantify the vulnerability of households to impact of HIV/AIDS.

4. Methodology

4.1 Sampling procedure

A stratified method of sampling was adopted in this study, whereby the four regions (Manzini, Lubombo, Shiselweni and Hhohho) of the country formed the strata, followed by purposive sampling of Regional Development Areas (RDAs) and households within each RDAs. The selected RDAs representing the four regions were: Motsahne RDA, Ntfonjeni RDA, Mayiwane RDA (Hhohho region); Ngwempisi RDA, Ludzeludze RDA and Luve RDA (Manzini region); Tikhuba RDA, Siphofaneni RDA (Lubombo region) and Mahamba/Zombodze RDA, Mahlalini/Madulini RDA, Southern RDA (Shiselweni region).

Although the disadvantages of non-probability sampling methods like purposive sampling, in terms of statistical precision and generalisation are generally recognised (Churchill, 1995), it was the appropriate method in this study. This is because the most important criterion in selecting a sample is to increase the validity of the collected data (Carmines & Zeller, 1988). Hence, the study used a purposive sampling, which is most desirable when certain important segments of the target population are intentionally represented in the sample. Purposive sampling is a deliberate non-random method of sampling, which aims to sample a group of people, or settings with a particular characteristic, such as where they live in society, or specific cultural knowledge. The power of purposive sampling lies in selecting cases with rich information for the study, such cases provide a great deal of insight into the issues of central importance to the research study (Patton, 1990).

In this study, farmers' households were selected on the basis of having been affected by HIV/AIDS related illnesses, either by having a sick member or have lost a member through HIV/AIDS. Key informants such as extension officers, caregivers, and health motivators were used to identify affected households.

4.2 Sample size

According to the Central Statistics Office (CSO, 1997), Swaziland has 172 416 households,[2] of which 113 797 are rural households. The sample size was 240 households from each region, making a total of 960. However, due to loss of households during the data collection, only 161 and 206 questionnaires were collected from the Lubombo and Hhohho regions respectively, whilst in the other two regions 240 questionnaires were collected as targeted. Among other reasons, households were lost if no one was found home or there was no suitable interviewee at the time of visit. Therefore, the final sample used in the study was 847 households.

4.3 Data collection

The study employed both quantitative and qualitative techniques. Personal interviews were used together with focus group discussions to collect data. Focus groups discussions involved three groups in each region. These were composed of women, children and men. Questionnaires were pre-tested prior to data collection in the non-sampled areas to ensure clarity, validity, correct understanding and translation of questions. Data were collected between May and September 2004. Data collected included changes in household income, changes in expenditure on food items, and changes in household crop production. Data were divided into before and after a household was affected with HIV/AIDS.

4.4 Data analysis

Data were analysed using descriptive statistics, such as frequencies, percentages and graphs. Statistical Package for Social Scientists (SPSS version 10) was used to analyse the data. To measure household vulnerability, the household vulnerability index (HVI) was calculated. The pandemic exposes rural households to poverty mainly through its effects on agricultural production and food security. The extent of households' vulnerability to the impacts of HIV/AIDS depends on their socio-economic and political status. Hence, households are bound to have varying degrees of the impact of HIV/AIDS. Bates *et al*. (2004) argued that vulnerability is too broad a concept to enable effective targeting of the most vulnerable, especially when resources are scarce.

[2] *A household is defined as a group of individuals who share living quarters and have common cooking utensils (CSO, 1997).*

In their guidelines for vulnerability mapping, the World Food Programme (WFP, 1999) stressed the need for creating a vulnerability database that is useful to identify both chronic and transitory vulnerabilities i.e., groups that are permanently vulnerable and those that are temporarily vulnerable must be differentiated for appropriate policy action. This cements the need to develop an appropriate method of quantifying the levels of vulnerability of each household (FANRPAN, 2007).

Sustainable livelihoods framework was used in analysing the ability of households who are affected by HIV/AIDS and how they cope with such shocks. A household is sustainable when it can cope with and or recover from stresses and shocks or enhance its capabilities and assets, while not undermining the natural resource base. Thus the more assets a household has, the lesser is its vulnerability. A household livelihood generally has five assets, i.e., human, physical, financial, social and natural capitals. Household vulnerability evolves from the impact of HIV/AIDS impacts on one or all of these assets.

According to Christiaensen and Subbarao (2004), vulnerability of households to HIV/AIDS is their capacity to cope with, resist and recover from HIV/AIDS infection, while Oyekale (2004) regards vulnerability as a function of exposure to risk and inability to cope. In this study the Luers *et al*. (2003) approach was adopted. The Fussy Set approach has been used to analyse the data. Following is the application of the Fussy Set approach:

- One can state that for the population N made up of n households i.e. (N = {hh1, hh2, hh3 … hhn}, V is a subset of v households that have some degree of vulnerability to HIV/AIDS – hence impacted by the pandemic. Thus $v \leq n$ and $v = 0$ implies that there are no vulnerable households, and $v = n$ implies that all households are vulnerable.
- One can also break down the vulnerability X into m specific dimensions of impact, and give a corresponding weight (wi, i = 1,…,m) to each dimension. The weights can be predetermined, or developed using an appropriate function.
- The vulnerability of any given household hhi I = 1…n to the jth j = 1,…m dimension of impact can be expressed as Xij, and set to take values between 0 and 1 such that 0 = no impact and 1 full impact. Thus each Xij denotes the degree of vulnerability of household i to

the jth dimension of impact, and Xijwi will be the corresponding weighted vulnerability.

- The sum of the weighted vulnerabilities across all dimensions give the particular household's total vulnerability Vhhi to HIV/AIDS, that is:

$$\sum_{j=1}^{m} Xwj / \sum_{j=1}^{m} Wj = Vhhi$$

- It is also possible to sum down the dimensions and calculate the particular dimension's contribution to vulnerability to HIV/AIDS.
- For the study, the sum of the weights has been conveniently set to

$$\sum_{j=1}^{m} W \quad j \;=\; 100$$

The household vulnerability index was calculated as follows:

1. Selecting appropriate dimensions of impact.
2. Selecting variables from collected data to describe these dimensions.
3. Setting the goal posts for each variable: maximum and minimum values.
4. Developing a matrix of weights for the dimensions. Each variable is given an appropriate weight within its cluster using the predetermined weights. The sum of weights is divided by 100 to ensure that the weighting remains between 0 and 1.
5. Next we calculate the individual variable indices as a number between 0 and 100 by using:

$$\frac{\text{Actual value - minimum value}}{\text{Maximum value – minimum value}} \quad \text{X } 100$$

6. The Household Vulnerability Index (HVI) is then computed for the total mark using the formula: Household Vulnerability Index (HVI) = average value of individual indices.

4.5 Limitations of the study

As with any study, the present study has its limitations, including time, financial considerations, and the nature of the research design. Therefore, several limitations of this study should be noted as they could provide opportunities for future research. Due to the nature and sensitivity of HIV/AIDS, the respondents were asked indirect questions about the disease. This involved using questions about symptoms related to HIV/AIDS infection. As a result of this indirect approach, some important information might have been missed in the process.

The use of questionnaires also limits useful information from respondents. However, this was taken care of by using focus group discussions to complement the data from questionnaires. This study also suffers from the weakness of using cross-sectional data. Therefore, inferences of the impact of HIV/AIDS on agricultural production should be made in the context of these limitations.

5. Results and discussion

5.1 HIV/AIDS Impact on household's food security

5.1.1 Changes in income

One way to examine the impact of HIV/AIDS on the households' ability to have access to food is to look at household income from both agricultural and non-agricultural activities points of view. The expenditure pattern of an infected household member also has a bearing on his/her ability to have access to food. Table 3 presents the changes in income of affected households. The table shows that, generally, there has been an increase in income from crops and livestock sales during the period when a household was affected by HIV/AIDS. This could be a result of households selling crops and livestock in order to get income to take care of the sick and pay medical bills. The results reveal that most income (19.5%) came from livestock sales, followed by income from crop sales (4.6%).

Table 3: Percentage change in income of households with HIV/AIDS related illnesses and deaths of adult members

Region	Crops	Livestock	On-farm agric products	Off-farm products	On-farm non-agric products	Off-farm non-agric products
Lubombo	9	11	4	-4	-5	-
Manzini	15	59	1	-	1	-2
Hhohho	-1	-	9	7	-	2
Shiselweni	-5	8	-	-	-	-
Overall	4.6	19.5	3.5	0.8	-1	-

- No statistically valid cases

Whilst on average there has been an increase in income from the different sources as outlined in the results in Table 3, this increase is low except for the Manzini region, which recorded a 59% increase in income from livestock sales. This implies that a lot of livestock was sold in this region to gain income. Such income becomes useful for taking care of the sick person in the household. In the Shiselweni region a 5% decline

in income from crop sales was realised. The Lubombo region registered a decline in income of 4% and 5% from off-farm agricultural and on-farm non-agricultural practices respectively. The decline in income from sales could be attributed to reduced agricultural production as a result of the shift in expenditure patterns. For example, reduced agricultural inputs and unavailability of labour to work in the fields. Overall, affected households had a general increase in income, mainly from sale of livestock, crops, and on-farm products, indicates that households tend to sell their livestock and crops in order to get money to cover medical bills and funerals.

5.1.2 Changes in expenditure

Households with an infected or dead member change their expenditure pattern by channelling income from food to non-food items such as health care, transportation and funerals. This tends to compromise agricultural production, as less income is used to purchase agricultural inputs and other agricultural equipments. Table 4 shows the percentage change in expenditure of households as a result of HIV/AIDS. The results indicate that expenditure on crops inputs was reduced by 12.3%, followed by livestock with 1.5%. The results further show that there was an increase in expenditure towards non-agricultural products. This could imply that affected households spend more on medication and compromise agricultural production. The results further show an overall increase in expenditure on both on-farm and off-farm non-agricultural products.

Table 4: Percentage change in expenditure of households with HIV/AIDS related illnesses and deaths of adult members.

Region	Crops inputs	Livestock	On-farm Agric product	Off-farm products	On-farm non-agric products	Off-farm non-agric products
Lubombo	-35	-8	-	-1	1	-15
Manzini	-3	4	-2	-	-	-1
Hhohho	2	-	-	-	1	18
Shiselweni	-13	-2	-1	-	-	-
Overall	-12.3	-1.5	-0.8	-0.3	0.5	0.5

- No statistically valid cases

The results shown in the Table 4 are in line with expectations as reduced expenditure on agricultural items was observed in all the regions except for Hhohho. Further analysis on household expenditure reveals that, the highest expenditure goes to funerals (Figure 1). Funeral

expenditure has increased by E 1 541[3] on the average, while medical bills have increased by E 1 010. The Lubombo region observed an average increase of E 1 765.18 and E 2 095.44 in medical bills and funeral costs, respectively. The Shiselweni region incurred an average increase of E 1 109.12 on medical bills and E 1 767.17 on funeral expenses. The reduced incomes coupled with an increase in expenditure on non-food and non-agricultural items result in less economic access to food.

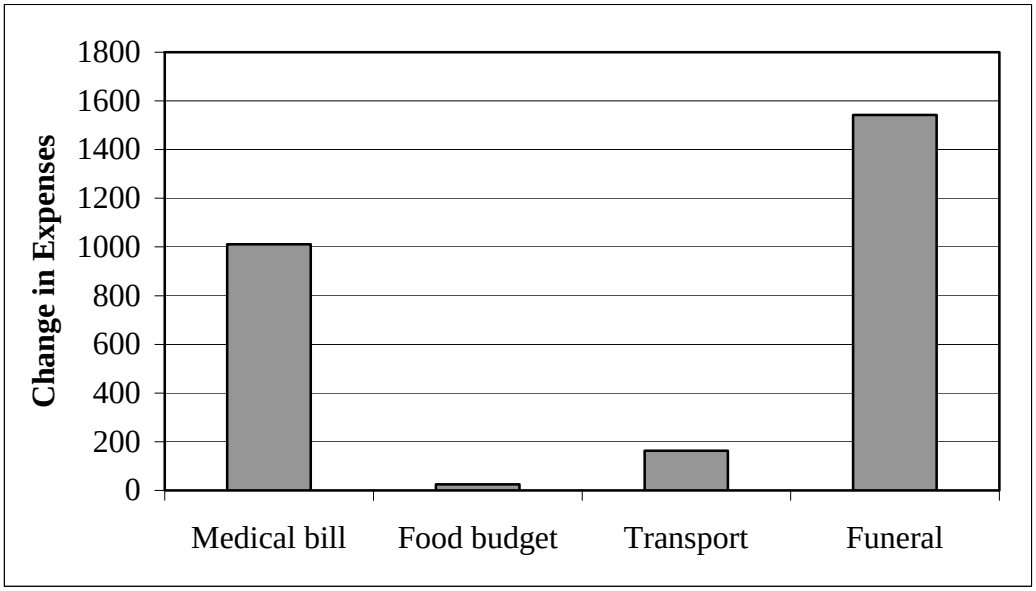

Figure 1: Change in expenditure by household with recent death/chronically ill members

5.1.3 Changes in production

Table 5 reveals a 21% decline in maize production based on the household sample, 4% decline in groundnuts production, 3% decline in sweet potatoes, 0.8% decline in Irish potatoes, 0.5% decline in cotton and 3% increase in beans. Impact within the regions indicated a 44% decline in maize production in the Lubombo region and 22% in the Shiselweni region. Given the dualistic agricultural practices in the rural areas, the subsistence farming is stronger than the commercial farming, once households are affected they may shift from commercial to subsistence farming. This may result in fewer crops sold to generate income for the households, hence less food security. The effect of HIV/AIDS on affected households living on commercial farming would be a reduction in cash crop as they switch from more demanding commercial farming to less demanding subsistence farming.

[3] *One Lilangeni (E) is equivalent to one Rand (R)*

It is noted that, although there was a decline in the production of other crops, there was an increase in the production of beans, especially in the Lubombo and Manzini regions. This could be attributed to the intervention programmes, which encourage the use legumes for their protein nutritional value, in coping with HIV/AIDS related illnesses.

Table 5: Percentage change in crop production for household with adult sick or died of HIV/AIDS related sicknesses

Region	Maize	Groundnuts	Sweet potatoes	Potatoes	Cotton	Beans
Lubombo	-44	-5	-7	-	-2	+7
Manzini	-9	-2	-2	-3	-	+4
Hhohho	-8	-3	-	-	-	-1
Shiselweni	-22	-4	-2	-	-	-
Overall	-21	-4	-3	-0.8	-0.5	+3

- No statistically valid cases

5.2 Household vulnerability

Household vulnerability is the extent of the impact of the HIV/AIDS on households with respect to food security. In this study, a Household Vulnerability Index (HVI) was calculated to establish the different levels of vulnerability that the impact of HIV/AIDS on food security has introduced in the households studied (Appendix A). The fuzzy set approach (Costa, 2002) was used to calculate the HVI. This approach quantifies the multidimensional impact of a health problem on a household. Weights for the HVI were conveniently set at $\sum_{j=1}^{m} W\ j = 100$ (FANPARN, 2007). Using the HVI, households were then categorised into 3 different degrees of vulnerability:

Vulnerability level 1, coping households (CLH). These are affected by the HIV pandemic in lesser critical areas as far as food security is concerned. Much of the vulnerability of these households was the results of the effects of the pandemic on social capital and financial capital. Little or no vulnerability is emanating from the physical, natural and human capital aspects of the households. Mitigation efforts for such households should be aimed at improving social support networks that will assist the households in building beneficial social relations within the community.

Vulnerability level 2, acute level households (ALH). Generally for all the households falling in this group financial, physical and human capitals are affected the mostly by the pandemic although the extent of the impact can be manageable with targeted response packages.

Vulnerability level 3, emergency level households (ELH). Although these households are vulnerable in all the livelihoods aspects of life, the degree to which the livelihood assets are affected is very high. A considerable amount of effort is required to resuscitate this household because it requires assistance in almost every aspect of its livelihood.

Table 6 presents the results of the HVI of the households in the study sample. The results show that a considerable proportion of the households (77.9%) were in the Coping Households (CLH) vulnerability level, and this implies that they were in a vulnerable situation but could still cope. However, a substantial proportion (22%) could be classified as Acute Level Households (ALH). These ALH households had been hit so hard that they badly need assistance to the degree of an acute health care unit in hospital. With some rapid response type of assistance these families could be resuscitated. Only 0.001% of the households fell in the Emergency Level Households (ELH) category. These were households, which were in the equivalent of an intensive care situation, almost a point of no return, but could still be resuscitated if the best possible expertise were to be provided.

Overall, the situation does not look that good, since the results indicate that some proportion of the households in the study need acute and emergency assistance. However, intervention is still needed for the affected households, and their proportion is expected to rise, as the full impact of the HIV/AIDS pandemic is still to be experienced given that the pandemic is still expected to reach maturity in the country.

6. Conclusions

Whilst it remains extremely difficult to ascertain the exact impact of HIV/AIDS, the study has shown some positive relationship between HIV/AIDS and food insecurity in Swaziland. The study concludes that the most affected component of agriculture in Swaziland is livestock, which, as a result of the pandemic, households have resorted to selling their livestock as a means of sustenance and to pay for medical bills and post death expenses. Crop production has diminished due to a fall in land utilisation, as inputs become unaffordable when the sick or dead

member was the one providing finance for inputs, household labour is diverted to caring for the sick, and skilled people die or fall sick; living behind people with little or no skill on production management. This situation has seen more households falling below the poverty line, as in more than 70% of the affected households, the sick or the dead members had been living on-farm. This undermines government's endeavour to alleviate poverty in the country, which, in turn makes people and households even more vulnerable to the pandemic.

Table 6: Household vulnerability index (HVI)

HVI level	HVI range	Situation of household	Frequency	%
Vulnerability Level 1	0 – 33.3%	Coping households (CHH) –household in vulnerable situation but still able to cope	660	77.9
Vulnerability Level 2	33.4 – 66.7%	Acute level households (ALH) –household has been hit so hard that it badly needs assistance to the degree of an acute health care unit in hospital. With some rapid-response type of assistance the family may be resuscitated.	186	22.0
Vulnerability Level 3	66.8 –100%	Emergency level households (ELH) – the equivalent of an intensive care situation – almost a point of no return – could be resuscitated only with the best possible expertise	1	0.1
Total			847	100.0

The study has indicated that, although the HIV pandemic has a severe negative impact on food security, the majority of the respondents have shown to be able to cope with the impact. However, there are some households who require attention.

7. Implications

In response to the pandemic and its consequences there is urgent need for government and non-governmental organisations to combine their efforts to come up with a comprehensive set of policy measures. These policy measures should include direct policy such as health policy targeted on improving the health of those already affected, whilst providing preventive health services to those not affected.

Forming part of the policy measures should be policy interventions that will assist the affected households to maintain their agricultural production and food security such as agricultural policy, food-aid policy and rural development policy. These policy interventions should include: Interventions in the form of therapeutic feeding and home

based care for the chronically ill in vulnerable. Households, households that are vulnerable and hosting orphans, should be assisted to prevent them from resorting to negative coping mechanisms. Such interventions should also be linked to long-term developmental programmes.

Provision of support in the form of agricultural inputs such as fertilisers should be done through the markets where functional and through special arrangements for the poor farmers and where markets are not functioning properly to allow farmers access to affordable inputs.

Government need to promote health and nutrition education on dietary intake and disease prevention which should also be essential in all developmental programmes aimed at changing behaviour on health and nutrition practices. Where labour resources are affected as a result of the pandemic, training by agricultural extension staff on the introduction of less labour-intensive crops such as growing cassava instead of maize as it has the same nutritive value.

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Appendix
Variables used to calculate the household vulnerability index (HVI)

Variable tracked in study	Variable name	Description of variable	Weight given to variable	Transformation used
Dependency ratio	Dependency	Number of household members less than 15 years of age and 65 years and above, divided by the number of members between 15 and 64 years of age	3	1 = households with dependency ratio > 1; zero otherwise
Number of dependants	Dependants	Number of household members less than 15 years of age and 65 years and above	3	1 = households with 3 or more dependants, and 0 for those with less
Age of head of household	Age of head of household	This was calculated exactly as described under the transformation.	2	0 = households headed by people aged in the 20–60 range, 1 otherwise.
Have household members suffered from any AIDS related illnesses	AidsRelatedness	The household was assessed on each disease. The answer to the question in the variable was 'yes' if a member suffered from at least one of the AIDS related illnesses.	3	1 = yes, and 0 = no
Total household size	TotalHouseholdSize	All members of the household were counted using the SUM function in EXCEL on the variables on members in different age categories described in the first variable which, in turn, had been generated using the COUNTIF function.	1	1 for those above 10, and 0 otherwise
Highest education level for the head of household	EducationLevelHHH	This was calculated exactly as described under the transformation.	2	1 for "no formal education" and "primary education", 0 otherwise
Who is the head of the household?	FamilyHead	This was calculated exactly as described under the transformation.	4	Widowed and orphans = 1, 0 elsewhere.

Variable tracked in study	**Variable name**	**Description of variable**	**Weight given to variable**	**Transformation used**
AIDS takes children's time to be at school looking after the sick	SchoolTimeLost	The household was considered as being in this situation if the age of the person looking after the sick was less than 18.	2	1 = yes, and 0 = no
AIDS takes farming time, as people will be looking after sick people	FarmingTimeLost	The household was considered as being in this situation if the age of the person looking after the sick was between 18 and 64, as these members were considered productive on the farm.	2	1 = yes, and 0 = no
Livestock is sold to finance medication of the sick	Livestockls	The household was considered as being in this situation if it sold more of any of the livestock during illness of a member than before.	3	1 = yes, and 0 = no