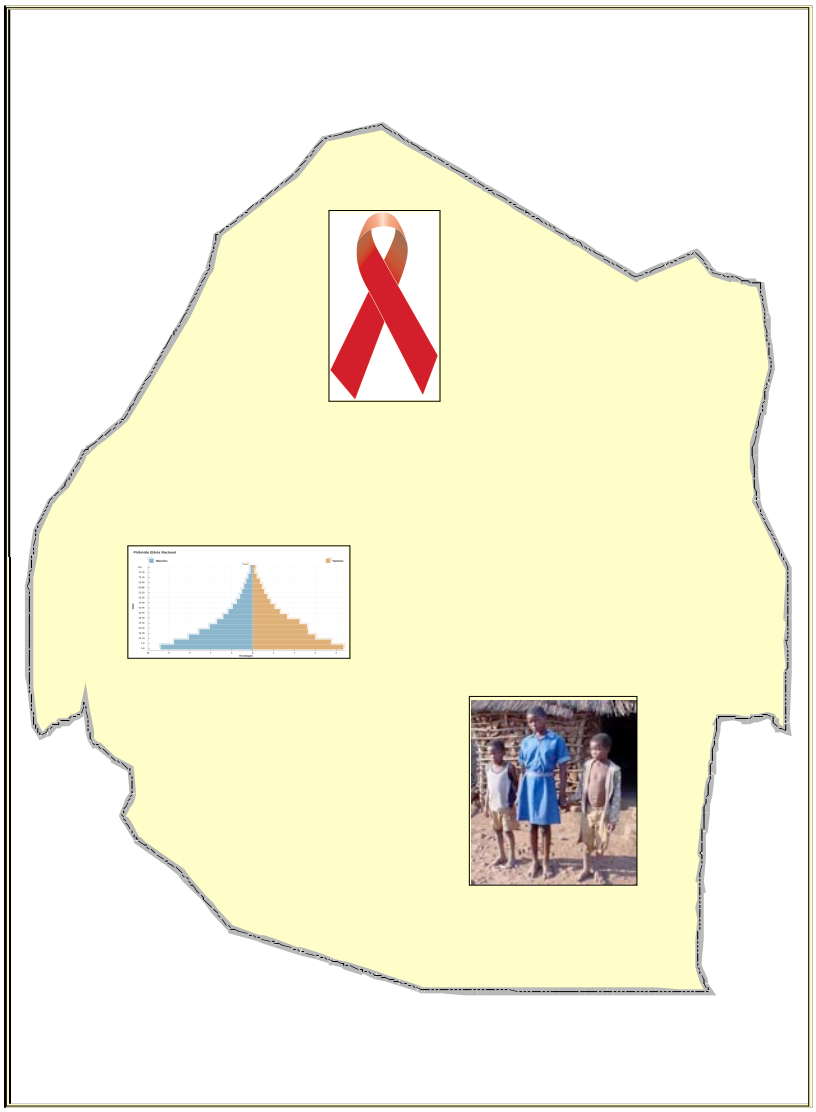
SWAZILAND
VULNERABILITY ASSESSMENT COMMITTEE

A Study To Determine The Links Between HIV/AIDS, Current Demographic Status And Livelihoods In Rural Swaziland



Mbabane, April 2004

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ACRONYMS

AIDS	:	Acquired Immuno-Deficiency Syndrome
AP	:	All Proxy Households
CFSAM	:	Crop & Food Supply Assessment Mission
CIHHH	:	Chronically Ill Household Head Households
CSO	:	Central Statistics Office
DFID	:	Department for International Development
EMOP	:	Emergency Operations
FANR	:	Food, Agriculture & Natural Resources Directorate (SADC)
FAO		Food and Agriculture Organization
FEZ	:	Food Economy Zone
GOS	:	Government of Swaziland
HH	:	Households
HIV	:	Human Immuno-Deficiency Virus
LDS	:	Lutheran Development Service
MOAC	:	Ministry of Agriculture & Cooperatives
MT	:	Metric Tonnes
NEWU	:	National Early Warning Unit
NGO	:	Non-Government Organization
NVAC	:	National Vulnerability Assessment Committee
RC	:	Baphalali Swaziland Red Cross Society
RVAC	:	Regional Vulnerability Assessment Committee
SADC	:	Southern African Development Community
SC SZ	:	Save the Children Swaziland
SC UK	:	Save the Children UK
SFDF	:	Swaziland Farmers Development Foundation
Swazi VAC	:	Swaziland Vulnerability Assessment Committee
UNAIDS	:	Joint United Nations Programme on HIV/AIDS
UNICEF	:	United Nations Children's Fund
VAC	:	Vulnerability Assessment Committee
VAM	:	Vulnerability Analysis and Mapping Unit (WFP)
WFP	:	World Food Programme
WVI	:	World Vision International

ACKNOWLEDGEMENTS

The Swaziland Vulnerability Assessment Committee[1] (Swazi VAC), with considerable support from the Central Statistical Office, conducted a nationwide survey to analyse the linkages between HIV/AIDS, demography and livelihoods in rural Swaziland. The study began in June 2003 and was completed in March 2004. The process included data collection, data capture, cleaning, analysis and report writing during this period. Further analysis and report writing is recommended for interested stakeholders when considering the rich data set captured by the survey. The current survey findings were guided and supported by the SADC FANR Regional VAC and consultants contracted by UNAIDS[2], in-country technical support has been provided by the Swazi VAC Livelihoods Advisor (seconded from Save the Children UK).

During the analytical process certain members of the aforementioned institutions played a pivotal role enabling the Swazi VAC to complete the study. In particular special appreciation goes to Choice Ginindza and Eugene Zwane from CSO, Johan van Zyl and Scott Drimie from UNAIDS/HSRC, Neil Marsland (formerly of SC UK, then FEWSNET seconded to the RVAC and finally as an independent consultant), Owen Calvert (WFP/VAM), and Alex Rees (Swazi VAC Livelihoods Advisor) for their continued support during the analytical journey through to completion of the report.

The whole process would not have been a success if it were not for the good co-ordination network that exists between CSO heads and their field enumerators in ensuring that the large data collection stage was a success.

The efforts of the core team members of the Swazi VAC namely: Nathie Vilakati (Save the Children Swaziland), Menzi Dube (MOAC), Choice Ginindza (CSO) and Lungile Mndzebele (MOAC) are greatly appreciated.

We also thank DFID, WFP and the Regional VAC who provided financial support for this HIV/AIDS based survey. Save the Children Swaziland is gratefully acknowledged for their on-going financial and administrative support for the Swazi VAC. Support was also provided by NERCHA during the initial stages of analysis.

Above all, special thanks are due to all the households in the all enumeration areas in the country who took part in the discussions and shared some of their life experiences with the CSO staff. We hope we have represented them accurately and there will be a deeper understanding of how HIV/AIDS is impacting the people of Swaziland and how we may mitigate its impact.

Mr. George Ndlangamandla
Swazi VAC Chairperson

[1] Currently housed under National Disaster Taskforce
[2] From the HSRC (Human Sciences Research Council), Pretoria, South Africa

EXECUTIVE SUMMARY

The Swaziland Vulnerability Assessment Committee carried out a nationwide survey of rural areas in Swaziland to analyse the linkages between HIV/AIDS, the demographic trends of the country and how livelihoods and food security status may be changing as a result. Stakeholders of the Swazi VAC are keen to get a more accurate understanding of the impact of HIV/AIDS on mortality and morbidity around the country to support policy decision-making and programmatic interventions (including targeting) at a period when high HIV/AIDS prevalence rates indicate that normal demographic trends cannot be assumed. The field survey focused solely on rural areas and was carried out in May and June 2003 with staff from CSO. A random sample census was carried out in 15% of enumeration areas in the country with samples across all regional, agro-ecological and food economy / livelihood areas. Questions focused on household demography, morbidity and mortality levels as well as food and income sources. The study used morbidity, mortality and orphan levels as proxy indicators of HIV/AIDS impact. The shortcomings of this are discussed in Chapter 2. The large sample size (18,528 HHs) allows the disaggregation of data down to Inkhundla level.

Expected demographic transition trends found in developing countries represented by a shift from **high** mortality and fertility levels to **low** mortality and fertility levels over a period of decades has been ruled out in Swaziland as a result of HIV/AIDS. Swaziland has entered uncharted territory. Previously declining mortality levels have increased markedly since the mid-1990s reversing a positive trend of development. Mortality has increased dramatically among the age group 0-4 and the previously healthy age group between 20 and 50. The long term decline in fertility levels continues (primarily as a result of normal development processes) and is likely to be entrenched by the HIV epidemic. The decline in fertility and the rise in mortality are the main determinants behind the lessening of the population growth rate in Swaziland. Between 1997 and 2003 the rural population growth rate is estimated at 2.01% compared to a growth rate of 2.9% between 1986 and 1997. Ever-increasing mortality at younger ages has reduced life expectancy, possibly down to as low as 40 years. This study projects an annual increase in deaths with an annual total of 31,830 deaths in 2010 (without ARVs). The current crude death rate of 25.8 will increase to 26.8 by 2010 with a total population of 1,190,000. The study shows that females are suffering the brunt of the disease with much higher levels of chronic illness and projected mortality. Against expectations (assuming an increase in AIDS related deaths) the age dependency ratio of the country continues to decrease (improve) because of the steady decline in fertility levels. However, when factoring in levels of chronic illness around the country (which are used as a proxy for HIV/AIDS) the 'effective' dependency ratio provides important insights into vulnerability of households and areas in rural Swaziland. The Lowveld and Lomahasha areas have the highest (worst) effective dependency ratios. Orphan levels in the country are high. Overall, 3.2% of rural children less than 15 years are double orphans and there are approximately 19,206 (6%) maternal orphans in the rural areas. Further analysis of the data set is recommended and will provide geographic and socio-economic disaggregation of findings.

An initial analysis of the impact of HIV/AIDS on rural livelihood patterns implies that there is a qualitative shift occurring whereby households affected are changing their income sources to cope/compensate for losses of income from crops sales and remittances. In contrast to income sources, household's ranking of the importance of different food sources does not appear to be related to (proxy) HIV/AIDS status. This finding is intuitively challenging and further investigation is recommended. No strong consistency in the relationship between HIV/AIDS proxy indicators and cropping areas, inputs or yields was detected. Whilst the data tentatively indicates that affected households are in general "more" protective of tubers than non-affected households and are less concerned (or able) to preserve or increase cash crop and cereal production. Overall, further analysis of the current data set is recommended to improve our understanding of the impact of HIV/AIDS on rural food security/livelihoods.

Summary of demographic findings in rural Swaziland in 2003

- The rural population growth rate between 1997 and 2003 has been 2.0% (and is likely to decline further in future).
- The rural population is approximately 807,000 (not including institutions e.g. army/police camps in rural areas).
- The survey confirms that fertility levels are declining with a greater percentage of the population in the age group 15 to 64 years than those above and below.
    - 43.7% of population aged 0-14 years
    - 52.6% of population aged 15-64 years
    - 3.7% of population aged 65+ years
- The current age dependency ratio (at a level of 90) has improved mostly because of a significant decline in the fertility rate.
- The effective dependency ratio is highest in the Lowveld and Lomahasha areas (this variant of the dependency ratio incorporates levels of chronic illness).
- Female morbidity is higher than male morbidity at all ages and starts at a much younger age.
- The survey confirms that mortality rates are rapidly increasing. The current mortality rate is 25.8 (per 1,000).
- Female mortality is higher than male at the younger age groups (20-29 years).
- Overall 78.3% of deaths were preceded by a bout(s) of chronic illness.
- Orphan numbers are growing:
    - 2.3% (totalling 7,400) of rural children (0-15 years) have lost both parents
    - 5.9% (totalling 19,206) of rural children (0-15 years) are maternal orphans
    - Maternal orphan rates are highest for children between 10 years
- The population is projected to grow to 1,190,000 by 2010 (this could be an underestimate considering the modelling predicted a population growth rate much less than the 2.0% found during the study).
- The crude death rate is projected to increase to 26.8% by 2010 (totalling 31,830 deaths in that year).

CHAPTER 1: INTRODUCTION

PURPOSE OF THE STUDY

In the context of the 2002/3 Southern Africa regional humanitarian emergency there is common agreement that HIV/AIDS has contributed to the depth and breadth of problems faced by rural households in Swaziland. What is less well understood is the extent of this impact on the Swaziland population, its structure and composition, demographic related outcomes such as morbidity and mortality, as well as its impact on the structure and workings of individual households. Furthermore, there is also no clear-cut analysis of how the demographic structure of the country and the livelihood profiles of the population is exacerbating or restraining the impact of HIV/AIDS on food security and livelihoods in general. Previous food security and livelihood assessments carried out by the Swaziland Vulnerability Assessment Committee (Swazi VAC) during 2002/3 were not specifically designed to analyse the relationships between HIV/AIDS, demographic patterns and livelihoods. However, all three Swazi VAC reports have made strong recommendations for more in-depth studies to investigate these relationships and the impact of HIV/AIDS.

The Vulnerability Assessment Committee (VAC) system in southern Africa comprises of a Regional Vulnerability Assessment Committee (RVAC) and National Vulnerability Assessment Committees (NVACs), currently in existence in about nine SADC Member States. The RVAC was constituted within the Southern African Development Community (SADC) Food Agricultural and Natural Resources (FANR) Directorate in 1999 in response to a need for the SADC regional food security programme. SADC wished to keep abreast of all developments that were going on in the field of vulnerability assessments and analysis in particular the Food Insecurity and Vulnerability Information and Mapping System (FIVIMS) initiative that came out of the 1996 World Food Summit and the various other methodologies that were being employed by a host of agencies and NGOs in member States. Under the Regional Early Warning Unit within the FANR Directorate, the RVAC was mandated to promote and strengthen the capacity of Member States to undertake and utilise vulnerability assessments for the purposes of food security planning in both emergency and non-emergency situations.

The purpose of this study is to attempt to fill some of the existing information gap and try to determine the impact of HIV/AIDS on the demographic structure and livelihood patterns in rural Swaziland. This study was designed to provide a statistical base to document the impact of HIV/AIDS at various levels of society, ranging from the individual and household level through to the national level. In view of the capacity building requirements of the Swaziland VAC and the regional implications of such a large study, every effort will be made to document and learn from the process of the study.

The study aimed to achieve the following objectives:

- To provide information on the links between HIV/AIDS, current demographic status and livelihoods in rural Swaziland to enable better informed decision making for policies, programmes and interventions
- To ascertain the quantitative impact of HIV/AIDS on the rural population of Swaziland, in particular on the age and sex composition
- To establish relationships between HIV/AIDS and livelihoods in rural Swaziland
- To analyse and learn from the process of the study

This study originated from concerns in earlier Swazi VAC assessments about the available population figures in the rural areas. During the preparation of the second VAC report in December 2002 several stakeholders involved in the VAC assessment wishing to utilise VAC outputs expressed their concerns about the validity of the base population figures and the annual percentage increment used to represent normal population increase in rural areas that were a basis for a lot of the food aid predictions. Concerns about urban areas were not deemed a major priority at the time. The demographic basis for previous VAC assessments was data collected during the 1997 population census (plus an annual increase of 2.9% to incorporate population growth). Swaziland VAC stakeholders felt that it was necessary to obtain more up to date demographic information given the contradictory opinions being expressed. Several NGOs were of the opinion that the available population figures and therefore food requirements were being underestimated in their areas of operations. Furthermore, all stakeholders concurred that there was a real need to understand and disentangle the impact that HIV/AIDS was having on the population. It was hypothesised that given the real possibility of an increase in mortality levels, (due to AIDS-related illnesses), there could even be a decline in population numbers in some areas. However, it was agreed that many of the hypotheses surrounding the impact of HIV/AIDS in southern Africa have not been statistically proven or quantified. The Swazi VAC needed to have strong statistical backing to its research in order for its findings to have sway with current programmes and interventions.

In particular, there was a programmatic need from several stakeholders to have access to current demographic information, such as the dependency ratio - possibly at Tinkundla level[3]. One idea mooted was to analyse the demographic and "effective" dependency ratio's to obtain statistical evidence of the geographic locations in Swaziland where HIV/AIDS was having the largest (probable) impact on food security and livelihoods, particularly as a result of higher mortality rates, an increase in the level of chronic illness and a rising number of orphans. If such information was collected, the potential use of the data could be enhanced by another initiative underway in Swaziland. UNICEF was in the process of digitising the spatial and demographic information of Enumeration Areas (EAs) from the 1997 census. By combining newly collected information with a spatial backdrop of the country at the lowest level, areas of the country most heavily affected could be identified and mapped out which would greatly assist relief operations (see Figure 4).

The issue of accurate population figures in the rural areas was tabled at a VAC stakeholder meeting in February 2003. At the meeting it was agreed in general terms that a study needed to be carried out to ascertain the impact of HIV/AIDS on the population. In essence the proposal entailed that a large-scale sample census be conducted in the rural areas of the country. Besides collecting demographic information at a household level, a number of income and food production questions were to be included in the questionnaire in an attempt to analyse the relationship between HIV/AIDS and livelihood patterns. The Swaziland VAC presented the proposal regarding the envisaged study at a Regional VAC workshop in Pretoria in March 2003. An agreement was reached in principle to proceed with the study. Support was pledged by key regional partners such as DFID, the RVAC and UNAIDS.

SWAZILAND IN CONTEXT

Macro-Economic Picture

Swaziland is a landlocked nation with an economy that is heavily dependent on South Africa from which it receives 83% of its imports and sends 74% of its exports. Export products

[3] Administrative level 3 in Swaziland – Nation, Region, Tinkhundla and Chiefdom. There are 55 Tinkhundla in Swaziland.

include wood pulp, soft drink concentrate and sugar. South Africa's economic success has had negative effects on the Swaziland economy as a result of its attraction to foreign investors. In 2001 Swaziland only attracted US$20 million in foreign direct investment. Agriculture and the agro-industry form the basis of the economy with sugar, citrus and wood pulp as the main products. Subsistence agriculture employs about 60% of the population. In terms of its political and constitutional framework, the King (Mswati III) is the country's head of state. He plays an active role in governance with the Government and Parliament.

As Swaziland continues to benefit from the United State's Africa Growth and Opportunity Act (AGOA), it is likely that real Gross Domestic Product (GDP) growth will increase, consolidated by an acceleration of real GDP growth in South Africa, which is Swaziland's main export market. However, the current national economic slowdown is proving to be exceptionally deep and broad. The global climate is not good and Swaziland faces some specific problems around access to the US markets through AGOA and the Generalised System of Preferences (GSP) because of policy complications. Taiwanese companies and others in the garment industry have warned government that they will pull out if AGOA/GSP status is lost. Thus there are real issues around both the structure of the economy and the type of employment being created. There has been a real decline in the total number of people employed in the formal sector forcing people to make a living in the informal sector, through agriculture or by moving to South Africa.

The structural context constraining livelihood options remains little changed over the past two-to-three years. Depressed employment opportunities, poor agricultural production, plus rising staple food prices and the effects of HIV/AIDS have undermined livelihoods. The formerly important cotton industry of the Lowveld has more or less collapsed over the past 4-5 years. High levels of household vulnerability combined with the shocks of two years of erratic weather patterns and an economic slow-down (2000-2002) precipitated a crisis for many Swazi communities. Poverty is endemic on Swazi National Land (SNL) where 70% of the population contribute to the agricultural sector's modest 10% share of GDP.

Food Security Situation

By July 2002 Swaziland had been incorporated as a beneficiary under a WFP Regional Emergency Operational Plan (EMOP). A total of 144,000 people were targeted for a general targeted food distribution (GFD). A total of 13,500 metric tons (MT) of cereal food aid was budgeted for the programme of assistance. The WFP and a consortium of national NGOs formed a partnership to distribute food aid in the worst affected areas. As part of a regionally coordinated food security and livelihood monitoring programme three consecutive assessments were planned and carried out in 2002 and 2003. The assessment / monitoring exercises were initially designed to provide guidance on food aid interventions throughout the country. However, it was soon realised that the crisis in Swaziland, and also in other countries in Southern Africa, was much more complex requiring a sophisticated analysis of the impact of economic indicators and HIV/AIDS that were affecting and undermining livelihoods in areas where populations were already vulnerable to food insecurity.

In the first round assessment, and under the guidance of the WFP reporting format, it was generally assumed that the number of people in need of food would tend to increase toward the "hungry season" – just before the April/May harvest. The July-August 2002 Swazi VAC first-round assessment provided new scenarios suggesting that the number of the people in rural areas requiring food assistance would rise from 144,000 to 153,000 for the period September through November 2002 and from 231,000 to 265,000 for the period December to March 2003. The total cereal requirement for food aid was increased from 13,500 MT to 19,500 MT.

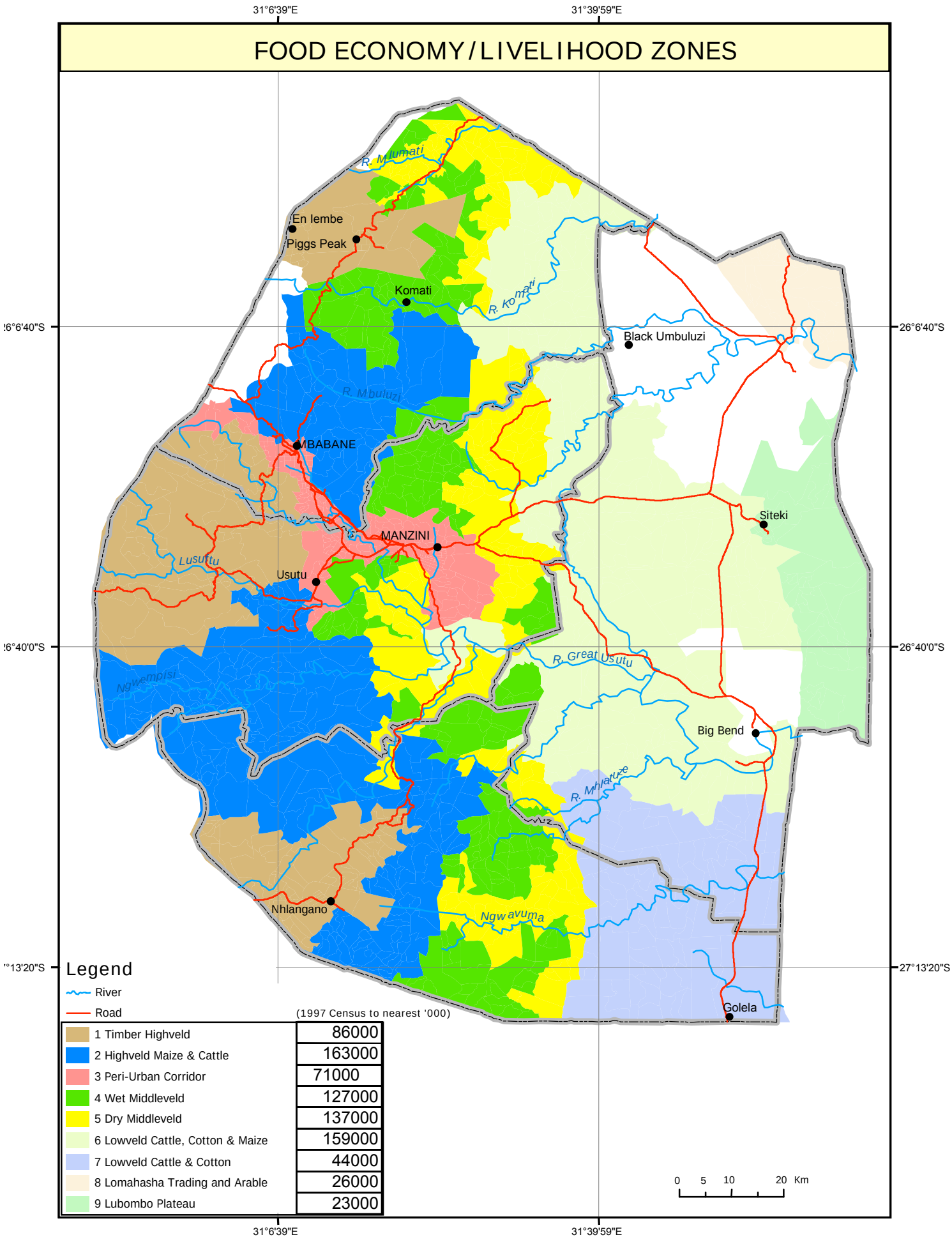
The second-round November-December 2002 Swazi VAC assessment, using the updated national Livelihood baseline profiles, defined an overall increase in the total number of people in need of food aid. The figure for the core EMOP areas rose yet again to an estimated of 297,000 'affected' people. This assessment confirmed that the worst affected areas were the Lowveld, the Lubombo Plateau and parts of the Middleveld. However it also indicated that the other five livelihood zones had all experienced a decline in mean income of between 7% and 10% and that the total 'affected' population was as large as 450,000 people. This assessment thus increased the total number of "affected" persons by an additional 150,000, albeit at a lesser need for assistance. The total food aid delivered to Swaziland in the 2002-2003 marketing year was 23,100 MT equivalent to 12.7% of domestic consumption requirement. The actual number of EMOP food aid beneficiaries peaked at 265,000 people.

A four-day rapid update exercise in March 2003 was commissioned by the WFP to look at the estimated impacts on the 2002-2003 production year and likely consequences for consumption in 2003-2004. The ongoing WFP programme had been set up to run from July 2002 to April 2003. It was therefore urgent to provide some estimates to guide the last three months of the programme (May to July) that overlapped the immediate post-harvest period. The rapid livelihood monitoring exercise suggested that the core affected areas would be the Lowveld Cattle & Cotton and Lowveld Cattle-Cotton-Maize, Lubombo Plateau and Lomahasha Trading & Arable Livelihood Zones and that up to 190,000 people could be affected by food shortages of up to 4.5-6.5 month duration. It also acknowledged that parts of the southern 'dry' Middleveld might be adversely affected. Between April and June 2003 the extension of the WFP EMOP benefited 152,000 people in the Lowveld, Lubombo and 'Dry' Middleveld.

The above overview indicates that while the EMOP has benefited the core-affected areas and communities with consumption support, many other non-beneficiaries, outside of core-affected areas, have probably incurred the cumulative consequence to 2-3 years of income/food deficits. Their overall levels of vulnerability have probably increased with a probable decline in their asset base. Moreover, rather than the EMOP being accompanied by an agricultural rehabilitation/revival in the core affected areas, the 2002-2003 year turned out to be one of agricultural collapse. The CSO estimated that in the Lowveld and Lubombo Plateau areas for the 2002-2003 season there was a reduction of 14,000 hectares in the area cultivated with maize. Added to this is the significant reduction in households' incomes as a result of the effective collapse of the cotton industry in the country.

Figure 1: Food economy / livelihood zones (with enumeration areas)

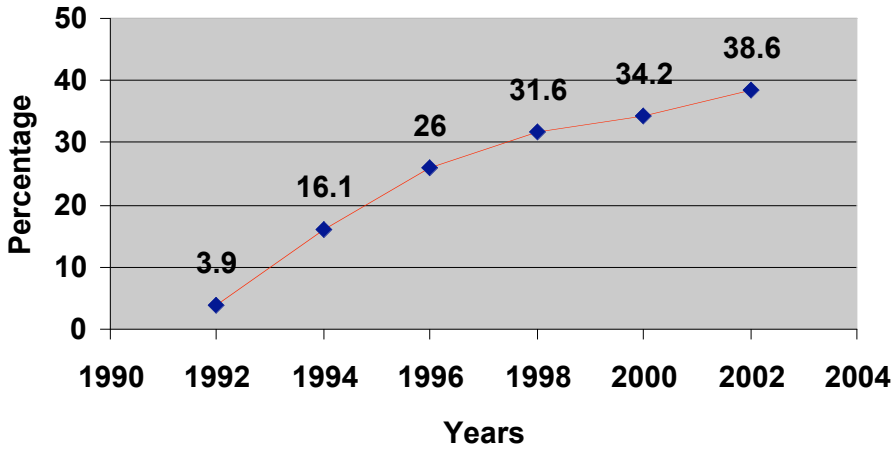
NB: This new livelihood zone map includes a disaggregated Middleveld into its 'dryer' and 'wetter' parts. This exercise was only completed in February 2004. For the purposes of this report references to the Middleveld include both the dry and wet Middleveld zones.


FOOD ECONOMY / LIVELIHOOD ZONES
31°6'39"E
31°39'59"E
26°6'40"S
26°40'0"S
27°13'20"S
R. Mlumati
En lembe
Piggs Peak
Komati
R. Komati
Black Umbuluzi
R. Mbuluzi
MBABANE
Siteki
MANZINI
Lusutfu
Usutu
R. Great Usutu
Ngwempisi
Big Bend
R. Mhlatuze
Nhlangano
Ngwavuma
Golela
Legend
River
Road
(1997 Census to nearest '000)
1 Timber Highveld 86000
2 Highveld Maize & Cattle 163000
3 Peri-Urban Corridor 71000
4 Wet Middleveld 127000
5 Dry Middleveld 137000
6 Lowveld Cattle, Cotton & Maize 159000
7 Lowveld Cattle & Cotton 44000
8 Lomahasha Trading and Arable 26000
9 Lubombo Plateau 23000
0 5 10 20 Km

HIV/AIDS in Swaziland

As elsewhere in the region, the HIV/AIDS epidemic is a serious threat to Swaziland's future. It is thought that the epidemic started in Swaziland about two decades ago. In the initial period, the epidemic was largely unseen and the main source of data pertaining to the epidemic was notified AIDS cases (Whiteside *et al*, 2003). From the first AIDS case reported in 1987, there was a steady increase in the number to over 150 in 1993. In 1992 the first national survey to determine prevalence of HIV in the country was carried out among women attending a sample of antenatal clinics. The results of this survey indicated a prevalence of 3.9% among pregnant women. Since 1992 such studies have been carried out at ante-natal clinics every two years. In 1994 the HIV prevalence rate was 16.1%. The subsequent surveys showed a worrying trend of a steep increase in the prevalence rate on a survey-by-survey basis (see Figure 2).

Figure 2: HIV Prevalence level among pregnant women in Swaziland



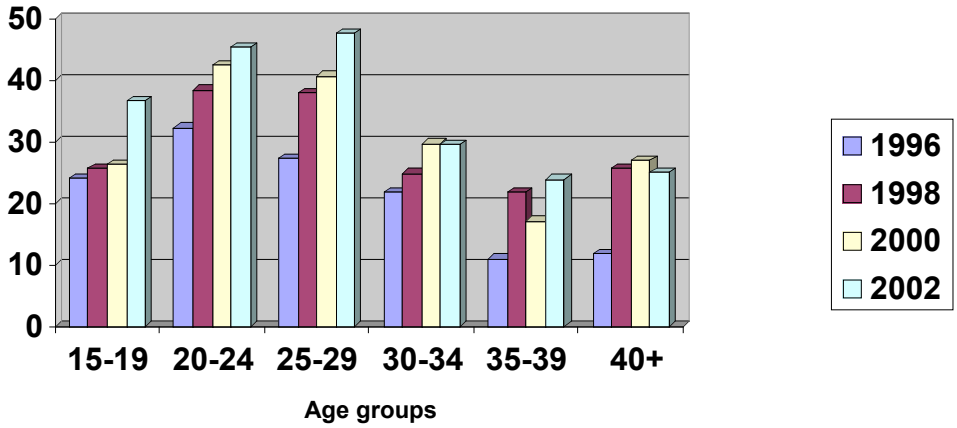
The results of the 2002 survey indicate that Swaziland now has the second highest HIV prevalence rate (38.6%) in the world (after Botswana[4]) (see UNAIDS 2003). This is consistent with near uniform high infection rates within the sub-region. For example, recent data from Zimbabwe and Lesotho also indicate prevalence rates of over 35%. In South Africa there is considerable variation between provinces. In the 2001 surveillance survey carried out in South Africa, prevalence in KwaZulu-Natal Province was 33.5% (a slight decline on the 36% in previous years) while in Mpumalanga Province it has consistently been about 29%. The only location with a significantly lower prevalence is Mozambique's Maputo Province that adjoins Swaziland, where HIV prevalence is 9%.

Another finding of the 2002 surveillance survey worth noting is the fact that the epidemic is widespread within the country. In fact, according to Whiteside et al, the uniqueness of Swaziland in terms of HIV/AIDS stems from how uniformly bad the epidemic is (2003). No large differences were found between the four main regions, although the prevalence rate in Shiselweni Region has increased markedly since 2000. Hhohho Region has the lowest level at 36.6%; and Manzini Region the highest at 41.2%. These are the richer and more urbanised regions while the poorer and more rural regions of Lubombo and Shiselweni have prevalence rates of 38.5% and 37.9% respectively. Furthermore, there are no significant differences between urban and rural areas, indicative of high population mobility and close links between rural and urban areas in Swaziland. In addition there are no significant differences between

4 Recent reports (March 04) from the UN suggest that the 2004 HIV/AIDS prevalence study by the Government of Botswana has recorded a decline in prevalence rates, giving Swaziland the unenviable title of the highest HIV/AIDS prevalence rates in the world.

married and unmarried women. The most worrying finding is the high infection rate among teenagers of more than 35%. To a certain extent infection rates in this age category equates an incidence rate, i.e. new infections.

Figure 3: HIV Prevalence by age group 1996 - 2002

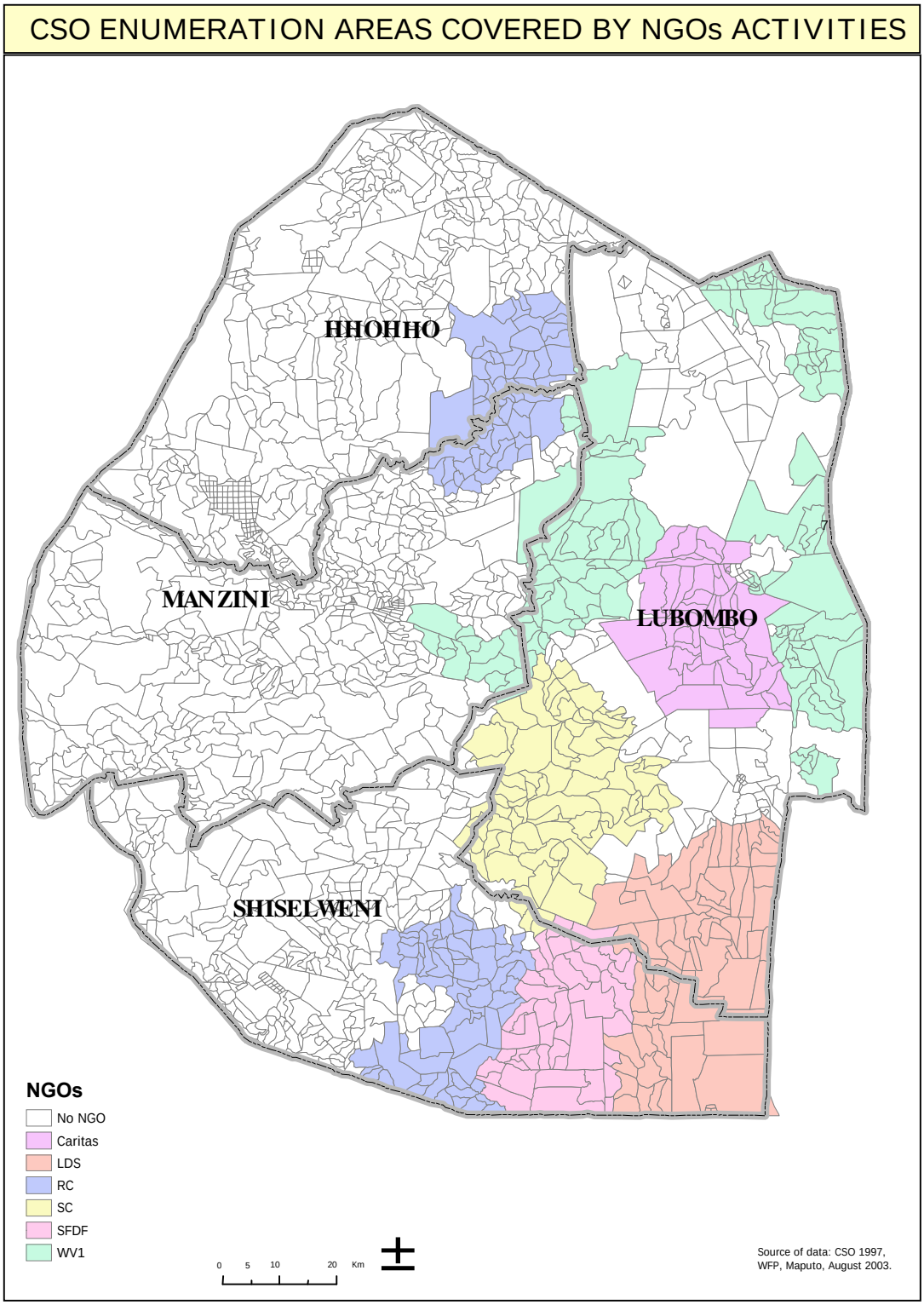


This leaves us with the fact that far from being contained, the HIV/AIDS epidemic has continued unabated. In short, it threatens to undo many of the social, health and welfare gains made in the past couple of decades in the country. A first major study of the epidemic in Swaziland undertaken by Whiteside in 1994 makes for sobering reading. Many of his predictions regarding infection levels and increased mortality have been borne out nearly ten years later. In a follow-up study (Whiteside et al, 2003) the drivers of the epidemic were listed in an attempt to understand why the virus spread so rapidly throughout Swaziland. Among the factors listed is the considerable cross border mobility, particularly to South Africa and included within the cross-border mobility has been the high level of migrant labour. Miners formally employed through The Employment Bureau of Africa (TEBA) travel as single men for periods of up to a year away from their homes. In 1998 10,336 Swazi men were employed on the South African mines. Therefore, approximately 8-10% of households had family members employed in South African mines. Many other Swazi seek employment in South Africa both formally and informally. They range from unskilled labourers to highly skilled professionals with further degrees. In addition, a number of other social and cultural factors contribute to the vulnerability of the Swazi population to HIV infection, especially the women.

FORMAT OF THE REPORT

This report is organised as follows. Chapter Two provides an overview of the methodology used in conducting this study. Chapter Three details some of the demographic changes that have occurred in Swaziland, including the impact of rising mortality levels in conjunction with a secular decline of fertility rates in rural Swaziland. Chapter Four outlines some links between livelihoods and the impact of HIV/AIDS in rural Swaziland. Finally, a concluding chapter indicates some pertinent issues around the study and possible follow-ups.

Figure 4: Spatial location of major humanitarian relief initiatives



CHAPTER 2: METHODOLOGY OF THE STUDY

INTRODUCTION

Scope of the Study

The purpose of this 2003/4 Swaziland VAC HIV/AIDS, demography and livelihoods survey has been to collect data and analyse the information to explain the impact of HIV/AIDS on the demography of the rural population of Swaziland as well the impact of the epidemic on the livelihoods of rural households. For programmatic purposes information was required at sub-national level. Large numbers of respondents were required to give the study a strong statistical basis. To operationalise the study, the decision was made to conduct a sample census in rural Swaziland. Besides generating data at Tinkundla and Regional levels, this approach facilitates a comparison with information collected in the 1997 and 1986 population censuses.

Planning and Preparation

The approach used throughout this study builds upon the experience obtained during the analysis of a Regional Vulnerability Assessment Committee (RVAC) report produced in May 2003[5]. This Swazi VAC study is the first study in Swaziland specifically designed to determine the impact of HIV/AIDS on the demography of the country and household livelihoods.

As noted in Chapter One, the initial objectives of the study were straightforward and initial plans indicated a short period required to carry out the study and analyse the data. In practice, this proved to be impossible. The schedule below demonstrates the length of time required when there are many stakeholders involved in the process and a variety of consultants providing technical support often from different countries.

Timeframe of the Study

December 2002	Population issues arise from VAC reports
January/February 2003	Discussion within the Swazi VAC and generation of study idea officially sanctioned in stakeholder meeting
March 2003	Agreement in principle by the Swazi VAC and RVAC that study should go ahead with tentative budget agreement
April/May 2003	Regional electronic discussion of questionnaire format and budget
Late May to Early June 2003	Delay until budget confirmation (following agreement of questionnaire format). Training of enumerators
June 2003	Data collection
July 2003	Data entry and start of analysis
August 2003 to March 2004	Analysis and report writing

The fourth objective of the current study, namely "to analyse and learn from the process of the study" requires that great care be taken to document and analyse the development and implementation of the methodology used in this study. This is important to enable stakeholders to draw conclusions from the lessons learned during the exercise in order to enhance the capacity of the Swaziland Vulnerability Assessment Committee (Swazi VAC) and assist NVACs or other bodies wishing to carry out similar studies elsewhere.

[5] SADC FANR Vulnerability Assessment Committee (2003), Towards Identifying Impacts of HIV/AIDS on Food Insecurity in Southern Africa and Implications for Response: Findings from Malawi, Zambia and Zimbabwe. Harare, Zimbabwe.

QUESTIONNAIRE, PLANNED ANALYSIS AND PROXY INDICATORS

Questionnaire Design

The questionnaire was developed by the Swazi VAC over a period of two months and incorporated a significant amount of technical support from the RVAC and UNAIDS. The questionnaire was based upon a concept note drafted by the Swazi VAC. The UN, through RIACSO supported the study by producing a regional multi-sectoral framework to guide multi-sectoral assessments. The Swazi VAC drafted the first version of the questionnaire format incorporating aspects from the aforementioned multi-sectoral framework. This first draft format was circulated to various interested parties for technical input e.g. the RVAC and UNAIDS (regional office[6] and Swaziland office). In general, the feedback was that the questionnaire focused too heavily on demography and there was a need to insert more of a food security and livelihood focus. However, there was also concern that the survey should only collect data that could practically be analysed and that the questionnaire should be as concise as possible. Following input from the RVAC, Section 4 (the livelihoods section) was added to the questionnaire.

Questionnaire Content

A copy of the questionnaire is attached as Annex 1. It was intended that one questionnaire be completed at each of the households falling within the selected sample of Enumeration Areas (EAs) (see figure 5).

The household questionnaire was divided into four sections:
Section 1 contained identifying information covering administrative details as well as the wealth ranking of the household.
Section 2 contained questions about the demographic characteristics of household members. It provided for a record of all household members further elaborated by age, gender, family relationships, status and education level. This section also focused on the level of chronic illness, maternal and paternal mortality in each household.
Section 3 dealt with mortality in the household broken down by gender, age and the presence of a bout of chronic illness prior to death.
Section 4 contained questions regarding livelihood information and focused on the ranking of food sources, income sources and changes in agricultural production.

Demographic Analysis and the use of Proxy Indicators

A standard census approach was used to collect general demographic information. The sensitivities associated with HIV/AIDS made direct questioning or testing for HIV/AIDS a difficult undertaking and it was not attempted during this survey. The methodology employed in the study needed to foster an understanding of the impact of HIV/AIDS on the population structure and the link between HIV/AIDS and changing livelihood characteristics as experienced by households. The VAC emergency assessments were not designed specifically to analyse the relationships between HIV/AIDS and household food security. It was possible, however, to utilise the variables in the assessments to explore some of these relationships using a "proxy variable" approach (see Mdladla et al, 2003, for a discussion on the opportunities and challenges present in utilising proxy variables). In a general survey it is not possible to accurately identify those households with HIV infected persons or those affected by the epidemic. For this reason use was made of a set of proxy indicators. A discussion of proxy indicators is set out below.

[6] The involvement of the regional office of UNAIDS stems from a UNAIDS sponsored review of HIV/AIDS literature in Swaziland for the May / June Vulnerability Assessment Report which was part of a regional package of support by UNAIDS to national VACs.

Proxy indicators to identify HIV/AIDS infected and affected individuals and households fall in four broad categories:

- Mortality (for instance deaths in specific age groups occurring following chronic illnesses);
- Morbidity (for example the presence of chronically ill individuals in a household);
- Demography (for example the absence of adults measured for instance by the dependency ratio – traditional or effective (see chapter 3));
- Social relationships (such as the presence of orphans).

The paragraphs below list the specific information that was collected during the 2003 Swaziland VAC survey with an elaboration of the potential use of this data.

Mortality information

Mortality information was obtained by asking respondents the following questions:

i) During the last 12 months has any member of the household died?
If the answer was "Yes", the age and sex of the deceased individual had to be written on the questionnaire.
ii) In addition, respondents were asked if the individual who died was ill for more than three months continuously before his/her death, or whether he/she suffered bouts of illness before dying. (This information was asked in an attempt to differentiate deaths as a result of accidents etc. from deaths that might have been the result of illnesses due to AIDS- related causes.)

Information collected in this way made it possible to calculate crude death rates by any age grouping or by sex, in addition to analysis by region, agro-ecological zone, food economy / livelihood zone or Tinkundla.

Mortality indicators can be constructed at the household level to function as HIV/AIDS proxy variables during an analysis to investigate the impact of HIV/AIDS on livelihood strategies. Examples of such proxies are:
a) Households in which an adult died in the last year after being chronically ill:
b) Households in which a child died during the last year after being chronically ill.
c) Households in which the household head died in the last year after being chronically ill.

Morbidity information

Respondents were also asked whether any of the listed household members was continuously ill for more than three months or kept getting ill over and over during the last three months. Information collected in this way allowed the calculation of crude morbidity rates by age and sex.

The prevalence of chronic morbidity in a household can be used as a proxy for HIV/AIDS induced illness within households. Such proxies can be employed during an analysis to determine the impact of HIV/AIDS on livelihood strategies. For instance, the following variables can be constructed at the household level:
a) Households with a chronically ill adult member.
b) Households with a chronically ill child member.
c) Households with a chronically ill household head.

Demographic information

During the survey individuals living in a household were listed in the questionnaire. Interviewers completed the questionnaire by asking the age and sex of each individual, his/her relationship to the head of the household, and their marital and residency status. The availability of this kind of information made it possible to calculate a variety of age and sex specific indices. It is also possible to construct indicators to employ as explanatory variables

when analysing the link between household structure and for instance livelihood strategies. Examples are:
a) The "*standard* dependency ratio" (the age group 0-14 and 60 + as a ratio of those aged 15-59) within each household.
b) The "*effective* dependency ratio" in a household, calculated by excluding ill adults from the denominator.

Social Information

The presence of orphans in the household and the absorption of orphans from other households are a direct indication of parental deaths and also a possible indication of the dissolution of other households. During the survey, a set of questions was directed to capture information on household members younger than 15 years to measure the prevalence of orphanhood. Firstly, respondents were asked if the natural mother of each child in the household under 15 years was still alive. If not, did she die during the last 12 months? Information on the status of the natural farther was also collected and whether, if deceased, he died during the last 12 months.

The availability of orphan data made it possible to calculate maternal orphan rates, paternal orphan rates or even "double orphan" rates by any specific age grouping or even sex. The information also allowed the calculation of the number of orphans in any selected area or age group - an important item for programmatic interventions.

The information collected on orphans also made it possible to construct indicators for use as explanatory variables during analysis for instance - the presence of orphans in a household.

Data collection issues

Surveys are prone to limitations emanating from the use of the general population as respondents. A variety of reasons (the level of education of respondents, clarity of questions, ability to recall events and the willingness to supply the correct information etc.) can impact on the quality of information collected in these types of surveys. In this respect one can also refer to the sizes of the samples, sampling methodologies, and training which all have a bearing on the data.

Inclusion errors in the selected proxy indicators

There is a possibility that selected proxy indicators are not able to discriminate sufficiently between HIV/AIDS infected/affected households and those less or unaffected. The following extraction from Mdladla et al (2003) elaborates:

> "By all accounts, rural areas are not very healthy environments, as shown by relatively low life expectancies in the absence of AIDS. Illnesses such as malaria, bilharzia and tuberculosis, to name a few, are common. When reporting a chronic illness in a household, a respondent would have included persons suffering from these diseases. Thus, chronic illness as a proxy for HIV/AIDS, is somewhat weakened by the presence of other diseases although the impact on the household may be the same - but not necessarily.
>
> The same applies to deaths that occurred in a household. In the case of deaths other inclusion errors may also provide a misleading picture such as difficulties for respondents in defining the period in which the chronic illness occurred. In addition, the shock of a death, even 18 or 24 months previously, may still haunt the members with the result that such a death is recounted. In addition, respondents are required to provide a medical opinion on the cause of death i.e. "after a chronic illness".

> In the case of orphans, it should be remembered high rates of fosterage/orphanhood was found in rural areas as a result of high mortality and migration, prior to HIV/AIDS. Thus orphans do not necessarily indicate HIV/AIDS consequences.
>
> The possibility of including non-HIV/AIDS households was increased by the wide age ranges applied to many of the morbidity and mortality indicators during the VAC surveys. AIDS related deaths are concentrated in the younger adult ages and the use of the age range 15-60, as was the case in some of the VAC surveys, probably led to the inclusion of many deaths due to other causes in the older age ranges. "

Interpretation of proxy indicators

The presence of orphans may increase food insecurity and strain the financial position of the receiving household. However, in rural households orphans depending on their age, may function as a labour source offsetting labour shortages in the household. Other factors such as the sex and age of the orphan, the socio-economic position and demographic characteristics of the host household are also important. The crude proxy: "presence of orphans" cannot detect these important nuances, and this reduces its usefulness for the purpose of analysis.

The (standard) dependency ratio is a demographically determined indicator. Apart from the impact of a reduction in the number of adults that increases the dependency ratio, the dependency ratio is largely influenced by the fertility rate of a population. Under conditions of high fertility, high dependency ratios are the norm. High fertility will be reflected in high dependency ratios independent of the HIV/AIDS epidemic. Also, higher dependency ratios due to higher mortality rates among adults are partially offset by a reduction in the dependency ratio due to high mortality among young children. Another factor that impacts upon the dependency ratio at a household level in rural areas is the out-migration of members in the economic active ages to look for employment in the urban areas. Therefore, more work needs to be done to tease out the exact cause and effect relationships of dependency at a household level.

In the case of deaths in rural areas, these may be inflated as a result of sick members returning from urban areas. Such deaths may negatively impact on remittance income, but such remittances probably ended some time before the death of that person, but they will also add to the expenditure burden and care allocation burden on the household. The impact of these deaths on household livelihood strategies needs further investigation.

CONDUCT OF THE SURVEY

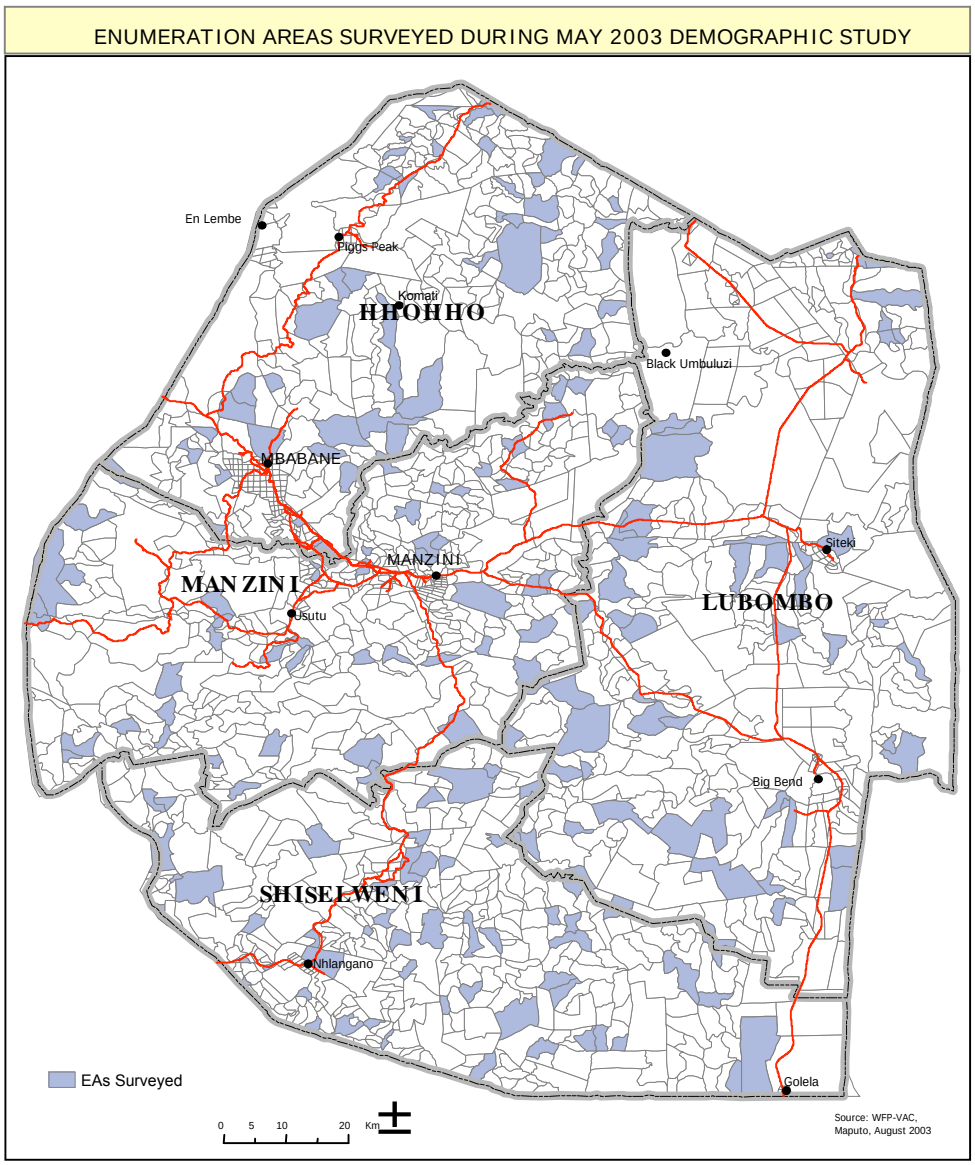
Sample design

It was determined that data records representing all households in 15% of the EAs in Swaziland would provide reasonably reliable estimates for the demographic and livelihood indicators at National, Region, Agro-Ecological, Food Economy / Livelihood Zone, and Tinkhundla levels. A total of 207 Enumeration Areas (EAs) were selected by a systematic sampling procedure with probability proportional to size (PPS), measure of size being the number of rural homesteads from the 1997 national population census (falling within 1,349 EAs in Swaziland). The EAs were representatively distributed among Regions, Agro-Ecological Zones, and Rural Development Areas (RDAs). Included is a map showing all the enumeration and district boundaries in Swaziland (Figure 5).

Enumeration areas classified as urban or private company estates were excluded from the sample. All EAs were classified according to Region namely Hhohho, Manzini, Shiselweni and Lubombo. EAs were also classified by agro-ecological zone (Highveld, Middleveld,

Lowveld and Lubombo Plateau), food economy / livelihood zone and by type of land tenure system (SNL-RDA, SNL-Non RDA, and ITF)[7]. These classifications constituted the strata from which the statistically sound random sample was drawn (see tables 1 to 3). The choice of sample design and its size was dependent on the available financial resources and the required precision of the estimate at national and at sub-national level.

Figure 5: Regions and enumeration area boundaries (total and sampled(blue))



The tables below give a breakdown of the 207 EAs sampled in the study according to Region, Agro-Ecological Zone and Food Economy Zone.

[7] Swaziland – Rural Development Area, Swaziland non-Rural Development Area, Individual Tenure Farm

Table 1: Size and allocation of the sample by administrative region

Region	*Total Number of Rural EAs*	*Number of EAs in sample*	*Number of households in the sample*
Hhohho	337	51	4,997
Manzini	340	51	4,484
Shiselweni	362	55	4,330
Lubombo	310	50	4,717
Swaziland	1,349	207	18,528

Table 2: Size and allocation of the sample by agro-ecological zone

Agro-Ecological Zone	*Total Number of Rural EAs*	*Number of EAs in sample*	*Number of households in the sample*
Highveld	402	62	5,241
Middleveld	504	74	6,790
Lowveld	342	56	4,978
Lubombo Plateau	101	15	1,519
Swaziland	1,349	207	18,528

Table 3: Size and allocation of the sample by food economy / livelihood zone

Food Economy/Livelihood Zone	*Total Number of Rural EAs*	*Number of EAs in sample*	*Number of Households in the sample*
Highveld Maize & Cattle	258	42	3,567
Timber Highlands	142	20	1,664
Urban Corridor	106	15	1,438
Middleveld Maize & Cattle	397	59	5,367
Lowveld Cattle & Cotton	77	12	917
Lowveld Cattle, Cotton & Maize	271	46	4,291
Lubombo Plateau	42	6	536
Lomahasha Trading & Arable	45	7	755
Unclassified[8]	11	-	-
Swaziland	1,349	207	18,528

Survey organisation

An agreement was reached between the Swazi VAC and the Central Statistical Office (CSO) in the Ministry of Economic Planning and Development (MEPD) providing for the latter to carry out the data collection on behalf of the Swazi VAC. It was recognised that the CSO had significant experience in carrying out surveys and capturing data, as well as having the field capacity to conduct the VAC survey. With CSO as an integral member of the Swazi VAC, the collaboration process was straightforward.

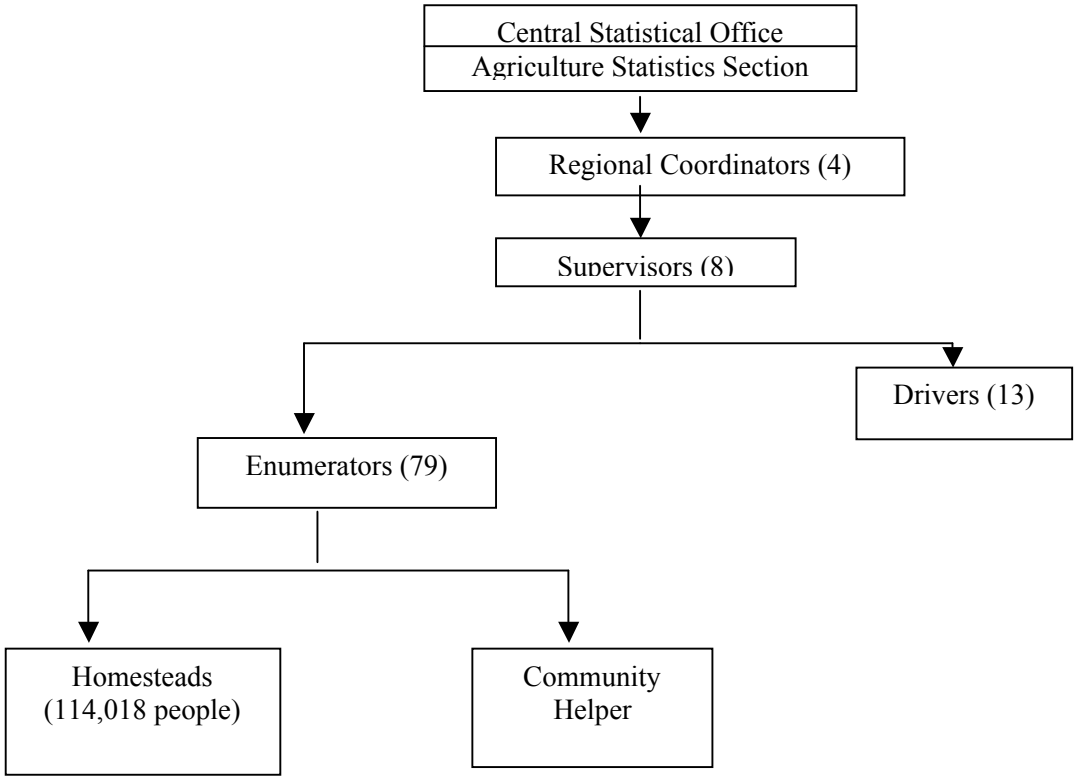
Prior to data collection, there was a training programme for the CSO enumerators and supervisors between the 25th and 31st May 2003. This took place in four locations, one per Region, lasting three days each. The content of the training sessions was fairly simple because the majority of enumerators were experienced questionnaire interviewers. The first day of training was spent familiarising the enumerators with the questionnaire focusing on sections three and four (death and livelihoods) because these subjects were fairly new to the

[8] Unclassified: 11 rural EAs are not linked to any Food Economy Zone as they occur mostly in urban or peri-urban areas.

enumerators. The second day of training included mock interviews and on the third day a review of the mock interview exercise was held to discuss difficulties that were encountered and identify ways to overcome problems. The training was staggered so that the Acting Head of the Agricultural Statistics Section of the CSO could attend the first day of training in each Region. In addition, the Acting Head developed a manual to assist field staff during the fieldwork. The CSO staff contingent consisted of one National survey co-ordinator, four Regional co-ordinators, eight supervisors and seventy-nine enumerators.

In order to facilitate entry of enumerators into communities, contact was made in advance with the traditional leaders in areas included in the sample. The flowchart (Figure 6) depicts the organisational structure of the CSO data collection staff in the VAC survey. Data collection in the field lasted twenty-one days.

Figure 6: Fieldwork organisational chart



Data editing and data entry

The questionnaire was pre-coded precluding the need to code the completed returns from the field. However, checks were done to ensure the level of completion of questionnaires and where necessary and possible, an imputation process was used to account for missing information. Data entry was completed in two weeks. The computer package CS Pro 2.3 was used for data entry, cleaning and merging different files. Ox Edit software was also used to thoroughly edit and clean the data. The data was subsequently exported to SPSS to facilitate analysis. SPSSWIN 10.0, WesVar 4.2 and RR1.7.1 were used for data analysis.

Weighting process

Since this VAC demographic / livelihood survey was conducted in a sample of enumeration areas of the country, the data had to be weighted to provide an accurate reflection of the universe (total national number) of households residing in the rural areas of Swaziland. The

livelihood indicators survey utilised a single stage-sampling plan. The following procedure was utilised to weigh the data set:

Let N_h denote the total number of homesteads in stratum h, and N_{hi} denote the total number of homesteads in the enumeration area i that is in stratum h, using this information the sampling procedure in the h_{th} stratum (h=1,2…H) is shown in the following table:

Stage	Unit	Total EAs in stratum	Sampled EAs in stratum	Selection Probability	Weight (fhi)
1	Enumeration Area	Gh	gh	$\pi_{hi} = \frac{N_{hi}}{N_h} \times g_h$	$\frac{N_h}{(N_{hi} \times g_h)}$

The weight for a household is simply the inverse of the selection probability of the respective EA. This implies that an unbiased estimator of the h_{th} stratum total Yh (h=1.2…H), obtained from the ith first stage-sampling unit (FSU) (i=1(1)…. gh) is:

$$y_h^* = \sum_{k=1}^{g_h} \sum_{j=1}^{N_{hi}} \left(\frac{N_h}{N_{hi} \times g_h} \right) \times y_{hij}$$

Legality and confidentiality

The survey was conducted by the CSO and completion of the questionnaires was a legal requirement according to the 1967 Statistics Act. This in all likelihood increased participation rates during the survey. The information collected from respondents is strictly confidential and only assigned members of the Swazi VAC are able to gain access to the information. All members of the Swazi VAC signed a data protocol document that prohibits use or dissemination of the information other than for the study itself. It is prohibited for the data set to leave Swaziland.

Data analysis

The wealth of data available from the study meant that it was essential to determine the analytical approach in order to make the most of the huge data set in a systematic manner. A series of meetings were held by the Swazi VAC to discuss analysis of the data. Technical support was provided by RVAC and UNAIDS at the beginning of the analysis. A tabulation plan was developed based on 57 proxy indicator variables to investigate the impact of HIV/AIDS and rural livelihood strategies (see Annex 2 for a complete list of proxy indicators developed during the initial tabulation phase). The output was a series of tables (several thousand) that required desk-study to identify trends and patterns. Various geographic and other breakdowns were used in the analysis, e.g., by Region, Food Economy / Livelihood Zone and Tinkhlunda as well as by socio-economic group. Additional tabulation requests were put to CSO regarding a variety of other matters. UNAIDS[9] consultants led with the analysis of the impact of HIV/AIDS on demography and an independent consultant[10] was engaged to analyse information on the impact of HIV/AIDS on livelihoods.

CONSTRAINTS AND LESSONS LEARNT

The size of the study and buy-in from interested parties as a result of the collaborative nature of the project means that the study results have significant credibility within Government, UN and NGO circles. However, the number of agencies involved both within Swaziland and regionally, in the development of the methodology and in particular the questionnaire, meant

[9] Consultants were from the Human Sciences Research Council (HSRC) in Pretoria, South Africa
[10] Neil Marsland

that the planned timeframe for the study was not realistic. The eventual study was many times larger than the study conceived at the beginning of 2003 particularly when considering the size and complexity of the data set and its potential for analysis. From a technical viewpoint, the considerable interest in the study resulted in a heavy focus on the construction of the questionnaire at an early stage of the study, rather than first clarifying the conceptual basis of the study, particularly the goal and objectives and identifying the data required. There was a need to more clearly link the objectives of the study, the data outputs and the tool used to develop those outputs. As new concepts for the study were developed through, a systematic revision of the conceptual basis of the study should have occurred.

Overall, the training of interviewers/enumerators was to an acceptable standard, but it could have been improved by the support of a trainer(s) with wider sectoral backgrounds that could explain a livelihood based approach. There were some difficulties explaining wealth ranking and other household economy / livelihood terminologies and approaches. This translated into isolated problems during data collection. The quality of a training programme prior to a field assessment should be of a high standard. It is also important that trainers have a clear idea of the objectives of the study and how the information that is collected will be analysed. In this way, potential problems and difficulties can be minimised before the analysis stage. Although the quality and validity of the data collected during the Swazi VAC survey is of a general high standard, some difficulties were experienced by a limited number of enumerators. For instance:

- Some of the enumerators had difficulty differentiating between wealth groups particularly because the criteria were not made clear enough in the training. The main criteria for ascertaining wealth status used in six Food Economy / Livelihood Zones (all except Timber Highlands and Lomahasha Trading and Arable) were the area of land cultivated and quantity and type of livestock owned by the household. In the other two Food Economy / Livelihood Zones, a more sophisticated approach including consideration of employment levels was used to differentiate between wealth groups.

- Defining chronic illness is always difficult and some enumerators agreed. A small minority of enumerators used slightly different definitions. Some defined it as bedridden for 3 months, others defined it as sick for 3 months but still mobile, a small minority included chronic illness that clearly came from other forms of ailment etc.

- Some enumerators confused the timeframe for death to have occurred within the family. A few enumerators recorded deaths in the household in the last few years when it should only have been the last year.

A more sophisticated computer set up in the CSO would have enabled a smoother process of data entry. The absence of a local area network within the CSO meant that the data was captured on a number of different computers and daily back-up had to be done using floppy disks.

The absence of any full-time staff working for the VAC in Swaziland proved to be an obstacle to finalise tasks. Members of the VAC Secretariat have permanent posts within their respective agencies or government ministries, with resultant delays in report production. Data analysis was inhibited by the part-time nature of all the participants in the study within the Swazi VAC and regional technical support from UNAIDS and RVAC.

CHAPTER 3: FINDINGS - HIV/AIDS AND THE DEMOGRAPHIC STRUCTURE OF SWAZILAND

INTRODUCTION

The first section of Chapter 3 presents a general overview of population trends and processes. The next section considers the various impacts that HIV/AIDS can have on a population. This is followed by a broad overview of population trends in Swaziland and more specifically, the current demographic profile of the rural population in Swaziland. Empirical findings of the 2003 Swaziland HIV/AIDS, Demographic and Livelihoods VAC Survey are used where applicable. One of the explicit aims of this VAC survey is to show how HIV/AIDS has been and is affecting and altering the demographic structure of the population in rural Swaziland. It should be realised that there are limits in using the results of the current VAC survey. The VAC survey was a cross-sectional survey. The information thus collected does not contain a dynamic element, needed to understand the impact of HIV/AIDS at for example, the household level. Such information is typically generated by long-term and very expensive longitudinal surveys. In addition, the survey was limited in scope and collected only a selected number of information variables (see Chapter 2).

In an attempt to enhance the available empirical information, in the final section of the chapter reference is made to a population projection of Swaziland. This was undertaken in order to assess the longer-term impacts of the epidemic on the population.

POPULATION PROCESSES

To understand the role that high fertility levels in Swaziland play in shaping the youthful population structure and its role in the high rate of population growth, it is necessary to look first at general population processes. This background knowledge enables a fuller understanding and appreciation of the effects that HIV/AIDS is having on the population.

Demographic transition

The demographic transition model is a tool that has frequently been used to understand and explain human population processes. This typology describes the different phases of human populations. It has been used on numerous occasions since the 1960's to explain the reasons for rapid growth occurring in human populations. The transition model was developed to understand the behaviour of human populations, and especially the mechanics of the differential growth rates in diverse populations. According to this model, changes in economic development or modernisation alter population growth rates as a result of reductions in mortality and fertility. One of the underlying assumptions of this model is a near constant and one-directional decline in mortality and fertility over time (see Figure 7)[11].

In the pre-transitional stage, the majority of a population is involved in a subsistence economy. The population growth rate is at a low level because both mortality and fertility levels are at high levels. As the economy modernises, mortality and fertility begins to decline. However, mortality reacts faster to external changes than fertility and therefore mortality levels decline at an earlier stage in the development process than fertility levels. The decline in fertility lags the mortality decline because the initiation and sustainability of a decline in fertility requires cultural and societal change. As a consequence of the lag in

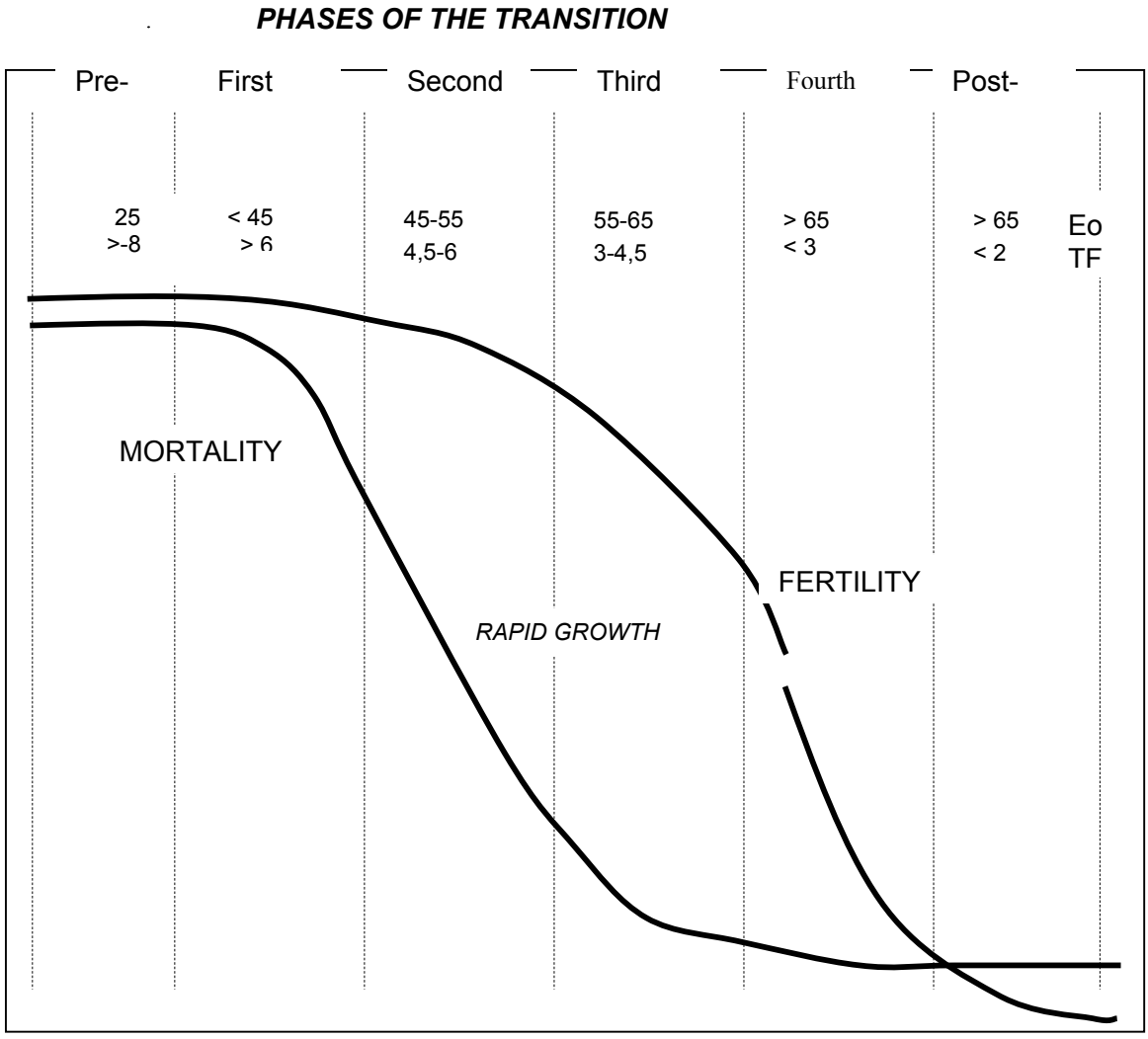
[11] Important to realise is that when this model was developed no one foresaw that vital trends could be reversed with implications difficult to predict. HIV/AIDS is reversing mortality trends and the next section will elaborate on the implications of this on population size and growth. The HIV/AIDS epidemic poses questions with regard to the functionality of the classical demographic transition model.

fertility decline, population growth is rapid. This stage is also referred to as the phase when a "population explosion" is taking place. As economic development progresses, mortality and fertility decline further to reach the final stage of demographic transition where as at the onset of transition, population growth is insignificant. The duration of each of these phases or stages are vastly different. Populations remained in Phases 1 and 2 for thousands of years, whereas in some populations the transition from high to low fertility occurred in a matter of decades.

According to the transition model, populations can be categorised according to their position in the transition process. The demographic transition can be divided into five phases (see points below) or even six phases (see Figure 7):

- The pre-transitional phase with very low life expectancies and high fertility rates. This was the situation found in Swaziland in the period up to the 19th century.
- The first stage of the transition is characterised by high mortality and fertility, in which life expectancy at birth **(E_0)** is lower than 45 years and the total fertility rate **(TFR)** is higher than 6 (each woman on average has 6 children).

Figure 7: A typology of demographic transition



- The second and third phases of the transition occur when mortality and later fertility, decline at an increasing rate. Life expectancy in these two phases is between 45 and 65 years at birth and the total fertility rate declines from 6 to 3.
- The fourth phase is one of low mortality and fertility. Life expectancy is higher than 65 years and the total fertility rate is lower than three.
- The post-transitional phase. In this phase the transition from high mortality to low levels has been completed and fertility is at levels equal to replacement (a situation where the average couple only replaces themselves, i.e. by having about two children) or even lower. In populations characterised by this phase, natural replacement levels are very low or even negative.

What is the situation in Swaziland in terms of this model? Over many decades death rates had been declining while fertility remained high, which in turn resulted in high rates of natural growth. Only during the past two decades did fertility rates start to decline significantly. By the end of the 1990's Swaziland exhibited mortality and fertility regimes that were reminiscent of a transition between stages 2 and 3 as normal development processes occurred. The appearance of HIV/AIDS has complicated an easy explanation of the expected future patterns and trends of vital rates in Swaziland. Mortality rates have already started to increase due to HIV/AIDS induced deaths.

Population processes - a general summary

- An increase in the natural growth rate is usually as a result of declining mortality while declining fertility rates have a large impact on declining growth rates.
- The fertility level is slower to react to social and cultural changes compared to the mortality level. The latter reacts faster to medical, public health and other factors. Global experience indicates that once fertility starts to decline, the decline continues until fertility reaches low levels, albeit with minor variations (for example the baby boom in Western countries during the 1950's).
- Fertility trends have a larger impact on the age structure than mortality trends. A decline in the fertility level inevitably leads to a less youthful population structure.
- The transition model provides no insight into a situation of rising mortality (e.g. as seen in the era of HIV/AIDS).

DEMOGRAPHIC IMPLICATIONS OF HIV/AIDS

HIV/AIDS is already having, and is anticipated to have an even greater impact in future on the Swaziland economy, productivity, aspects of service delivery and the social fabric of the country. These impacts are in many cases a function of the impact that the epidemic is having on the population. For instance, losses among those in the working ages due to premature mortality are and will increasingly affect the labour force. Associated losses of skill, costs associated with replacing lost workers, lower productivity, and pressures on pension and medical aid funds are a few of the consequences of increasing young morbidity and mortality within Swaziland.

HIV/AIDS and the future

When the demographic transition model was developed to explain human population growth it was envisaged that mortality declines would be one-directional. The transition model assumed a sustained decline in mortality of human populations until the limits of human longevity was reached. It was never foreseen that human populations would once again be faced by circumstances where gains in life expectancy would be wiped out and life expectancy would decline. In effect, the HIV/AIDS epidemic is now confronting human populations with a new challenge – a situation of increasing mortality levels and low fertility.

The real long-term impacts of HIV/AIDS on human population are not yet well understood. There are a number of reasons for this. In the first instance we do not have an analogy to fall

back on to provide pointers to what will happen. Other major epidemics, such as the Black Death plague that killed millions of people in Europe in the Middle Ages, are dissimilar to HIV/AIDS in a number of ways. For instance, the infection vectors are different and death usually occurred rapidly following infection, unlike the slow onset of chronic illness and death associated with HIV/AIDS (when untreated). Although great advances have been made in understanding the HIV/AIDS virus, our knowledge of the epidemiology of the epidemic is not yet complete. For example, what is the limit of the HIV epidemic curve in a population? Previously it was assumed that the epidemic prevalence curve would stabilise around 30% of the population and then decline. Yet in Botswana and Swaziland the most recent surveillance results show infection rates nearing 40% of the reproductive female population. Neither do we know when, or if in fact ever, a vaccine will be developed. Furthermore, we do not know whether it will be possible to treat all of those already infected with antiretroviral drugs (e.g. as a result of financial, and infrastructure constraints to name a few) and neither are we sure of the long term efficacy of intervention programmes to prevent new infections from occurring. All of the above factors will have a role in determining the severity of the impact of HIV/AIDS on human populations. However, even with these uncertainties, we can predict within a relatively narrow band of uncertainty that the epidemic will have significant impacts on the mortality levels of a population where HIV infection rates are high. The epidemic also has an impact on fertility in a heavily affected population. It is important that the phases or waves of the epidemic are analysed separately for the purpose of policy and programmatic interventions. Each phase is likely to require a different approach/support mechanism.

With regard to the longer-term implications of the epidemic on the demography of the world and countries, the only recourse at present is by making longer-term population projections, using a variety of assumptions.

Morbidity

Once infected with HIV, the average individual will become prone to an increasing number of infections (AIDS-related diseases) with the progress of time. Due to the reduced levels of immunity, individuals are also more prone to develop Tuberculosis. During the last phase of full-blown AIDS, an individual will be stricken with a variety of infections and related illnesses, to such an extent that illness leaves such a person in a disabled state. The direct impact of the epidemic on the individual is to leave them less productive or unproductive for an increasing number and ever longer period of time until death. Family members and others have to take care of these individuals. The availability of antiretroviral drugs makes it possible that infected individuals can avoid many of the complications of untreated infections, allowing them to live a longer and more productive life, without becoming a burden on their families/communities or the state. Increased morbidity is thus the first apparent impact of the epidemic on the lives of individuals. The infections and diseases eventually lead to the death of an individual. The period between falling ill with bouts of infections and death, if untreated, may vary between individuals but could be from one to ten years. Therefore it is expected given the already high HIV infection rates in Swaziland, that chronic morbidity rates will be high in Swaziland.

Mortality

The epidemic is changing mortality levels and patterns in a way that was not deemed possible a few years ago.

- The major direct impact of the epidemic on populations is the increased number of deaths, resulting in an increase in the crude death rate.

- The change in the level of mortality is accompanied by a change in the age pattern of deaths. Age-specific death rates in the age groups 24-45 years are increasing. Whereas many of the degenerative diseases mainly take their toll among older persons, HIV/AIDS

has changed the age pattern of mortality markedly. People in the younger age groups are falling ill and dying with a number of social, economic and demographic effects.

- Deaths among infants and young children have also risen due to HIV/AIDS, mainly as a result of the vertical transmission of the disease from mother to child.

- As a result of higher mortality, life expectancy at birth is declining to levels found in a pre-modern epoch.

- This change in mortality trends is set to undo many decades of improvements in the general health and welfare status of populations which occurred as a result of improved medical services, the availability of modern medicines and vaccines, health promotion campaigns, improved public health and sanitation, etc. In some countries most heavily affected by HIV/AIDS, mortality levels are set to approach levels found a century ago.

Fertility

In many African countries with high HIV infection rates, fertility levels are declining at the same time as mortality levels are increasing. On the one hand fertility levels are declining independently from HIV/AIDS. This is a process that commenced a considerable time before the advent of HIV/AIDS and is a result of normal developmental processes such as rising educational levels, the availability of modern contraceptive methods, changes in the status of women, changing marital patterns, increasing economic burden of children etc. Although declines in the fertility level of Swaziland were not as rapid in the past two decades as noted in neighbouring countries, the decline had started. And once fertility starts declining, the decline is not easily reversed. Importantly, HIV/AIDS also serves to reinforce this decline in fertility in the following ways:

- Firstly, HIV/AIDS has a fertility inhibiting effect on infected women due to the biological effects of the disease. Small-scale studies in Eastern Africa found (evidence e.g. Carpenter et al, 1997) that fertility rates of HIV positive women are up to 30% lower than a comparable group of women not infected. Thus the fertility rate of the infected cohort of women is reduced and as a consequence, the fertility rate of the entire cohort of women in a country is proportionately reduced.

- In absolute terms, fewer children will be born because of the reduction in the size of the reproductive population cohort. Infection and mortality is largely confined to the reproductive ages. The size of the reproductive population is likely to be reduced in the long term because of AIDS-related deaths among women in these age groups. As a result, the size of the cohort in a population that can potentially bear children is reduced, and therefore fewer children are born into the population – even though fertility rates may remain the same.

- The HIV/AIDS epidemic may even have another fertility reducing impact through behaviour change. Information campaigns focusing on abstinence or increasing the use of barrier methods, especially male condoms, will potentially impact on fertility rates. In neighbouring South Africa, such messages have seen a significant increase in the use of condoms. Therefore one may surmise that given the protective nature of the barrier methods available, and if used effectively, higher rates of condom use should result in fewer infections of HIV and at the same time lead to a reduction in the number of births.

Impact of HIV/AIDS on the rate of natural increase and the population size

As yet there is no example of a country where the HIV/AIDS epidemic has resulted in a negative population growth rate or in a decline of the absolute numbers of people in a population. However, longer-term population projections that incorporate the impact of HIV/AIDS, predict actual population declines to occur in a number of sub-Saharan countries.

In the meantime, there is an increasing body of evidence to show that HIV/AIDS is reducing the rate of natural increase in a number of countries severely affected by HIV/AIDS.

An increase in the mortality rate due to HIV/AIDS reduces the rate of natural increase – but the level of such a reduction depends on the severity of the HIV/AIDS epidemic (expressed n terms of the number dying) and the level of fertility. Negative growth rates will result if death rates increase to levels higher than birth rates.

Preliminary studies in a number of countries resulted in varying findings: where HIV prevalence levels were low combined with sustained high fertility, growth rates declined somewhat (see for example Robinson and Marindo, 1999). In situations with higher prevalence levels and lower fertility levels, population growth rates were lower (O'Neill and Balk, 2001). And although up to the present, the HIV/AIDS epidemic had not led to a situation of negative growth at a national level, high prevalence levels in combination with lowering fertility rates could reduce the future population size in a number of countries (see for instance the long-range population projections carried out by the UN (United Nations Population Division, 2001)).

DEMOGRAPHIC TRENDS IN SWAZILAND

Swaziland is a small country with a population of about 1.1 million people. According to the 1997 census more than 75% of the population is classified as rural, while only 22.5% were resident in urban areas. Numerous other economic and social indicators point to Swaziland as a developing country (albeit recently described as low-middle income). For instance fertility levels remain very high in comparison with developed countries. Mortality rates declined rapidly during the last five decades of the twentieth century but these gains have been reversed as a result of HIV/AIDS (see the next section). The table below contains a summary of the most important population indicators for the country from secondary sources (not from this study).

Table 4: Demographic indicators for Swaziland and the developed world in 2003

Indicator	**Swaziland 1997[1]**	**Swaziland 2003[1]**	*Developed countries*
Birth rate (births per 1000 population)	43	41	11
Death rate (deaths per 1000 population)	11	20	10
Rate of natural increase (%)	3.2	2.0	0.1
Infant mortality rate	88	109	8
Total fertility rate	4.9	5.9	1.6
Percent of the population < 15 years	43	46	18
Percent of the population 65+	3	3	14
Dependency ratio	85	96	47
Life expectancy – Total	57	40	75
Life expectancy – Males	53	40	72
Life expectancy – Females	61	41	79
Percent urban	30	25	75
Percent of married women age 15-49 using a modern contraceptive method	17	28[3]	58
Population density (Persons per km^2)	54[2]	-	23

Sources: [1] Estimates prepared by the Population Reference Bureau, 1997 and 2003
[2] Calculated using the 1997 census total. However the Swaziland Human Development Report 2000 lists a density of 57 persons per square kilometre (UNDP/SHDF, 2001).
[2] Central Statistical Office,2000, Multiple Indicator Cluster Survey

It should be noted that the Population Reference Bureau adjusted the mortality indicators for Swaziland i.e. the death rate and the life expectancy at birth significantly between 1997 and 2003. This was in response to a realisation of the seriousness of the demographic consequences of HIV/AIDS. For comparative purposes, the table contains similar combined indices for the developed countries of the world.

Population growth rate

Due to declining mortality and sustained high fertility, Swaziland experienced relatively high rates of population growth for a prolonged period of time (Figure 8). The high growth rate recorded for the period 1956-1966 should be viewed with circumspection. It was probably a result of under-enumeration in the 1956 census or even combined with over-enumeration in 1966 (see for example the lower growth rate between 1966 and 1976). In the early 1980s the rate of population increase was 3.2% per annum. If this rate of growth were to have continued Swaziland would have doubled its population in less than 22 years. By the end of the 1980's the growth rate had started to decline (as a result of declining fertility).

The 2003 VAC HIV/AIDS demographic and livelihoods survey in rural areas confirmed this lessening rate of natural increase. Between 1986 and 1997 the annual increase in the rural population was 2.79% - only about 0.1% lower than the national figure. Between 1997 and 2003 the annual increase in the rural population was 2.01%[12]. Although under-enumeration during the VAC study (being a sample census) may have resulted in an under-estimation of the population growth rate, the growth rate generated by this study is in all likelihood closer to the actual situation than the current official growth rate of 2.9%. However, even a growth rate of 2% remains high, if one considers that the population will double within 36 years should the Swaziland rural population continue to grow at this rate. The two components of the decline in the growth rate was a conjectured decrease in fertility, while increased mortality is also playing a more influential role.

Table 5: Population size by urban and rural areas according to recent population census

Year	Urban	Rural	Total[1]
1986 Population Census	154,979	526,080	681,059
1997 Population Census	214,428	715,290	929,718
2003 VAC Survey	-	807,000[2]	-

[1] The figures do not include persons living outside the borders of the country (non-resident)

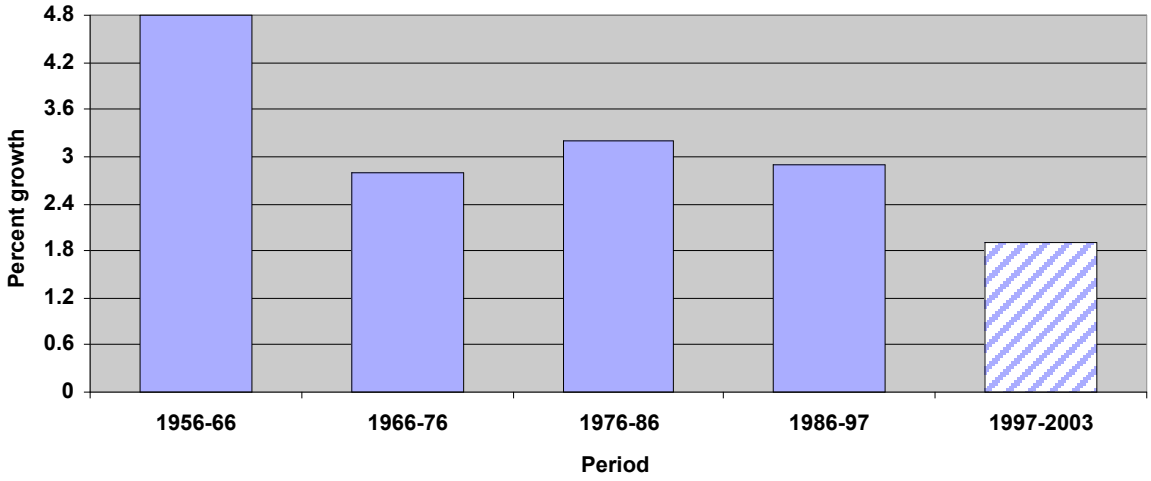
[2] The 2003 VAC survey in rural areas did not include the institutional population resident in the sampled areas. Based on the results of the 1997 census, it is estimated that 3000 persons were resident in various institutions in rural areas. These persons were added to the survey total to provide comparable figures when calculating a growth rate.

The Swazi VAC survey collected detailed information at Tinkundla and EA levels. It would be possible to compare population growth at these levels as long as comparisons included the same variables[13]. Such an undertaking is beyond the scope of this report.

[12] The growth rate for the period 1997-2003 is not exactly comparable to the rates calculated for the other periods as these rates refer to the total Swaziland population. Rates of increase are lower in rural areas compared to urban areas due to rural-urban migration.

[13] This VAC Survey included all 'official homesteads' and did not include 'unofficial homesteads' e.g. army barracks, compounds of sugar cane workers etc.

Figure 8: Swaziland population growth rates



Source: CSO, 1960-1997; Also see UNDP/SHDF 2001; VAC 2003

Fertility

Accurate and recent measures of current fertility in Swaziland are not easily available. Various secondary sources indicate fertility remains at a high level.

The information presented in Table 6 was obtained from secondary sources. The crude birth rate is a measure calculated by dividing the number of births reported in a population during a specific year with the mid-year total population in the same year. The total fertility rate is a more complex measure taking into account the age-specific birth rates. In essence, this measure is an indication of how many children an average woman would give birth to in her lifetime if current fertility rates were to continue. The available information indicates fertility remains at a high level. Given the fact that contraceptive use has increased in recent years, there is a need to verify recent fertility trends in the country. This typically calls for a demographic and health survey.

Table 6: Measures of fertility in Swaziland

Source	Crude Birth Rate	Total Fertility Rate
Sustainability Indicators for Swaziland (circa 1998)	36.8	4.46
Population Reference Bureau (1997)	43	4.9

Mortality

As a general statement it can be said that mortality rates declined in Swaziland for a considerable period of time. However, there is evidence that during the latter half of the 1990's mortality trends were reversed due to an increase in the number of deaths as a result of HIV/AIDS.

The most common measure to monitor changes in mortality trends is the indicator - life expectancy at birth. In the absence of a complete vital registration system, in combination with regular population censuses, the calculation of life expectancy values are more difficult. However, methods and models have been developed to estimate life expectancy indirectly from census results. In the case of Swaziland different sources do not agree about the life expectancy at birth. The table below contains a ten year time series of the life expectancy in Swaziland compiled to construct the Human Development Index. These values show a steady increase in the life expectancy from 1990 to 2000. This does not seem plausible, given the

reported rise in mortality due to HIV/AIDS. In the same report (UNDP/SHDF, 2000: 84) it is stated that a recalculation of the life expectancy using the 1997 census data, put the year 2000 value at 58.3 years. Other more recent estimates of the life expectancy at birth are all derived from models to estimate the impact of HIV/AIDS on the population. These models predict that the life expectancy in the country had fallen significantly. Empirical verification is needed to determine whether life expectancy (40 years at birth) is as low as predicted by modelling.

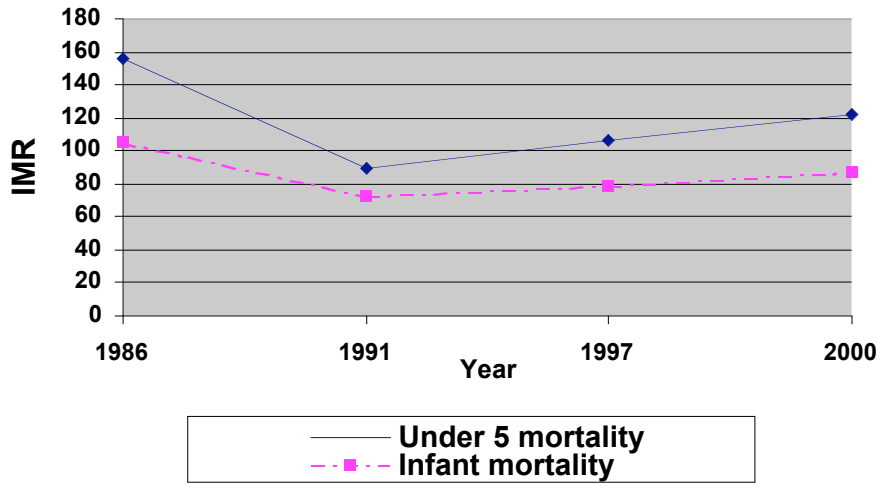
Figure 9: Life expectancy in Swaziland, 1990-2000

Year	Life expectancy at birth HDI series[1]	Other sources
1990	56.8	
1991	56.8	
1992	56.8	
1993	56.8	
1994	57.3	
1995	58.8	
1996	57.8	
1997	58.3	57[2]
1998	58.8	
1999	60.2	
2000	60.7/58.3	40.2[2]

Source: [1]UNDP/SHDF, 2000
[2] Population Reference Bureau

The Multiple Indicator Cluster Survey conducted in 2000 by the Central Statistical Office of Swaziland provides evidence of a recent increase in the mortality of young children in the country. This large survey covered 4,500 households. The aim of the survey was to collect a number of indicators intended to monitor progress towards the goals and objectives set by the World Plan of Action for Children. Using indirect estimation techniques, the results of the survey show that infant mortality (IMR) i.e. deaths among children under the age of one year, as well as the under-5 mortality rate were declining up to the early 1990s (see Figure 10). Whereas the IMR was about 105 deaths per 1,000 births in the mid 1980s, it declined to about 72 in 1991. This was a significant improvement in child survival over a relatively short period. Unfortunately a reversal in child survival trends occurred since the mid-1990s. For the year 2000 the Multiple Indicator Cluster Survey estimated the infant mortality rate at 87, while in that year 122 children under the age of 5 years died, up from 89 in 1991 (per 1000 children in that age group). These reversals will make it very difficult to reach targets set by the Plan of Action for Children or the Millennium Development Goals. The recent increases in child deaths can only be ascribed to the impact of HIV/AIDS due to the vertical transmission of the virus from mother to child.

Figure 10: Infant mortality trends in Swaziland



Source: Central Statistical Office, Multiple Indicator Survey, 2000

Age and sex structure of rural Swaziland

The age and sex structure of a population is a mirror of past population processes that occurred in that population. The age and sex structure reflects the impact of fertility (having the major impact on the age composition) as well as mortality and migration. For the purpose of this study, the age and sex structure of the rural population of Swaziland was scrutinised at three points in time namely 1986, 1997 and 2003. This was done by means of a population pyramid (Figures 11-13).

The 1986 population pyramid shows a very youthful population, a result of sustained high fertility levels and moderate mortality levels. This pyramid also indicates missing males from the ages of 20 to approximately 44. It is unlikely that this is the result of excess male mortality, but rather the consequence of significant male out-migration from rural areas to urban areas or as migrant labourers to South Africa.

The 1997 pyramid exhibits a fairly similar picture with the exception of a smaller number in the age group 0-4 years than the preceding age group. Analysing the 1997 pyramid in isolation, one could either infer that the reduction in the age group 0-4 years is evidence of the beginning of fertility decline among the rural population of Swaziland, or as a result of the non-enumeration of children 0-4 years, which is a common occurrence in developing countries.

In 2003 (from the data collected by this VAC survey) the population pyramid is starting to look different from the pyramid of 1986. The bottom age categories (0-14 years) are smaller than the in previous censuses giving substance to the hypothesis of a decline in fertility in rural Swaziland. It also indicates that the fertility decline is larger and more sustained than one would have thought, given the rural nature of the population.

Figure 11: Swaziland rural population, age and sex structure in 1986

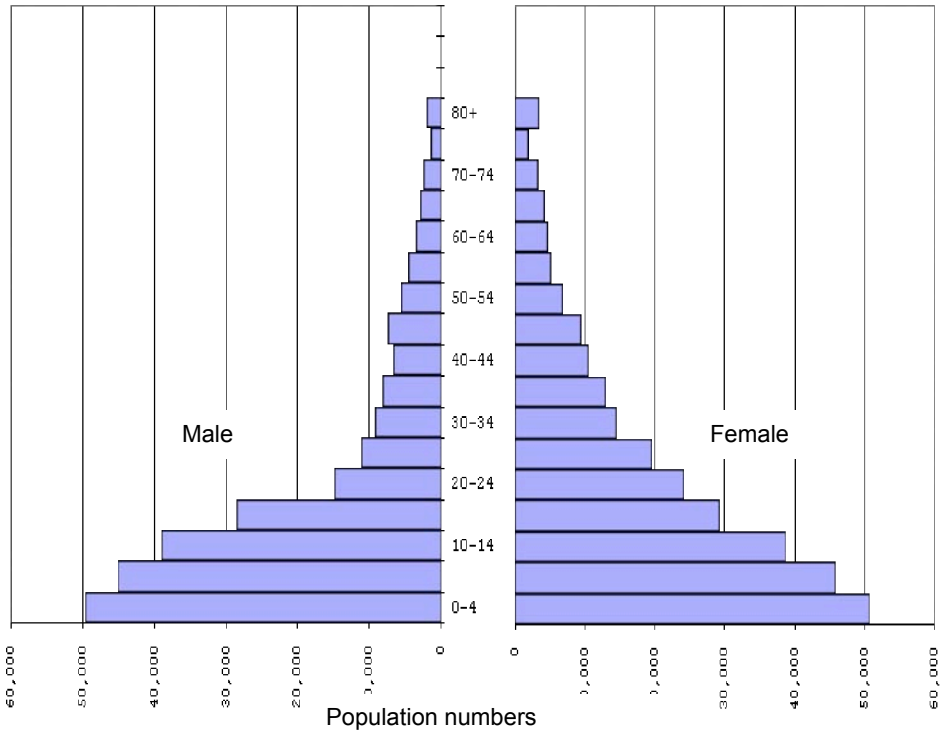


Figure 12: Swaziland rural population, age and sex structure in 1997

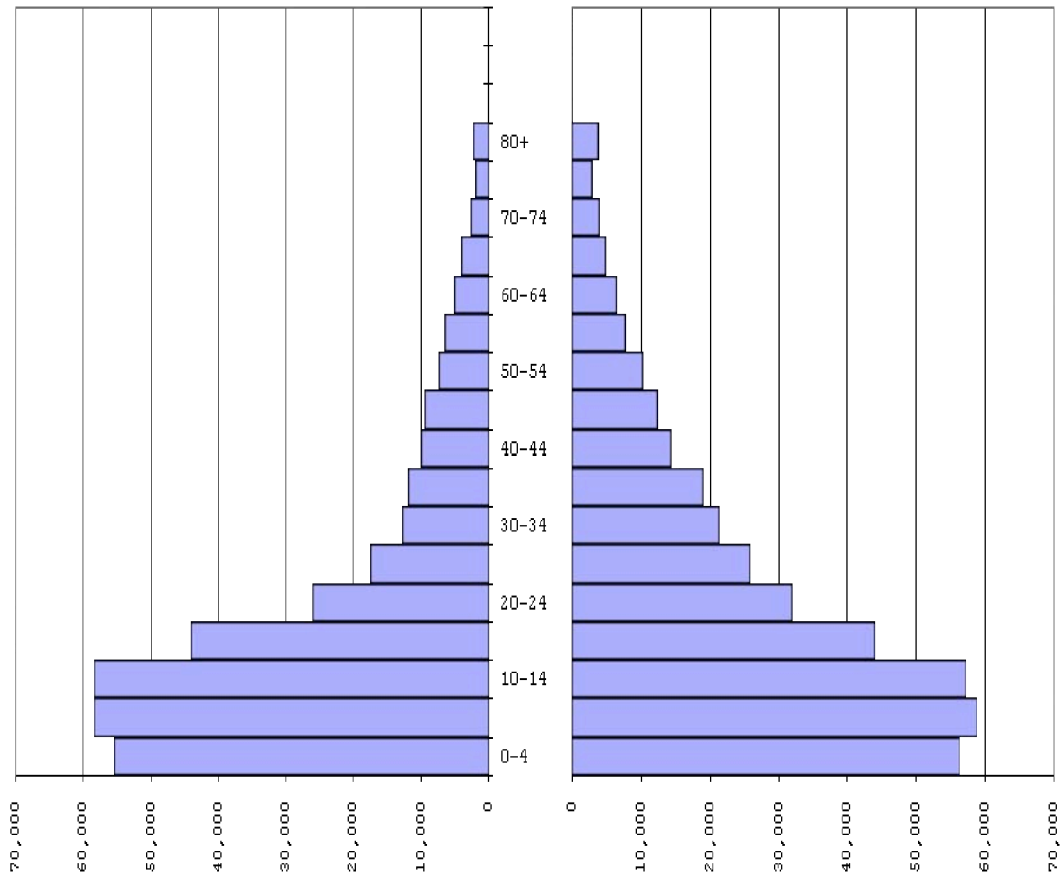
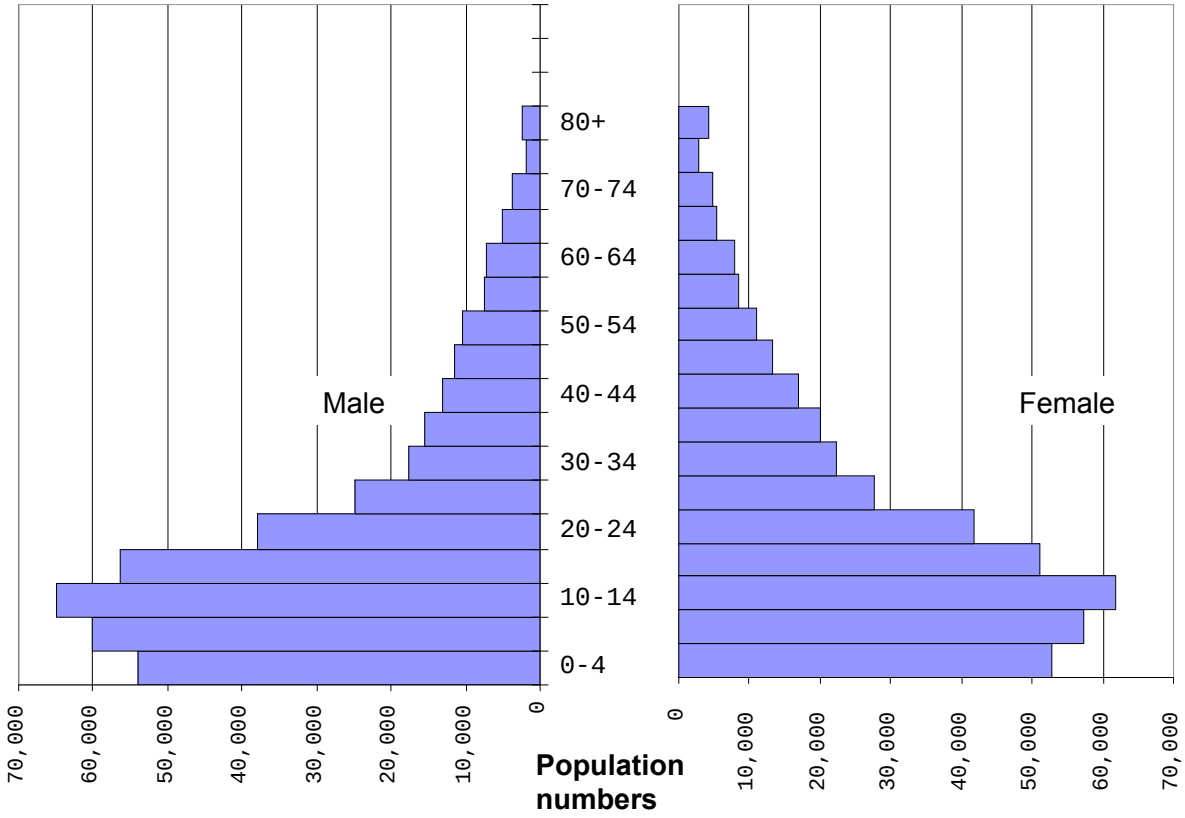


Figure 13: Swaziland rural population, age and sex structure in 2003



As a consequence of the reduced number of persons in the younger age groups in 2003, the Swaziland rural population is less youthful than 17 years ago. In addition the shortage of males in the prime productive ages is less prominent than at the time of the two preceding censuses. However, due to the small scale of a pyramid, it is not possible to detect the impact of higher mortality on the age and sex structure of the rural population during the past few years.

Broad age categories

An analysis by broad age category confirms that the Swaziland rural population is less concentrated in the younger ages in 2003 than in 1986 (see figures above). Whereas 51.2% of the **rural** population was younger than 15 years in 1986, this proportion has dropped to 43.7% in 2003. The shift in population is evident in the fact that while nearly 45% of the rural population was in the broad age range of 15-64 years in 1986, those in this category made up nearly 53% of the population in 2003.

Figure 14: Age composition of the Swaziland rural population (%)

Rural Population In Selected Age Categories	1986	1997	2003
Proportion aged 0-14	51.2	48.2	43.7
Proportion aged 15-64	44.8	48.1	52. 6
Proportion aged 65+	4.0	3.7	3.7

The age dependency ratio

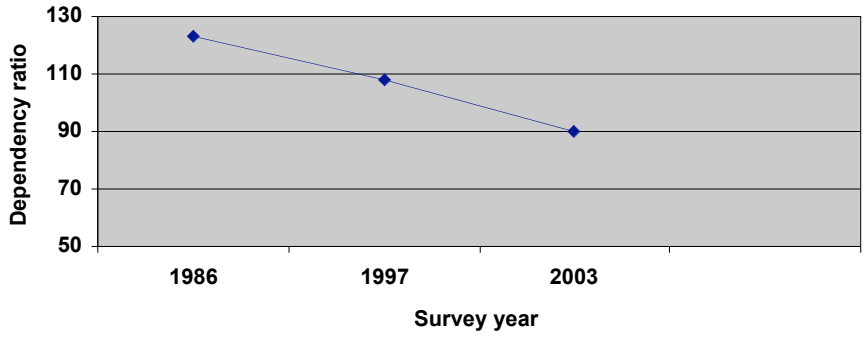
The age dependency ratio is defined as the ratio of young people less than 15 years of age plus persons aged 65 and older to those in the age group 15-64 years. This is a demographic

determined measure, and indicates the relative importance of those in the "dependent" ages to those in the productive ages. This ratio also serves as a measure of demographic change. In developing countries characterised by high fertility, the ratio typically ranges from 80 to 105 dependents per 100 productive persons while in developed countries the ratio is between 50 and 60 per 100 productive persons.

Comparing the three main population data sets used in this analysis, i.e. the 1986 census, the 1997 census and the 2003 sample census, it is apparent that the dependency ratio at the national level has **decreased** (or improved) substantially (by 27%) between 1986 and 2003 (see Figure 15). Compared to developed countries, the current dependency ratio of 90 is still high. This reduction in the dependency ratio in rural areas is due to changes in the age structure, which in turn is mainly the result of lower fertility levels and less so due to the effects of mortality. It is expected that the dependency ratio will show further reductions in the years to come as fertility declines to lower levels. And although HIV/AIDS will increase mortality levels among those in the adult ages,[14] those deaths will not be sufficient to cause a rapid upturn in the national dependency ratio, at least not in the short and medium term.

At the household level, the dependency ratio may be very high in particular households affected by the death of adult members, leaving behind children and possibly elderly persons. In these circumstances the "dependency ratio" may serve as one useful function by identifying households that are vulnerable. However, it should be realised that empirical information obtained by means of a cross-sectional survey may underestimate the impact of high mortality on households (and therefore the dependency ratio). This is because the phenomenon of households that have disintegrated because of significant mortality cannot be detected by a single survey. Examples that come to mind are single person households that "disappear" after the death of that person or that other households may dissolve after a death of a member because of migration/moving away of the remaining household members and/or the absorption into other households.

Figure 15: Reduction in the age dependency ratio in rural Swaziland, 1986-2003



An analysis of crude dependency does not adequately portray the impact of HIV/AIDS on the burden experienced by affected households. De Waal correctly pointed out that one has to look at a slightly refined dependency ratio, where those who suffer from chronic illnesses are assumed to be dependent (as they have to be cared for and supported) in order to factor in the impact of HIV-related illnesses. He described this measure as an "effective dependency ratio" (see for example de Waal and Whiteside, 2003). In the preceding paragraphs it was shown that there had been a steady improvement in the age determined dependency ratio. However, an analysis of the "effective dependency ratio" in rural Swaziland shows significant differences between groups, which may well be a reflection of the differing impact of the

[14] Another reason why AIDS does not markedly influence the dependency ratio at a national level is that AIDS also leads to child deaths which partly cancel out the adult deaths.

epidemic on different segments of society and thus also have important implications for mitigating the impact of the epidemic.

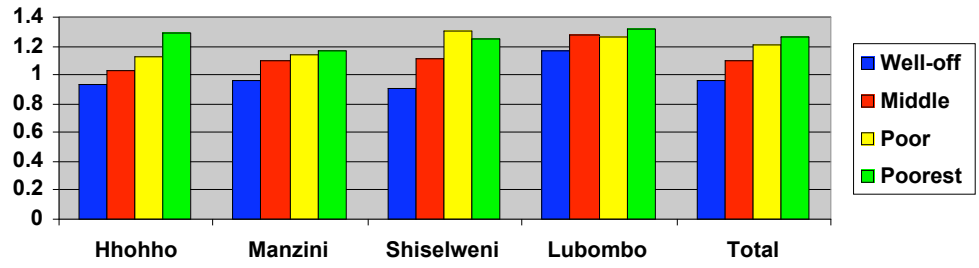
In table 7 below a comparison is provided of the age dependency ratio and the "effective dependency ratio" by food economy / livelihood zone in rural Swaziland. The table clearly indicates that the dependency burden increases when those, suffering from bouts of chronic illness, are added to the conventional group of dependents. In general, the "effective dependency ratio" is between 20–30 % higher than the conventional dependency ratio. In the Lowveld cattle, cotton and maize food economy / livelihood zone the "effective dependency ratio" is 35% higher than the conventional age dependency ratio.

Table 7: Dependency ratios by food economy / livelihood zone

Food Economy / Livelihood Zone	Dependency ratio	Effective dependency ratio (difference)
Highveld maize and cattle	0.88	1.08 (0.20)
Lomahasha trading and arable	0.88	1.21 (0.33)
Lowveld cattle and cotton	0.98	1.30 (0.32)
Lowveld cattle, cotton and maize	0.95	1.28 (0.33)
Lubombo plateau	0.96	1.15 (0.21)
Middleveld maize and cattle	0.96	1.18 (0.24)
Timber highlands	0.82	1.04 (0.22)
Peri-Urban corridor	0.67	0.79 (0.12)

In the Lowveld cattle, cotton food economy / livelihood zone, there are effectively 130 dependents for every 100 productive persons. This is an indication of the direct impact that the burden of disease is having on the rural population. The variation of the effective dependency ratio between zones poses some interesting questions relating to the access to health provision, level of HIV/AIDS prevalence and in general the high level of chronic illness in the Lowveld areas of the country. Levels of chronic illness, highlighted by showing the difference between the traditional dependency ratio and the effective dependency ratio, vary significantly around the country. Clearly the Lowveld and Lomahasha areas reflect relatively higher levels of chronic illness while the Peri-Urban corridor seemingly has significantly lower levels of chronic illness, possibly as a result of better access to health care facilities. The figure below shows the "effective dependency ratio" according to region and wealth rankings. The "effective dependency ratio" is consistently higher in those households classified as poor compared to more well off households. In fact, this near linear relationship is found across all regions. For rural Swaziland as a whole, the effective dependency ratio of households classified as the "poorest of the poor" is 30% higher than the ratio found in well off households. This finding has clear programmatic implications. For targeted interventions it is possible to use the results of the Swazi VAC survey to obtain "effective dependency ratios" at a smaller geographical level and do cross tabulation with socio-economic status for example. Such an approach would make it possible to identify specific geographic areas or groups of households in need of livelihood and health support initiatives.

Figure 16: Effective dependency ratio by region and socio economic status



CURRENT IMPACT OF HIV/AIDS ON THE POPULATION OF RURAL SWAZILAND

This section primarily utilises the empirical evidence collected during the 2003 VAC HIV/AIDS, Demographic and Livelihoods Survey in rural Swaziland in order to provide pointers on how HIV/AIDS is impacting on the dynamics and structure of the Swaziland population. The impact of HIV/AIDS is changing continually, driven by the proportion infected. To provide a future dimension of expected trends, use was made of a population projection. That dynamic element cannot be described by a survey conducted at a specific point in time.

Morbidity

In the 2003 VAC survey, respondents were asked to list the members of the household suffering from a chronic illness during the year preceding the survey. Respondents reported high rates of chronic illness. Reported rates of chronic illness decrease from age 0-4 years to age 10-14 years. Thereafter, the chronic morbidity rate increases linearly with age. Even at ages where one would expect individuals to be healthy and not exhibit signs of any chronic illness, e.g. between the ages of 15 and 29, nearly 9% of inhabitants of rural areas were classified as being chronically ill. It is plausible to point to the impact of HIV/AIDS as a reason, given the high HIV prevalence rates. Very disturbing is the fact that 15% of women in the age group 35-39 years were reportedly suffering from bouts of chronic illness. In the age group 45-49, nearly a quarter of women were reported as chronically ill (see Figure 17). These trends are ominous, given the important role that women play as homemakers, income earners and subsistence agriculturalists. High rates of chronic illness among those older than 50 years probably relates more to the normal aging process than any single factor. Furthermore, there appears to be a gender difference with women being more likely to suffer from chronic illness after the age of 10 years. These periods of being unable to be productive will have significant effects on child care activities, food production, domestic management and other income generation activities in rural Swaziland.

Figure 17: Prevalence of chronic illness by age and sex

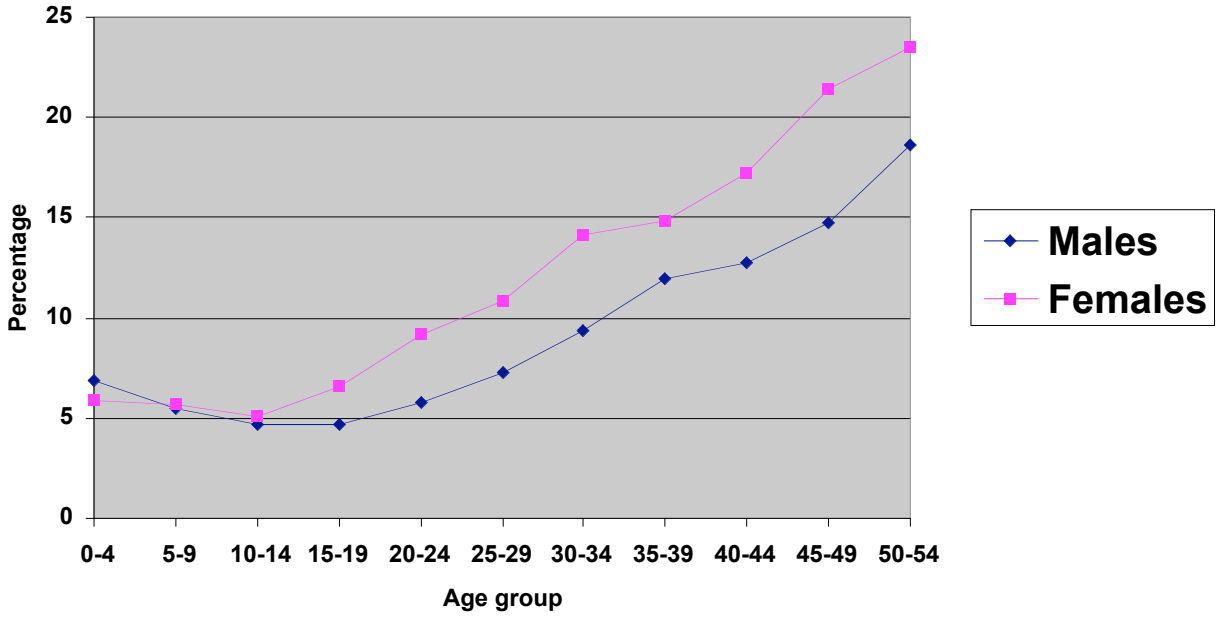
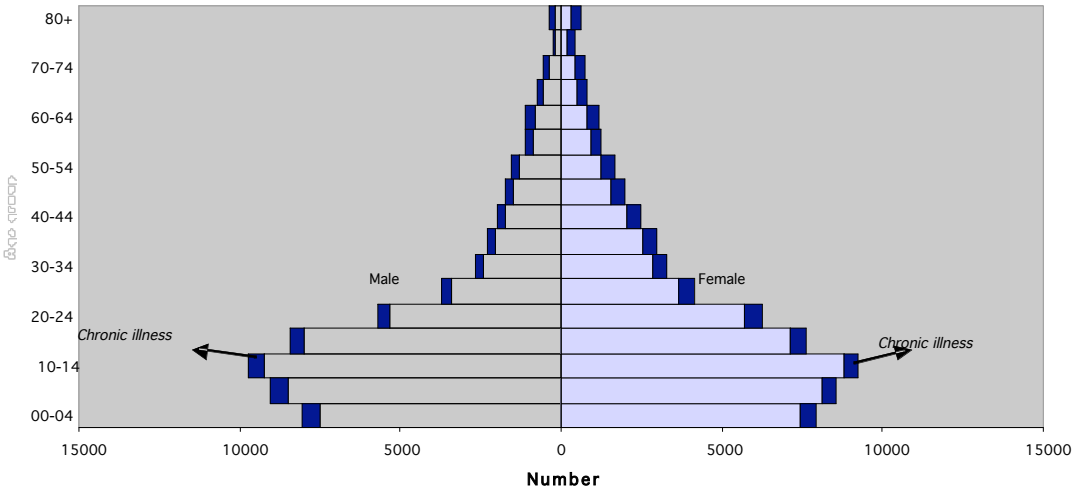


Figure 18 below provides a visual presentation by means of a population pyramid, of the proportion of chronically ill persons found among the rural population in Swaziland.

Figure 18: Proportion of chronically ill population (rural Swaziland)



The results generated by this VAC survey allow for the generation of tables of numbers of chronically ill persons by smaller geographic area e.g. at the Tinkundla level. Comparing such data with the available clinics/hospitals in the area should be instructive in terms of the accessibility of health to those in need as well as the ability of the health services to meet the demand for such services.

Mortality

In less than two decades, the near exponential increase in the HIV prevalence rate ensured that a sizable proportion of the population has become infected (possibly more than a third of the adult population). The epidemic is set to reverse the long-term trend of a steady decline in death rates in Swaziland. The increase in the number of deaths in recent years had a noticeable impact on the crude death rate and on the rate of natural increase. Current deaths reflect infection levels of approximately a decade ago. The extent of future increases in mortality levels will depend to a certain extent upon the quantity and accessibility of anti-retro viral drugs in the country. At present, the results of the Swaziland VAC survey indicate **higher** than "normal" mortality rates in the prime adult age groups (thus reflecting both higher mortality and a radical change in the normal mortality curve).

What is the extent of mortality in rural Swaziland? As mentioned in Chapter 2, respondents were requested to list those household members who had died during the past 12 months by age and sex. Admittedly such information has many flaws. Among these reasons is an inability to correctly assess the previous 12-month period, recall lapses, an unwillingness to talk about an unpleasant occurrence or even including persons not belonging to the specific household. **Yet even with the possibility of including such errors, the results of the 2003 VAC survey indicate high levels of death among those living in rural areas.** Table 8 contains the crude death rate for selected age categories. The crude death rate is a simple measure obtained by dividing the number of deaths in a specific category with the total number of persons in that category. The result is usually expressed per 1,000 of the population. To place matters in perspective - in developed counties the crude death rate is about 10 while in many developing countries it is even lower (due to the youthful age structure concomitant with the fact that young people are less likely to die compared to the elderly).

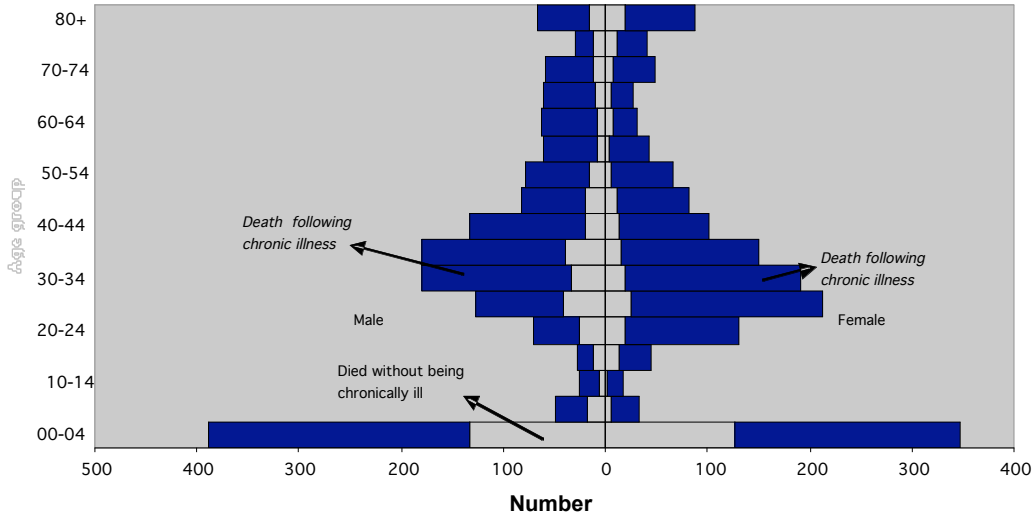
Table 8: Crude death rate in rural Swaziland

Age group	Crude death rate (Number of deaths per 1000 persons)			Number of deaths
	Male	**Female**	**Total**	
0-4	44.4	41.9	43.2	4,612
5-19	3.3	3.5	3.4	1,187
20-29	19.6	30.5	25.3	3,345
30-54	61.1	43.0	51.1	7,763
55+	76.9	52.5	63.6	3,878
Total	**26.7**	**25.1**	**25.8**	**20,785**

The 2003 VAC survey found a crude death rate of 25.8 for the total rural population. Of more interest is the breakdown of the crude death rate by age and sex. As expected, a high death rate was reported for the age group 0-4 years. Also not unexpected was the very low reported death rates for the age group 5-19 years. Virtually no gender differentials are found at these age groups. At this stage of the life cycle, human beings are healthy and experience low mortality. In terms of HIV/AIDS the older children in this group are at high risk of HIV infection, but as a result of the epidemiology of the disease, if infected in their teenage years, such persons will only die later. The death rate increases rapidly in the age group 20-29 years. Typically this is also a healthy age group and one would expect low mortality. Yet this is not the case in Swaziland. More striking is the fact that the death rate among the females aged 20-29 is more than 50% higher than the comparable male rate. This is consistent with the typical pattern of HIV infection and AIDS-related mortality in sub-Saharan Africa, where younger females are being infected at rates higher than their male counter parts. An even higher crude death rate is found in the age group 30-54. The gender differential is reversed in this age group and among males the death rate is 61 per 1000 males. And although the death rate is higher in the next category (persons aged 55 and older), this can be expected. More important is the fact that the number of deaths among those aged 30-54 was more than double the number found in the next age category. This has many social and economic implications as the age group can be seen as the core productive segment of a population.

The figure below provides certain clues as to the cause of this higher mortality. During the VAC survey, respondents were asked to indicate whether household members who died during the past year, had suffered from a chronic illness before their death. In all age groups, deaths preceded by a chronic illness constituted the majority of deaths. In conceptualising the study, chronic illness followed by death was seen as a proxy for AIDS-related mortality (with a stronger correlation among younger age groups 15 to 45 years). The high level of death among men and women in their productive years rather than among the elderly shows the extent of the problem.

Figure 19: Comparison of deaths following chronic illness and deaths not preceded by chronic illness (un-weighted numbers)



The sample size of the VAC survey makes it possible to generate a variety of tables even at smaller geographic level. This could assist programme managers to direct their efforts to more problematic areas. For analytical purposes, relative magnitudes are more important to indicate levels/trends while a field manager involved in a programme would equally be interested in the actual numbers. Table 9 illustrates the point. The table provides a breakdown of the number of deaths following a chronic illness by socio-economic group, including an indication of the relative weight of these deaths compared to all deaths. For analytical purposes it would have been more useful to present the results of this table as crude death rates in order to make comparisons using a common unit.

Table 9: Number of deaths by socio-economic group and the proportional importance of such deaths among all deaths

Age group	**Number of deaths following chronic illness**					**Deaths following chronic illness as a percentage of all deaths (%)**				
	Well off	*Middle*	*Poor*	*Poorest*	*Total*	*Well off*	*Middle*	*Poor*	*Poorest*	*Total*
0-4	219	1063	1506	261	3048	59.2	69.9	63.3	75.9	66.1
5-19	67	261	460	53	842	70.5	73.7	69.7	67.9	70.9
20-29	225	881	1384	175	2665	78.4	76.6	81.1	86.6	79.7
30-54	606	2064	3325	577	6573	79.8	85.5	84.1	90.7	84.7
55+	429	919	1666	131	3146	84.1	77.3	83.0	76.1	81.1
Total	1547	5189	8341	1197	16274	76.6	78.3	77.9	83.6	78.3

Orphans

This 2003 Swazi VAC survey provided the opportunity to investigate the prevalence of orphanhood in the rural areas. Sometimes called the "Fourth Wave" of the HIV/AIDS epidemic, the rise in the number of orphans as a result of their parent dying due to AIDS-related complications, has significant social and societal repercussions. In a normal situation of low mortality, approximately 2% of children under the age of eighteen are likely to have lost one or both of their parents. With an increase in mortality levels, there is a strong likelihood of an increase in the proportion of children being orphaned. Respondents within households were asked whether the natural/biological mother and father of children aged 0-14 years, resident in the household were alive at the time of the survey. This information enabled the calculation of maternal, paternal and double orphan rates.

Table 10 below presents the maternal, paternal and double orphan rates for rural Swaziland. The reported paternal orphan rate is double that of the maternal orphan rate for the age group 0-14 years. However, the paternal orphan rate should be used with caution as it may over-estimate the number of paternal orphans. This indicator is prone to errors, especially in situations where high rates of non-marital births occur (as is the case in Swaziland), where family dissolution is common or where men participate in labour migration. Therefore, the maternal orphan rate calculated in this fashion is a more reliable indicator. Overall in 2003, 2.3% of children younger than 15 years had lost **both** parents and these children are in a particularly precarious position. Although the proportion of children who have lost both their parents is relatively low at the present time, a calculation based on the survey results indicates that there are already 7,400 double orphans aged 0-14 years living in the rural areas of Swaziland.

Table 10: Paternal, maternal and double orphan rates in rural Swaziland

Age group	Paternal orphan rate	Maternal orphan rate	Double orphan rate
	Percentage		
0-4	5.8	**2.3**	**0.7**
5-9	13.0	**5.7**	**2.2**
10-14	16.8	**9.0**	**3.6**
0-14	12.2	**5.9**	**2.3**

Table 11 below shows the number and percentage of children under the age of 15 years who lost their biological **mother** according to the sex and age group of the child as well as according to the agro-ecological zones in the country.

Table 11: Maternal orphan rates of children under 15 years by age group, sex and agro-ecological zone

Agro-ecol. Zone	Age group							
	0-4		5-9		10-14		0-14	
	%	*N**	*%*	*N**	*%*	*N**	*%*	*N**
Highveld:								
Male	2.9	377	6.7	971	8.8	1,348	6..3	2,696
Female	2.7	329	5.9	812	9.5	1,434	6.3	2,575
Both sexes	2.8	706	6.3	1,783	9.1	2,782	6.3	5,271
Middleveld:								
Male	2.4	469	5.8	1,319	8.6	2,154	5.9	3,942
Female	1.8	364	4.4	928	8.8	2,027	5.2	3,320
Both sexes	2.1	833	5.1	2,247	8.7	4,181	5.5	7,261
Lowveld:								
Male	1.8	253	5.7	851	9.0	1,468	5.7	2,572
Female	2.5	341	5.9	897	8.8	1,349	5.8	2,587
Both sexes	2.2	594	5.8	1,748	8.9	2,817	5.8	5,159
Lubombo Pl:								
Male	1.7	71	6.9	285	11.0	430	6.5	786
Female	2.0	72	6.5	229	11.3	428	6.7	729
Both sexes	1.9	143	6.7	514	11.1	858	6.6	1,515
Swaziland:								
Male	**2.3**	**1,170**	**6.1**	**3,426**	**8.9**	**5,400**	**6.0**	**9,996**
Female	**2.2**	**1,106**	**5.3**	**2,866**	**9.1**	**5,238**	**5.7**	**9,210**
Both sexes	**2.3**	**2,276**	**5.7**	**6,292**	**9.0**	**10,638**	**5.9**	**19,206**

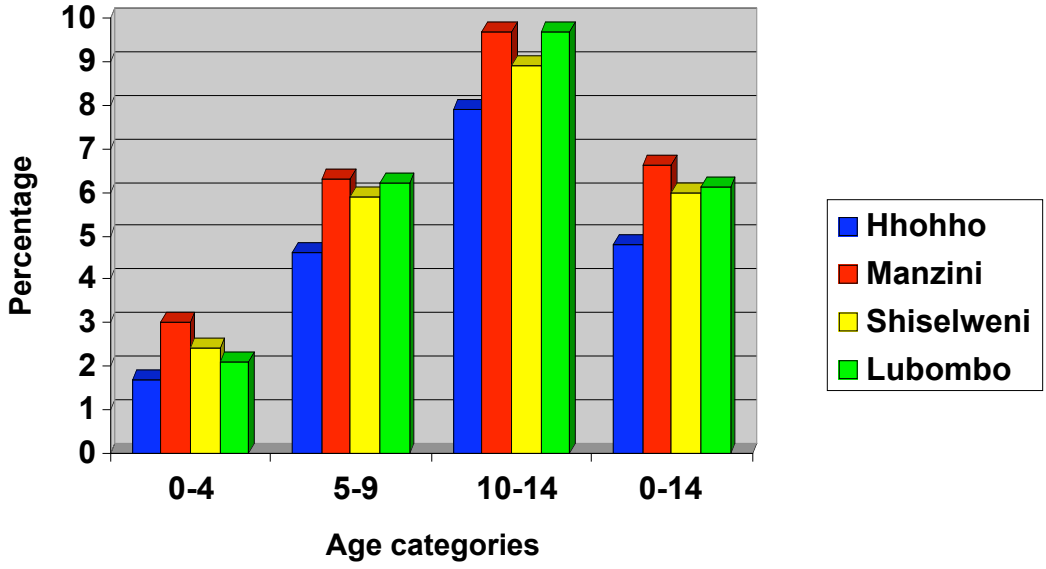
*Number of maternal orphans in the specific locality, according to age group and sex.

This table was constructed using weighted data. Salient points that emerge from the statistics are:

- The maternal orphan rate is higher in each subsequent age category.
- There is an unexpected gender difference between orphan rates of male and female children. The differences that occur are possibly the result of age misstatements and sample size. However, it is also possible that male orphans are more likely to remain a separate household than female orphans after parental deaths have occurred and are more likely to be numerically counted in surveys than female orphans who may sometimes be assumed to be with their biological parents.
- When comparing the main agro-ecological zones, children living in households in the Lubombo Plateau Zone are slightly more likely to be orphans, than those in for example the Middleveld Zone.
- The highest maternal orphan rates are found in the age group 10-14 years. On average 9% of children have lost their mother.
- In total there are approximately 19,206 maternal orphans under the age of 15, living in rural households in Swaziland.

The prevalence of maternal orphans according to region is shown in Figure 20. The increase in the maternal orphan rate by age group is clearly visible. Of the four Regions in Swaziland, Hhohho had the lowest maternal orphan rates in all age categories. The highest maternal orphan prevalence rates are found in Manzini Region – albeit only higher than the other Regions. Overall the maternal orphan rate for the age group 0-14 is nearly the same in the rural areas of Manzini, Shiselweni and Lubombo, however from the age of 5 years both Manzini and Lubombo Districts have a slightly higher level of maternal orphanhood.

Figure 20: Maternal orphan rate of children under 15 years of age by region



FUTURE POPULATION SIZE AND GROWTH

The results of the VAC survey are empirically based and are therefore very useful when tracking past trends. However, the survey results cannot provide any indication of future trends. To do this, some modelling is required. To provide some indication of future population trends for the country as a whole, a population projection was undertaken.

The projection itself was done with the use of Spectrum, a widely used population projection programme developed by the Futures Group (Stover, 1999). HIV/AIDS parameters were estimated by means of the EPP programme (UNAIDS, 2003). These results were used as input for the Spectrum population projection programme. The 1986 Swaziland census population was used as the baseline of the projection enabling a mid-way check of the accuracy of the modelling. It allowed a testing of the model with current empirical data such as the 1997 census and the 2003 VAC Survey. This check on more recent information allowed an assessment of how well the projection was performing.

The population projection is largely confirmed by the results of the 1997 population census and the 2003 VAC survey. Trends generated by the modelling exercise are largely similar to the trends found in the Swazi VAC survey. Population growth rates will continue to decline. Even though the number of deaths will increase in the coming years, Swaziland will not experience negative population growth in the near future (see Table 12). The population growth rates generated by the projection seem too low in comparison to the results of the VAC survey, indicating that the fertility assumptions used in the projection may have been too low. In addition, the age structure of the country will increasingly become more mature, as the younger age groups are reduced in size. This potentially has numerous positive implications in terms of the economy, employment, education provision and the like.

The projected population size up to the year 2010 is shown in the table below alongside the rate of natural increase for the preceding five year period. It should be remembered that this modelling exercise is subjective and is dependent on several assumptions. The mortality and fertility outcomes should be verified by empirical studies.

Table 12: Growth of the Swaziland population, 1995-2010: results of a population projection*

Year	*Males*	*Females*	*Total*	*Rate of natural increase (per 100)*
1990	405,000	345,000	850,000	3.12
1995	480,000	510,000	990,000	2.24
2000	530,000	570,000	1,100,000	1.0
2005	**565,000**	**595,000**	**1,160,000**	**0.36**
2010	**590,000**	**600,000**	**1,190,000**	**-**

*Rounded to the nearest 1,000

The table below contains a summary of indicators generated by the modelling exercise. Note should be taken of the assumed decline in fertility. A change in this value will produce different population size outcomes. Of concern is the drop in the life expectancy at birth, projected as a result of the impact of HIV/AIDS. Of interest is the fact that the infant mortality rate declines again after 2005. This may indicate flawed input data, or the impact of changing fertility levels. According to this projection the annual rate of natural increase will decline to only 0.3% by the year 2000. This low level of natural increase in the population predicted by the modelling between 1997 and 2003 has not been borne out by the empirically based VAC survey.

Table 13: Selected demographic indicators, 1990-2010

Selected indicators	1990	1995	2000	2005	2010
Total fertility rate	**5.9**	**5.3**	**4.8**	4.2	3.7
Crude birth rate	**46**	**41**	**37**	33	30
Life expectancy at birth	**54.4**	**49.6**	**35.5**	29.6	29.7
Crude death rate	**13**	**13.3**	**19.9**	26.2	26.8
Infant mortality rate	**94.4**	**95.3**	**97.3**	89.8	80.7
Rate of natural increase	**3.2**	**2.8**	**1.7**	0.7	0.3
Dependency ratio	**0.97**	**0.95**	**0.92**	0.88	0.8

The modelling exercise shows a drastic increase in the crude death rate, very similar to the findings of the 2003 VAC survey. Between 1990 and 2005 the crude death rate will double as a result of HIV/AIDS-related deaths. By 2010 the crude death rate will stabilise at approximately 27 per 1000. The table below contains an estimate of the annual number of deaths occurring in Swaziland, based on this population projection. After 1995 the number of deaths increased rapidly - while an estimated 13,000 people died in 1995 with a corresponding crude death rate (CDR) of 13.3 per thousand of the population, the projected number of deaths in 2000 rose to 21,990 (CDR =19.9). It is projected that the increase will continue until 2010 when it will stabilise at approximately 31,830 deaths per annum (a CDR of 26.8). The increasing relative death rate of women compared to men is important when considering the social and economic impact that the mortality may have on homesteads and the country as a whole

Table 14: Estimated annual deaths in Swaziland for selected years: results of a population projection

Year	Males	Females	Total	Crude death rate (per 1000)
1990	5,500	5,520	11,020	13.0
1995	6,630	6,450	13,090	13.3
2000	11,240	10,750	21,990	19.9
2005	**14,620**	**15,930**	**30,540**	**26.2**
2010	**14,960**	**16,870**	**31,830**	**26.8**

CONCLUSIONS

This 2003 HIV/AIDS, demographic and livelihoods VAC survey in rural Swaziland confirmed that rates of natural increase have lessened in rural areas down to approximately 2.0% growth per annum. This reduction was not solely the result of the long term trend of declining fertility rates in Swaziland. The death rate among the rural population was found to be high and increasing. In addition, a fair proportion of these young and normally unexpected deaths occurred after a bout of chronic illness, some indication that AIDS related complications play a determining role in the increasing death rate. These results should be seen against a backdrop of rising HIV prevalence rates as measured at selected antenatal clinics in the country.

The survey confirmed the presence of relatively high rates of chronic illness among the rural population, even in age groups where one would normally not expect this to occur.

The 2003 VAC survey in Swaziland found high rates of orphanhood among children below the age of 15 years. At present, 6% of children (totalling 19,206) aged 0-14 years are

maternal orphans and 2.3% of children less than 15 years have lost both their parents. Given the predicted course of the epidemic, characterised by deaths among young adults, the proportion of orphaned children is set to rise in the coming years. This will have numerous social and economic implications, both on care-giving households, as well as the country as a whole. Access to education for these orphans is one determinant of whether they will be in a position to actively contribute to Swaziland society and economy as they grow older. It is important to monitor how many of these orphans are indeed regularly accessing education and build on current initiatives (by NERCHA and other NGOs etc.) of education provision for these often vulnerable children.

One of the pre-survey expectations was that this VAC study would show higher age dependency ratios at the national and sub-national levels, as a result of increasing deaths among adults. However, the results of the survey indicate that changes in the age structure, as a result of declining fertility, more than compensated for deaths among those in the most productive age groups. When taking into account household members who reported bouts of chronic illness, and thus are not likely to be productive (income earners/home makers etc.) in the usual sense, the Swaziland VAC survey found that the "effective dependency ratio" in rural Swaziland was between 20% and 35% higher than the standard dependency ratio. The effective dependency ratio will, of course, vary by area and household. Therefore individual households who lost productive members, or who took in orphans from households that have dissolved, or who have ill members, may be faced by a "dependency" crisis: children, sick members and elderly persons depending on fewer or no productive adults that may bring food and/or income into the household.

The population projection undertaken to benchmark the findings of the VAC survey, resulted in magnitudes largely consistent with the survey results, as well as with the findings of other projections carried out in Swaziland. The VAC survey highlights a strong need for a demographic and health survey in Swaziland. Besides generating accurate fertility and infant mortality data, such a survey should investigate other reproductive health matters, not the least is the current use of barrier methods. This will indicate how successful current information, education and communication (IEC) campaigns are in convincing the population of Swaziland to change behaviour patterns in order to stop the epidemic from spreading any further.

Another aspect to note is the need for accurate population-based HIV prevalence data. Recent population-based surveys conducted in Zambia, Kenya and South Africa found that surveillance data may over-estimate the HIV prevalence rate in the population (ORCMacro, 2003; Shisana, et al 2003). Stronger statistical prevalence data will give more credibility to the outputs of models predicting the course of the epidemic as well as population projections.

It is possible (and indeed desirable) to generate numerous tables on a variety of topics for example by smaller geographic area and socio-economic status because of the large sample size of the survey. Due to length considerations the present report did not exhaust the numerous potential avenues of analysis at smaller geographic levels. Therefore, government departments, NGOs and multi-national donor and aid organisations active in Swaziland may desire additional analysis from the data collected during the survey. More detailed tabulations will make it possible to conduct interventions and programmes targeted in specific areas. For example, it is possible to determine figures on the estimated number of orphans by Tinkundla, or for instance the number of chronically ill women and/or men by Tinkundla. The comparison of crude death rates by smaller geographic area could also show if there are indeed any regional differences in the impact of HIV/AIDS. The Swazi VAC is keen to hear from stakeholders who are interested in taking the analysis further.

CHAPTER 4: FINDINGS - TOWARDS IDENTIFYING THE IMPACT OF HIV/AIDS ON LIVELIHOODS

INTRODUCTION

This part of the study begins to explore some of the relationships between indicators of HIV/AIDS infection and household's livelihoods and food security. The conceptual basis of the analysis draws on Amartya Sen's entitlement approach to understanding food access. Briefly, Sen (1980) argued that there are five ways of accessing food: production, monetary exchange, non-monetary exchange (barter), gifts, and illegal means such as theft. The analysis that follows explores the extent to which households in rural Swaziland have utilised these food access strategies (apart from theft) in the 12 months leading up to the time of the survey.

Chapter 4 is divided into five sections: introduction, analytical method, results, conclusions and recommendations. The results section is split into sub-sections dealing with (i) national level and (ii) agro-ecological zone level and food economy / livelihood zone level findings respectively.

HIV/AIDS and Agriculture

The results of a recent HIV/AIDS study conducted by the Ministry of Agriculture and Co-operatives, the Federation of Swaziland Employers and UNAIDS reveals the stark reality of the epidemic in Swaziland (MoAC et al 2003). The impact of prolonged morbidity and increased mortality on households and productivity on farms through HIV/AIDS has severe ramifications for the subsistence agriculture sector in Swaziland. Data from the subsistence agriculture component of the MoAC study has been stratified according to whether there was any (i) death in the household, (ii) death but not related to HIV/AIDS and (iii) HIV/AIDS-related death. This was done to control for confounding factors like climate, changes in income and the local labour market that operates within communities. Measures of impact have been computed using non-AIDS related death as the reference. The impacts on the household and farm are shown in Table 15 and discussed further below.

Table 15: Impact of AIDS related death on the household and farm

	No deaths (n = 230) (Control) Cases (%)	**Non-AIDS related deaths** (n = 122) Cases (%)	**AIDS-related deaths** (n = 104) Cases (%)	OR	95% Confidence Interval	P-value
Reduction in area under cultivation	18(7.8%)	22(18%)	40(38.5%)	2.84	1.48-5.46	0.00060
Increase in healthcare costs	23(10%)	17(13.9%)	23(22.1%)	1.75	0.83-3.70	0.10903
Reduction in crop yield	34(14.8%)	26(21.3%)	49(47.1%)	3.29	1.37-2.34	0.00004
Change in cropping pattern	46(20%)	37(30.3%)	44(42.3%)	1.68	0.94-3.03	0.06180
Children dropout of school due to a lack of fees	37(16.1%)	31(25.4%)	46(44.2%)	2.33	1.28-4.25	0.00298
Death of head of household	-	28(23%)	30(28.8%)	1.40	0.74-2.66	0.27269
Diversion of labour to care for sick member of HH	-	28(23%)	32(30.8%)	1.49	0.79-2.82	0.18561
Loss of remittances due to death of member of household	-	24(19.7%)	40(38.5%)	2.55	1.35-4.84	0.00182

Source: MOAC *et al*, 2003: 17 Household Demographics

Morbidity: During the terminal stages of the illness, household members spend time taking care of sick member (s). This diversion of labour may have a serious impact on agricultural production, particularly if the produce is labour intensive. The MoAC et al study did not find a significant increase in diversion of labour to take care of a patient with AIDS in comparison to other causes of morbidity. It is, however, important to note that HIV/AIDS is associated with a prolonged morbidity meaning that diversion of labour for care giving is over a longer period of time compared to non-AIDS illness. The resultant impact on the household is therefore greater in AIDS-related illnesses.

Mortality: The study found that male heads of households were dying more than women - in the ratio 3:2. Under Swazi communal tenure, this has ramifications for food security in terms of security of tenure of female-headed households and the loss of agricultural knowledge in terms of gender-based task differences, as women take over as head of household. The importance of power relations and access to resources and ability to leverage resources is an important consideration in food security.

Orphans: The death of adult members who have children leads to orphans, if the mother or both parents die and if the child is under 15 years (UNAIDS definition). The MoAC et al study found that 17% of households were caring for AIDS orphans. From this study, the estimated total number of AIDS orphans in Swaziland was 29,379. This is about 20% lower than the UNAIDS estimated figure of 35,000 orphans at the end of 2001. Chapter 3 of this report has shown that there are 19,206 orphans in rural Swaziland.

Sources of income: Most households (88%) sell their farm produce to raise income. The impact of mortality and morbidity through HIV/AIDS has serious implications for households' livelihoods systems. The second largest source of income was remittances (50%) used to meet the daily needs of the household and to maintain the farm. Many households (44%) also raise income from supplying services and labour to other households within the community. Historically, remittances particularly from South Africa have been an important source of income for many Swazi families. The death of a household member invariably leads to a loss of remittances and increases in expenditure due to funeral costs. The study found that there was indeed a significant loss of remittances in 38.5% of households that experienced an AIDS-related death (see Table 16). The fact that over half of the households depend on remittances for household expenditure and maintaining the farm means that this loss has wide ramifications for the household and the farm.

Table 16: Sources of income for households

Source of Income	Households (%) n = 456
Remittances from household heads and relatives working away from home	228 (50%)
Household members and heads – self-employed or work within community	184 (40.3%)
Sale of farm produce (cash crops)	406 (87.7%)
Borrow	44 (9.6%)

Source: MOAC et al, 2003: 13

Area under cultivation: The MoAC study found that there was a significant reduction in area under cultivation in households that experienced AIDS-related deaths (see table 17). The average reduction in land under cultivation was 51% compared to 15.8% in households that experienced a non-AIDS related death. The reduction in land area under cultivation attributable to HIV for this study was 34.2%.

Table 17: Land cultivation

	Average household land under cultivation		**Percent reduced due to AIDS**
	Non-AIDS deaths	AIDS deaths	
% land cultivated	84.2%	50%	34.2%

Source: MOAC *et al*, 2003: 18

Crop production: In the absence of increased productivity**,** the result of reduction in land area under cultivation is a decrease in overall crop production. In order to verify this in Swaziland, the MoAC study analysed maize production to determine the impact on crop production. The study found a significant reduction in crop production in households that had experienced an AIDS related death (see table 18). The reduction in maize production due to AIDS was 54.2%.

Table 18: Farm production for households

Produce	**Average per year**	**Production**	**Reduction in production due to AIDS**	**Percent reduction in production due to AIDS**
	Non-AIDS deaths	AIDS deaths	-	-
Maize	35.06 bags	16.05 bags	19.01 bags	**54.2%**
Cattle	13.610 herds	9.583 herds	4.027 herds	**29.6%**

Source: MOAC *et al*, 2003: 18

Cropping patterns: Of the households that experienced AIDS deaths, 42.3% showed changes in cropping patterns. Such changes include the substitution of labour intensive crops like cotton with less labour intensive crops like maize, and moving from cash crops to purely subsistence crops. However, the change in cropping patterns was not significant.

Livestock: The study also found a 29.6% reduction in the number of cattle kept by households with an AIDS death as opposed to non-AIDS deaths. These cattle were sold to cater for the increased costs of healthcare and funerals.

Household expenditure: the study found a significant increase in children dropping out of school due to lack of fees in 46% of households that experienced AIDS deaths. This is a measure that households take to reduce expenditure. HIV/AIDS normally increases the costs and reduces the incomes of households: falling income or a loss of remittances as members of the household become increasingly or terminally sick and ultimately die. However, children may be an additional source of labour for the farm - although this could not be established for certain within the MoAC study.

HIV/AIDS and Livelihoods

The current study builds on this useful piece of work in the following ways:

Levels of analysis

Due to limitations of sample size, the MoAC study was able to generate conclusions at the national level only. With a sample size of over 18,000 households, the current study is able to explore relationships down to the Food Economy / Livelihood Zone (FE / L Zone) level. There are 8 FE / L Zones in Swaziland. The relationship between these Zones and the four Regions of the country is mapped in figure 1 (see chapter one).

Wealth breakdown

The MoAC study did not disaggregate impacts of HIV/AIDS according to socio-economic status. It is important to analyse according to socio-economic status because a household's stock of wealth or assets and social capital (informing their livelihood strategy) play an important role in determining the severity and type of impact of HIV/AIDS on food security.

Proxy variables

The MoAC study used one variable to measure HIV/AIDS impact: "AIDS related death". The technique used was to take this measure and compare it against "non-AIDS related death" and "no deaths" in relation to various income, expenditure, time allocation and crop production variables. This approach, whilst powerful, cannot capture a number of important facets of HIV/AIDS related morbidity and the broader demographic aspects of disease impact. Thus, in order to build on the MoAC study, analysis during the VAC study was carried out on a number of "proxy" variables (57 variables in all). These fall into four categories: mortality, morbidity, social and demographic (see Chapter 2 and annex 2 for further details).

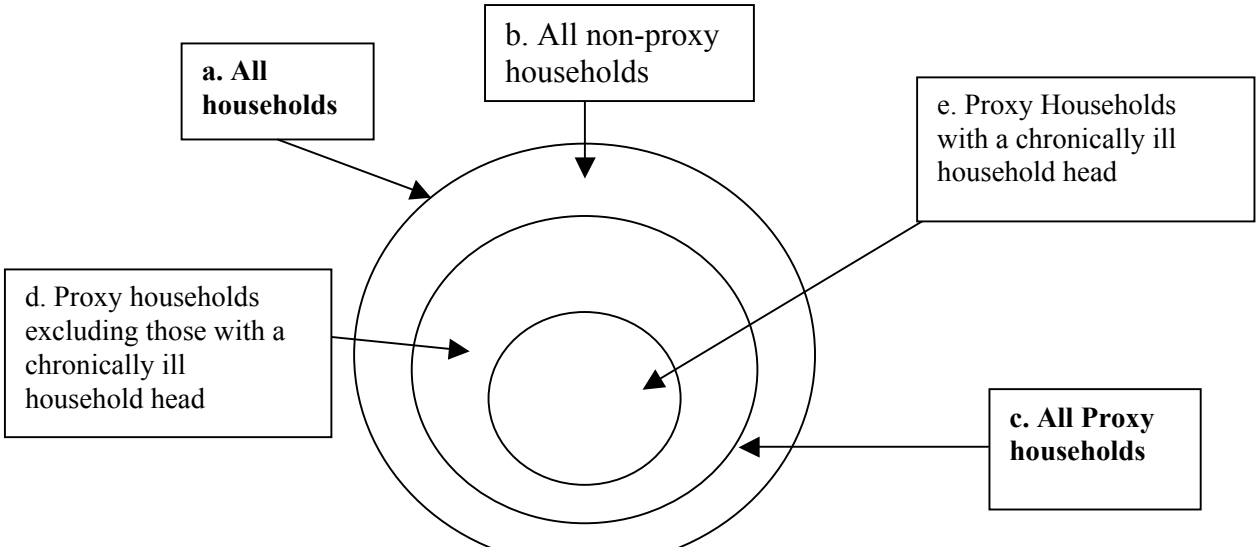
ANALYTICAL METHOD

Proxy variables

In this chapter, **two** key proxy variables for HIV/AIDS are used. The **first** is a composite variable consisting of several dimensions of impact. It is comprised of all the indicators listed in chapter 2 under the "mortality", "morbidity" and "social" headings and also the "absence of adults" indicator under the "demographic" heading. This variable was chosen to explore whether there were any consistent differences between households affected in some way by HIV/AIDS and households where there was no HIV/AIDS impact.

Second is a variable which measures the incidence of chronic illness of heads of households in the sample. This is defined as heads of households aged between 15 and 49 years of age who have either been continuously ill for more than 3 months in the 12 months preceding the survey or have suffered several bouts of illness in the 12 months preceding the survey. This variable was chosen for two reasons: first, it is relatively common in Swaziland to come across a household head that is or has been chronically ill in the recent past: at national level, the proportion of household heads ill according to this measure was found to be 20.8% in this study. Second, recent work conducted elsewhere in the Southern African region has strongly suggested that chronic illness in heads of households has a larger impact on household food security than other variables such as chronic illness of adults in general (i.e. irrespective of position in the household) and presence or absence of orphans (SADC VAC: 2003). The following diagram illustrates the relationship between the proxies and "non-proxy" households.

Figure 21: Proxy and non-proxy households



Food security variables

Sources of food, sources of income and crop production were used to measure impact of HIV/AIDS proxies on household food security. Households were asked to rank sources of food and income over the year preceding the survey in order of importance. They were also asked to indicate whether area planted / quantity of seed / planting material and yield of cereals, cash crops and tubers had increased, decreased or stayed the same as previous years in the 2002/3 cropping season.

Wealth groups

These were derived from responses given to field enumerators at the start of each interview. A simplified form of the wealth criteria used by the Swazi VAC in the recent third round VAC assessments was used to judge whether households fell into better-off, middle, poor and poorest wealth categories (see page 1 of annex 1).

Approach

The basic approach was to compare associations between each of the proxy variables and measures of food security at national, AEZ and FE / L Zones and by wealth group at national level. This was done in three ways:

- By comparing "proxy" households in total ("all proxies" both 1 and 2) against non-proxy households or unaffected households (area c against area b in figure 21)
- By comparing households with a chronically ill household head "CIHHH" against non proxy households or unaffected households (area e against b in figure 21)
- By comparing "all proxies" against "CIHHH" (areas c and e in figure 21)

Data outputs were scanned to detect percentage differences between variables of above 5% where the number of observations was greater than 30. For example, if both 30% of households with chronically ill heads of household and 34% of non proxy households stated that the yield of cereals had increased last year in comparison to the previous year, then this was not defined as a difference. If the respective figures were 30% and 40%, however, then this was taken to be a difference. Similarly, if the total number of observations for either of these percentages was below 30, then any differences, no matter how large, were ignored for the purposes of analysis.

This decision rule was adopted to increase the chances of detecting statistically significant differences. It has not been possible to conduct statistical analysis for the purposes of this chapter, however, by weeding out obviously insignificant differences the subsequent testing process can be focussed on "best bets".

Caveats with the data

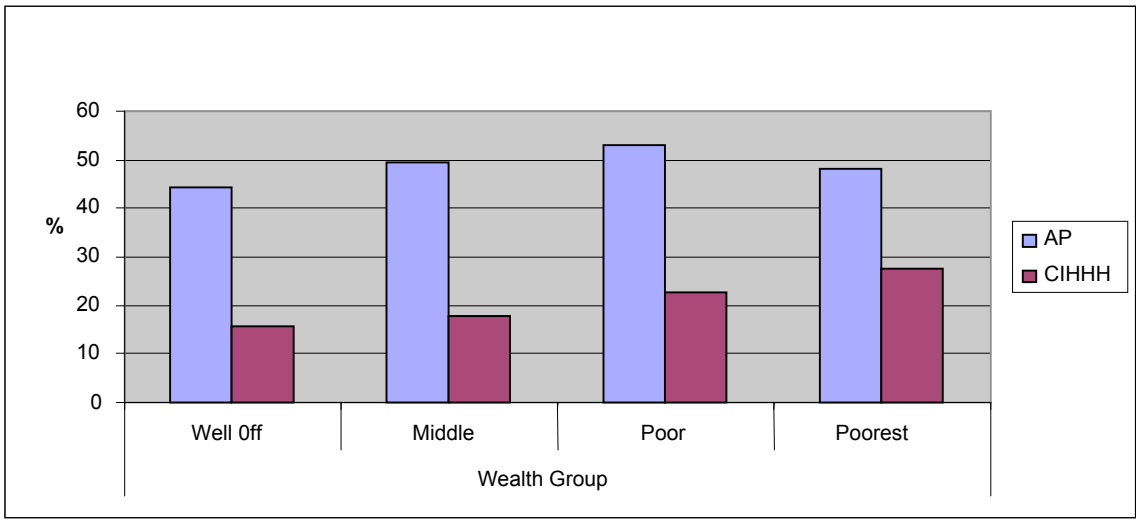
Both proxy variables have inclusion errors i.e. they will include non-HIV/AIDS related influences. Short of actual HIV/AIDS testing, some level of inclusion error is inevitable. Given the high rates of HIV/AIDS in rural Swaziland, however, the proxies can plausibly be trusted to give at least a general picture of HIV/AIDS impact with respect to food security. In addition to the proxy variables, the food security variables used in the analysis also have shortcomings. One issue is to do with scope: the range of variables used in the survey is not extensive enough to give a full picture of food security impact. For example, there are no outcome variables such as size of harvest or quantities of food purchased relative to household size. The second issue is to do with the data collection process. Enumerators encountered problems with the ranking data required for income and food source questions. Instead of getting a ranked set of answers, only the most important answers were recorded. Thus a considerable amount of information was missed. Nevertheless, the data that has been captured does serve to give a picture of some important food security variables.

RESULTS

Incidence of key variables

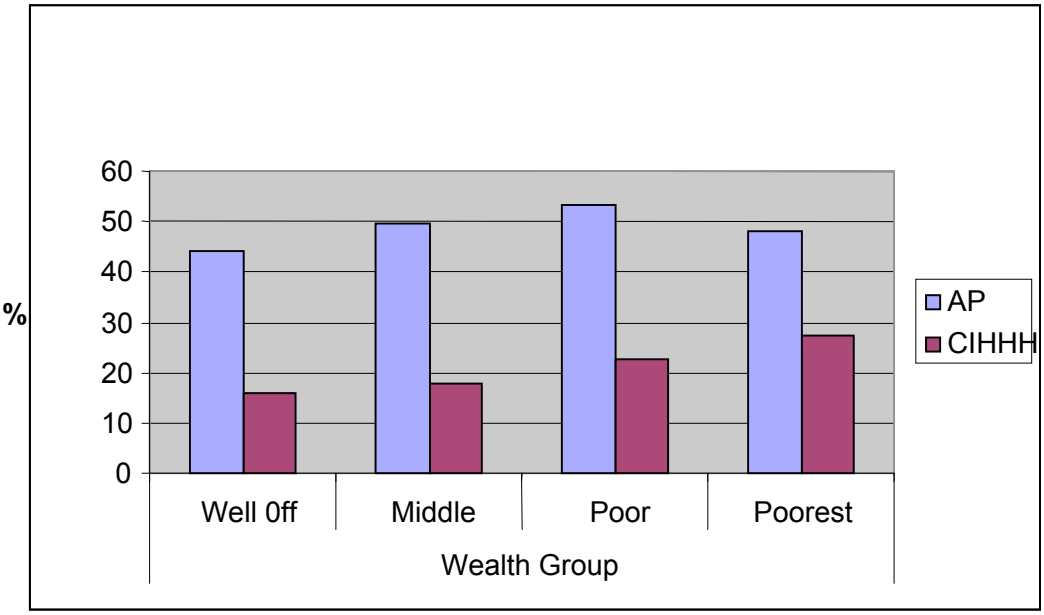
The total number of the "all proxy" and "chronically ill head of household" variables at national, regional, AEZ, and FEZ levels, and the incidence of the wealth group variable at national and AEZ level are shown in the following figures.

Figure 22: Proxy variables at national level



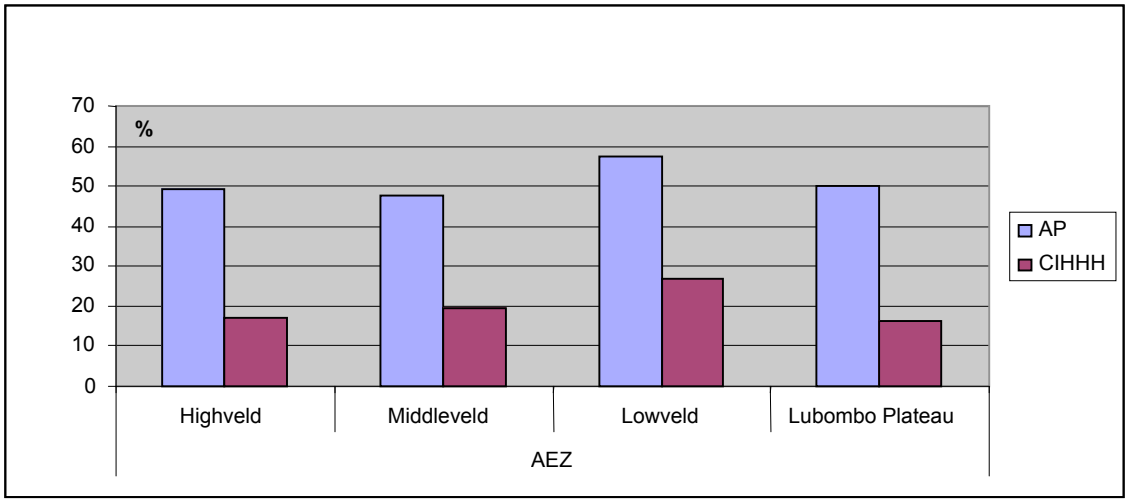
Key: AP = All-Proxy households
CIHHH = Chronically Ill Head of Households

Figure 23: Incidence of proxies by wealth group at national level



The all proxy households (AP) variable is spread fairly evenly across all wealth groups, illustrating the fact that HIV/AIDS touches all parts of rural Swazi society. In contrast, the chronically ill head of household variable occurs disproportionately amongst the poor and poorest groups, suggesting the link between HIV/AIDS and poverty.

Figure 24: Proxy variables by agro-ecological zone



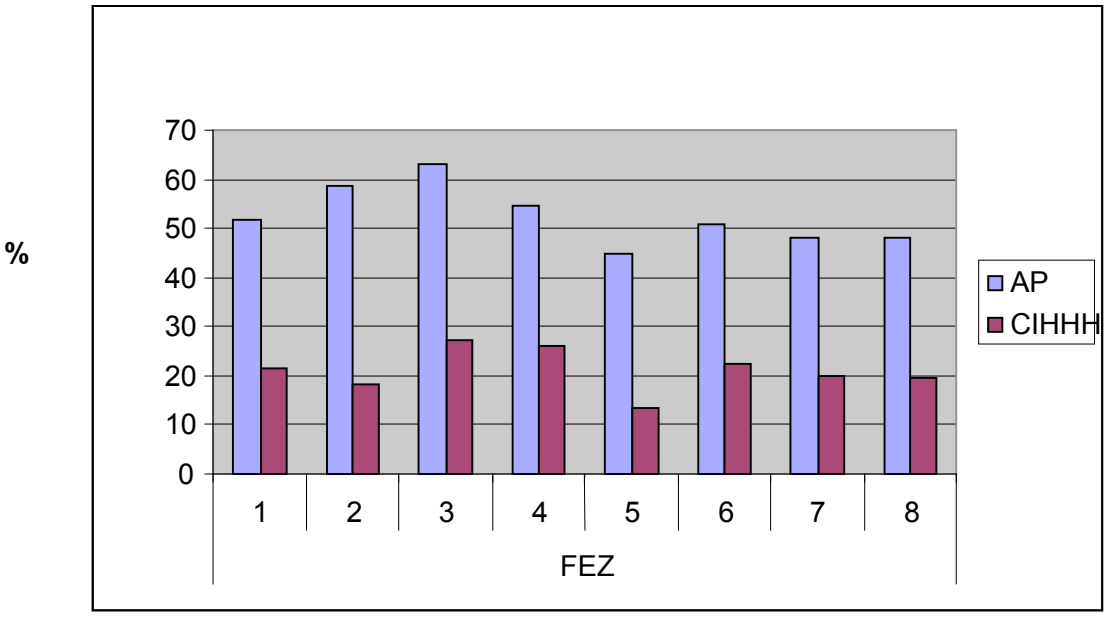
Both all proxy and chronically ill household head proxy measures occur most frequently in the Lowveld. The differences in incidence between the other three regions are small.

Table 19: Incidence of wealth group by agro-ecological zone

Region	Wealth Group			
	Well off	Middle	Poor	Poorest
Highveld	18.3 (n = 5,495)	38.8 (n = 11,634)	36.7 (n = 10,999)	6.0 (n = 1,804)
Middleveld	9.0 (n = 4,175)	32.0 (n = 14,749)	51.7 (n = 23,804)	7.0 (n = 3,220)
Lowveld	6.6 (n = 1,944)	24.1 (n = 7,065)	59.3 (n = 17,426)	9.5 (n = 2,796)
Lubombo Plateau	14.0 (n = 1,245)	16.5 (n = 1,466)	60.3 (n = 5,349)	6.8 (n = 604)
National	**11.3 (n =12,859)**	**30.7 (n =34,914)**	**50.6 (n =57,578)**	**7.4 (n =8,424)**

It is in the Highveld that wealth groups are spread most evenly. In all but the Highveld, the largest population group is the poor group. In percentage terms, the highest concentrations of poor and poorest groups are in the Lowveld and the Lubombo Plateau, whilst in terms of numbers, the highest concentrations of these wealth groups are found in the Middleveld.

Figure 25: Incidence of proxy variables by food economy / livelihood zone



Key: 1= Highveld Maize and Cattle; 2= Lomahasha Trading and Arable; 3= Lowveld Cotton and Cattle; 4= Lowveld Cotton, Cattle and Maize; 5= Lubombo Plateau; 6= Middleveld Maize and Cotton; 7= Timber Highlands; 8= Peri-Urban Corridor.

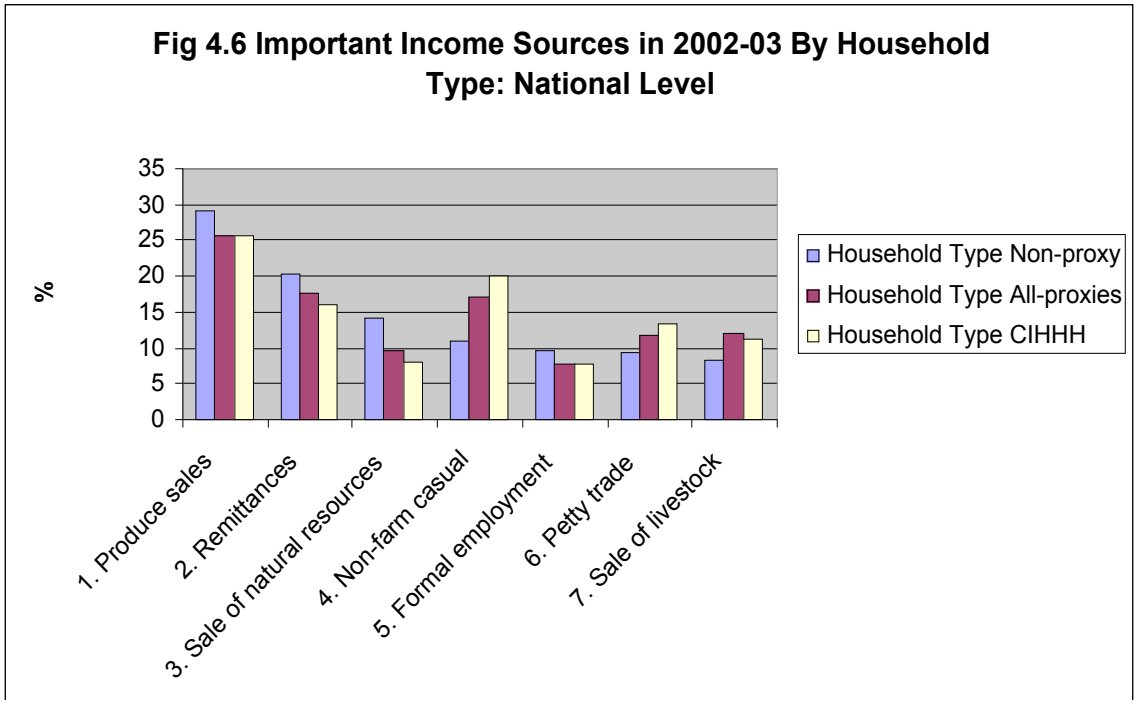
The highest percentages of both proxies occur in FE/L Zone 3 (Lowveld Cotton and Cattle), whilst the lowest are found in FEZ 5 (Lubombo Plateau).

Associations between proxy variables and food security indicators at national level

Income sources

Households were asked what their main income sources had been over the past year. Figure 26 shows how frequently households mentioned an income source as being the most important.

Figure 26: Important income sources in 2002/3 by household type at national level



At first glance, the figures are quite similar. There is however some notable variation that will be reflected later on in this chapter as the analysis proceeds to AEZ and FEZ levels. Produce sales was the most popular answer for each household type, slightly fewer 'all proxy' and 'chronically ill head of household' highlighted this than 'non-proxy' households. Likewise, remittances were less likely to be mentioned by 'all proxy' households and 'chronically ill head of household' groups compared to 'non proxy' households. Larger differences are found in the case of sale of natural resources and non-farm casual labour i.e. proxy households are more likely than non-proxy households to cite non-farm labour as the most important income source and less likely to cite the sale of natural resources. Sales of livestock are higher for the 'all proxy' and 'chronically ill head of household' groups also.

The hypothesis here is that 'all proxy' and households with a chronically ill head are relying on non-farm casual labour and to some extent livestock sales to meet the losses of income from reduced remittances, produce and natural resource sales caused by ill-health and death. In general, households with a chronically ill head show a larger divergence from 'non proxy' households than do 'all proxy' households.

Wealth group breakdowns of income sources last year throw up some interesting issues (see figures below).

Figure 27: Important income sources in 2002/3 in well off wealth group

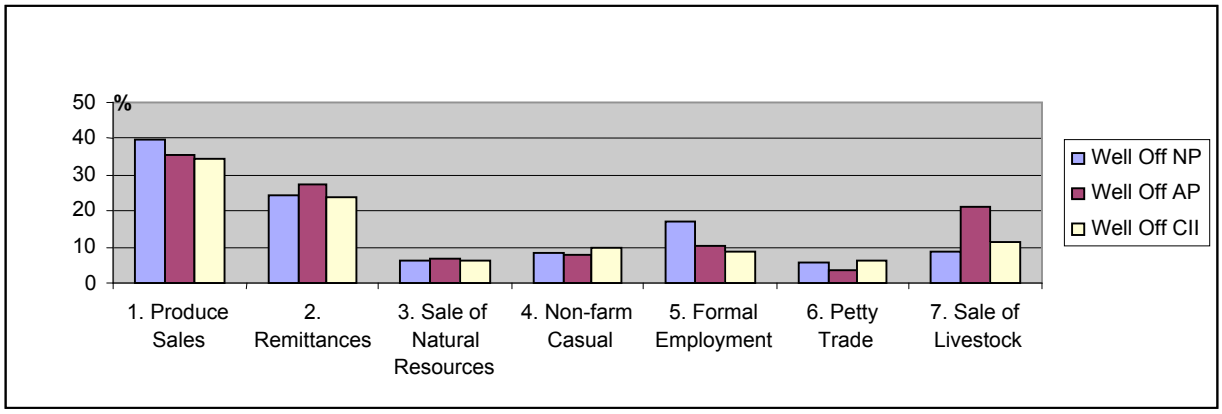


Figure 28: Important income sources in 2002/3 in middle wealth group

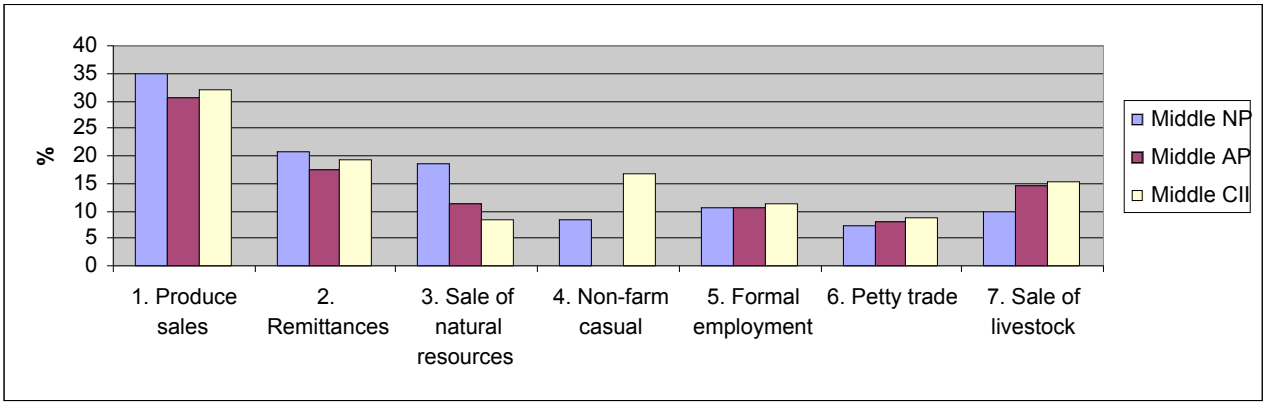


Figure 29: Important income sources in 2002/3 in poor wealth group

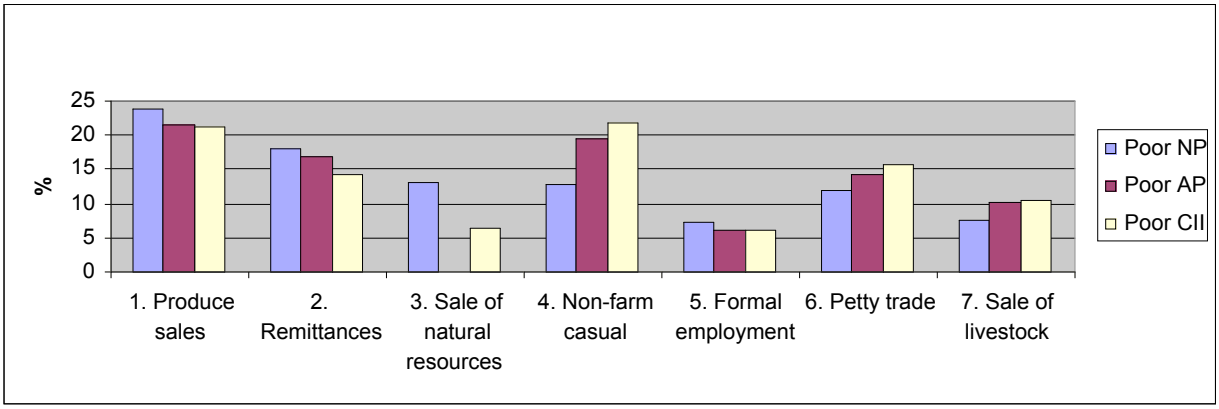
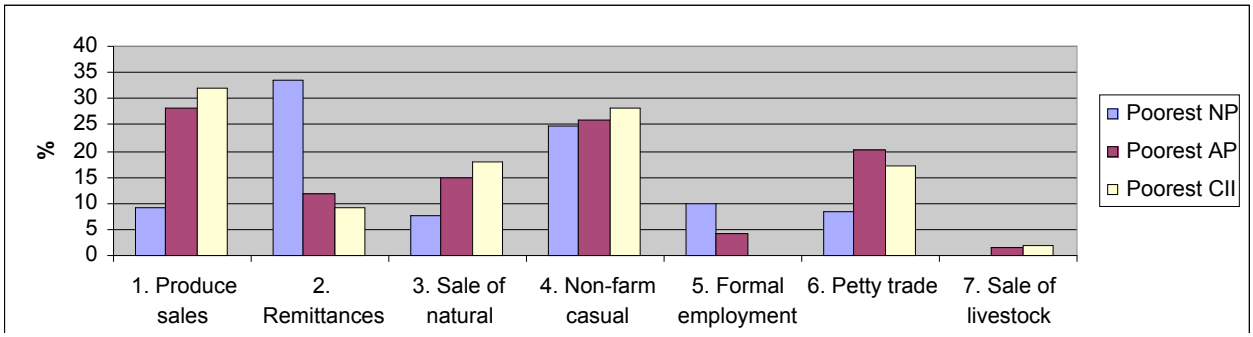


Figure 30: Important income sources in 2002/3 in poorest wealth group



➢ Well-off

There appears to be little difference between proxy and non-proxy households with the exception of formal employment and sale of livestock. One possible explanation of this is that well-off households affected by illness and death are compensating for the loss of income from formal employment (because of HIV/AIDS) through livestock sales. This can result in asset depletion.

➢ Middle

Notable divergences between proxy and non-proxy households are with respect to non-farm casual labour, sales of natural resources and sales of livestock. One hypothesis here is that livestock sales and non-farm income are being used by 'all proxy' and households with a chronically household head to make up for income losses from reduced remittances and produce sales.

➢ Poor

Non-farm casual labour is mentioned appreciably more frequently for all-proxy and households with a chronically ill head than for non-proxy households, indeed for households with a chronically ill head it is the most frequently mentioned important income source. Livestock sales are higher and sales of natural resources lower for all proxy and chronically ill head of household groups in comparison with the non-proxy group.

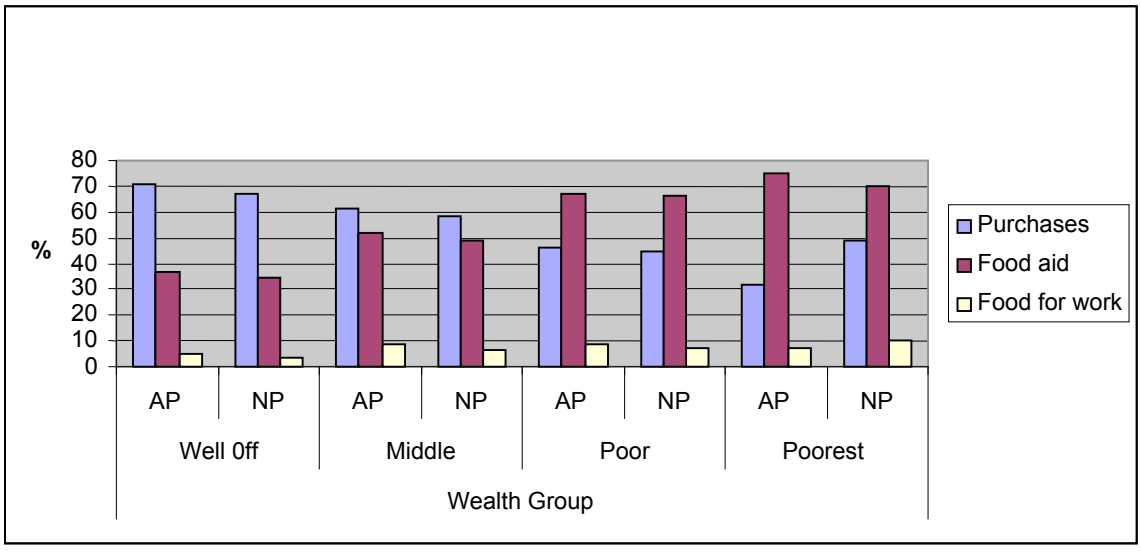
➢ Poorest

Of all the wealth groups, the differences between non proxy and other households are most marked. Compared to non-proxy households, the importance of produce sales is much greater for all proxy and chronically head of household groups and the importance of remittances much lower. Sales of natural resources are more important for these proxy than households than for non-proxy (the opposite is true for the middle and poor groups), as is petty trade.

Food sources

In contrast to income sources last year, food sources show a remarkable degree of similarity across household types (i.e. all proxy, non-proxy and chronically ill head of households). This is also true for the most part if wealth groups are considered, as the following chart shows:

Figure 31: Important food sources in 2002/3 by wealth group at national level



Key: AP = All Proxy households, NP = non-proxy households

As households get poorer, the ratio between purchases and food aid changes in favour of the latter. This is what would be expected in a year like 2002/3 when there was crop failure in the Lowveld and much of the Middleveld particularly among middle, poor and poorest income groups. As a result there were large scale food aid distributions. The differences between all proxy and non-proxy households are small, with the exception of purchases for the poorest group. Here, it appears that considerably fewer all proxy households regarded purchases as an important food source compared to non-proxy households. It should be noted that this table masks important regional differences between the Highveld and the rest of the country. These are highlighted later on in this chapter

Crop production

Responses to questions about area, seed and yields for cereal, cash and tuber crops show up a few differences between household types but these are not many and not large. The following table shows this by recording only those instances where area, input and yield data for all proxy households compared to non-proxy households differed by more than 5%. Within this sub-set, the figures in the table represent the percentage of respondents in each wealth group saying that area, inputs or yield had **decreased** in comparison to previous years (hence the minus signs).[15]

Table 20: Crop production in 2002/3 compared to 2001/2 at national level by wealth group, all proxy HHs vs. non-proxy HHs

Production variable	Wealth Group							
	Well 0ff		Middle		Poor		Poorest	
Area	AP	NP	AP	NP	AP	NP	AP	NP
➢ Cereal	-	-	-	-	-25.3	-19.1	-	-
➢ Cash	-	-	-	-	-28.1	-19.8	-	-
➢ Tubers	-	-	-	-	-	-	-	-
Inputs								
➢ Cereal	-	-	-	-	-	-	-	-
➢ Cash	-	-	-18.3	-11.8	-	-	-	-
➢ Tubers	-	-	-26.5	-34.6	-	-	-	-
Yield								
➢ Cereal	-	-	-	-				
➢ Cash	-70.2	-63.4	-	-	-75.8	-62.3	-55.2	-77.1
➢ Tubers			-	-	-73.0	-65.1	-68.4	-51.7

In a minority of cases where there were differences between all proxy and non-proxy households, in most cases more all proxy households than no proxy households stated that a negative change had occurred. For example, whereas 70.2% of well-off all proxy households said that yields of cash crops had fallen, the corresponding figure for non proxy households was 63.4%. In general, however, it is difficult to infer anything conclusive from the crop production data because differences between all proxy and non proxy households are too small and too few.

Proxy variables and food security indicators at AEZ and FEZ levels

This section takes a look at the associations between the HIV/AIDS proxy variables and income, food and crop production at AEZ and FE/L Zone levels. As noted earlier, there are

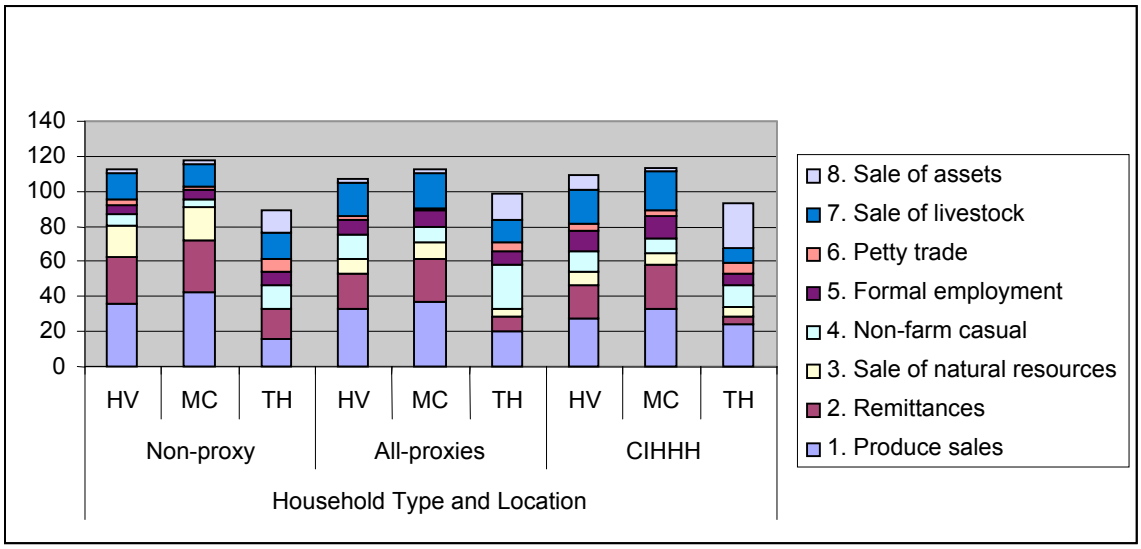
[15] Note: Some households in all groups said that area, inputs and yields had either increased or stayed the same in comparison to the previous year. These data are not reported in the table.

four AEZs in the country and the FE/L Zones are, with one exception, subdivisions of these AEZs.

Highveld

In the Highveld there are two FEZs: the Highveld Maize and Cattle and the Highveld Timber. Figure 32 shows the differences and similarities in **income sources** between these, with respect to all proxy households and non proxy households.

Figure 32: Important income sources in 2002/3 in Highveld*



Key: HV = Highveld; MC = Highveld Maize and Cattle; TH = Timber Highlands

*Note: This chart shows the percentage of households who stated that a particular income source was the most important source. Total percentages are over 100% in those cases where a household stated more than one "most important source" and are under 100% in those cases where there is missing data. i.e. where some households did not respond and/or the data was not recorded.

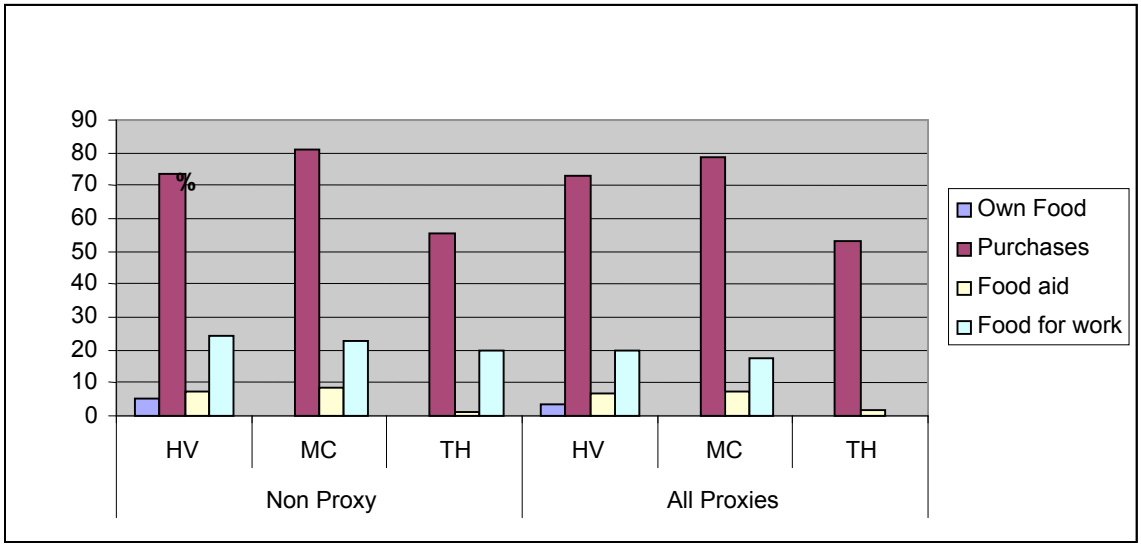
Quite significant differences according to FE/L Zone are apparent, as is the case if the FE/L Zone is compared to the broader AEZ. Indeed, the differences between the same household type in different geographical areas is often greater than the gap between different household types in the same geographical area. For example there is greater difference in produce sales between non proxy households in the Middleveld Maize and Cattle FE/L Zone versus Timber Highlands FE/L Zone than there is for non-proxy households versus households with a chronically ill head within the Middleveld Maize and Cotton FE/L Zone. This fact underlines the importance of a FE/L Zone level analysis wherever possible.

Overall, chronically ill head of household groups differ in livelihood more from non proxy groups than do all proxy groups together. This illustrates the point that the choice of proxy variable for analysis of the impact of HIV/AIDS on food security is important. In the Highveld as a whole, the largest differences in percentages are in relation to remittances and sales of natural resources where HIV/AIDS proxy households (both groups) have lower readings than non-proxy households. The 'gaps' between these households (i.e. non-proxy households and the rest) are of the order of 6 – 10%. Proxy households are more likely to list non-farm casual employment than non-proxy households. These same points apply broadly within both FE/L Zones. There is no consistent pattern with respect to livestock sales.

Turning to **food sources**, the following figure reflects the finding at national level. There is a high degree of similarity between household types with respect to food sources last year. Within a particular FE/L Zone there are no real differences between proxy and non-proxy

households. There are, however, some major differences between FE/L Zones in terms of purchases. Households in the Timber highland relied much less on purchases and were much more dependent on gifts (not shown in the chart).

Figure 33: Important food sources 2002/3 in Highveld



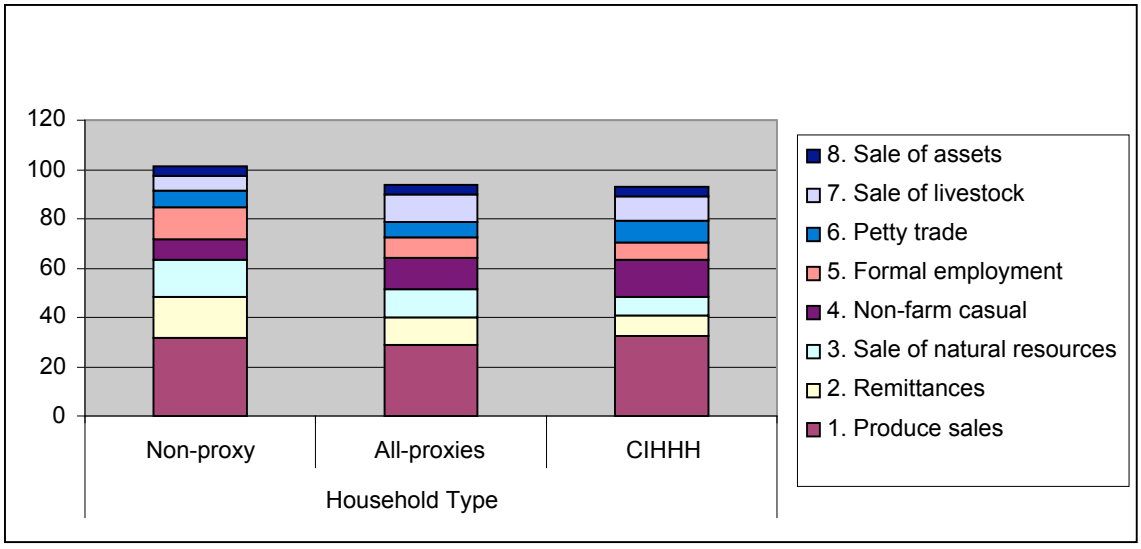
Key: HV = Highveld; MC = Highveld Maize and Cattle; TH = Timber Highlands

In relation to **crop production**, as is the case at the national level, there are not many obvious differences between proxy and non-proxy households. The only discernable pattern is that all proxy households were less likely than non-proxy households to say that they had less area under cultivation, planting material and yield of tubers in comparison to previous years. This may imply that all proxy households are placing more attention on lower labour requirement root crops.

Middleveld

One Food Economy / Livelihood Zone covers the Middleveld called the Middleveld Maize and Cattle zone. For this reason, both the AEZ and the FEZ can be treated as one unit for the purposes of analysis. Similar to the Highveld, the main **income source** differences between HIV/AIDS proxy households and non-proxies household are that (a) remittances and sales of natural resources are mentioned less frequently by the proxy households and (b) non-farm casual labour is mentioned more frequently as the main source of income. Livestock sales are also mentioned more frequently.

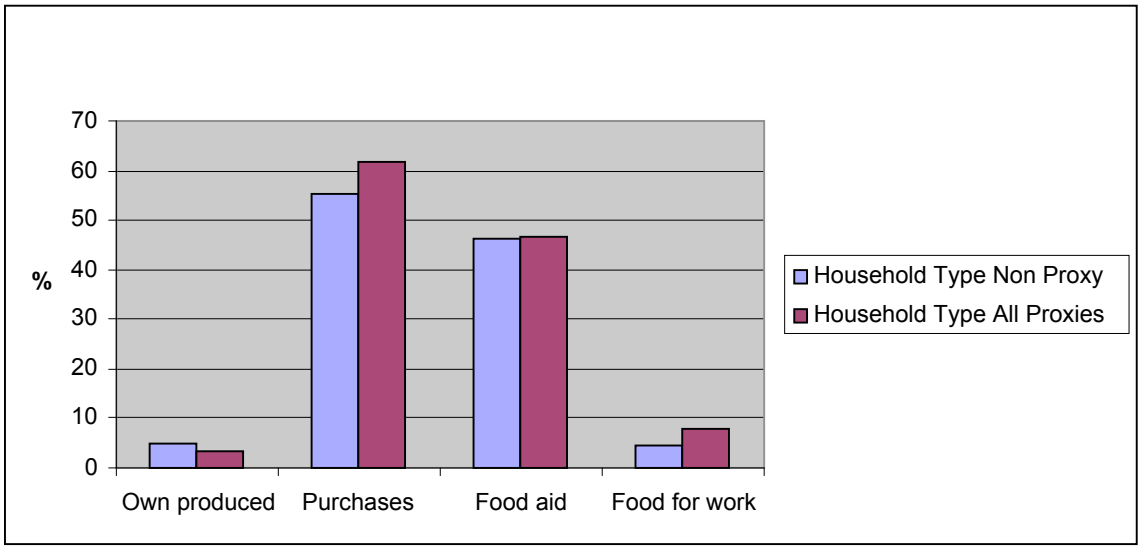
Figure 34: Important income sources in 2002/3 in Middleveld



Key: CIHHH = chronically ill household head

Similar to the Highveld and at national level, there were no significant differences between household types in terms of **food sources**, as shown in figure 35. In relation to crop production, it has not been possible to draw any inferences from the available data.

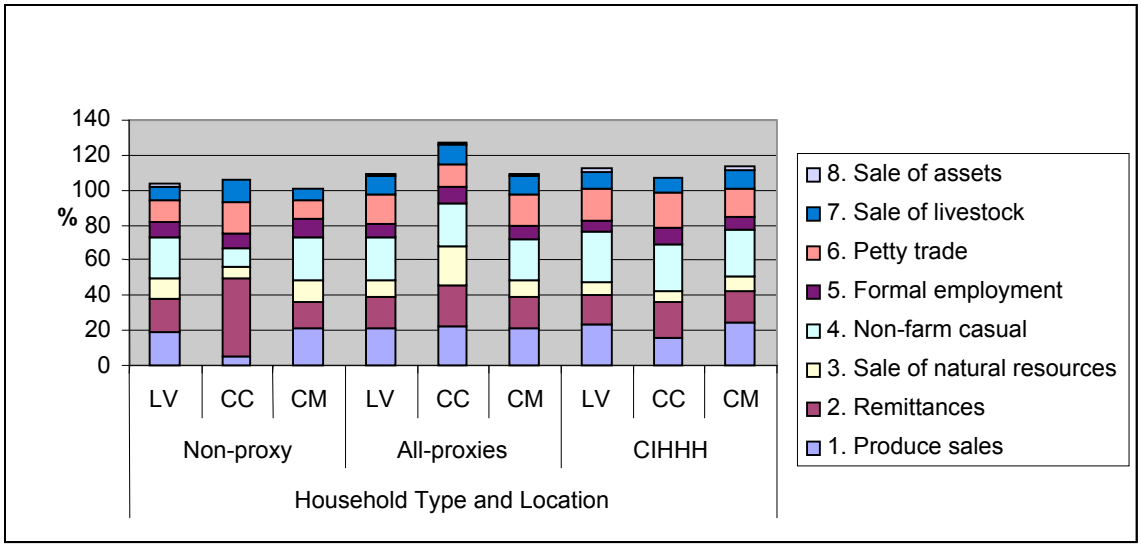
Figure 35: Important food sources 2002/3 in Middleveld



Lowveld

Within the Lowveld, there are two Food Economy / Livelihood Zones: the Lowveld Cattle and Cotton and the Lowveld Cattle, Cotton and Maize (see figure 1). However, taking the Lowveld as a whole, there are very few disparities between the different household types in terms of important income sources last year. In the Cattle, Cotton and Maize FEZ, the variations between household types are also small, and drawing firm inferences is difficult. In the Cattle and Cotton FEZ on the other hand, there are major differences with respect to remittances – non-proxy households were over twice as likely to mention this as an important income source compared to both households with a chronically head and all proxy households. In addition .the figures for produce sales and for non-farm casual employment are much lower for NP households.

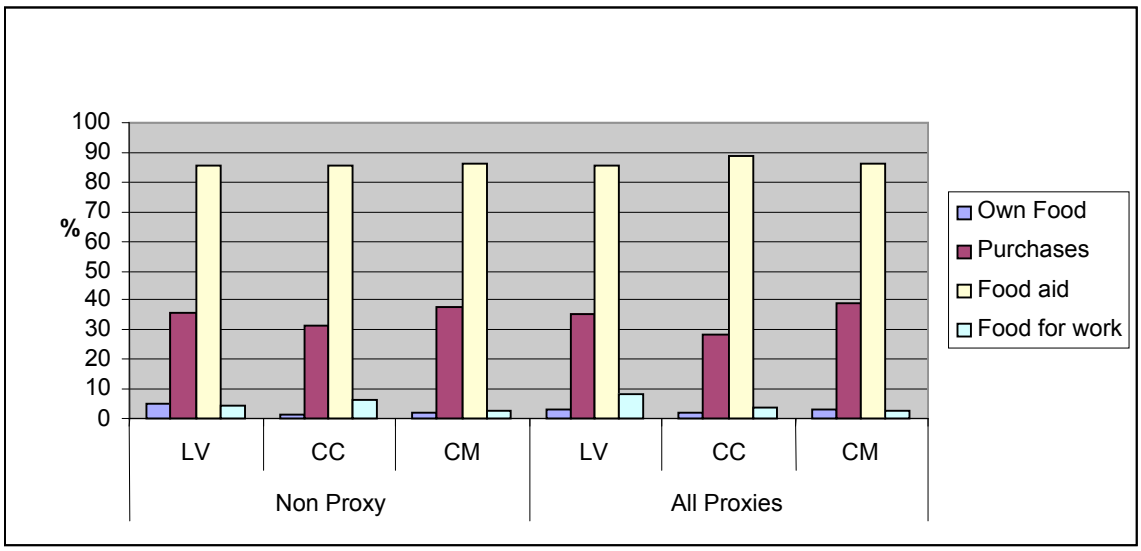
Figure 36: Important income sources in 2002/3 in Lowveld



Key: LV = Lowveld AEZ; CC = Lowveld Cotton and Cattle FE/L Zone; CM = Lowveld Cattle, Cotton and Maize FE/L Zone

As for all other AEZs and FE/L Zones the differences between non-proxy and all proxy households in terms of important sources of food last year are small. In addition, differences between FE/L Zones are slight also.

Figure 37: Important food sources in 2002/3 in Lowveld



In common with other parts of the country, the crop production data does not give any indication of significantly different behaviour as between proxy and non-proxy households.

Lubombo Plateau

Unfortunately, the number of observations in the Lubombo Plateau FE/L Zone was too small to make inferences about income sources, as the table below shows. Focusing on the Lubombo Plateau **AEZ**, there are some differences between household types. In both the Lubombo Plateau AEZ and the Lomahasha Trading FE/L Zone, in comparison to non proxy households, 10–15% more all proxy and households with a chronically head said that remittances were an important income source. This is in contrast to all other AEZs and FE/L Zones. All proxy households and households with a chronically ill head in the Lomahasha

Trading FE/L Zone were much less likely than non-proxy households to say that petty trade was an important income source.

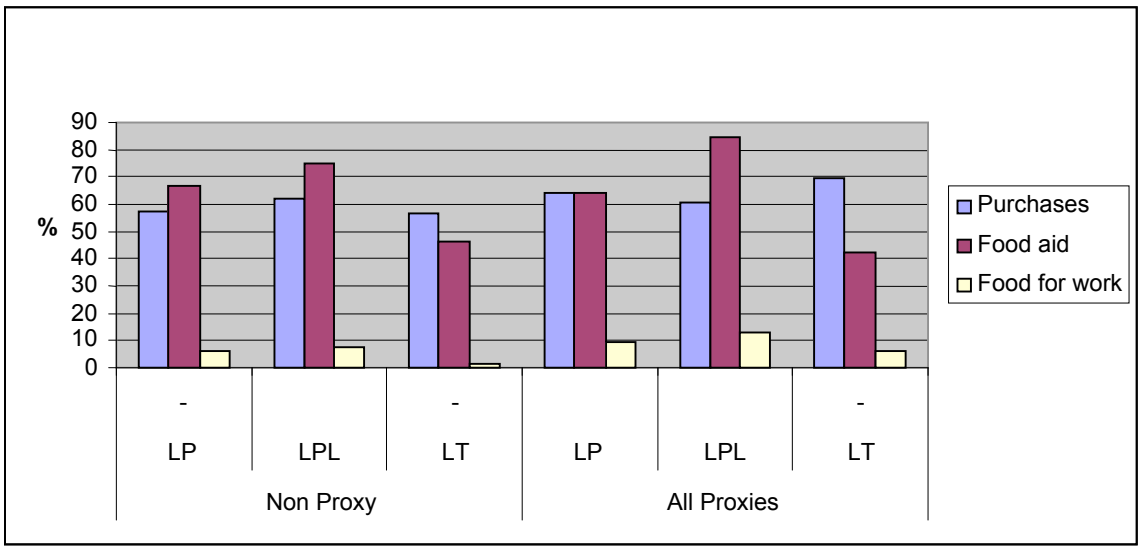
Table 21: Important income sources in the Lubombo Plateau 2002/3

Income source	Household Type and Location								
	Non-proxy			All-proxies			CIHHH		
	LP	LPL	LT	LP	LPL	LT	LP	LPL	LT
1. Produce sales	20.7	N*	.13.1	17.8	N*	16.8	12.3	N*	N*
2. Remittances	20.7	N*	21.1	30.9	N*	31.5	35.7	N*	34.8
3. Sale of natural resources	11.3	N*	1.6	8.2	N*	5.5	7.2	N*	N*
4. Non-farm casual	4.6	N*	7.4	8.9	N*	8.3	10.4	N*	N*
5. Formal employment	3.4	N*	5.2	4.0	N*	3.6	2.7	N*	-
6. Petty trade	33.6	N*	51.5	31.8	N*	37.6	26.5	N*	34.6
7. Sale of livestock	2.2	N*	-	2.9	N*	2.7	4.8	N*	N*
8. Sale of assets	0.6	N*	-	0.9	N*	-	3.0	N*	-

Key: LP = Lubombo Plateau AEZ; LPL = Lubombo Plateau FE/L Zone; LT = Lomahasha Trading FE/L Zone
Note: N* indicates that the number of observations is below 30 and thus too small to make inferences from.

When looking at food sources, it appears that food aid has been more important in the Lubombo Plateau FE/L Zone than the Lomahasha Trading FE/L Zone

Figure 38: Important food sources in 2002/3 in Lubombo Plateau



In relation to **crop production**, the available data indicates that non-proxy households were more likely than all proxy households to say that area and inputs devoted to tubers had fallen, although the proportion stating that yield of tubers had fallen was roughly the same.

Peri-Urban Corridor

Income source data is interesting in that both types of proxy household were **more** likely than non-proxy households to say that remittances, petty trade and sales of produce were most important (see Table 22). As has been described earlier, in other FE/L Zones, remittances and produce sales are usually **less** frequently cited as being important by proxy households.

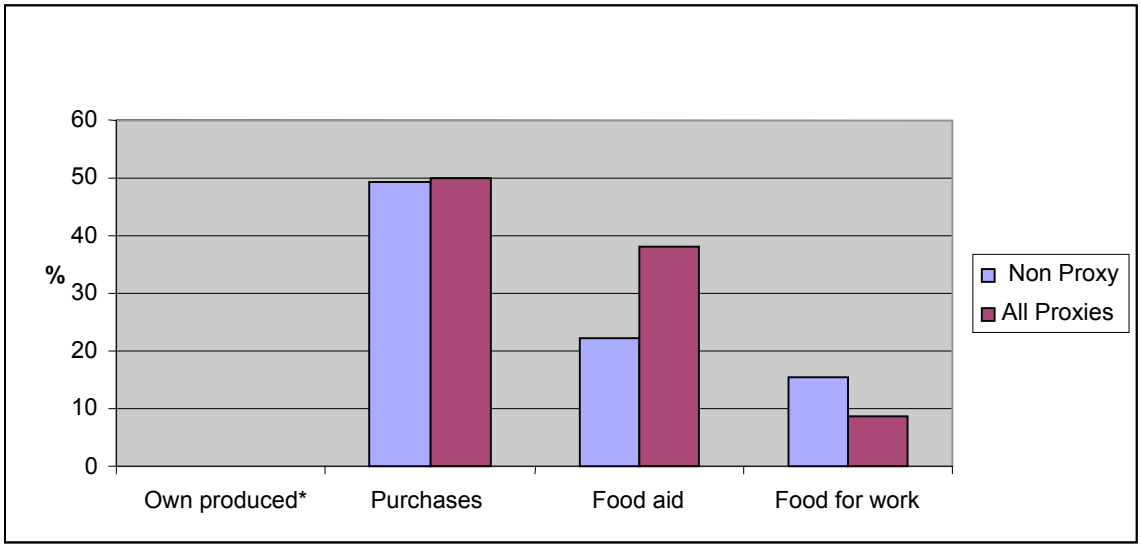
Table 22: Important income sources in 2002/3 in the Peri-Urban Corridor

Income source	Household Type [16]		
	Non-proxy	All-proxies	CIHHH
1. Produce sales	19.5	24.1	38.8
2. Remittances	12.3	23.6	16.4
3. Sale of natural resources	-	-	-
4. Non-farm casual	11.3	2.4	N*
5. Formal employment	11.0	5.6	N*
6. Petty trade	16.3	30.3	35.0
7. Sale of livestock	6.1	6.2	N*
8. Sale of assets	18.4	11.7	N*

Key: CIHHH = Chronically ill head of household

Regarding **food sources**, it appears that proxy households were more likely to have benefited from food aid than non-proxy households. Non-proxy households were more likely than all proxy households to have cited food for work as an important food source.

Figure 39: Important food sources in 2002/3 in Peri-Urban Corridor



*** Note**: This does not mean that there was no 'own' production, but rather that respondents thought it was not an important food source in 2002/3.

Turning to crop production, the data that is available indicates that non-proxy households were less likely to have cited reductions in area cultivated, inputs or yield of cash and cereal crops and were more likely to have cited increases in yield of cereal crops and tubers.

CONCLUSIONS

This chapter has used simple qualitative analysis to search for relationships between HIV/AIDS proxy variables and important aspects of household food security. The analysis is a tentative first step on what could be a much more detailed and extensive process. Owing to the simplicity of the analysis and the small number of proxy variables used (because of time/funding limitations) it is only possible to draw some tentative conclusions at this stage. The key points are as follows:

[16] figures represent number of households stating that a particular income source was important

Uniformity vs. Heterogeneity

Whilst the prevalence of HIV/AIDS infection across the country is reported to be fairly uniform, the incidence of key indicators associated with infection is not. The initial analysis conducted in this chapter shows that incidence of chronic illness in heads of household varies across the country and across wealth groups. It is likely that different indicators of HIV/AIDS impact will show different patterns with respect to geography and socio-economic status. It is important to analyse and document this.

Proxy variables and income sources

Certain common patterns emerge across wealth groups and geographical areas. In general terms, income from agricultural produce, remittances and sale of natural resources was less important to proxy households than to non-proxy households. The converse is true for non-farm casual income and livestock sales. These findings imply that there is a qualitative shift going on whereby households affected by HIV/AIDS are changing their income sources to compensate for losses of income from crop sales and remittances. The next steps in analytical terms would be (i) to conduct statistical testing on the estimates to see if there are any statistically significant differences and (ii) look at a greater range of proxy variables. More details on this are contained in a draft proposal[17]. As a caveat, it should be noted that with the current data set it is only possible to detect changes in the relative importance of different income sources not their actual monetary value. The same point applies to food sources and crop production.

Proxy variables and food sources

In contrast to income sources, proxy status appears to have no bearing on most important food sources. Intuitively, this finding is challenging as one would have expected there to be differences. It might be argued that the drought "evened-out" any differences in food sources, however, this does not explain the results for the Highveld which escaped the worst of the weather in the past 2 years. Further exploration with a wider range of variables is recommended.

Proxy variables and crop production

It was difficult to detect any strong consistency in relationships between proxy and non-proxy households in relation to areas cultivated, input used or yields achieved One tentative conclusion is that proxy households were in general more "protective" of tubers than non-proxy households and less concerned (or able) to preserve or increase cash crop and cereal production. This suggestion is in line with the widely observed phenomenon of HIV/AIDS households focussing on low labour input tuber crops at the expense of more labour intensive crops. Again, it is important to conduct some more rigorous testing and to use a broader range of proxy variables to explore this issue further.

Recommendations for further analysis

Given the large volume of data generated by this survey and the difficulty of analysing it fully at the current time, it is recommended that a proposal be written to analyse more proxy variables with greater rigour than has been possible here. The proposal could be submitted to relevant UN agencies (and other interested donors) for funding.

[17] Please contact Swazi VAC for more details: swazivac@realnet.co.sz (+268 4044209)

CHAPTER 5: STUDY CONCLUSIONS

Purpose of the Study

As indicated throughout this report, the purpose of the study is to attempt to fill some of the existing information gap and try to determine the impact of HIV/AIDS on the demographic structure and livelihood patterns in rural Swaziland. In particular the study aimed to achieve the following:

- To provide information on the links between HIV/AIDS, current demographic status and livelihoods in rural Swaziland to enable better informed decision making for policies, programmes and interventions
- To ascertain the quantitative impact of HIV/AIDS on the rural population of Swaziland, in particular on the age and sex composition
- To establish relationships between HIV/AIDS and livelihoods in rural Swaziland
- To analyse and learn from the process of the study

Lessons from methodological approach

- The concept note and early drafts of the questionnaire were circulated amongst relevant expertise, including the Regional VAC, to ensure sharing of regional experience and expertise in the early stages of the study.
- The inclusion of government officials ensured buy-in and support from national structures. Increased rates of participation during the survey were likely because of government implementation and understanding that household information would be strictly confidential.
- The size of the study and interest from stakeholders as a result of the collaborative nature of the study meant that the study results have credibility within Government, UN and NGOs.
- Training of interviewers/enumerators could have been improved by more support from a trainer(s) with wider sectoral backgrounds that could explain a livelihood based approach. Some difficulties were experienced explaining wealth ranking and other household economy / livelihood terminologies and approaches.
- While the quality and validity of the data collected during the Swazi VAC survey meets the necessary high standard, some difficulties were experienced by a limited number of enumerators. For instance:
    - Some of the enumerators had difficulty differentiating between wealth groups particularly because the criteria were not made clear enough in the training. The main criteria for ascertaining wealth status used in six Food Economy / Livelihood Zones (all except Timber Highlands and Lomahasha Trading and Arable) were the area of land cultivated and quantity and type of livestock owned by the household. In the other two Food Economy / Livelihood Zones, a more sophisticated approach including consideration of employment levels was used to differentiate between wealth groups.
    - Defining chronic illness is always difficult and some enumerators agreed. A small minority of enumerators used slightly different definitions. Some defined it as bedridden for 3 months, others defined it as sick for 3 months but still mobile, a small minority included chronic illness that clearly came from other forms of ailment etc.

- Some enumerators confused the timeframe for death to have occurred within the family. A few enumerators recorded deaths in the household in the last few years when it should only have been the last year.

- The absence of any full-time staff working for the VAC in Swaziland proved to be an obstacle to finalise tasks. Members of the VAC Secretariat have permanent posts within their respective agencies or government ministries, with resultant delays in report production. Data analysis and report writing was inhibited by the part-time nature of all the participants in the study within the Swazi VAC and regional technical support from UNAIDS and RVAC.

HIV/AIDS and the current demographic structure of Swaziland

This 2003 HIV/AIDS, demographic and livelihoods VAC survey in rural Swaziland, confirmed that rates of natural increase have lessened in rural areas down to approximately 2.0% growth per annum. This reduction was mostly as a result of the long term trend of declining fertility rates in Swaziland. However, the death rate among the rural population also played a hand and was found to be high and increasing, particularly among age groups between 20 and 50 years. In addition, a fair proportion of these young and normally unexpected deaths occurred after a bout of chronic illness, some indication that AIDS related complications play a determining role in the increasing death rate. These results should be seen against a backdrop of rising HIV prevalence rates as measured at selected antenatal clinics in the country.

The survey confirmed the presence of relatively high rates of chronic illness among the rural population, even in age groups where one would normally not expect this to occur. The statistics show that women are bearing the brunt of the disease with higher levels of morbidity and mortality at younger ages than men.

The 2003 VAC survey in Swaziland found high rates of orphanhood among children below the age of 15 years. At present, 5.9% of children (totalling 19,206) aged 0-14 years are maternal orphans and 2.3% of children (totalling 7,400) less than 15 years have lost both their parents. Given the predicted course of the epidemic, characterised by deaths among young adults, the proportion of orphaned children is set to rise in the coming years. This will have numerous social and economic implications, both on care-giving households, as well as the country as a whole. Access to education for these orphans is one determinant of whether they will be in a position to actively contribute to Swaziland society and economy as they grow older. It is important to monitor how many of these orphans are indeed regularly accessing education and build on current initiatives (by NERCHA, Ministry of Education, UN and NGOs etc.) of education provision for these often vulnerable children.

One of the pre-survey expectations was that this study would show higher dependency ratios at the national and sub-national levels as a result of increasing mortality among adults. However, the results of the survey indicate that changes in the age structure, as a result of declining fertility, more than compensated for deaths among those in the most productive age groups. When taking into account household members who reported bouts of chronic illness, and thus are not likely to be productive (income earners/home makers etc.) in the usual sense, the Swaziland VAC survey found that the "effective dependency ratio" in rural Swaziland was between 20% and 35% higher than the conventional age dependency ratio. The effective dependency ratio will, of course, vary by area and household. Therefore individual households who lost productive members, or who took in orphans from households that have dissolved, or who have ill members, may be faced by a "dependency" crisis: children, sick members and elderly persons depending on fewer or no productive adults that may bring income into the household. However, targeting such households for support based solely on this indicator is not advised. A more in-depth socio-economic analysis will determine the true

vulnerability of each household to factors such as losing access to education or food insecurity.

The population projection undertaken to benchmark the findings of the VAC survey, resulted in magnitudes largely consistent with the survey results, as well as with the findings of other projections carried out in Swaziland[18]. The VAC survey highlights a strong need for a demographic and health survey in Swaziland. Besides generating accurate fertility and infant mortality data, such a survey should investigate other reproductive health matters, not the least is the current use of barrier methods. This will indicate how successful current information, education and communication (IEC) campaigns are in convincing the population of Swaziland to change behaviour patterns in order to stop the epidemic from spreading any further.

Another aspect to note is the need for accurate population-based HIV prevalence data. Recently, population-based surveys conducted in Zambia, Kenya and South Africa found that surveillance data may overestimate the HIV prevalence rate in the population (ORCMacro, 2003; Shisana, et al 2003). Being able to work with more reliable prevalence data will give more credibility to the outputs of models predicting the course of the epidemic as well as population projections.

The relationships between HIV/AIDS and livelihoods in rural Swaziland

Simple qualitative analysis was used to search for relationships between HIV/AIDS proxy variables and important aspects of household food security. The analysis is a tentative first step on what could be a much more detailed and extensive process. Owing to the simplicity of the analysis and the small number of proxy variables used (because of time/funding limitations – although many more could be analysed) it is only possible to draw some tentative conclusions at this stage. The key conclusions are as follows:

Uniformity vs. Heterogeneity

Whilst the prevalence of HIV/AIDS infection across the country is reported to be fairly uniform, the incidence of key indicators associated with infection is not. The initial analysis conducted in chapter 4 shows that incidence of chronic illness in heads of household varies across the country and across wealth groups. It is likely that different indicators of HIV/AIDS impact will show different patterns with respect to geography and socio-economic status. It is important to analyse and document this.

Proxy variables and income sources

Certain common patterns emerge across wealth groups and geographical areas. In general terms, income from agricultural produce, remittances and sale of natural resources was less important to proxy households than to non-proxy households. The converse is true for non-farm casual income and livestock sales. These findings imply that there is a qualitative shift going on whereby households affected by HIV/AIDS are changing their income sources to compensate for losses of income from crop sales and remittances.

Proxy variables and food sources

In contrast to income sources, proxy status appears to have no bearing on what are considered to be the most important food sources. Intuitively, this finding is challenging as one would have expected there to be differences. It might be argued that the drought "evened-out" any differences in food sources, however, this does not explain the results for the Highveld which escaped the worst of the weather in the past 2 years. Further exploration of the data set with a wider range of variables is recommended.

[18] It is understood that such a survey may be carried out in June 2004 however details are not known.

Recommendations

The implications of the findings contained in this report for current and future policies and emergency and development programmes are considerable. The study clearly demonstrates that HIV/AIDS is causing a great deal of illness and death among the rural population in Swaziland. At the current time levels of illness and death are projected to rise precipitating an increase in vulnerability of homesteads, communities and the nation as a whole to shocks. The economic and social implications for communities and the national economy are enormous and every effort must be made by Government, UN and civil society to minimise these detrimental effects. Prevention of further infection and support of infected and affected households should be prioritised. Wider consultations to discuss the policy and programmatic implications of the findings of this report with stakeholders are extremely important and necessary to flesh out more meaningful consequences for policy makers and programmers. The Swazi VAC does not believe that it should provide policy recommendations in isolation. In addition, further study is required to analyse the economic and social impacts of HIV/AIDS, from community to national level, to inform policy and programming nationwide in all sectors.

Given the large volume of data generated by this survey, its relevance for policy-making and interventions within the Government, UN, and civil society (regionally as well as nationally) and the difficulty of analysing it fully at the current time, it is recommended that further analysis of the demographic and livelihoods sections be undertaken in the near future. A short consultation process is required to pull together the types analysis that may be required by the plethora of agencies interested in the findings of this study. For instance more in-depth analysis of the income and food sources in the survey will provide additional evidence of the impact of HIV/AIDS on livelihoods throughout rural Swaziland. Furthermore, disaggregation of population growth rates, morbidity and/or mortality may prove interesting to ministries, agencies and organisations. It is possible to generate large amounts of essential information on a variety of outputs by smaller geographic area, socio-economic status and age/gender because of the large sample size of the VAC survey. The present report did not exhaust the numerous potential avenues of analysis because of length considerations. Therefore, Government Ministries, NGOs and multi-national donor and aid organisations active in Swaziland and in the region may desire additional analysis from the data collected during the survey. More detailed tabulations will make it possible to conduct interventions and programmes targeted in specific areas. For example, it is possible to determine figures on the estimated number of orphans by Tinkhundla, or for instance the number of chronically ill women and/or men by Tinkhundla. The comparison of crude death rates by smaller geographic area could also show if there are indeed any regional differences in the impact of HIV/AIDS. The Swazi VAC is keen to hear from stakeholders who are interested in further analysis.

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ANNEX 1

Form AC/M/J/03

THE KINGDOM OF SWAZILAND VAC DEPENDENCY SURVEY MAY / JUNE 2003
QUESTIONNAIRE

SECTION 1: IDENTIFICATION

1. Region _____

2. Name of Area _____

3. Name of Chief / Indvuna _____

4. Enumeration Area No. ☐

5. Homestead No. ☐

6. Household No ☐

7. Inkhundla No. ☐

8. Food Economy Zone ☐

9. Name of HH Head _____

10. Status of Head ☐
1 = married 2 = widowed 3 = divorced 4 = single
5 = separated 6 = orphan younger than 19

11. Legal Status ☐
1 = SNL 2 = TDL Owner
3 = TDL Leaser 4 = TDL settler (Squatter)

12. Name of Respondent _____

13. Name of Enumerator _____

14. Date of Enumeration _____

15. Supervisor's Name _____

16. Date of Supervision _____

.

Wealth Status Criterion:	**Wealth group**
1.Area cultivated 2. Cattle Owned 3. Formal/seasonal employement	1. Well- off 2. Middle ☐ 3. Poor 4. Poorest of the poor

SECTION 2: DEMOGRAPHIC CHARACTERISTICS

Member No	*Name of member of household*	*Age in completed years*	*Gender 1. Male 2. Female*	*Relationship To Head* 1. Thead 2. Dhead 3.Spouse 4.Son/ Daughter 5.Brother/Sister 6.Nephew/ Niece 7. Grandchild 8. Parent 9. Other Relative 10. Not Related 99. Not Stated	*Status of HH member Marital Status* *For persons 12 yrs and over* 1. Widow 2. Divorce 3.Seperated 4.Mbr 5.Mcr 6.Msc 7.Cmr 8.Nmc 9Nmw 10.Ns	*Educational Level* *For persons 5 yrs and over* 1. Illiterate 2. Literate with informal schooling 3. Primary 4. Secondary 5. University 6. Post schooling training	*Does this member live permanently (all time) in this household* 1. Yes 2. No	*During the last 12 months,* **(since 30 June 2002) ,** *was (name of member) (a) continuously ill for more than 3 months?* (or (b) kept getting ill over and over 1. Yes 2. No	*For Children Less Than 15 Years Who have lost one or both parents?*			
									Is natural Mother dead? 1. Yes 2. No If no, skip to col.12	Did the mother die during the last 12 months? **(since 30 June 2002)** 1. Yes 2. No	*Is natural Father dead?* 1. Yes 2. No If no, skip to section 3	Did the fathe die during th last 12 month **(since 30 Ju 2002)** 1. Yes 2. No
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
1												
2												
3												
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Column 5. Relationship To Head: 1.Thead – True Head. **2.Dhead –** De-facto Head.
Column 6. Marital Status: 4.Mbr – Married by both civil rites and Swazi law and Custom. **5.Mcr –** Married by civil rites. **6. Msc –** married by Swazi law & custom
7. Cmr – Consensually married **8. Nmc –** Never married with children. **9. Nmw** – Never married without children. 10. **Ns –** Not stated**.**

SECTION 3: DEATH

Serial No.	*Death*			
	During the last 12 months,(since 30 June 2002) , Has any member of HH Died? 1. Yes 2. No **If no, skip to Section 4**	**Gender** 1. Male 2. Female	**Age** (In Completed Years)	Before s/he died was s/he ill for more than 3 months continuously **OR** Did s/he suffer repeated bouts of illness before dying? 1. Yes 2. No
1	**2**	**3**	**4**	**5**
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
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19				
20				

SECTION 4: FOOD AND INCOME SOURCES:

Food Sources

Please rank the normal sources of food during a normal year?
(in a good year)

1 = most important
2 = second most important
3 = third most important
4 = forth most important
and so on…

During the last year, has your household relied on different sources of food than mentioned previously

1.Yes
2.No

☐

If yes, Rank the main sources

If still producing cereal food or cash crop, has the following occurred?

Area under cultivation	Yields	Inputs (seeds)
1=Increased 2=decreased 3=no change	1=Increased 2=decreased 3=no change	1=Increased 2=decreased 3=no change
Cereal crops ☐	Cereal crops ☐	Cereal crops ☐
Cash crops ☐	Cash crops ☐	Cash crops ☐
Tubers ☐	Tubers ☐	Tubers ☐

Income Sources

Please rank the normal sources of income during a normal year?
(in a good year)

1 = most important
2 = second most important
3 = third most important
4 = forth most important
and so on…

During the last year, has your household relied o different sources of income than mentioned previously

1.Yes
2.No

☐

If yes, Rank the main sources

Serial no.	1. Own Food production	2. Purchase	3. Barter	4. Food for work (i.e piece work food)	5. Wild Foods	6.. Food Aid	7.Gifts	8. Other (specify)	1. Own Food Production	2. Purchase	3. Barter	4. Food for work (i.e piece work food)	5. Wild Foods	6. Food Aid	7. Gifts	8. Other (specify)	Cereal crops	Cash crops	Tubers	Cereal crops	Cash crops	Tubers	Cereal crops	Cash crops	Tubers	1. Formal Employment	2. Farm casual employment (agric. labour)	3. Non – farm casual empl(unskilled labouring)	4. Remittances	5. Sale of own produce (food & non – food)	6. Petty trade	7. Sale of natural resources	8. Sale of Livestock	9. Sale of assets	10. Borrowing money	1. Formal Employment	2. Farm casual empl. (Agricultural labour)	3. Non – farm casual empl(unskilled labouring)	4. Remittances	5. Sale of own produce (food & non – food)	6. Petty trade	7. Sale of natural resources	8. Sale of Livestock	9. Sale of assets
1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**										**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**
1																																											
2																																											
3																																											

ANNEX 2

FRAMEWORK FOR THE CREATION OF PROXY VARIABLES

Introduction

One of the main aims of this report is to investigate the link between HIV/AIDS, demography and livelihoods in rural areas. Since no direct HIV/AIDS questions were asked in the survey, we have to establish any such links in an indirect way. Variables are selected from the data set that mimic suspected HIV/AIDS patterns and trends in terms of illness patterns, mortality by broad age group and the presence of orphans. These variables are used to indicate which households potentially have HIV infected members and/or are affected by HIV/AIDS. Since they are not unambiguous indicators of HIV/AIDS these variables act as a proxy or substitute for definitive HIV/AIDS indicators e.g. blood tests to ascertain whether somebody is infected.

The format of this Swaziland VAC survey provided more detail on the household population in terms of age, sex and relationships etc. This makes it possible to construct more detailed indicators than was possible in the other regional VAC reports. Besides having the information available to construct specific indicators, the size of the Swaziland sample makes it possible to conduct such analysis at national level, and this opportunity should be used. However, more detailed indicators make data analysis more time consuming and complicated.

Rationale

The rationale for developing this framework includes:

a) To ensure that the construction of each variable is unambiguous
b) To ensure that all team members work with exactly the same variables
c) To provide documentation in a systematic fashion to the data analysis team. At the same time this becomes a source document for the report writing team.
d) To provide a list of possible indicators which may be useful in the analysis of the data in our search for links between HIV/AIDS and livelihoods. Use this list to check whether some potentially useful indicators were left out

Task for the data analysis team:

Create a variable on the data set for each of the listed items. These variables will be used in later analysis. It should be made clear from the start that although there is a logic that would imply households infected/affected by HIV/AIDS will be worse off in a number of ways compared to households not infected/affected, it is not that easy to prove this association using empirical data. We will have to look for this evidence using the data at hand.

Task for the data analysis team:

a) The majority of these variables were constructed during the week of the 28th of July to the 1st of August. What remains is to systematize their order and naming in order to assist in the planned tabulation activities.
b) Some of the more detailed variables (e.g. number of deaths by sex etc.) may be discarded or collapsed if they contain too few cases.
c) The number of composite indicators can be increased (please consider other options). The function of the composite indicators include:
   i) Indicate higher likelihood's of HIV/AIDS effect or infection
   ii) For use as filters in the analysis
   iii) Attempt to provide a temporal dimension for the epidemic curve at household level

A: LIST OF PROXY VARIABLES

VARIABLE NAME	"LABEL"	DESCRIPTION	METHOD OF CONSTRUCTION
Chronically ill children			
Proxy01	Chronically ill child	There is a chronically ill child(ren) aged 0-4 present in this household	Create the variable in the following way: If there is one or more chronically ill children aged 0-4 residing in the household then value =1 (Yes) If not, value =2 (No)
Proxy02	One chronically ill child	There is 1 (one) chronically ill child aged 0-4 present in this household	Create the variable in the following way: If there is one chronically ill child aged 0-4 residing in the household, value =1 If not, value =2
Proxy03	Two or more chronically ill children	There is 2 (two) or more chronically ill children aged 0-4 present in this household	Create the variable in the following way: If there is 2+ chronically ill children aged 0-4 residing in the household then value =1 If not, value =2
Chronically ill adults			
Proxy04	Chronically ill adult	There is a chronically ill adult(s) aged 15-49 present in this household	Create the variable in the following way: If there is one or more chronically ill adult(s)aged 15-49 residing in the household then value =1 If not, value = 2
Proxy05	Chronically ill male adult	There is a chronically ill male adult(s) aged 15-49 present in this household	Create the variable in the following way: If there is one or more chronically ill male adult(s)aged 15-49 residing in the household then value=1 If not, value=2
Proxy06	Chronically ill female adult	There is a chronically ill female adult(s) aged 15-49 present in this household	Create the variable in the following way: If there is one or more chronically ill female adult(s)aged 15-49 residing in the household then value =1 If not, value =2
Proxy07	One chronically ill adult	There is 1 (one) chronically ill adult aged 15-49 present in this household	Create the variable in the following way: If there is one chronically ill adult aged 15-49 residing in the household then value=1 If not, value =2
Proxy08	One chronically ill male adult	There is 1 (one) chronically ill male adult aged 15-49 present in this household	Create the variable in the following way: If there is one chronically ill male adult aged 15-49 in the household then value=1 If not, value =2
Proxy09	One chronically ill female adult	There is 1 (one) chronically ill female adult aged 15-49 present in this household	Create the variable in the following way: If there is one chronically ill male adult aged 15-49 residing in the household then value=1 If not, value =2
Proxy10	Two or more chronically ill adults	There is 2 (two) or more chronically ill adults aged 15-49 present in this household	Create the variable in the following way: If there is 2+ chronically ill adults aged 15-49 residing in the household then value=1 If not, value =2
Proxy11	Two or more chronically ill male adults	There is 2 (two) or more chronically ill male adults aged 15-	Create the variable in the following way:

		49 present in this household	If there is 2+ chronically ill male adults aged 15-49 living in the household then value=1 If not, value =2
Proxy12	Two or more chronically ill female adults	There is 2 (two) or more chronically ill female adults aged 15-49 present in this household	Create the variable in the following way: If there is 2+ chronically ill female adults aged 15-49 residing in the household then value=1 If not, value =2

Chronically ill household head

Proxy13	Household head chronically ill	The household head (aged 15-49) is listed as being chronically ill	Create the variable in the following way: If the head of the household is between 15-49 and is chronically ill then value=1. If not, value =2
Proxy14	Male household head chronically ill	The household head (aged 15-49) is a male and is listed as being chronically ill	Create the variable in the following way: If the head of the household is between 15-49 and is male and is chronically ill then value=1 If not, value =2
Proxy15	Female household head chronically ill	The household head (aged 15-49) is a female and is listed as being chronically ill	Create the variable in the following way: If the head of the household is between 15-49 and is female and is chronically ill then value=1 If not, value =2

Children that died in the past year after being chronically ill

Proxy16	Child died after being chronically ill	A chronically ill child(ren) aged 0-4 died in the past year in this household	Create the variable in the following way: If one or more chronically ill children aged 0-4 died in the household during the past year then value=1 If not, value =2
Proxy17	One child died after being chronically ill	One child aged 0-4 died in this household after being chronically ill during the past year	Create the variable in the following way: If one chronically ill child aged 0-4 died in the household during the past year then value=1 If not, value =2
Proxy18	Two or more children died after being chronically ill	Two or more children aged 0-4 died in this household after being chronically ill during the past year	Create the variable in the following way: If 2+ chronically ill children aged 0-4 died in the household during the past year then value=1 If not, value =2

Adults that died in the past year after being chronically ill

Proxy19	Adult died after being chronically ill	A chronically ill adult (s) aged 15-49 died in the past year in this household	Create the variable in the following way: If one or more adults aged 15-49 died in the household during the past year after being chronically ill then value=1 If not, value =2
Proxy20	Male adult died after being chronically ill	A chronically ill male adult (s) aged 15-49 died in the past year in this household	Create the variable in the following way: If one or more male adults aged 15-49 died in the household during the past year after being chronically ill then value=1 If not, value =2
Proxy21	Female adult died after being chronically ill	A chronically ill female adult (s) aged 15-49 died in the past year in this household	Create the variable in the following way: If one or more female adults aged 15-49 died in the household during the past year after being chronically ill then value=1 If not, value =2

Proxy22	One adult died after being chronically ill	One adult aged 15-49 died in this household after being chronically ill during the past year	Create the variable in the following way: If one adult aged 15-49 died in the household during the past year after being chronically ill then value=1 If not, value =2
Proxy23	One male adult died after being chronically ill	One male adult aged 15-49 died in this household after being chronically ill during the past year	Create the variable in the following way: If one male adult aged 15-49 died in the household during the past year after being chronically ill then value=1 If not, value =2
Proxy24	One female adult died after being chronically ill	One female adult aged 15-49 died in this household after being chronically ill during the past year	Create the variable in the following way: If one female adult aged 15-49 died in the household during the past year after being chronically ill then value=1 If not, value =2
Proxy25	Two or more adults died after being chronically ill	Two or more adults aged 15-49 died in this household after being chronically ill during the past year	Create the variable in the following way: If two or more adults aged 15-49 died in the household during the past year after being chronically ill then value=1 If not, value =2
Proxy26	Two or more male adults died after being chronically ill	Two or more male adults aged 15-49 died in this household after being chronically ill during the past year	Create the variable in the following way: If two or more male adults aged 15-49 died in the household during the past year after being chronically ill then value=1 If not, value =2
Proxy27	Two or more female adults died after being chronically ill	Two or more female adults aged 15-49 died in this household after being chronically ill during the past year	Create the variable in the following way: If two or more female adults aged 15-49 died in the household during the past year after being chronically ill then value=1 If not, value =2

Household head that died in the past year after being chronically ill

Proxy28	Adult household head died after being chronically ill	The household head (aged 15-49) died during the past year after being chronically ill	Create the variable in the following way: If the head of the household is between 15-49 and died after being chronically ill then value=1. If not, value =2
Proxy29	Male adult household head died after being chronically ill	The male household head (aged 15-49) died during the past year after being chronically ill	Create the variable in the following way: If the head of the household is between 15-49 and a male and died after being chronically ill then value=1. If not, value =2
Proxy30	Female adult household head died after being chronically ill	The female household head (aged 15-49) died during the past year after being chronically ill	Create the variable in the following way: If the head of the household is between 15-49 and a female and died after being chronically ill then value=1. If not, value =2

Orphans

Proxy31	Child(ren) who lost both parents	Household where a child or children aged 0-14 is living and who lost both the father and the mother to death (i.e. double orphan)	Create the variable in the following way: If there is one or more children aged 0-14 who lost both parents to death in the household then value=1. If not, value =2
Proxy32	Child(ren) who lost at least one parent	Household where a child or children aged 0-14 is living and who lost the father or the mother or both to death	Create the variable in the following way: if there is one or more children aged 0-14 in the household who lost either the mother, the father or both to death then value=1. If not, value =2
Proxy33	Child(ren) whose father died	Household where a child or children aged 0-14 is living and who lost the father to death (i.e. paternal orphan)	Create the variable in the following way: If there is one or more children aged 0-14 in the household

			who lost the father to death then value=1. If not, value =2
Proxy34	Child(ren) whose mother died	Household where a child or children aged 0-14 is living and who lost the mother to death (i.e. maternal orphan)	Create the variable in the following way: If there is one or more children aged 0-14 in the household who lost the mother to death then value=1. If not, value =2
Proxy35	One child is a double orphan	Household where there is one child aged 0-14 listed that lost both parents	Create the variable in the following way: If there is one child aged 0-14 in the household who lost both parents to death then value=1. If not, value =2

Proxy36	One child is an orphan (any configuration)	Household where there is one child aged 0-14 listed that lost at least one of its parents to death	Create the variable in the following way: If there is one child aged 0-14 in the household who lost one parent to death then value=1. If not, value =2
Proxy37	One child is a maternal orphan	Household where there is one child listed that lost the mother to death	Create the variable in the following way: If there is one child aged 0-14 in the household who lost his/her mother to death then value=1. If not, value =2
Proxy38	2-3 children are double orphans	Household where there is 2-3 children aged 0-14 listed that lost both parents to death	Create the variable in the following way: If there is 2-3 children aged 0-14 in the household who lost both parents to death then value=1. If not, value =2
Proxy39	2-3 children are orphans (any configuration|)	Household where there is 2-3 children aged 0-14 listed who lost at least one parent to death	Create the variable in the following way: If there is 2-3 children aged 0-14 in the household who lost at least one parent to death then value=1. If not, value =2
Proxy40	2-3 children are maternal orphans	Household where there is 2-3 children listed that lost the mother to death	Create the variable in the following way: If there is 2-3 children aged 0-14 in the household who lost their mother to death then value=1. If not, value =2
Proxy41	4+ children are double orphans	Household where there is 4+ children aged 0-14 listed that lost both parents to death	Create the variable in the following way: If there is 4+ children aged 0-14 in the household who lost both parents to death then value=1. If not, value =2
Proxy42	4+ children are orphans (any configuration|)	Household where there is 4+ children aged 0-14 listed who lost at least one parent to death	Create the variable in the following way: If there is 4+ children aged 0-14 in the household who lost at least one parent to death then value=1. If not, value =2
Proxy43	4+ children are maternal orphans	Household where there is 4+ children listed that lost the mother to death	Create the variable in the following way: If there is 4+ children aged 0-14 in the household who lost the mother to death then value=1. If not, value =2

Presence of adults

Proxy44	Household with no adult	Household without any adult aged 15-65	Create the variable in the following way: If there is no (0) adults aged 15-65 listed in the household schedule then value=1. If not, value =2
Proxy45	"Grand parent" households	Households consisting of children and older persons but without anyone in the economic active ages (15-65) Note: This proxy differs from Proxy44 as it doesn't include households with only elderly persons	Create the variable in the following way: If there is no (0) adults aged 15-65 listed in the household schedule and there is children aged 0-14 and persons 65+ in the household then value=1. If not, value =2
Proxy46	Household with 1 adult	Household with 1 adult aged 15-65	Create the variable in the following way: If there is only 1 adult aged 15-65 listed in the household schedule then value=1. If not, value =2
Proxy47	Household with 2 adults	Household with 2 adults aged 15-65	Create the variable in the following way: If 2 adults aged 15-65 are listed in the household schedule then value=1. If not, value =2
Proxy48	Household with 3+ adults	Household with 3+ adults aged 15-65	Create the variable in the following way: If 3+ adults aged 15-65 are listed in the household schedule then value=1. If not, value =2
Proxy44A	Household with no adult	Household without any adult aged 20-65	Create the variable in the following way:

		Note: This is a slightly different formulation of Proxy44. Proxy44 assumes that persons aged 15-19 are adult and able to look after a household. See also Proxy 45A – Proxy48A	If there is no (0) adults aged 20-65 listed in the household schedule then value=1. If not, value =2
Proxy45A	"Grand parent" households	Households consisting of children and older persons but without anyone in the age group 20-65	Create the variable in the following way: If there is no (0) adults aged 20-65 listed in the household schedule and there is children aged 0-19 (NB) and persons 65+ in the household then value=1. If not, value =2
Proxy46A	Household with 1 adult	Household with 1 adult aged 20-65	Create the variable in the following way: If there is only 1 adult aged 20-65 listed in the household schedule then value=1. If not, value =2
Proxy47A	Household with 2 adults	Household with 2 adults aged 20-65	Create the variable in the following way: If 2 adults aged 20-65 are listed in the household schedule then value=1. If not, value =2
Proxy48A	Household with 3+ adults	Household with 3+ adults aged 20-65	Create the variable in the following way: If 3+ adults aged 20-65 are listed in the household schedule then value=1. If not, value =2

Dependency ratios

Proxy49	"Crude" dependency ratio	The "crude" dependency ratio within a household	Create the variable in the following way: The "crude" dependency ratio is obtained by dividing the dependents in a household with those in the economic active years Numerator: (0-14) + (65+) Denominator: (15-65) Ranges: 0-1= Low 1.0001-2.5 =Medium 2.5001+ =High If denominator =0 (no one 15-65) = Very high
Proxy50	"Effective" dependency ratio	The "effective" dependency ratio within a household	Create the variable in the following way: The "effective" dependency ratio is obtained by dividing the dependents in a household with the healthy individuals in the economic active years Numerator: (0-14) + (65+) + (chronically ill aged 15-65) Denominator: (15-65) – (chronically ill aged 15-65) Ranges: 0-1= Low 1.0001-2.5 =Medium 2.5001+ =High If denominator =0 (no one 15-65) = Very high

Composite indicators			
Proxy51	Adult died after being chronically ill and chronically ill adult present	A chronically ill adult (s) aged 15-49 died in the past year in this household and there is a chronically ill adult(s) aged 15-49 present in this household (Proxy19 and Proxy04)	Create the variable in the following way: If a chronically ill adult (s) aged 15-49 died in the past year in this household and there is a chronically ill adult(s) aged 15-49 present in this household then value =1 If not, value =2
Proxy52	A chronically ill adult member died and a chronically ill child died	An adult died in the past year after being chronically ill and a chronically ill child(ren) aged 0-4 died in the past year in this household (Proxy19 and Proxy16)	Create the variable in the following way: If adult(s) aged 15-49 died after being chronically ill the past year and child aged 0-4 died in the past year after being a

			chronically ill in this household then value =1 If not, value =2
Proxy53	A chronically ill adult member is present and a chronically ill child died	There is chronically ill adult member(s) present and in this household and a child 0-4 died after being chronically ill in the past year (Proxy04 and Proxy16)	Create the variable in the following way: If there is a chronically ill adult(s) aged 15-49 present in this household and a child aged 0-4 died the past year after being chronically ill in this household then value =1 If not, value =2
Proxy54	A chronically ill adult member is present and there is a chronically ill child	There is chronically ill adult member(s) and chronically ill child(ren) aged 0-4 present in this household (Proxy04 and Proxy01)	Create the variable in the following way: If there is a chronically ill adult(s) aged 15-49 present in this household and a chronically ill child aged 0-4 present in this household then value =1 If not, value =2
Proxy55	Adult household member died or chronically ill adult member present	A chronically ill adult (s) aged 15-49 died in the past year in this household or there is a chronically ill adult(s) aged 15-49 present in this household (Proxy19 or Proxy04)	Create the variable in the following way: If a chronically ill adult (s) aged 15-49 died in the past year in this household or there is a chronically ill adult(s) aged 15-49 present in this household then value =1 If not, value =2
Proxy56	Adult died and chronically ill adult present and chronically ill child present or a child died	A chronically ill adult (s) aged 15-49 died in the past year in this household and there is a chronically ill adult(s) aged 15-49 present in this household and there is a chronically ill child aged 0-4 present or a child aged 0-4 died after being chronically ill during the past year (Proxy19 and Proxy04) and (Proxy16 or Proxy01)	Create the variable in the following way: (If a chronically ill adult (s) aged 15-49 died in the past year in this household and there is a chronically ill adult(s) aged 15-49 present in this household) and (a chronically ill child(ren) aged 0-4 died in the past or there is a chronically ill child(ren) aged 0-4 present in this household) then value =1 If not, value =2
Proxy57	Households with only child members	The household consists only of members 0-19. There are no persons 20 years and older present in the household.	Create the variable in the following way: If there are only persons aged 0-19 present in this household then value = 1 If not, value = 2