THE IMPACT OF A HIGH PROTEIN FOOD SUPPLEMENT ON THE NUTRITIONAL STATUS OF HIV INFECTED PATIENTS ON ARV TREATMENT AND THEIR FAMILIES

Jolanda Coetzee (Yssel)

Dissertation submitted in fulfilment of the requirements for the degree

Magister Scientiae:

Dietetics

In the

Department of Nutrition and Dietetics

University of the Free State

Supervisor: Prof CM Walsh, PhD

BLOEMFONTEIN

January 2013

DECLARATION OF INDEPENDENT WORK

DECLARATION WITH REGARD TO INDEPENDENT WORK

I, Jolanda Coetzee (Yssel), identity number 8309160210081 and student number 2002014138, do hereby declare that this research project submitted to the University of the Free State for the degree MAGISTER SCIENTIAE: “The Impact of a high Protein Food Supplement on the Nutritional Status of HIV Infected Patients on ARV Treatment and their families”, is my own independent work, and has not been submitted before to any institution by myself or any other person in fulfilment of the requirements for the attainment of any qualification. I further cede copyright of this research in favour of the University of the Free State.

ACKNOWLEDGEMENTS

- This study would not have been possible without the assistance of the following persons:
- My supervisor and mentor Prof Corinna Walsh, for her advice, assistance, and encouragement;
- Prof Gina Joubert, from the Department of Biostatistics, University of the Free State, for the valuable input regarding the statistical analysis of data;
- The FEATS (Improving the effectiveness of AIDS treatment while strengthening prevention in the Free State Province, South Africa) research team, especially Prof Frikkie Booysen;
- The respondents that participated in the study;
- My family and friends for their interest and moral support; and,
- The National Research Foundation (NRF) for financial assistance.

SUMMARY

The advantages of anti-retroviral (ARV) treatment in human immunodeficiency virus (HIV) infected patients are well documented. Although it has been noted that food security impacts on treatment success and quality of life, very few studies have investigated the impact of food supplementation in HIV-infected patients. This study determined the impact of a nutrition intervention (meatballs and spaghetti in tomato sauce) on parameters of nutritional status (including foods bought or consumed, food security and anthropometry) in HIV-infected participants on ARV therapy.

The study formed part of a larger study titled: “Improving the effectiveness of AIDS treatment while strengthening prevention in the Free State Province, South Africa (FEATS)”. The FEATS study had three objectives that included: to develop a view of treatment success, develop a more complete model of the determinants of treatment success and understand the nature of links between treatment and prevention.

The study took place in 12 of the 16 phase I ARV therapy assessment sites (primary health care facilities) in the Free State province. This sub-study described socio-demographic status, household information, symptoms experienced as a result of taking HAART and food supplements received from the government in a control (no nutrition intervention) and experimental (nutrition intervention) group. The impact of the intervention on foods bought or consumed by the household, food security and anthropometry were determined in both groups after the intervention in the experimental group.

Socio-demographic and household information, symptoms experienced as a result of taking ART, food supplements received from the government, food bought or consumed by the household and household food security were assessed using questionnaires completed in personal interviews with participants. Anthropometric status was assessed by trained fieldworkers (adherence supporters) using recognised techniques and included height, weight, and waist circumference.

Participants in the experimental group received two tins (410 g tins) of meatballs and spaghetti in tomato sauce per week for a median period of 15 months. These were

delivered by the adherence supporters during routine visits to the households of participants.

A total of 260 participants were included in the study (135 in the control group and 125 in the experimental group). The mean age of both the groups (control and experimental) was similar at 38 years for the control and 37.3 years for the experimental group with a standard deviation of [-1.8;2.9].

The majority of participants were of African race (99.3% in the control and 97.6% in the experimental group) and female (80% in the control and 81.6% in the experimental group). A large percentage had never been married (43% in the control and 45.5% in the experimental group). Most had a low level of formal education. About 65% had access to a flush toilet and more than 80% had electricity.

About one in three participants reported experiencing side effects as a result of ARV therapy. These included tiredness (8.1% in the control and 10.4% in the experimental group), dizziness (8.1% in the control and 7.2% in the experimental group), skin rash (5.9% in the control and 10.4% in the experimental group) and nausea (6.7% in the control and 4% in the experimental group).

Less than 80% of participants in the current study had received food supplementation from the government Nutrition Supplementation Programme in the past.

Although food and nutrient intake cannot be estimated very accurately from information related to foods bought or consumed, they do give an idea of what foods are available in the household. From this list it was concluded that a large percentage of households frequently bought and consumed starchy staple foods (mealie meal, rice, bread and potatoes), vegetable oil and sugar. As far as foods containing protein are concerned, a large percentage of households did purchase and consume dairy products (milk, sour milk or yoghurt), chicken and eggs.

In both the control and experimental groups the percentage of households that bought or consumed breakfast cereals, legumes (dried peas, lentils and beans), and fruits and vegetables were relatively low. In addition, more costly protein sources such as red meat, fish and cheese were not bought or consumed by a large percentage of participants.

Only a few changes in the foods bought or consumed occurred after intervention, and these were unlikely to be related to the nutrition intervention.

In both groups, participants reported that they often do not have enough to eat (31.1% in the control and 30.4% of the experimental group), the food that they buy does not last (40.6% in the control and 48.4% in the experimental group) and they worry whether they will run out of food. Households that had children, also struggled to feed them a balanced meal (53.8% of the control and 46.0% of the experimental group), and reported that the children in the household were not eating enough (46.2% in the control and 41.9% in the experimental group). After intervention participants in the experimental group worried less about running out of food (50.4 % before intervention and 37.2% after intervention, [-25.5;0.9]), and fewer reported that they could not afford a balanced meal (50.8% before intervention and 39.2% after intervention,[-23.0;-0.4]). Fewer respondents that had received the food supplement felt that the food that they eat just did not last (49.2% before intervention and 35.0% after intervention,-26.0;-2.4]). This statistically significant change in the experimental group could possibly be ascribed to the food supplements that were provided as part of the intervention.

For all anthropometric parameters the control and experimental groups were very similar at baseline. Mean body mass index (BMI) of participants was 24.7kg/m^2 in both groups. About one in every 10 participants was underweight according to their BMI and 50% of all participants had a normal weight. A relatively large percentage of respondents in both groups were either overweight (26.4% in the control and 21.7% in the experimental group) or obese (14.7% in the control and 18.8% in the experimental group), putting them at risk for chronic non-communicable diseases. More than half of respondents also had a waist circumference in the high risk category. Mean waist circumference in the control group was 85.7cm and 83.7cm in the experimental group. After intervention, no significant changes in anthropometric variables were observed in the experimental group.

Other than a small improvement in some measures of food security, the nutrition intervention that was implemented in this study did not have a significant impact on foods bought or consumed, or anthropometric variables of HIV-infected participants on ARV therapy. Possible reasons for this lack of improvement in these parameters

could be that the amount of food supplement provided was not enough to make a significant contribution to food intake, especially if it was shared with family members. The food supplement could also have replaced other foods instead of supplementing the usual diet. Other forms of supplementation, such as ready-to-use therapeutic foods, may be of more benefit to food insecure HIV-infected patients.

OPSOMMING

Die voordele van anti-retro virale (ARV) behandeling in MIV-geïnfekteerde pasiënte is goed gedokumenteer. Alhoewel voedsel sekuriteit die sukses van die behandeling, asook die lewenskwaliteit van die pasiënt kan beinvloed, is min studies wat die impak van voedsel supplementasie bestudeer beskikbaar. Hierdie studie fokus op die impak van ‘n voedingintervensie (frikkadelle en spaghetti in tamatie sous) op verskillende parameters van voedingstatus (voedsel gekoop of gebruik, voedsel sekuriteit en antropometrie), van MIV-geïnfekteerde pasiente op ARV behandeling.

Hierdie studie maak deel uit van ‘n groter studie: “Improving the effectiveness of AIDS treatment while strengthening prevention in the Free State Province, South Africa (FEATS)”. Die FEATS studie het 3 doelwitte gehad, naamlik: om behandelingsukses te bepaal, om ‘n model te ontwikkel wat die sukses van behandeling bepaal en om die verhouding tussen behandeling en voorkoming te bepaal.

Die studie het plaasgevind in 12 van die 16, fase I ARV asseseringsklinieke (primêre gesondheidsorgfasiliteite) in die Vrystaat. Hierdie sub-studie beskryf die sosio-demografiese status, huishoudelike inligting, simptome wat ondervind word as gevolg van die behandeling, en voedsel supplemente wat ontvang is van die regering in ‘n kontrole (geen voeding intervensie) en eksperimentele (voeding intervensie) groep. Die gevolge van die intervensie op voedsel wat gekoop of gebruik is deur die huishouding; voedselsekuriteit en antropometrie is ook voor en na die intervensie in albei groepe bepaal.

Sosio-demografiese status, huishoudlike inligting, simptome wat ondervind word as gevolg van behandeling, voedsel wat gekoop of gebruik is, en voedsel supplemente wat ontvang is van die regering, is ingesamel, deur vraelyste te voltooi. Antropometriese inligting is ingesamel deur opgeleide veldwerkers (adherence supporters) om massa, lengte, en middel-omtrek te bepaal.

Deelnemers in die eksperimentele groep het 2 blikkies (410 g per blikkie) frikkadelle en spaghetti in tamatie sous per week ontvang, vir ‘n gemiddelde tydperk van 15

maande. Die voedsel is tydens roetine besoeke aan die huishoudings deur die “adherence supporters” by die deelnemers se huise afgelewer.

‘n Totaal van 260 deelnemers is in die studie ingesluit (135 in die kontrole groep en 125 in die eksperimentele groep). Die gemiddelde ouderdom van albei groepe (kontrole en eksperimenteel) was baie eenders (38 jaar vir die kontrole en 37.3 jaar vir die eksperimentele groep), met ‘n standaard afwyking van [-1.8;2.9].

Die meerderheid van die deelnemers was swart (99.3% in die kontrole en 97.6% in die eksperimentele groep) en vroulik (80% in die kontole en 81.6% in die kontrole groep). ‘n Groot persentasie was nog nooit getroud nie (43% in die kontrole en 45.5% in die eksperimentele groep). Die meeste het ‘n lae vlak van formele onderrig gehad. Ongeveer 65% het toegang tot ‘n spoeltoilet gehad en meer as 80% het elektrisiteit gehad.

Ongeveer een uit drie van die deelnemers het newe-effekte ondervind as gevolg van die behandeling. Newe-effekte soos moegheid (8.1% in die kontrole en 10.4% in die eksperimentele groep), duisligheid (8.1% in die kontrole en 7.2% in die ekperimentele groep), veluitslag (5.9% in die kontrole en 10.4% in die eksperimentele groep) en naarheid (6.7% in die kontrole en 4% in die eksperimentele groep) is deur die deelnemers ondervind.

Minder as 80% van die deelnemers in die studie het voorheen voedsel supplementasie van die regering se Voeding Supplementasie Program ontvang.

Alhoewel voedsel en voedingstofinname nie akkuraat geskat kan word vanaf die vraelys nie (voedsel gekoop of gebruik deur die huishouding), kan dit ‘n idee gee van watter voedsel beskikbaar is in die huishouding. ‘n Groot persentasie van die huishoudings het styselryke stapel voedsel (mieliemeel, rys, brood en aartappels), groente olie en suiker gekoop en gebruik. Proteïenryke voelsel, hoofsaaklik suiwel (melk, suurmelk of jogurt), hoender en eiers is ook deur ‘n groot persentasie van die huishoudings gebruik.

In albei groepe (kontrole en eksperimentele groep), is die hoeveelheid ontbytgrane, peulgroentes (gedroogte ertjies, lensies en bone), vrugte en groente wat gekoop en gebruik is relatief laag. Duurder proteïenbronne soos rooivleis, vis en kaas is nie deur die meerderheid van die huishoudings gebruik of gekoop nie.

Slegs enkele veranderinge in die voedsels gekoop en gebruik kon na die intervensie waargeneem word. Dit is onwaarskynlik dat dit verband hou met die intervensie.

In albei groepe het deelnemers rapporteer dat hulle op ‘n gereelde basis nie genoeg voedsel het om te eet nie (31.1% in die kontrole en 30.4% in die eksperimentele groep), dat die voedsel wat hulle koop nie hou nie (40.6% in die kontrole en 48.4% in die eksperimentele groep) en dat hulle bekommerd is dat hulle voedsel sal opraak. Huishoudings met kinders het ook rapporteer dat hulle sukkel om aan die kinders ‘n gebalanseerde ete te voorsien (53.8% van die kontrole en 46.0% van die eksperimentele groep) en dat die kinders in die huishouding nie genoeg voedsel eet nie (46.2% in die kontrole en 41.9% in die eksperimentele groep). Na die intervensie, het deelnemers in die eksperimentele groep rapporteer dat hulle, hulle minder bekommer dat voedsel sal opraak (50.4 % voor intervensie en 37.2% na intervensie, [-25.5;0.9]), en minder het gemeld dat hulle nie ‘n gebalanseerde ete kon bekostig nie (50.8% voor intervensie en 39.2% na intervensie,[-23.0;-0.4]). Minder deelnemers wat supplemente ontvang het, het gevoel dat die voedsel wat hulle eet nie hou nie (49.2% voor intervensie en 35.0% na intervensie,-26.0;-2.4]). Hierdie veranderinge wat voorgekom het in die eksperimentele groep kan moontlik te danke wees aan die voedsel wat voorsien is.

By basislyn was al die antropometriese metings in die kontrole en eksperimetele groep baie eenders. Die gemiddelde liggaams massa indeks (LMI) van die deelnemers was 24.7kg/m^2 in albei groepe. Ongeveer een uit elke 10 deelnemers was ondermassa, volgens hulle LMI, en 50% van alle deelnemers het ‘n normale massa gehad. ‘n Relatiewe groot persentasie van deelnemers was oormassa (26.4% in die kontrole groep en 21.7% in die eksperimentele groep) of vetsugtig (14.7% in die kontrole groep en 18.8% in die eksperimentele groep), wat aandui dat hulle ‘n risiko het om lewenstylsiektes te ontwikkel. Meer as die helfte van die deelnemers het ook ‘n middelomtrek in die hoë risiko kategorie gehad. Die gemiddelde middelomtrek in die kontrole groep was 85.7cm en 83.7cm in die eksperimentele groep. Na die intervensie, kon geen betekenisvolle veranderinge in antropometrie van persone wat aan die intervensie blootgestel is, gesien word nie.

Buiten die klein veranderinge wat in parameters van voedselsekuriteit gesien is, het die voedselintervensie nie ‘n groot impak op voedsel wat gekoop of gebruik is gehad nie; ook nie op die antropometriese metings nie. Moontlike redes vir die tekort aan verbetering kan wees dat die hoeveelheid voedsel wat voorsien is, nie genoeg was om ‘n betekenisvolle bydra tot voedselinname te maak nie, veral as die voedsel in die huishouding gedeel is. Die voedselsupplement kon ook ander voedsel in die dieet vervang het, in plaas van om die dieet aan te vul. Ander vorms van supplementasie soos gereed-om-te-gebruik terapeutiese voedsels, mag dalk meer voordele inhou.

TABLE OF CONTENTS **PAGES**

DECLARATION OF INDEPENDENT WORK ii

ACKNOWLEDGEMENTS iii

SUMMARY iv

OPSOMMING VIII

TABLE OF CONTENT XII

LIST OF TABLES XIX

LIST OF FIGURES XX

LIST OF APPENDICES XXI

LIST OF ABBREVIATIONS XXII

TABLE OF CONTENT

Chapter 1: Introduction and motivation for the study		1
1.1	Introduction	1
1.2	Nutritional status of HIV-infected persons	4
1.2.1	Dietary Intake and household food security	4
1.2.2	Anthropometry	5
1.2.3	Lifestyle	7
1.2.3.1	Smoking	7
1.2.3.2	Alcohol consumption	7
1.2.3.3	Physical activity	8
1.2.3.4	Psychosocial factors	9
1.3	Aim and Objectives	9
1.3.1	Aim	10
1.3.2	Objectives	10
1.4	Outline of the dissertation	11
Chapter 2: Literature review: Food aid in HIV		12
2.1	Introduction	12
2.2	Stages of HIV	13
2.3	Highly Active Antiretroviral Therapy (HAART)	15
2.3.1	Categories of ARV's	15
2.3.2	Adverse effects of HAART	17
2.4	Relationship between malnutrition and HIV/AIDS	20

2.5	Causes of food insecurity	22
2.5.1	Food availability at household level	23
2.5.2	Food intake by the individual	24
2.5.3	Nutrient Utilization	24
2.5.4	Food distribution	25
2.5.5	Depression and food security	26
2.5.6	Work load and food production	26
2.5.7	Environmental factors	27
2.6	Impact of food insecurity	27
2.6.1	Sexual behaviour	28
2.6.2	Food choices	28
2.6.3	HIV transmission, non-adherence and progression	29
2.6.4	Health care	29
2.6.5	Mental health	30
2.7	Nutrition intervention in HIV	30
2.7.1	Macronutrient requirements	31
2.7.1.1	Energy and protein	32
2.7.1.2	Fat	33
2.7.2	Micronutrient requirements	34
2.8	Food support in HIV	35
2.8.1	Assessment of nutritional status of HIV infected patients	36
2.8.2	Advantages of food and nutrition support	37

2.8.3 Types of food support 39

2.8.4 Current support for HIV infected persons in the Free State Department of Health 41

Chapter 3: Methodology 43

3.1 Introduction 43

3.2 Ethical considerations 44

3.3 Sample selection 44

3.3.1 Study design 44

3.3.2 Study Population 44

3.3.2.1 Inclusion and exclusion criteria 45

3.3.2.2 Study sample 46

3.4 Operational definitions 48

3.4.1 Household information and household welfare and wealth information 48

3.4.2 Symptoms experienced as result of taking ART 48

3.4.3 Food supplements received from the government 48

3.4.4 Food consumed or bought by the household 48

3.4.5 Household food security 48

3.4.6 Anthropometric status 49

3.5 Pilot study 49

3.6 Data collection process 50

3.7 Techniques 53

3.7.1	Structured interviews	54
3.7.2	Anthropometric status	54
3.7.2.1	Weight	54
3.7.2.2	Height	54
3.7.2.3	Waist circumference	55
3.8	Statistical analysis	55
3.9	Reliability and validity	55
3.9.1	Questionnaires	56
3.9.2	Anthropometric status	56
Chapter 4: Results		58
4.1	Introduction	58
4.2	Socio-demographic status (Household information)	58
4.2.1	Household information	60
4.3	Symptoms as a result of ARV's	63
4.4	Food Supplements	64
4.5	Food consumed or bought by the household	64
4.6	Anthropometry	76
Chapter 5: Discussion		80
5.1	Introduction	80
5.2	Limitations of the study	80
5.3	Socio-demographic status (Household information)	82

5.3.1	Race, gender, marital status and level of education	82
5.3.2	Household information	83
5.4	Symptoms as a result of ARV's	84
5.5	Food Supplements	86
5.6	Food consumed or bought by the household	87
5.7	Food Security	89
5.8	Anthropometry	91

Chapter 6: Conclusions and recommendations 93

6.1	Introduction	93
6.2	Conclusion	93
6.2.1	Socio-demographic status (Household information)	93
6.2.1.1	Race, gender, marital status and level of education	93
6.2.1.2	Household information	94
6.2.2	Symptoms as a result of ARV's	94
6.2.3	Food Supplements	95
6.2.4	Food consumed or bought by the household	95
6.2.5	Food Security	96
6.2.6.	Anthropometry	97
6.3	Recommendations	98
6.3.1	Recommendations regarding food intake and supplementation	98
6.3.2.	Recommendations for further research	101

References 104

LIST OF TABLES

Table 2.1	Adult ARV regimes in South Africa	16
Table 3.1	Selected study sites, per district	45
Table 3.2	Study Sample	47
Table 4.1	Socio-demographic status (Baseline)	59
Table 4.2	Household information (Baseline)	61
Table 4.3	Household Size and Density (Baseline)	62
Table 4.4	Symptoms as result of taking ARV drugs (Baseline)	63
Table 4.5	Food Supplementation (Baseline)	64
Table 4.6	Food Consumed or bought by the household during the past month (Baseline)	65
Table 4.7	Changes in food consumed or bought by the household during the past month from baseline to post-intervention	67
Table 4.8	Food Security (Baseline)	69
Table 4.9	Changes in food security from baseline to post-intervention	74
Table 4.10	Mean values for anthropometric variables (Baseline)	77
Table 4.11	BMI and Waist circumference categories (Baseline)	78
Table 4.12	Changes in mean anthropometric values from baseline to post-intervention	78
Table 4.13	Changes in categorical anthropometric parameters from baseline to post-intervention	79

LIST OF FIGURES

Figure 2.1	Vicious cycle of HIV and malnutrition	21
Figure 2.2	Nutrition Cycle	22

LIST OF APPENDIXES

Appendix A	Ethical Clearance	142
Appendix B	Recruitment Form	146
Appendix C	Information document and consent form	151
Appendix D	Household Questionnaire	170
Appendix E	Household Welfare and Wealth Questionnaire	188
Appendix F	Patient Questionnaire	209
Appendix G	Pilot Study	232
Appendix H	Anthropometric Manual	234

LIST OF ABBREVIATIONS

<	Less than
>	Greater than
≤	Equal to or less than
≥	Equal to or greater than
3TC	Lamivudine
AIDS	Acquired Immune Deficiency Syndrome
ART	Anti-retroviral Therapy
ARVs	Anti-retroviral Drugs
ASSAF	Academy of Science in South Africa
AZT	Zidovudine
BMI	Body Mass Index
CD4 cell count	Cluster of differentiation 4
CDC	Centre for Disease Control
cm	centimetre
Cn	n values for controle group
d4T	Stavudine
DoH	Department of Health
EFV	Efavirenz
En	n values for experimental group
FEATS	Effective AIDS Treatment and Support in the Free State Province

g	Gram
HAART	Highly Active Antiretroviral Therapy
HALS	HIV-associated lipodystrophy syndrome
HDL	High Density Lipoprotein
HIV	Human Immunodeficiency Virus
kg	Kilogram
kg/m^2	Kilogram/meter square
kJ	Killojoule
LDL	Low Density Lipoprotein
LPV/r	Lopinavir/ ritonavir
mg	Milligram
ml	Millilitre
mmol/L	Millimoll per liter
NGO	Non-Goverment Orginasation
NNRTI	Non nucleoside reverse transcriptase inhibitors
NRTI	Nucleoside reverse transcriptase inhibitors
NSP	Nutrition Supplementation Programme
NVP	Nevirapine
PI	Protease Inhibitors
RDA	Recommended daily allowance
REE	Resting energy expenditure
Stats SA	Stats South Africa
TB	Tuberculosis

TDF	Tenofovir
THUSA	Transition in Health and Urbanisation in South Africa
UFS	University of the Free State
UNAIDS	United Nations Joint Programme on HIV/AIDS
USA	United States of America
USDA	United States Department of Agriculture
WHO	World Health Organization

Chapter 1: Introduction and motivation for the study

1.1 Introduction

The human immunodeficiency virus (HIV) has developed into one of the most important infectious pathogens of all time. HIV was first diagnosed in high risk groups in developed countries, but the virus now affects other groups as well (Alrajhi, 2004). The Centre for Disease Control (CDC) described Acquired Immune Deficiency Syndrome (AIDS) for the first time in 1981 (Dong and Imai, 2012, p.864).

According to UNAIDS, an estimated 34 million people were living with HIV at the end of 2010, with 2.7 million new infections and 1.8 million people dying of HIV related illnesses (UNAIDS, 2010). Global reports have shown that the number of people infected with HIV decreased from 2.2 million people in 2001 to 1.8 million people in 2009. Sub-Saharan Africa remains the most affected area (UNAIDS, 2008). South Africa is one of the countries with the largest HIV epidemic. In Africa, HIV prevalence in females is higher than in males. The largest number of new HIV cases is among the youth and women who are often also economically disadvantaged and cannot always access HIV care (Fields-Gardener *et al.*, 2004).

Generally, treatment scale-up is having a positive effect on patient survival. In Sub-Saharan Africa the main focus is on treatment, care and support as well as elimination of new HIV infections in children (UNAIDS, 2011). Between 2004 and 2009, AIDS related deaths declined by twenty percent in sub-Saharan Africa (UNAIDS, 2010). According to UNAIDS (2008), the global number of people living with HIV has stabilized since 2007, but the total number has increased due to new infections. Together with HIV, factors such as droughts, floods, poverty, food

insecurity, war and political insecurities, place a significant burden on people living in sub-Saharan Africa (Spencer *et al*., 2007).

Globally the HIV epidemic remains a challenge for health systems. Political and financial support have resulted in an increasing availability of HIV services in recent years, but the number of new infections remains high; much higher than the number of people receiving treatment (WHO, 2009).

Globally, the food and agriculture organisation (FAO) estimates that 925 million people were undernourished in 2010, compared to 1.023 billion people in 2009, and food insecurity remains a major global challenge (Nagata *et al.,* 2012). According to the USDA (2011), food security is projected to improve in most of the world, except in sub-Saharan Africa, where it is projected that the number of food insecure people will increase by 17 million between 2011 and 2021. HIV infected patients cannot always afford to buy high quality foods such as meats, fish and milk, which may be due to a lack of finances that result in food insecurity. In addition to poverty, lack of knowledge also plays a role in what people choose to eat (WHO, 2009).

Proper food and nutrition is a basic human right. Proper nutrition will never cure HIV, but can have a positive effect on outcome, help with the maintenance of the immune system, enhance physical activity, and contribute to optimal quality of life (UNAIDS, 2006). Adequate nutrition also has a positive effect on the function of antiretroviral drugs and improves adherence (Tomkins, 2005). Nutrition can thus significantly impact on survival in HIV infected persons.

A patient's nutritional status is affected by a number of factors. These include reduced food intake; malabsorption; increased nutritional needs as a result of fever

and infection; increased nutrient losses and medication related side effects (Fawzi *et al.*, 2005; Earthman, 2004; Kennedy and MacIntyre, 2003).

Weight loss, as well as protein malnutrition, are common complications in HIV infected patients (Berneis *et al*., 2000), with wasting occurring commonly. Malnutrition has a negative impact on outcome in patients, as it significantly affects the frequency and severity of opportunistic infections (Kennedy and MacIntyre, 2003). Malnourished patients often have low muscle mass and the balance between protein synthesis and protein degradation is often affected (Lynch *et al.,* 2007).

According to Schwenk *et al*. (1999) and Almeida *et al.* (2011), nutritional counselling and food supplementation are essential methods to restore energy intake and improve weight status in HIV infected patients. According to Sattler *et al.* (2008) and Oqunitibeju *et al.* (2006), there is consensus regarding the importance of food supplementation for HIV infected patients. Despite this, not enough focus has been placed on the role of food supplementation in ensuring patient's treatment success and quality of life which may be closely related to their food security and nutritional status. Food aid can have a positive effect on weight status as well as having a non-nutritional impact in HIV infected patients (De Pee and Semba, 2010; Kim and Frongillo, 2007). Food insecurity can contribute to poor drug adherence and drug resistance which can have a negative effect on viral load (Wang *et al.,* 2011). While ARV treatment often results in weight gain in undernourished patients (Pedral-Sampaio *et al.,* 2004), the contribution of improved food security cannot be underestimated.

1.2 Nutritional status of HIV infected persons

Nutritional status is influenced by dietary intake and household food security; and lifestyle factors such as smoking, alcohol use and physical activity. Each of these will briefly be discussed in the following section.

1.2.1 Dietary Intake and household food security

In South Africa there is a variety of cultural groups with different traditional eating patterns. The general population's diet is high in total fat and saturated fat and low in fiber as well as all the micronutrients (FAO, 2006). A western diet is generally followed by the white population as well as the Indian and Coloured population, a diet high in fat (more than thirty percent of total energy intake), lower carbohydrate (less than 55% of total energy intake), low fibre and high added sugar intake (more than ten percent of total energy intake). The black African population has two types of eating patterns. Most rural populations follow a very traditional diet; which is high in carbohydrates (more than 65% of total energy intake); low in fat (less than 25% of total energy intake); low in sugar (less than ten percent of total energy intake); and moderately high in fibre. Where, the black African urban population, started to follow the Western diet, of the other groups (FAO, 2006). Due to the nutrition transition taking place in South Africa, the burden of diseases of lifestyle, such as coronary artery disease, has shifted from the rich to the poor in the general population.

HIV/AIDS not only has an impact on health, but also affects nutrition, food security and socio-economic development (WHO, 2003). Low educational status and income can have an effect on food security (Tiyou *et al.,* 2012). In addition living conditions

such as housing are closely related to food security (Vasarhelyi *et al.,* 2011). When focus is placed on improving food security through food assistance, body mass index (BMI) and adherence to treatment as well as regular clinic visits all tend to improve (Ivers *et al.,* 2010).

The nutritional status of people living with HIV can be improved by using available resources wisely, learning from clinical experience and applying scientific-based evidence to treatment programs (WHO, 2003).

Information on dietary intake of HIV-infected persons in the Free State is scarce. In a study done by Dannhauser *et al*. (1999) it was shown than most of the HIV infected patients in a immunology clinic in the Free State province had a low intake of vitamin C, vitamin B6, vitamin D, vitamin A, calcium, iron and zinc (less than 67% of the recommended dietary allowance). Similar results were also reported by Van Staden *et al.* (1998), who determined nutritional status of HIV infected patients in a clinic setting in the Free State. A large number of these patients had severe micronutrient deficiencies.

1.2.2 Anthropometry

Anthropometry is “the science of measuring the size, weight and proportions of the human body” (Berneis *et al*., 2000). Changes in anthropometry that are often reported in HIV-infected patients include weight loss, body cell mass depletion, decreased skinfold thickness and decreased mid-upper arm circumference.

In HIV infection, weight loss as well as protein energy malnutrition are common complications (Berneis *et al*., 2000). Weight loss patterns differ from HIV infected

patients and HIV uninfected patients. In patients who are HIV uninfected with an illness, a protein sparing effect is likely to occur, with fat stores being utilized for energy to meet the patient's energy needs. In a patient that is HIV infected, protein is used as an energy source (Colecraft, 2008). The changes in body composition in women with AIDS are similar to those seen in starvation, with a bigger loss of fat than lean body mass compared to men, who tend to lose more muscle mass. The reason for this is probably that women initially have a higher percentage of body fat than men (Grinspoon *et al*., 1997). According to Sharkey *et al*. (1992), HIV infected patients generally have a lower fat percentage than HIV uninfected patients. BMI at diagnosis, is often an independent predictor of survival (Van der Sande *et al.,* 2004).

In patients on Highly Active Antiretroviral Therapy (HAART), initial weight has a significant impact on outcome. Patients who start on HAART with a low BMI have a poorer nutritional and immunological response to treatment (Tafese *et al.,* 2012) and an increased risk for early mortality. On the other hand, a higher BMI can also be detrimental. According to a study done in Botswana, patients with a high BMI had an increased risk of developing lactic acidosis when they initiated HAART (Koethe and Heimburger, 2010).

Maintenance of muscle mass can be achieved when there is a balance between protein synthesis and protein degradation (Grinspoon *et al*., 1997). It is thus helpful to assess parameters of anthropometric nutritional status such as height, weight, waist circumference, triceps skinfold and mid upper arm circumference (Dong and Imai, 2012, p. 877).

1.2.3 Lifestyle

Smoking habits, alcohol consumption, physical activity levels and psychosocial circumstances can affect HIV disease progression and quality of life.

1.2.3.1 Smoking

A large number of people in lower socioeconomic groups smoke (Feldman *et al.,* 2006), and patients often do not have sufficient knowledge on the effect of smoking (tobacco) on HIV disease progression (Robinson *et al.,* 2012). In HIV infected patients, smoking is associated with an increased prevalence of angina and cardiovascular disease (Zirpoli *et al.,* 2012; Petoumenos and Worm, 2011; Stein 2009). Smoking can also affect immunity with higher plasma viral loads as well as lower CD4 cell counts occurring in HIV infected patients that smoke (Wojna *et al*., 2007). In addition to affected immunity, a poor adherence to treatment is also more common amongst smokers (Shuter and Bernstein, 2008; Feldman *et al*., 2006).

1.2.3.2 Alcohol consumption

In 1998, fifty percent of males and 17% of females in South Africa over the age of 15 years, consumed alcohol (Van Heerden and Parry, 2001). In a study done by Schneider *et al*. (2007), burden of disease as a result of alcohol use by gender and age group in South Africa was evaluated. Alcohol was the cause of 7.1% of all deaths. Injuries as well as cardiovascular diseases were classified as first and second in terms of attributable deaths. Top rankings for the overall attributable burden included family violence (39.0%), neuropsychiatric conditions (18.4%) and

road accidents (14.3%). Alcohol has a direct as well as an indirect influence on drug adherence in HIV infected persons with poor adherence to drug therapy occurring more commonly in those patients that use alcohol (Longmire-Avital *et al.,* 2012). In a study done in the USA by Kalichman *et al.* (2012), 52% of study participants that used alcohol did not adhere to their ARV treatment. HIV infected persons that use alcohol are also more likely to suffer from depression (Longmire-Avital *et al.,* 2012).

1.2.3.3 Physical activity

Although exercise, especially aerobic exercise (Schuelter-Trevisol *et al.,* 2012), can assist in improving muscle atrophy, lipohypertrophy and dyslipidemia in HIV infected patients (Singhania and Kotler, 2011), HIV infected persons are usually less physically active than HIV uninfected persons (Stein *et al*., 2012).

In a study done by Ogalha *et al.* (2011) in Brazil, HIV infected patients that exercised were compared to a non-exercising group. Exercise improved the quality of life of the patients as well as general health and mental health. In the exercise group, fat mass, resting heart rate, waist circumference and glucose levels were positively affected. Exercise also has a positive effect on body composition, strength and fitness (Botros *et al.,* 2012) with an increase in muscle mass and CD4 cell count occurring in patients that exercise moderately. Brisk walks, with or without strength exercise, are beneficial for HIV infected patients, and may also help with the long-term side-effects of the ARV treatment (Bonato *et al.,* 2012) such as metabolic changes, cardiovascular disease and psychological consequences (Botros *et al.,* 2012).

1.2.3.4 Psychosocial factors

Psychosocial factors can also affect a patient's food intake. Fear, anxiety, depression and social isolation may occur in HIV infection (Dong and Imai, 2012, p.877). Psychosocial factors can lead to negative social behaviours, which can impact on a patient's health status. Patients can engage in risky sexual behaviours as a result of financial vulnerability (Van Devanter *et al.,* 2011). Olley (2007) has reported that patients that belonged to a support group were more knowledgeable about HIV-related issues and also had a more positive attitude toward the illness and its treatment. Focus should be placed on the social environment of patients, since a positive psychological environment is important in HIV (Oppong Asante, 2012).

1.3 Aim and Objectives

The advantages of food supplementation in HIV infected patients have been emphasized in the literature, yet little attention has been given to the possibility that a patient's treatment success and quality of life may depend on whether a patient suffers from malnutrition and micronutrient deficiencies (UNAIDS, 2006). In view of the important role that food supplementation can play in the outcome of HIV infected patients on ART, this study evaluated the impact of a nutrition intervention (meatballs and spaghetti in tomato sauce) on parameters of health and nutritional status.

This study formed part of a larger study titled: "Improving the effectiveness of AIDS treatment while strengthening prevention in the Free State Province, South Africa (FEATS)". The FEATS study had three objectives that included: to develop a view of

treatment success; develop a more complete model of the determinants of treatment success; and understand the nature of links between treatment and prevention.

1.3.1 Aim

The main aim of this sub study was to describe the impact of a nutrition intervention (meatballs and spaghetti in tomato sauce), provided to HIV infected patients on HAART and their families, on the health and nutritional status of the HIV infected patients on HAART treatment.

1. 3.2 Objectives:

To achieve the aim, the following objectives were set:

1. To describe the following in a control (no nutrition intervention) and experimental (nutrition intervention) group before food supplementation in patients on HAART:

1.1. Socio-demographic status and household information;

1.2 Symptoms experienced as a result of taking HAART; and

1.3 Food supplements received from the government.

2. To describe the following in a control (no nutrition intervention) and experimental (nutrition intervention) group, before and after food supplementation in patients on HAART in an effort to determine the impact of the nutrition intervention:

2.1 Food consumed or bought by the household;

2.2 Food security; and

2.3 Anthropometry.

1.4 Outline of the dissertation

The dissertation has been structured to include an introduction and motivation to the study (Chapter 1); a literature review on food aid in HIV (Chapter 2); methodology (Chapter 3) followed by results (Chapter 4), discussion of results (Chapter 5) and conclusions and recommendations (Chapter 6).

Chapter 2: Literature review: Food aid in HIV

2.1 Introduction

According to Ivers and Cullen (2011) household food security is assured when "people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for an active and healthy life". Household food security is assured when a household has continual access to the amount and variety of safe foods so that all the members of the household live an active and healthy life. The household can thus produce their own food or buy sufficient food to meet their dietary needs. For a household to be food secure, the members of the household should have adequate food, not run out of food, eat balanced meals and not lose weight unintentionally. Household food security is thus a term used to describe how the household produces their food or acquires the food (WHO, 2009). Household food security also refers to how the household stores, processes and preserves food to prevent shortage of certain foods in certain seasons, as well as how the food is used or eaten in the household (WHO, 2009).

At an international level, the production of food is sufficient to meet the requirements of the world's people, but at the household level food is not available to everyone. Food security not only affects the individual, but can affect whole households and communities. Food insecurity may be temporary or chronic (Chopra and Darnton-Hill, 2006).

The term hunger is linked with food insecurity and food insecurity is further linked with wasting in HIV (Bahwere *et al.,* 2011). There is a two-way interaction between HIV and food security, where HIV/AIDS has an effect on food security but food security and food practices also have an effect on HIV progression (Loevinsohn and Gillespie, 2003). As mentioned, malnutrition as well as HIV, can have a negative impact on HIV care and treatment (Kadiyala *et al.,* 2009).

In chapter two a short overview of antiretroviral therapy, nutritional status and the relationship between malnutrition and HIV is given. The main focus will however fall on food security and supplementary food aid in the management of HIV.

2.2 Stages of HIV

As the HIV virus spreads throughout the body, the viral load increases while the blood CD4 cell count decreases. In addition to blood, both the central nervous system as well as the gastrointestinal tract are reservoirs for the virus. It can take years (eight to ten years) before active HIV replication affects CD4 cell count and increases risk for opportunistic infections (Dong and Imai, 2012, p. 866).

The infection occurs in four stages, namely acute HIV infection; asymptomatic; symptomatic; and AIDS (Dong and Imai, 2012, p. 866).

Acute HIV infection presents within two to four weeks after infection. At this stage of the infection, rapid viral replication occurs. A large number of patients develop flulike symptoms (including oral ulcers, loss of appetite, weight loss, fever, inflamed lymph nodes, malaise and pharyngitis). An HIV diagnosis is seldom made at this stage, due

to the fact that symptoms are not always present. After HIV antibodies develop and become apparent in the blood (seroconversion), an individual can test positive for HIV. During this time, patients are very infectious and viral loads are very high (Dong and Imai, 2012, p. 866; Hermans *et al.,* 2012).

Asymptomatic chronic HIV infection can last anything between a few months to 10 years. During this time most of the virus replication takes place in the lymphoid tissue, with very few or no symptoms (Dong and Imai, 2012, p. 866; Hermans *et al.,* 2012). Only a few subclinical changes can be seen during this period. Muscle mass may decrease. Water as well as food borne pathogens may affect patients more easily (Dong and Imai, 2012, p. 866).

Symptomatic HIV infection occurs when symptoms begin to appear. Non-AIDS defining symptoms such as fever, thrush, bacterial pneumonia, skin problems, sweats and fatigue as well as changes in body composition and nutritional status may become apparent (Dong and Imai, 2012, p. 866; Hira *et al.,* 2003).

AIDS is the advanced stage of HIV disease. It is the diagnostic term for someone with at least one well-defined, life threatening clinical condition (Dong and Imai, 2012, p. 866; Hira *et al.,* 2003). In developing countries late presentation of HIV is common, and is associated with negative outcomes and faster progression of the disease (Mukolo *et al.,* 2012; De Olalla *et al*., 2011; Waters and Sabin, 2011).

2.3 Highly Active Antiretroviral Therapy (HAART)

According to the WHO (2009), late access to HAART therapy is still the most important threat to patient survival. In the UNAIDS report of 2008, it is stated that the aim of medical treatment of HIV is to reduce morbidity and mortality related to HIV, to ensure quality of life, to restore immunological function and also to suppress viral replication (UNAIDS, 2008).

In an effort to improve quality of life, lifestyle modifications are important for patients on HAART. Lifestyle modifications include exercise, proper nutrition and prevention of weight loss if a patient has a normal body weight as well as abstinence from drugs, alcohol and smoking (WHO, 2009).

2.3.1 Categories of ARV's

According to the South African Antiretroviral Treatment Guidelines, a patient is eligible to start on ARV's when their CD4 count is below 200 cells/mm³ (after 2012 a CD4 cell count of 350 cells/mm³ or less is used to determine whether an HIV infected patient is eligible for treatment). Patients who have a CD4 count below 350 cells/mm³, with HIV and tuberculosis (TB); or pregnant women with HIV are eligible for HAART.

Globally four major treatment modalities are available, namely:

1. Nucleoside reverse transcriptase inhibitors (NRTIs),

2. Non nucleoside reverse transcriptase inhibitors (NNRTIs),

3. Protease inhibitors (PIs) and

4. Fusion or entry inhibitors (The South African Antiretroviral Treatment Guidelines, 2010; Grinspoon, 2005; Fields-Gardener *et al*., 2004).

The different drugs that are used in the South African ARV program have made a significant contribution to the prevention of new infections (South African Antiretroviral Treatment Guidelines, 2010). Although ARV treatment can cause clinical and metabolic complications, it increases a patient's life expectancy (Oh and Hegele, 2007; Montessori *et al*., 2004), and has the potential to reduce viral load to undetectable levels and to elevate CD4 cell counts (Nerad *et al*., 2003).

Tabel 2.1 shows the adult regimes currently available in South Africa (South African Antiretroviral Treatment Guidelines, 2010).

Table 2.1 Adult ARV regimes in South Africa

First line		
All new patients, needing treatment, including pregnant women	TDF + 3TC/FTC +EFV/NVP	TB co-infections, EFV is preferred NVP for women in child-bearing age
Currently on d4T-based regimen. With no side effects	d4T + 3TC + EFV	Stay on d4T if well tolerated. Early switch with toxicity.
Contraindication to TDF: renal disease	AZT + 3TC + EFV/NVP	
Second line		
Failing on d4T or AZT regimen	TDF + 3TC/FTC + LPV/r	.
Failing on a TDF regimen	AZT + 3TC + LPV/r	
Salvage		
Failing second line regimen	Specialist referral	

The use of ARV's has the potential to impact significantly on prognosis of HIV infected patients (Watermeyer, 2011) and in many developed countries, HIV has become a manageable chronic condition (Nambiar *et al.,* 2011). The success of ARV treatment, is however, directly linked to adherence (Watermeyer, 2011). Patients using ARV's should understand the importance of adhering to the drug therapy to improve clinical outcomes, reduce HIV transmission (Holstad *et al.,* 2011), suppress viral replication and improve physical well-being (Idigbe *et al.,* 2005). Factors such as literacy, age, psychosocial issues, depression, homelessness, stigma and medication side-effects can have an effect on a patient's adherence. Poor follow-up can also contribute to poor outcomes (Dong and Imai, 2012, pp. 867-868; Talam *et al.,* 2008).

Non-adherence or interruption or discontinuation of HAART, can be life-threatening for patients, since it can increase the risk for opportunistic infections and death. Ensuring adherence to treatment is one of the most difficult challenges in the management of HIV (Enriquez and McKinsey, 2011; Stein, 2009; Fenton and Silverman, 2008, p.1001).

2.3.2 Adverse effects of HAART

Although HAART plays an important role in patient's survival, HAART also has adverse effects (Stein, 2009; Handford *et al,.* 2006). For this reason, patients sometimes hesitate to start with ARV's (Fenton and Silverman, 2008, p.1001; Nzienqui *et al.,* 2006).

Side effects of the different group of drugs may differ. Fever, diarrhea, nausea, anorexia, headache and sinusitis may occur when therapy is initially introduced (Fenton and Silverman, 2008, p.1001).

Unplanned weight loss is common (five to ten percent over six months) in patients initiating ARV treatment (Tang *et al.,* 2005; Bell, 1998). Hepatic necrosis, Stevens-Johnson syndrome, lactic acidosis and hypersensitivity are more serious life-threatening conditions (Reust, 2011; Stone *et al.,* 2010; Beadles *et al.,* 2009; Fenton and Silverman, 2008, p.1001).

Lactic acidosis can occur as early as one month after starting on ARV treatment (WHO, 2009). When lactic acidosis occurs, high levels of venous lactate are present (Salomon *et al*., 2002). Lactic acidosis is seen more commonly in patients with a high BMI (Dlamini *et al.,* 2011; Matthews *et al.,* 2011; Reust, 2011; Montessori *et al*., 2004). Lactic acidosis can cause general fatigue and weakness as well as gastrointestinal symptoms (nausea, vomiting, diarrhea, and weight loss), respiratory symptoms (tachypnea and dyspnea) and neurological symptoms (Vorasayan and Phanthumchinda; 2011; WHO, 2009). If lactic acidosis is not treated, it can be life threatening. It can lead to cardiac dysrhythmias, liver failure and death (Montessori *et al*., 2004). The liver may be enlarged and tender and liver enzymes increased (WHO, 2009).

Despite the improved life expectancy in patients on HAART, it is also associated with long term chronic side effects. These can include an increased risk of becoming overweight and obese and developing insulin resistance (Reust, 2011; Tomazic *et al*., 2004). Other side effects may include peripheral neuropathy, as well as reduced bone mineral density. HIV infection itself may have an effect on the pancreatic beta

cell function and insulin secretion (Montessori *et al*., 2004), while NRTI's and PI's can also increase risk of developing insulin resistance (Engelson *et al*., 2006).

Fat redistribution is also called HIV-associated lipodystrophy syndrome (HALS) (Marcason, 2009). HALS is characterized by peripheral fat-wasting in the cheeks and buttocks, and localization of fat in the visceral area. Buffalo hump, peripheral lipomatosis and enlargement of breasts may also occur. The fat redistribution that results in visceral and abdominal fat increases the risk for glucose intolerance, insulin resistance and other metabolic abnormalities (Aboud *et al.,* 2007) which in turn increases risk for cardiovascular disease, hypertension (Freitas *et al,.* 2011; Singhania and Kotler, 2011; Marcason, 2009; Montessori *et al.*, 2004) and dyslipidaemia (Singhania and Kotler, 2011; Kotler, 2000).

Dyslipidemia occurs when triglyceride levels are increased or HDL (high density lipoprotein) cholesterol is decreased (Montessori *et al*., 2004). Lipid abnormalities can contribute to diabetes, heart disease and stroke (Nerad *et al*., 2003). A high intake of animal protein, trans fats and a low intake of soluble fiber can worsen dyslipidemia in patients on protease inhibiters (Shah *et al*., 2005).

ARV's may also result in an increase in resting energy expenditure (REE) and alteration in bone metabolism and can also cause vitamin D deficiency (Luetkemeyer *et al.,* 2012; Kosmiski, 2011). Tenofovir is one of the medications that decreases bone mass density and increases bone turnover markers (Rasmussen *et al.,* 2012).

2.4 Relationship between malnutrition and HIV/AIDS

HIV/AIDS not only has an impact on health, but also affects nutrition, food security and socio-economic development (WHO, 2003). The nutritional status of people living with HIV can be improved by using available resources wisely, learning from clinical experience and applying scientific-based evidence to treatment programs (WHO, 2003).

The immune system can be affected by either malnutrition or HIV or the two combined. Malnutrition is a problem often seen in HIV infected patients (Argemi *et al.,* 2012; Hu *et al.,* 2011) and is one of the consequences of HIV infection (Hu *et al.,* 2011). When both these factors are present at the same time, it affects a person's food intake, absorption and metabolism and immune function, which can lead to wasting (Colecraft, 2008).

HIV increases the risk of malnutrition through reduced food intake and decreased nutrient absorption together with increased nutrient needs and losses. The time that it takes for HIV to progress also depends on a patient's nutritional status before and after infection (Burgess *et al.,* 2009, p. 67). Poor nutrition can have a negative impact on a patient's health, which can in turn increase morbidity and mortality (Fenton and Silverman, 2008, p. 1008; Suttajit, 2007).

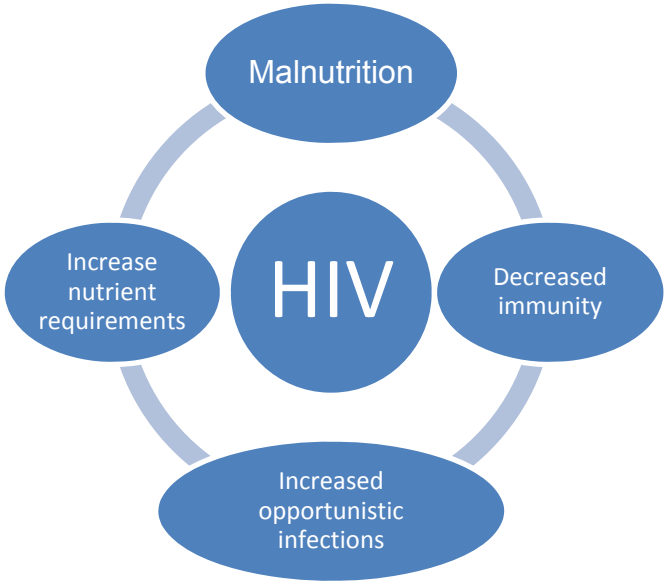

Figure 2.1: Vicious cycle of HIV and malnutrition (Colecraft, 2008)

As seen in Figure 2.1, malnutrition has a negative effect on HIV as well as food security which can create a vicious cycle (Colecraft, 2008). As the disease progresses, patients can become catabolic, and this leads to an increase in infections, which can lead to a further decrease in food intake and worsening of malnutrition. In addition, HIV can have an effect on metabolic functions, storage of nutrients and utilization of nutrients (Ivers *et al.,* 2009).

Malabsorption of fats and carbohydrates is common, leading to lower absorption of fat-soluble vitamins and further affecting the immune system. Together with the increased energy and protein requirements of HIV infection, the impact can be significant (Ivers *et al*., 2009; McDermott *et al.,* 2003). HIV infected patients have a higher resting energy expenditure (about ten percent higher) than non-infected patients. It can be even higher in patients with AIDS. This is also a contributing factor to weight loss and malnutrition (Sutinen and Yki-Jarvinen, 2007).

As a result of the above, HIV wasting syndrome is commonly observed in HIV infected patients (Ogoina *et al.,* 2010; Tang *et al.,* 2005). Weight loss and wasting are multi-factorial. Lack of adequate intake, malabsorption, lower CD4 cell count, high viral load, diarrhea, nausea, metabolic irregularities, uncontrolled opportunistic infections or a lack of physical activity can worsen weight loss and wasting (WHO, 2009; Colecralft, 2008; Fenton & Silverman, 2008, p.1008; Suttajit, 2007; Tang *et al.,* 2005).

2.5 Causes of food insecurity

A patient can only function optimally if he/she continues to eat, either by working for money for food or growing food. Food insecurity can have a negative impact on this cycle.

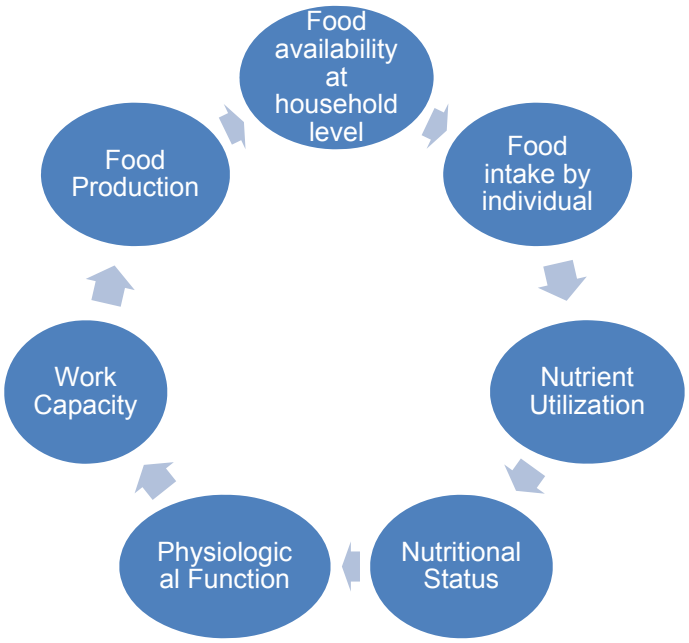

Figure 2.2: Nutrition Cycle (Tomkins and Watson, 1993)

As seen in Figure 2.2, factors that may affect nutritional status include availability of food, food intake, nutrient utilization, physiological factors, physical activity and food production (Tomkins and Watson, 1993).

2.5.1 Food availability at household level

Food insecurity is a major challenge in sub-Saharan Africa (Nagata *et al.,* 2012), and a number of African countries have identified food security as an important goal to focus on. To assure food access to all households, all individuals or households must have adequate resources to assure enough of the appropriate foods (Kuzwayo, 2008).

The amount and availability of food has an effect on dietary intake and will eventually impact on anthropometric measurements and health status (Kadiyala and Rawat, 2012). Although poverty is one of the major causes of food insecurity, it is not the only cause (Wolfe *et al.,* 2003), but food security is most often associated with income and has an effect on general health, coping strategies, risk of developing depression, sexual behaviour and disease progression (Ivers and Cullen, 2011). There are a wide variety of causes for household food insecurity (most of which are the results of poverty) such as food shortages, inadequate feeding practices and poor living conditions (Burgess *et al.,* 2009, p. 81). Other causes include illiteracy, unemployment, renting of houses, female headed households (Bawadi *et al.,* 2012), single headed households, and living in houses that need repair (Huet *et al.,* 2012). Low food production and a lack of knowledge on food budgeting also need to be considered (Burgess *et al.,* 2009, p. 81). It is important to consider all the causes of

food insecurity (Burgess *et al.,* 2009, p. 81). The result of food insecurity is most often poor dietary intake. School absenteeism also increases due to food insecurity and HIV, as children often have to stay home to help ill adults (Bawadi *et al.,* 2012).

2.5.2 Food intake by the individual

In addition to poverty, access to food because of transport problems, functional limitations or an inability to prepare food or eat the available food due to illness may also affect nutritional status (Wolfe *et al.,* 2003).

When food insecurity is present, a reduction of food intake is common, characterized by intake of a small variety of food, usually carbohydrate foods (Seligman *et al.,* 2010). Other factors that may affect food intake of the individual include pain, loss of appetite, general body weakness, diarrhoea, nausea and vomiting, coughing and mouth sores (Norval, 2004).

2.5.3 Nutrient Utilization

An improvement in micronutrient status can improve the immune-competence of a patient and decrease the side-effects of treatments (Scrimgeour and Condlin, 2009). Ongoing diarrhea is a major cause of malabsorption as well as malnutrition in HIV infected patients. The diarrhea damages the gastrointestinal tract and can lead to further worsening of the condition. It is important that patients protect themselves from acquiring new pathogens through food-born sources, risky sexual behavior and

an unhygienic environment (Bouvier, 1998). Micronutrient deficiencies may signal malabsorption (Patrick, 1999).

2.5.4 Food distribution

Traditionally, women in a household are the primary caregivers, usually responsible for the production, buying and preparation of food as well as looking after ill family members. When these women are HIV infected or when they are taking care of ill family members, younger inexperienced women in the household may be expected to take over these responsibilities (UNAIDS, 2008).

Distribution of food in the household affects the amount and type of food a specific household member is going to eat (for example: family size, number of dependents, age of the people in the household and beliefs about appropriate food) (Belachew *et al.,* 2011). Women do not always have a say in a household, which puts them at greater risk of experiencing food insecurity (Belachew *et al.,* 2011; Hindin, 2006; Tomkins and Watson, 1993). In the case of food insecurity, women would rather skip a meal so that they can feed their children. In such households a very small variety of food is eaten (Labadarios *et al.,* 2011). Female headed households, the elderly, disabled and low income households are disadvantaged groups with an increased risk of becoming food insecure (Riley *et al.,* 2012; Labadarios *et al.,* 2011).

2.5.5 Depression and food security

According to Weiser *et al* (2009) and Tsai *et al.* (2012), depression also plays a major role in household food security in HIV individuals, since depression doubles the risk for food insecurity. Food is one of the first concerns when people struggle to cope (Kadiyale and Gillespie, 2003). Health psychology is a global health concern and focus needs to be placed on individual interventions as well as broader level initiatives to address this problem (Tomlinson *et al.,* 2010). Household food insecurity can have a mental impact, which contributes to depression (Kong et al., 2012; Lewis *et al.,* 2012) and increases the susceptibility to HIV as well as the vulnerability to the impact of the virus (Kadiyale and Gillespie, 2003). Depression is often under-diagnosed (Kong et al., 2012; Lewis *et al., 2012*) even though it increases the risk for HIV transmission, risky sexual practices and non-adherence to treatment. On the other hand, good physical and mental health decreases the odds for food insecurity (Hinnen *et al.,* 2012; Weiser *et al.,* 2011).

2.5.6 Work load and food production

HIV can have an effect on physical fitness and health, as well as ability to work or to grow food, which may impact on food security. Not only does physical fitness affect work, it also has an effect on a patient's strength, immune function and BMI (Roubenhoff and Wilson, 2001; Shephard, 1998; Tomkins and Watson, 1993). It may be of benefit to families with ill members to make use of labour-saving practices such as growing crops that are easier to grow and prepare (sweet potato) and

growing gardens in small containers that are easy to water (plastic boxes, cans, tyres) (Burgess *et al.,* 2009, p. 21).

2.5.7 Environmental factors

According to Haile (2005), a third of the population in Africa has to face hunger, malnutrition and food crisis. Factors such as land, climate, infrastructure (roads), traveling distances, unsafe conditions for walking, and food prices can have an effect on food intake (Haile, 2005; Tomkins and Watson, 1993). Rural environment, small marginal farmers and the urban poor are vulnerable groups that can be affected by household food insecurity (Kuzwayo, 2008). These groups usually rely on rain for their crops to grow. There is a direct link between poverty, food insecurity and vulnerability. Other factors such as transport costs, lack of marketing strategies, high disease burden (Haile, 2005) political influences (Scelza, 2012), social factors and psychological factors (Ganasegeran *et al.,* 2012) can influence food intake that can impact on malnutrition (Scelza, 2012).

2.6 Impact of food insecurity

As previously mentioned, food insecurity is linked with sexual behavior, anxiety, physical and mental health, work load, food production and food choices (Ivers and Cullen, 2011), HIV transmission, non-adherence and progression, health care and mental health (Kalichman *et al.,* 2010).

2.6.1 Sexual behaviour

Food insecurity increases the risk of spreading HIV/AIDS through the practice of unprotected sex for food or money (WHO, 2009). Research done in Southern Africa has shown that an inadequate amount of available food is linked with a low rate of condom use, intergenerational sex partners and sexual exchanges. Hunger as well as malnutrition may result in young women using sexual favors for survival (Oyefara, 2007).

Food insecurity is also linked with a delayed menarche in girls. The age of menarche reflects on the development of girls in terms of sexual maturation (Belachew *et al.,* 2011). Adolescents from HIV-affected households are more likely to be physically and emotionally abused (Cluver *et al.,* 2011).

According to Miller *et al.* (2011), there is a need to focus on food security programs for women with HIV/AIDS, so that sexual behaviors related to hunger can be decreased. Such programs have the potential to improve the health and total well-being of HIV infected patients.

2.6.2 Food choices

Poverty, together with food insecurity, decreases the accessibility to a balanced diet, with adequate amounts of micronutrients, macronutrients, fatty acids and other nutrients. Other factors such as gender roles, socio-economic factors and structural factors also pay a role in food choices (Dean *et al.,* 2012). Poverty and food insecurity cause patients to rely on foods from plant sources with very little animal

protein and fortified foods being eaten (De Pee and Bloem, 2009). In these circumstances, unhealthy food choices are made (De Bem Lignani *et al.,* 2011). Intake is often from food high in sugar and fat (Huet *et al.,* 2012), fresh fruit (Mello *et al.,* 2010), vegetable and dairy intake is low (Guilliford *et al.,* 2003).

2.6.3 HIV transmission, non-adherence and progression

Food insecurity increases a patients experience of hunger, ARV side effects are worse and poor adherence to treatment is common (Nagata *et al.,* 2012). Food insecurity is linked with increased risk of immunological failure and HIV transmission (Weiser *et al.,* 2011; Anema *et al.,* 2009) and poor response to treatment (Shannon *et al.,* 2011). Food insecurity further decreases accessibility to treatment that may affect patient survival (Anema *et al.,* 2009), and it can worsen non-adherence to ARV treatment, resulting in treatment interruptions and irregular clinic visits. Food insecurity can also contribute to non-adherence due to the fact that patients think they should not drink their treatment if there is no food to eat. Competing expenses (such as: food versus medical expenses), can also impact on adherence (Nagata *et al.,* 2012; Weiser *et al.,* 2011).

2.6.4 Health care

Food insecurity can result in poor health, while poor health can again increase the risk of being food insecure (Kaiser *et al.,* 2007). Food insecurity is linked to increased visits to emergency units, increased hospitalisation rates, postponement of needed medical assistance and medication (Weiser, *et al.*, 2009), increases in

chronic illnesses in adults and children (Weinreb *et al.,* 2002) and increases in opportunistic infections (Weiser, *et al.*, 2012). There is thus a direct link between HIV, food insecurity and an increased risk for morbidity and mortality (Tsai *et al.,* 2011).

2.6.5 Mental health

As previously mentioned, a positive correlation between food insecurity and poor mental health has been identified (Cole and Tembo, 2011) with higher prevalence of maternal depression, psychosis spectrum disorder, domestic violence and children with behavioral problems associated with food insecurity (Melchior *et al.,* 2009).

Food insecurity may result in increased levels of worry, concerns, anxiety (Nanama and Frongillo, 2012) and depression (Hadley and Patil, 2008) in adults as well as children (Weinreb *et al.,* 2002) which may result in weight loss and lack of sleep.

2.7 Nutrition intervention in HIV

The importance of nutrition in the treatment of HIV infection and AIDS is widely recognized. As an intervention, it should start when the initial diagnosis is made and should include nutrition counseling. During the later stages of HIV/AIDS, more intense nutrition support might be needed which may include enteral support (Thuita and Mirie, 1999). Optimal nutrition plays an essential role in maintaining a patient's immune system and survival and may have a positive effect on muscle mass, decrease HIV-related symptoms, enhance a patient's quality of life and contribute to improved drug adherence (Dong and Imai, 2012, p. 868).

Individualized nutrition management and counseling plays an important role in treatment success (Fenton and Silverman, 2008, p.1010). Evidence shows that nutrition interventions can have an impact on disease progression as well as health outcomes in HIV infected patients (Fawzi *et al*., 2005; Nerad *et al.*, 2003). Thus early ongoing medical nutrition therapy is important for all individuals with HIV-infection and AIDS (Dong and Imai, 2012, p. 873; Thuita and Mirie, 1999).

The aim of nutrition intervention should include improving patients' nutritional knowledge and nutritional status by educating patients about their condition, thereby enhancing their sense of empowerment and improving and prolonging their quality of life (Dong and Imai, 2012, p.873; Fenton and Silverman 2008, p.1010).

When considering nutrition intervention, nutrient requirements (including macronutrients and micronutrients) need to be taken into account.

2.7.1 Macronutrient requirements

Macronutrient metabolism is affected by HIV infection (Ware *et al.,* 2002). A diet low in energy and macronutrients together with poor nutritional status can lead to an impaired immune response (Cunningham-Rundles et al., 2005; Kim et al., 2001). Adequate macronutrients are important to maintain and restore malnutrition-related immune dysfunction (Fields-Gardener et al., 2004). Wasting in HIV infected adults is often an indication that macronutrient requirements are not being met (ASSAf, 2007, p. 131).

2.7.1.1 Energy and protein

Patients affected by HIV, often have an energy intake that is much lower than the recommended intake (Sachdeva *et al.,* 2011). An increased amount of energy and protein are needed during HIV infection because of metabolic changes. Metabolic changes are also often associated with inefficient utilization of nutrients (Colecraft, 2008).

Energy and protein requirements may differ, depending on the patient's age, gender, amount of physical activity, pregnancy, lactation, health status at the time of HIV infection, progression of the disease and the development of complications that can decrease nutrient intake (ASSAf, 2007, p. 132). A ten percent increase in energy is required during the asymptomatic HIV stage to ensure maintenance of body weight and physical activity (WHO, 2003). During the symptomatic stage, energy requirements may be increased by twenty to thirty percent (WHO, 2009; WHO 2003).

There is a direct correlation between a patient's energy intake, weight and CD4 cell count. Weight loss, together with a low energy intake, is linked with faster disease progression (ASSAf, 2007, p.132). Prolonged HIV with or without TB or other opportunistic infections, is linked with a negative energy balance. A negative energy balance can occur because an HIV infected patient does not always have the ability to increase his/her food intake. This can lead to a decrease in protein and fat stores (ASSAf, 2007, p.134).

A positive nitrogen balance and improved muscle mass can be achieved by increasing protein intake (Fenton and Silverman, 2008, p.1011; Mc Dermott *et al*.,

2003). Protein requirements are about 1-1.4 g/kg for maintenance and 1.5-2 g/kg for repletion, except in patients with kidney or liver disease (Fenton and Silverman, 2008, p.1011). Nutrition counseling about an adequate protein intake plays an important role in improving the weight status of patients, increasing their response to treatment as well as their quality of life, self-image and survival (Tabi and Vogel, 2006; Solomon and Lynde, 1992).

2.7.1.2 Fat

Tolerance to fat varies from person to person. In general, the fat requirement for an HIV infected and HIV uninfected individual is the same (WHO, 2003).

HIV, as well as ARV's, can affect blood lipid levels. High levels of triglycerides can occur as well as a decrease in HDL-cholesterol and sometimes an increase in LDL cholesterol levels in patients on HAART (Metroka *et al.,* 2007), increasing the risk for cardiovascular disease (Kruger *et al.,* 2011).

Omega-3 fatty acids can assist in improving immune function by reducing inflammation related to higher consumption of omega-6 fatty acids (Peters *et al.,* 2012; Thusgaard *et al.,* 2009; Fenton and Silverman, 2008). By increasing the intake of omega-3 fatty acids, serum triglyceride levels can be decreased (Peters *et al.,* 2012; Woods *et al.,* 2009).

2.7.2 Micronutrient requirements

Micronutrient deficiencies often occur in advanced HIV disease (Tomkins, 2005) and a deficiency can increase the risk for disease progression and mortality (Drain *et al*., 2007; Semba, 2006; WHO, 2003). Deficiencies can be the result of low food intake, gastrointestinal malabsorption, increased losses, increased utilization and increased excretion of nutrients (ASSAf, 2007, p. 143).

Use of a multivitamin- mineral supplement that provides a hundred percent of the recommended daily allowance (RDA) (WHO, 2003) to slow down progression to AIDS, and to lower the risk of death has been suggested in HIV infected patients (ASSAf, 2007, p.144). Deficiencies in vitamin A, B_1, B_2, B_6, B_{12}, and E in addition to folic acid, zinc and iron can impair host resistance and lymphocyte function (WHO, 2003). A study done in Cape Town showed that the prevalence of Vitamin A and zinc deficiencies was high under HIV infected adults (Visser *et al.,* 2003).

Large doses of antioxidants decrease oxidative stress, which can contribute to decreased CD4 counts and increased viral replication in HIV infected patients (Arendt *et al*., 2008; Drain *et al*., 2007; Faintuch *et al*., 2006) and for this reason large doses of micronutrients are not recommended. Vitamin A, zinc and iron can have a negative effect on a HIV patient's outcome if used in large amounts (above the recommendation) (WHO, 2003).

According to Fawzi *et al*. (2005), multivitamin supplementation should not be seen as an alternative to HAART in developing countries, but should be used as a complementary intervention as part of a comprehensive care package (WHO, 2003).

2.8 Food support in HIV

To assure adherence, a supportive environment is needed that includes access to ARV's, guidelines on using treatment effectively, a healthy lifestyle and social support (Wasti *et al.,* 2012). Without food, proper hygiene and housing, patients will not fully benefit from ARV's (Riley *et al.,* 2012). Effective, affordable and acceptable nutrition interventions for HIV infected patients are thus critical in the care of HIV infected patients (Piwoz and Preble, 2000).

According to a study done in a clinic setting in Ghana, a high number of HIV infected patients died as a result of a poor nutritional status (Zachariah *et al.,* 2009). Hu *et al.* (2011) have stated that "nutrition support should be considered as an integral part of national and community HIV/AIDS treatment". According to Kadiyla and Gillespie (2004) food and nutrition security is very relevant in all phases of HIV management, including; prevention, care and treatment. Food aid is a fundamental component of an effective management approach.

The provision of consistent meals/food to HIV infected patients is needed, to address food insecurity (Kalichman *et al.,* 2010). Food programs can play an important role in supporting patients, decreasing food insecurity, increasing nutrient intake and providing care to patients living with HIV/AIDS (Walker and Kawachi, 2012; WHO, 2009).

Before food support is introduced, it is essential to assess the specific situation and needs of the patient in order to ensure that interventions are relevant and effective.

2.8.1 Assessment of nutritional status of HIV infected patients

Assessment of nutritional status plays an important role in the general care of patients that are HIV infected (Gerrior and Neff, 2005). Ideally, each patient's nutritional status should be assessed with every visit, in an ongoing process (Dong and Imai, 2012, p. 873; Nerad *et al*., 2003). The ideal is that all HIV infected patients should have access to a dietician or to a qualified nutrition professional to ensure nutritional assessment, education and support, as well as reassessment to evaluate interventions (Dong and Imai, 2012, pp. 868-876).

Nutrition assessment should include medical as well as nutritional factors. One should consider the stage of the HIV disease, comorbidities, opportunistic infections, metabolic complications, biochemical status as well as changes in body shape (check every 3 to 6 months) (Gerrior and Neff, 2005). Weight, gastrointestinal symptoms, anthropometric measurements, environment, eating behaviors, mental health, nutritional barriers, food intake, food preparation, food allergies and intolerances, supplementation, alcohol intake and other drug therapies should also be assessed. Good assessment can further assist in identifying problems such as inadequate food intake, increased nutrient needs, problems with swallowing, food-drug interactions, weight loss and unsafe food practices (Dong and Imai, 2012, pp. 868-876; Stambullin *et al.,* 2007).

By assessing a patient's diet history, one can assess whether a patient's dietary intake is adequate, especially the nutrients involved in immune function. Psychosocial conditions such as anxiety and depression can also be identified as these conditions can also affect a patient's nutrient intake (Dong and Imai, 2012, p. 877).

Anthropometric measurements such as weight, usual weight, goal weight and percent of ideal body weight are helpful measurements when assessing nutritional status. Other measurements that can be of value include waist, hip, and neck circumference as well as lean body mass (triceps skinfold and mid arm muscle circumference) (Dong and Imai, 2012, p. 877; Gerrior and Neff, 2005).

Biochemical measurements that should be monitored include CD4 cell count, viral load, albumin, hemoglobin, iron status, lipid profile, liver function, renal function, glucose and insulin levels (Dong and Imai, 2012, p.873; Mgogwe *et al.,* 2012).

2.8.2 Advantages of food and nutrition support

As previously mentioned, improvement of nutritional status by nutrition interventions (including food and supplements) play a vital role in proper functioning of a patient's immune system. Optimal nutrition together with lifestyle changes, can contribute to strengthening the immune system, increase a patient's life span, assist in the management of symptoms and support the effectiveness of ARV's (Suttajit, 2007).

According to the WHO, nutrition interventions should be adequate and appropriate from the early to advanced stages of HIV infections, to ensure better outcomes (WHO, 2009). Food aid can save the lives of HIV patients (WHO, 2009) and food supplementation has the potential to contribute to a better clinical outcome in HIV infected patients by having a positive effect on weight status and decreasing disease progression. This positive effect can be seen in patients using HAART as well in those not yet receiving antiretroviral therapy (Rawat *et al.,* 2010). On the other hand,

poor knowledge about nutrition and poor dietary practices, can lead to a faster progression of HIV to AIDS (Bukusuba *et al.*, 2010).

According to a study done in two public health care centers in Mozambique, nutrition education and food supplementation had a positive effect on the total well-being and health of participants, including BMI (Scarcella *et al.,* 2011). Food interventions, supplementation as well as education are basic ways to improve nutrition, and to ensure that the immune system is strengthened (Duggal *et al.,* 2012; Suttajit, 2007). Nutrition education can also assist in lowering mortality rates and improving quality of life (Duggal *et al.,* 2012). Nutrition counseling also has the potential to improve a patient's food habits, like increasing fiber and energy intake (Almeida *et al.,* 2011; Rabeneck *et al.,* 1998). In HIV infected persons, education should include food safety, general hygiene and water safety (Kennedy, 2001).

In a study done in Uganda, participants reported receiving information on the importance of healthy eating when living with HIV. Although they received nutrition information, less than half of the patients consumed a balanced diet, due to food insecurity. This emphasizes the importance of providing food aid together with nutrition education (Bukusuba *et al.,* 2010).

Support groups are a good method of communicating and implementing nutrition-related interventions (Bukusuba *et al.,* 2010). A patient's immune system can be strengthened by educating patients about optimal nutrition and helping them to identify key foods and nutrients as well as education and support on healthy lifestyle changes (Suttajit, 2007).

The WHO, UNAIDS as well as the World Food Program have suggested that food support should be integrated into all HIV treatment programs (Weiser *et al.,* 2010).

Food supplementation programs may replace a patient's usual food intake (Schwenk *et al.,* 1999) but should ideally improve food security, decreasing stress in households and addressing malnutrition (Ivers *et al.,* 2010, Bahwere *et al.,* 2009).

Food supplementation can also result in improved levels of physical activity and also has a positive effect on reducing sexual favors for food or money to obtain food (Shannon *et al.,* 2011). In addition, food aid can improve treatment adherence and encourage more regular clinic visits (Ivers *et al.,* 2010).

Patients that are ill are a source of stress for households or families (Makoae, 2011). Because of the uplifting effect of food supplementation, programs that assist with the burden of food insecurity can also provide emotional support to patients and decrease depression (Tsai *et al.,* 2012).

2.8.3 Types of food support

HIV infected patients should have access to high quality, nutritious food, so that optimal dietary patters can be established (Sachdeva *et al.,* 2011), especially in the symptomatic stage of HIV infection to prevent deterioration of nutritional status (Sherlekar and Udipi, 2002).

Ready-to-use therapeutic foods may be more effective than supplementing ordinary food, as far as weight gain and physical performance are concerned (Bahwere *et al.,* 2009). Supplementation of foods that are regularly eaten can, however, impact on

food security (Cantrell *et al.,* 2008). According to Hickey (1991) patients in a hospital setting have different nutritional requirements, levels of tolerance and degree of gut dysfunction, implying that one food supplement may not be suitable for all patients.

Mamlin *et al.* (2009) has stated that: “HIV infected patients and their dependents who are hungry require food as an integral component of care”. In that study, they supplied food (vegetables, eggs, dairy products and sometimes corn and chicken) as a form of supplementation to HIV infected patients and their families in Kenya. This form of support not only affected the patient’s weight status but also their health. Patients were healthier and stronger, able to do general work and grow their own gardens which contributed to improved household food security.

According to a study done in a rural area in Bangladesh (Nahar *et al.,* 2009), not all the patients that qualified for supplementation received it. In contrast, a study done in nine sub-Saharan African countries, found that ninety percent of ARV sites gave some form of nutrition support, which included counseling and supplementation (Anema *et al.,* 2011).

Globally fortified staples such as maize are often used as a form of food aid. Dairy products such as milk can also be used, but this form of support can be expensive (Carney *et al.,* 2011; Bushamuka *et al.,* 2005). By encouraging households to grow community gardens, food security can be improved, dietary intake can be improved and family relationships can improve (Carney *et al.,* 2011; Bushamuka *et al.,* 2005). Community gardens can provide food to people who are not able to work due to illness or to those who do not have land to make their own gardens. In Zambia, community gardens are grown for the benefit of the ill, those that are not able to grow their own due to illness. Some of the crop was sold and the money used to buy

chickens. Households in need each received five chickens but in return had to give five baby chickens to the next family that needed support, making a big difference to food security in Zambia (Burgess *et al.,* 2009, p. 21).

2.8.4 Current support for HIV infected persons in the Free State Department of Health

According to the supplementation policy of the Department of Health (DoH) in the Free State Province, nutritional supplementation plays an important role in the management of HIV/AIDS patients (Nutrition Supplementation Policy, DoH, 2006). In the Free State, supplements are available through the Nutrition Supplementation Programme (NSP) for underweight infants, underweight pregnant and lactating women, TB patients and underweight HIV patients. The policy states that nutrition education should also be given to patients as part of the programme and should include guidelines on healthy eating; hygiene; dangers of alcohol and smoking.

As part of the NSP in the Free State, underweight children and adults as well as pregnant women can receive 1 kg enriched, lactose free protein drink and 2 kg enriched maize meal per patient until they reach a healthy weight. In the case of children they should also receive 100 ml Multivitamin syrup per child per month. Vegetable seeds should also be provided with the first visit (underweight persons, in case of household food insecurity, or according to identified needs) (Nutrition Supplementation Policy, DoH, 2006). The Free State DoH, is currently busy adapting the existing nutrition supplementation policy, to substitute the enriched maize meal with a lactose free energy drink.

There are a number of factors that affect the success of the NSP programme. Lack of training of staff that need to manage the programme, incorrect identification of target groups, entry and exit criteria that are applied incorrectly, inadequate assessment of nutrition-related disease, inadequate counselling and poor monitoring have all hindered the programme (Hendriks *et al.,* 2005).

Disability grants are considered important in assisting patients without an income, especially low-income HIV patients. The grant system targets patients that are not able to work, but has been characterized by many challenges. Patients do not always adhere to treatment so that they can remain eligible for the grant system; some patients receive grants beyond the exit criteria; and other are working and receive an additional income (Venkataramani *et al.,* 2010).

Social support (grants and food parcels) plays an essential role in HIV infected patients and their families, but create a platform for stigmatization in South Africa (Ncama *et al.,* 2008). According to Vekataramani *et al.* (2010),"welfare measures need consideration". The disability grant is, however, seen as a lifeline for many HIV/AIDS-affected families (Phaswana-Mafuya *et al*., 2009). De Paoli *et al.,* (2012) suggest that a chronic illness grant, basic income grant and an unemployment grant should be considered for patients when they no longer qualify for a disability grant (De Paoli *et al.,* 2012).

Chapter 3: Methodology

3.1 Introduction

The main aim of this study was to describe the impact of a nutrition intervention (meatballs and spaghetti in tomato sauce) on the health and nutritional status of HIV infected patients on ARV treatment and their families.

1. To achieve the above mentioned objective, information about the following was collected before intervention to describe the sample (control and experimental):

- Socio-demographic status and household information;
- Symptoms experienced as a result of taking HAART; and
- Food supplements received from the government.

2. In order to determine the impact of the intervention the following were determined in a control (no nutrition intervention) and experimental (nutrition intervention) group, before and after food supplementation in patients on HAART

- Food consumed or bought by the household;
- Food security; and
- Anthropometry.

3.2 Ethical considerations

Ethical approval to undertake the study was obtained from the Ethics Committee of the Faculty of Health Sciences, UFS (ETOVS 145/07). This study formed part of a bigger study, namely the Effective AIDS Treatment and Support in the Free State Province (FEATS), which was also approved by the Free State Department of Health in October 2007 (Appendix A). When a patient was recruited (Appendix B) for the study, the patient completed an informed consent form (Appendix C), in Afrikaans, English or Sotho. A patient had the choice to voluntarily participate in the study or not. All information was explained to the participants before they signed the consent form. All information was treated confidentially and codes were used on forms and in data analysis. Patients were free to withdraw from the study at any time without any loss of benefits.

3.3 Sample selection

3.3.1 Study design

A randomized pre-test post-test design was applied.

3.3.2 Study Population

This study was performed in the Free State Province. Table 3.1 illustrates the selected sites that were included in the study population.

Table 3.1: Selected study sites, per district

Facility name	Town	District
Matjhabeng	Welkom	Lejweleputswa
Phomolong	Hennenman	Lejweleputswa
Welkom	Welkom	Lejweleputswa
Batho	Bloemfontein	Motheo
Heidedal	Bloemfontein	Motheo
MUCPP	Bloemfontein	Motheo
Namahali	Phuthadjithaba	Thabo Mofutsanyana
Tseki	Phuthadjithaba	Thabo Mofutsanyana
Tshiame	Harrismith	Thabo Mofutsanyana
Refengkhotso	Deneysville	Fezile Dabi
Zamdela	Sasolburg	Fezile Dabi
Itumeleng	Jagersfontein	Xhariep

The study took place in 12 of the 16 phase I assessment sites. The 12 sites that were selected, the smallest of the 16, were the primary health care facilities where the ARV programme was initially rolled out.

3.3.2.1 Inclusion and exclusion criteria

- Patients (male and female) that had commenced ARV treatment in the month (4 weeks), before the study was initiated, were eligible to participate in the study. ARV nursing staff working with patients on a regular basis, assisted in

the recruitment of patients. ARV nurses received an amount (R40) for each ARV patient that they recruited.

- Age: 18 years or older.
- Patients should have been living in the town/village in which the specific ARV clinic was located. Due to the logistical and financial reasons, only patients who resided in the town or village where the facility was located were recruited into the study by the ARV nurses.

3.3.2.2 Study Sample

Freedman's (1982) logrank test method of analysis of two proportions of survival derived from a clinical trial with treatment and control arms was used to calculate the sample size. In the larger study there were two experimental and two control arms. The number of households in each group or arm was not equal (Table 3.2) but they were selected to take drop-outs into consideration.

Total sample sizes of ~800 households were envisaged according to affordability criteria. The study included four different arms (Table 3.2).

For the purpose of this sub-study, group B was included as the control group and group C as the experimental group, due to the fact that the only difference between the groups was the nutrition intervention that was implemented in group C.

Table 3.2: Study Sample

Group A: Group A was used in the main study. Households including ARV patients who received the ARV treatment and associated support provided as part of government's ARV treatment programme [Sample size: n~216; 18 patient households/site]	**Group B**: Households including ARV patients who received the ARV treatment and associated support provided as part of government's ARV treatment programme *PLUS* Adherence support provided by a trained peer adherence supporter during twice weekly visits to the patient [Sample size: n~216; 18 patient households/site]
Group C: Households including ARV patients who received the ARV treatment and associated support provided as part of government's ARV treatment programme *PLUS* Adherence support provided by a trained peer adherence supporter during twice weekly visits to the patient *PLUS* Nutritional supplementation: two 400g cans of meatballs and spaghetti in tomato sauce (weekly). [Sample size: n~216; 18 patient households/site]	**Group D**: Group D was used in the main study. Randomly selected households from the general community served by the selected health facility, excluding households where someone was known to receive ARV treatment [Sample size: n~180; 15 households/site]

3.4 Operational definitions

For the purpose of the study the following operational definitions were defined:

3.4.1 Household information (Appendix D) **and household welfare and wealth information** (Appendix E) included information about the anthropometric information, age, gender, education, housing, basic services available, marital status, morbidity, mortality, work and basic services of households.

3.4.2 Symptoms experienced as result of taking ART (of the patients) (Appendix F) included information on symptoms reported by the participants such as loss of appetite, hypertension, tiredness, diarrhoea, painful feet and others.

3.4.3 Food supplements received from the government (by the patients) (Appendix F) included information such as who received supplementation through the NSP programme and how the supplementation was used.

3.4.4 Food consumed or bought by the household (Appendix E) included a list of food bought and consumed by the household in the past month.

3.4.5 Household food security (Appendix E) referred to the responses that were obtained to a number of statements related to food security (e.g. whether the household was able to afford the food they needed; whether the household ever ran out of food because of a lack of money and whether the household was able to eat

balanced meals).

3.4.6 Anthropometric status included (Appendix D); height, weight, and waist circumference of the adults in the household on the ARV programme.

Weight and height assisted in determining if a patient was under weight, normal weight or overweight. BMI was used to determine weight status: BMI = weight (kg) ÷ Height² (m^2)

In adults, the BMI values were classified as (Hammond, 2008, p. 400):

<18.5kg/m^2	Underweight
18.5 – 24.9 kg/m^2	Normal weight
≥ 25 – 29.9 kg/m^2	Overweight
≥ 30 kg/m2	Obese.

Waist circumference was used to identify risk for central obesity and was classified as (Alberti *et al.,* 2006):

Women: ≥80cm

Men: ≥ 94cm.

3.5 Pilot Study

Before commencing with the main study, a pilot study was conducted. The pilot study was conducted on 20 households in Thaba Nchu, by the fieldworkers, with the

assistance of the researcher. During the pilot study, all measuring instruments were standardised. The pilot study helped to determine any changes that needed to be made before the study started as well as the time consumed to complete each questionnaire.

In addition to the pilot study, an investigation into the acceptability of the supplement in patients on ARV therapy was undertaken in August/September 2008 (Appendix G). The researcher developed a form on which participants could indicate whether they found the food supplement (meatballs and spaghetti in tomato sauce) acceptable. The collection of this data was managed by dieticians at ARV facilities in Bloemfontein and Sasolburg after being informed of the procedure to follow by the researcher. During the investigation, approximately seventy patients were interviewed regarding the acceptability of meatballs and spaghetti in tomato sauce (Appendix G). All surveyed patients indicated that they would eat the product and would eat it on a weekly basis when provided as a food supplement as part of an envisaged research study. The supplement, therefore, was confirmed to be highly acceptable to patients on ART.

3.6 Data collection process

Step1

ARV nurses were used to recruit patients (Appendix B). The idea was to recruit an equal number of ARV patients at each of the twelve selected ARV facilities. Patients that were recruited at each facility were tracked on a weekly basis, by the research team (FEATS). The minimum requirement was to recruit 36 patients per site, but when a study site had reached their target, they did not stop recruiting patients, the

reason being that some other site might have had difficulty recruiting the minimum required patients.

Step 2

Participants were interviewed by trained fieldworkers (adherence supporters), after written informed consent had been obtained from each participant (Appendix C).

Step 3

The fieldworkers were divided into teams. The team consisted of two persons, one male and one female. At this stage the main aim of these teams was to approach the patient households for recruitment into the study.

Step 4

Training was given to the fieldworkers on how to complete the questionnaires as well as how to do the different anthropometric measurements (by the researcher, a dietician) (Appendix H).

Steps 5 and 6

After recruiting the patients, all the adult members of the households were interviewed by the fieldworkers. For this study, only the data for adult patients were used. Patient confidentiality was very important, thus the patient and household surveys were conducted by different fieldworkers (baseline and follow-up).

Steps 7

After baseline, ARV patients in the study were randomly assigned to three groups. Group four included the control group.

The three experiments or interventions comprised the following:

(a) Antiretroviral (ARV) treatment

Patients received their treatment, according to the Treatment Guidelines (National Department of Health, 2004).

(b) Adherence support intervention

Trained peer adherence supporters, were assigned to visit patients on a bi-weekly basis (adherence support experiment). These peer adherence supporters were patients who had been on ARV treatment for 12 months or longer. Only patients with no other related training were included as supporters, to assure that lay health workers that were already working for government or a non-government organisasion (NGO) were not included. These supporters received eight days of theoretical and practical training. The training covered topics such as HIV/AIDS, ARV treatment, adherence support for ARV patients, as well as referral skills. These peer adherence supporters received a monthly stipend of R500. Each peer adherence supporter had to visit fourteen ARV patients, twice a week over a period of twelve months.

The peer adherence supporters were supported by Naledi Hospice and professional nurses. They supported them by arranging meetings with the peer adherence supporters for the purpose of debriefing, and they made unannounced visits to some ARV patients provided with adherence support for quality assurance purposes.

(c) Nutrition intervention

At the time of the survey, the food supplements that were available at clinics as part of the Nutrition Supplementation Program of the DoH, were Philani for adults, Philani Yabantwana for children and NutriMil for adults and children. In this study a nutrition supplement in the form of two 400g cans of meatballs and spaghetti in tomato sauce per week for the intervention period were given to the patients and households. Each can contained (per 100g) 420 kJ of energy, 6.6 g of protein, 9.9 g of carbohydrates, 4.1 g of fat, 29.9 mg of magnesium, 1116.6 mg of phosphorous and 1.6 mg of iron. The peer adherence supporters distributed the nutritional supplement to patients during their weekly visits.

The main aim of this experiment was to determine whether the food supplement would have any effect on foods bought or consumed, level of food security and anthropometry.

As seen with other supplements, patients were likely to share their food supplements with their children or other household members. For this reason, participants were encouraged to consume a large portion of the supplement themselves. Patients received this message at the time of obtaining written informed consent as well as at each visit by the peer adherence supporter.

3.7 Techniques

Two techniques were used in this study namely: structured interviews to determine patient's socio demographic and household information, household food security as well as food intake and the use of supplements as well as anthropometry to determine weight, height and weight circumference.

3.7.1. Structured interviews

Structured interviews were undertaken by trained fieldworkers, using standardised questionnaires (developed by the research team for the purpose of the study) to determine household information and household wealfare and wealth information (Appendix D and E). The household finance questionnaire included a section on symptoms experienced, household food security, food intake and supplementation (Appendix E and F).

3.7.2. Anthropometric status:

All anthropometric measurements were obtained according to the techniques described in the training manual compiled for the fieldworkers by the researcher (Appendix H) and noted on the questionnaire as indicated in Appendix D.

3.7.2.1) Weight

Weight was measured using a digital electronic scale to the nearest 0.1 kg. The scale was placed on a flat, hard surface. The scale was zeroed before each patient was weighed. Patients were weighed without shoes and wearing minimum clothing. Patients stood still in the middle of the scale, with both feet on the scale (Lee & Nieman, 2003, p. 166).

3.7.2.2) Height

Height was measured using a stadiometer to the nearest 0.1 cm. Patients were without shoes and wore minimal clothing to facilitate correct positioning of the body.

Patients stood with their legs together, their arms to the side, legs straight and the shoulders relaxed. Patients looked straight in front of them. Heels, buttocks, shoulder blades and the back of the head were against the stadiometer. Height was taken twice, to make sure it was accurate (Lee & Nieman, 2003, p. 166).

3.7.2.3) Waist circumference

Waist circumference was measured using a tape measure. The waist was measured as the midway between the lower rib and the ileac crest (Lee & Nieman, 2003, p. 184) to the nearest 0.5 cm.

3.8 Statistical analysis

The Department of Biostatistics at the UFS, performed the analysis of all data related to this study. Descriptive statistics, namely frequencies and percentages for categorical data and means and standard deviation or medians and percentiles for continuous data, were calculated as relevant. Groups were compared using 95% confidence intervals for the mean, median or percentage differences and similarly for the changes within the groups.

3.9 Reliability and validity

Validity refers to the extent to which a measure actually measures what it is meant to measure (Trochim, 2006).

According to Babie and Mouton (2001, p. 273); “internal validity refers to the extent

to which an empirical measure adequately reflects the real meaning of the concept under study". Allowing for the study design and overall methodology, all questions used for the purposes of this study were considered to be a valid measure of the variables analysed.

Reliability refers to the degree of similarity of the information obtained when measuring the group more than once (Lee and Nieman, 2003, p.65). To ensure reliability, data collection was supervised by a trained fieldwork manager and data editor at each site. If the patients were not at home at the time of the interview, or if questionnaires were returned with missing data, interviewers returned to the households up to five times.

3.9.1 Questionnaires

To ensure validity of the results all the information in the questionnaires was directly related to the aim and objective of the study. Fieldworkers were trained on completing the questionnaire correctly.

3.9.2 Anthropometric status

To ensure validity of the results, the scale was moved to the zero mark before each patient was weighed. The scale was calibrated after every twenty patients measured (Lee and Nieman, 2003, p.65).

To ensure reliability, all the techniques/measurements were practiced by the fieldworkers, under the supervision of the researcher. All anthropometric measurements were measured using standard methods, as recommended by Lee

and Nieman (2003, p. 65).

Chapter 4: Results

4.1 Introduction

This chapter gives an overview of the results of the study. In the first two tables a description of the socio-demographic status (Appendix D) and household walfare and wealth information (Appendix E) as determined at baseline. In addition to this, the symptoms experienced by participants as a result of taking ARV medication and the food supplementation received from government before intervention are described. Against this background, an overview of foods consumed or bought by the household during the past month; information related to food security; and anthropometric variables of participants are given for both control and experimental groups at baseline. For each of these variables, the impact of the nutrition intervention is described by tabling the changes in these parameters from baseline to follow-up in the control and experimental groups.

The mean age of both the groups (control and experimental) was similar at 38 years for the control and 37.3 years for the experimental group with a standard deviation of [-1.8;2.9]. Ages ranged between 19 - 65 years for the control and 17 - 69 years for the experimental group. The mean period between baseline and post-intervention was 15 months (range 7.2 - 22.7 months) with a standard deviation of [-0.6;0.7].

4.2 Socio-demographic status (Household information)

Initially data was collected for 166 control and 171 experimental, respondents. Of these, all questionnaires (both baseline and post-intervention) were only completed for 135 participants in the control group and 125 participants in the experimental group and these were included in the final analysis. The two groups (those included and those excluded) were, however, compared to ensure that they were comparable

and that those that were excluded were not different from those included. For most variables, a short description of the excluded group will be given in the text to show how they compared with the group included in the final analysis. Table 4.1 depicts the socio-demographic status of the control and experimental groups at baseline.

Table 4.1: Socio-demographic status (Baseline)

	Control		Experimental		95% CI for percentage difference
Race (Cn=135;En=124)	**n**	**%**	**n**	**%**	
African	134	99.3	121	97.6	-2.6;6.7
Coloured	1	0.74	3	2.4	-6.8;2.6
Gender (Cn=135;En=125)					
Male	27	20	23	18.4	-8.6;11.6
Female	108	80	102	81.6	-11.6;8.6
Marital Status (Cn=135;En=123)					
Married Civil Religious	8	5.9	20	16.3	-18.9;-2.1*
Married Traditional	9	6.7	10	8.1	-9;5.7
Living together as partners	11	8.2	10	8.1	-7.7;7.5
Never married	58	43	56	45.5	-15;10
Widower/Widow	27	40	16	13	-2.8;16.5
Separated	16	11.9	8	6.5	-25;13.1
Divorced	6	4.4	3	2.4	-3.7;7.7
Highest level of education (Cn=134;En=123)					
No formal education	4	3	8	6.5	-10.2;2.6
Grade 1- Grade 3	10	7.5	6	4.2	-4.3;9.4
Grade 4- Grade7	42	31.3	32	26	-6.3;16.7
Grade 8- Grade9	27	20.1	31	25.2	-15.8;5.7
Grade 10-11	30	22.4	25	20.3	-8.6;12.5
Grade 12	18	13.4	21	17.1	-13.2;5.7
Diploma	3	2.2	0	0	-1.9;6.9

Cn= n values for control group
En= n values for experimental group
* Sicnificant difference

In both the control and the experimental groups, the majority of the participants were of African race (99.3% in the control group and 97.6% in the experimental group). Most participants were female. More than fourty percent of participants in both of the groups had never been married. Significantly more participants in the experimental group (16.3%) compared to the control group (5.9%) were married in the civil

religious category (95% CI for percentage difference [-18.9;-2.1]. About 10% of all participants had either no education or achieved a level of education below grade 3. Fewer than 20% had achieved an educational level at grade12.

In terms of the excluded group of participants (who did not have completed questionnaires for both baseline and post-intervention, 29 in the excluded control group and 45 in the excluded experimental group), all parameters of socio-demographic status looked very similar to those of the included group, except for gender in the excluded control group, where 45% were male. This was higher than the twenty percent of males in the included group.

4.2.1 Household information

Table 4.2 reflects the household information of all participants at baseline.

In both of the groups (control and experimental) the majority of the participants lived in a house/dwelling or brick structure on a separate stand or yard (68.2% for control and 64.8% for experimental). Most of these houses/dwellings had a tap in the yard, but respondents still had to carry their water to their dwelling/house (66.2% of the control and 55.2% of the experimental).

The majority of the participants had access to a flush toilet (66.7% in the control group and 64.8% in the experimental group) and electricity supply (87.3% of the control and 82.3% of the experimental group).

Table 4.2 Household information (Baseline)

Parameter	Control		Experimental		95% CI for percentage difference
	n	%	n	%	
Type of dwelling (Cn= 135; En= 125)					
Dwelling/house or brick structure on a separate stand or yard	92	68.2	81	64.8	-8.6;15.2
Traditional dwelling/hut/structure made of traditional materials	4	3	11	8.8	-12.9;0.6
Flat or apartment in a block flats	2	1.5	3	2.4	-6.5;3.7
Town/cluster/semi-detached house	2	1.5	0	0.0	-2.4;5.8
Dwelling/house/flat/room in backyard	3	2.2	8	6.4	-10.6;1.6
Informal dwelling/shack in backyard	15	11.1	18	6.4	-12.2;5.4
Informal dwelling/shack/not in backyard e.g. informal/squatter settlement	15	11.1	14	11.2	-8.6;8.2
Hostel	1	0.7	0	0.0	-3.0;4.7
Other (mud house)	1	0.7	0	0.0	-3.0;4.7
Source of water used most often in the house (Cn= 135; En= 124)					
Piped-internal (inside dwelling)	46	34.1	47	37.9	-15.9;8.3
Piped-yard tap (in yard)	75	55.6	66	53.2	-10.2;14.8
Water carrier/tanker	2	1.5	0	0.0	-2.5;5.8
Piped-public tap/kiosk (free)	9	6.7	9	7.3	-7.9;6.4
Piped-public tap/kiosk (paid for)	1	0.7	1	0.8	-4.4;3.9
Borehole (other)	1	0.7	1	0.8	-4.4;3.9
Other	1	0.7	0	0.0	-3.1;4.7
Does the household have to fetch and carry water to the dwelling? (Cn= 135; En= 125)					
Yes	84	62.2	69	55.2	-5.4;19.2
No	51	37.8	56	44.8	-19.2;5.4
Toilet (Cn= 135; En= 125)					
Flush toilet	90	66.7	81	64.8	-10.1;13.8
Pit tavern with ventilation	2	1.5	8	6.4	-11.3;0.6
Pit toilet without ventilation	21	15.6	19	15.2	-9.1;9.7
Bucket toilet	14	10.4	13	10.4	-8.3;8.1
Chemical toilet	6	4.4	1	0.8	-1.3;9.1
No	2	1.5	3	2.4	-6.1;3.7
Electricity supply (Cn= 134; En= 124)					
Yes	117	87.3	102	82.3	-4.2;14.5
No	17	12.7	22	17.7	-14.5;4.2
Main source of energy for cooking (Cn= 134; En= 125)					
Wood	1	0.8	4	3.2	-7.8;2.0
Paraffin	28	20.9	29	23.2	-13.0;8.3
Charcoal/coal	4	3.0	1	0.8	-2.5;7.2
Electricity from a grid	94	70.2	84	67.2	-8.8;14.7
Electricity from a generator	4	3.0	4	3.2	-5.9;5.2
Gas form a bottle	3	2.2	3	2.4	-5.4;4.8
Room density (Cn=135 ;En= 125)					
≤2.5	99	73.3	96	76.8	-14.3;7.6
>2.5	36	26.7	29	23.2	-7.6;14.3

Cn= n values for control group
En= n values for experimental group

In most households participants used electricity from a grid to cook their food (70.2% for control and 67.2% for experimental group). No statistically significant differences in household information occurred between the two groups at baseline.

In terms of the excluded group of participants, parameters of household information were very similar to those of the included group.

As seen in Table 4.3, the household size ranged from 1 to 11 persons in both the control and experimental groups with a median of 3 persons per household in both groups. In both groups a median of two rooms were occupied and household density ranged from a median of 1.5 persons per room in the control group to 2 persons per room in the experimental group. The household size and density in both these groups was thus very similar.

Table 4.3 Household Size and Density (Baseline)

Parameters	Control (n=135)				Experimental (n=125)				95% CI for Med difference
	25th percentile	Median	75th percentile	Range	25th percentile	Median	75th percentile	Range	
Household size	2.0	3.0	4.0	1.0 - 11.0	2.0	3.0	4.0	1.0 - 11.0	0;0
Rooms occupied by the household	1.0	2.0	2.0	1.0-4.0	1.0	2.0	2.0	1.0-5.0	0;0
Household density	1.0	1.50	3.0	0.25 - 7.00	1.0	2.00		0.33 - 7.00	-0.5;0

4.3 Symptoms as a result of ARV's

Table 4.4 reflects the common symptoms as a result of taking ARV's in both groups at baseline.

More than thirty percent of participants in both groups (control and experimental) reported, experiencing symptoms after taking ARV medication that made them feel ill.

About one in ten participants complained about tiredness (8.1% for the control and 10.4% for the experimental), while dizziness (8.1% in the control and 7.2% in the experimental group) and rash on the body (5.9% in the control group and 10.4% in the experimental group) were also reported by some. The 95% CI for the percentages difference between the two groups (control and experimental), indicated that no significant differences were seen in terms of symptoms experienced as a result of taking ARVs.

Table 4.4 Symptoms as result of taking ARV drugs (baseline)

Parameters	Control		Experimental		
	n	%	n	%	95% CI for % diff
Does the patient feel worse after taking ARV treatment (Cn=135, En=125)					
Yes	47	34.8	41	32.8	-5.0;2.7
No	88	65.2	84	67.2	-5.0;2.7
Common symptoms (Cn= 153, En=125)					
Tired	11	8.1	13	10.4	-10.0;13.8
Abdominal discomfort	4	3.0	2	1.6	-13.8;10.0
Diarrhoea	4	3.0	4	3.2	-10.3;5.5
Dizziness	11	8.1	9	7.2	-3.7;6.4
Rash on body	8	5.9	13	10.4	-6.0;5.1
Rash in mouth/mouth sores	1	0.7	1	0.8	-6.5;8.2
Pain in feet	5	1.7	8	6.4	-12.2;2.9
Hypertension	1	0.7	0	0.00	-4.3;3.9
Nausea/vomiting	9	6.7	5	4	-9.9;3.5
Constipation	1	0.7	1	0.8	-3.0;4.7
Increase food intake	0	0.0	1	0.8	-3.8;9.2
Loss of appetite	0	0.0	1	0.8	-4.3;3.9
Weight loss	0	0.0	1	0.8	-5.0;2.7
Loss of energy	0	0.00	1	0.8	-5.0;2.7

Cn= n values for control group
En= n values for experimental group

4.4 Food Supplements

Table 4.5 shows that the majority of participants had not received food supplementation from the government (83.0% for the control and 89.6% for the experimental) at baseline. Of those that did receive supplementation (23 in the control group and 13 in the experimental group), all reported that they did eat the supplements that were provided. More than sixty percent in both groups reported that they did not share those supplements with their families.

Table 4.5 Food supplementation (baseline)

Parameters	Control		Experimental		
	n	%	n	%	95% CI for % diff
Who is receiving food supplementation from the government? (Cn=135, En=125)					
Yes	23	17.0	13	10.4	-15.5;2.4
Does the patient eat the supplements received from the government? (Cn=23, En=13)					
Yes	23	100	13	100	-17.8;28.3
Do patients share their food supplement that they receive from the government (Cn=23, En=13)					
Yes	8	34.8	5	38.5	-37.8;28.7

Cn= n values for control group
En= n values for experimental group

No significant differences were observed between the two groups in any of the variables related to food supplementation received by the government at baseline.

4.5 Food consumed or bought by the household

Table 4.6 depicts the food bought by households in the control and experimental groups during the past month.

Table 4.6 Food Consumed or bought by the household during the past month (Baseline)

Parameters	Control		Experimental		95% CI for % difference
	n	%	n	%	
Maize grain/stamp (Cn= 133; En= 122)	53	39.9	49	40.2	-12.3;11.7
Mealie meal/maize flour (Cn= 135; En= 125)	126	93.3	116	92.8	-5.7;6.7
Rice (Cn= 133; En= 125)	103	77.4	89	71.2	-4.4;16.9
Bread (Cn= 135; En= 124)	101	74.8	100	80.7	-15.9;4.3
White Flour (Cn= 134; En= 125)	69	51.5	68	54.4	-15.1;9.2
Breakfast Cereal (Cn= 134; En= 124)	26	19.4	24	19.4	-9.6;9.7
Dried peas/ lentils/beans (Cn= 133; En= 124)	44	33.1	42	33.9	-12.3;10.8
Potatoes (Cn= 134; En= 125)	120	89.6	118	94.4	-11.4;1.7
Tomatoes (Cn= 134; En= 124)	91	67.9	95	76.6	-19.6;2.2
Sweet potatoes/other roots (Cn= 134; En= 124)	20	14.9	20	16.1	-10.1;7.7
Vegetable oil (Cn= 135; En= 125)	105	77.8	97	77.6	-9.9;10.3
Margarine/ butter/ other fats (Cn= 134; En= 124)	68	50.8	63	50.8	-12.3;12.2
Cheese (Cn= 134; En= 124)	9	6.7	11	8.9	-8.7;4.4
Jam (Cn= 134; En= 124)	36	26.9	27	21.8	-5.4;15.5
Fresh milk/ sour milk/ yogurt (Cn= 133; En= 125)	103	77.4	95	76.6	-9.5;11.1
Baby formula/ milk powder (Cn= 132; En= 124)	20	15.2	12	9.7	-2.6;13.5
Sugar (Cn= 132; En= 125)	124	93.9	117	93.6	-5.6;6.3
Mutton/beef/pork (Cn= 133; En= 124)	42	31.6	51	41.1	-21.3;2.2
Chicken (Cn= 135; En= 125)	129	95.6	115	92.0	-2.3;9.5
Eggs (Cn= 135; En= 124)	101	74.8	100	80.7	-15.9;4.3
Fish (frozen/fresh) (Cn= 134; En= 124)	25	18.7	27	21.8	-12.9;6.7
Tinned fish (Cn= 135; En= 125)	58	43.0	44	35.2	-4.1;19.6
Pumpkin/squash (Cn= 135; En= 125)	51	37.8	45	36.0	-9.9;13.5
Other vegetables (Cn= 135; En= 125)	82	60.7	65	52.0	-3.3;20.8
Bananas (Cn= 134; En= 125)	73	54.5	65	52.0	-9.7;14.6
Apples (Cn= 135; En= 125)	78	57.8	70	56.0	-10.3;13.8
Citrus fruits (Cn= 133; En= 124)	19	14.3	21	16.9	-11.5;6.2
Soft drinks (Cn= 135; En= 124)	57	42.2	46	37.1	-6.8;17.3
Fruit juices (Cn= 134; En= 123)	43	32.1	44	35.8	-15.3;7.9
Simba and other chips (Cn= 133; En= 124)	36	27.1	30	24.2	-7.8;12.5
"slap" chips (Cn= 133; En= 123)	12	9.0	11	8.9	-6.9;7.1
Vetkoek (Cn= 134; En= 124)	34	25.4	22	17.7	-2.3;17.6
Sweets (Cn= 131; En= 122)	31	23.5	33	27.1	-14.3;7.1

Cn= n values for control group
En= n values for experimental group

In both the groups, more than fifty percent of the participants bought mealie meal/maize flour, rice, bread, white flour, potatoes, tomatoes, vegetable oil, margarine/butter or other fats, fresh milk/sour milk/yogurt, sugar, chicken, eggs, variety of vegetables, bananas and apples during the past month. No statistically differences in the percentage of respondents that had consumed or purchased these foods were found between the control and experimental groups.

In both of these groups less than fifty percent of the participants had bought maize grain/samp, breakfast cereals, dried peas/lentils and beans, sweet potatoes/other roots, cheese, jam, baby formula/milk powder, mutton/beef/pork, fish, pumpkin/squash, citrus fruits, soft drinks, fruit juices, Simba and other chips, “slap” chips, vetkoek and sweets during the past month.

Although food and nutrient intake cannot be estimated very accurately from information related to foods bought or consumed, they do give an idea of what foods are available in the household. From this list it can be concluded that a large percentage of households frequently bought and consumed starchy staple foods (mielie meal, rice, bread and potatoes), vegetable oil and sugar. As far as foods containing protein are concerned, a large percentage (>75%) of households did purchase and consume dairy products (milk, sour milk or yoghurt), chicken (more than ninty percent) and eggs (>75%).

In both the control and experimental groups the percentage of households that bought or consumed breakfast cereals, legumes (dried peas, lentils and beans), and fruits and vegetables were relatively low. In addition, more costly protein sources such as red meat (less than fifty percent), fish (<25%) and cheese (less than ten percent) were not bought or consumed by a large percentage of participants.

In the excluded control and experimental groups the types of foods bought and consumed looked very similar to that of the included group.

Table 4.7: Changes in food consumed or bought by the household during the past month from baseline to post-intervention

Parameters	Control					Experimental				
	Baseline		Post-intervention		95% CI for % difference	Baseline		Post-intervention		95% CI for % difference
	n	%	n	%		n	%	n	%	
Maize grain/stamp (Cn=133,En= 121)	53	39.9	64	48.1	-3.3;19.9	48	39.7	56	46.3	-5.0;18.1
Mealie meal/maize flour (Cn=135, En=124)	126	93.3	128	94.8	-4.7;7.7	116	93.6	120	96.8	-2.1;8.6
Rice (Cn=133, En=124)	103	77.4	104	78.2	-7.8;9.3	89	71.0	81	65.3	-16.4;5.1
Bread (Cn=135, En=123)	101	74.8	114	84.4	0.6;18.7*	99	80.5	88	71.5	-19.2;1.2
White Flour (Cn=134, En=124)	69	51.5	62	46.3	-15.3;4.9	67	54.0	64	51.1	-13.7;8.8
Breakfast Cereal (Cn=134, En=123)	26	19.4	24	17.9	-8.7;5.7	24	19.4	21	17.1	-12.3;7.4
Dried peas/ lentils/beans (Cn=133, En=123)	44	33.1	43	32.3	-11.7;10.1	42	34.2	47	38.2	-7.0;15.1
Potatoes (Cn=134, En=124)	120	89.6	122	91.0	-5.4;8.4	117	94.4	108	87.1	-14.1;-0.5*
Tomatoes (Cn=134, En=123)	91	67.9	102	76.1	-1.0;17.3	94	76.6	97	78.9	-8.6;13.5
Sweet potatoes/other roots (Cn=134, En=123)	20	14.9	19	14.2	-8.7;7.2	20	16.1	19	15.5	-10.1;8.5
Vegetable oil (Cn=135, En=124)	105	77.8	121	89.6	3.0;20.7*	97	78.2	101	81.5	-7.2;13.6
Margarine/ butter/ other fats (Cn=134, En=123)	68	50.8	71	53.0	-7.7;12.2	63	50.8	62	50.14	-11.4;9.8
Cheese (Cn=134, En=123)	9	6.7	12	9.0	-3.0;7.4	11	8.9	8	6.5	-9.4;4.5
Jam (Cn=134, En=123)	36	26.9	34	25.4	-10.9;7.9	27	22.0	22	17.9	-13.3;5.2
Fresh milk/ sour milk/ yogurt (Cn=133, En=123)	103	77.4	107	80.5	-6.4;12.55	94	76.4	97	78.9	-7.1;12.0
Baby formula/ milk powder (Cn=132, En=123)	20	15.2	23	17.4	-3.1;6.1	12	9.8	14	11.4	-5.5;8.8
Mutton/beef/pork (Cn=132, En=124)	124	93.9	126	95.5	-12.5;9.5	116	93.6	116	93.6	-6.7;6.7
Chicken (Cn=133, En=122)	42	31.6	40	30.1	-7.3;4.3	51	41.8	39	32.0	-21.5;1.8
Eggs (Cn=135, En=123)	129	95.6	127	94.1	-17.5;2.7	113	91.9	114	92.7	-6.2;7.8
Fish (frozen/fresh) (Cn=135, En=123)	58	43.0	58	43.0	-11.3;11.2	42	34.2	43	35.0	-10.7;12.4
Tinned fish (Cn=135, En=123)	51	37.8	58	43.0	-5.1;15.5	43	35.0	38	30.9	-14.4;6.3
Pumpkin/squash (Cn=135, En=123)	82	60.7	63	46.7	-24.9;-3.2*	65	52.9	55	44.7	-19.2;3.0
Other vegetables (Cn=135, En=123)	73	54.5	71	53.0	-13.6;10.6	64	52.0	60	48.8	-16.0;9.5
Bananas (Cn=135, En=123)	78	57.8	80	59.3	-10.5;13.5	69	56.1	65	52.9	-15.6;9.1
Apples (Cn=133, En=122)	19	14.3	23	17.3	-4.6;10.6	21	17.2	19	15.6	-10.5;7.3

Table 4.7: Changes in food consumed or bought by the household during the past month from baseline to post-intervention (Continue)

Citrus fruits (Cn=135, En=122)	57	42.2	40	29.6	-23.7; -1.5*	46	37.7	43	35.3	-13.6;8.7
Soft drinks (Cn=133, En=122)	57	42.2	40	29.6	-23.7;-1.5*	46	37.7	43	35.3	-13.6;8.7
Fruit juices (Cn=134, En=121)	43	32.1	39	29.1	-13.5;7.5	43	35.5	39	32.2	-14.4;7.8
Samba and other chips (Cn=133, En=122)	36	27.1	30	22.6	-14.6;5.6	30	24.6	32	26.2	-9.9;13.2
"slap" chips (Cn=133, En=121)	12	9.0	5	3.8	-11.6;1.1	11	9.1	2	1.7	-13.5;-1.3*
Vetkoek (Cn=134, En=123)	34	25.4	18	13.4	-22.2;-1.6*	22	18.0	13	10.7	-16.6;19
Sweets (Cn=132, En=120)	31	23.5	30	22.7	-11.1;9.6	33	27.5	25	20.8	-18.1;4.8

Cn= n values for control group
En= n values for experimental group
*Significant difference

Very few changes occurred in foods bought or consumed by the control and experimental groups from baseline to post-intervention (Table 4.7). In the control group the purchase or consumption of bread increased significantly from 74.8% to 84.4% with a 95% CI for the percentage change of [0.6; 18.7]; while consumption of vegetable oil increased from 77.8% to 89.6% [3.0; 20.7]. In the control group the purchase or consumption of four foods decreased from baseline to post-intervention, namely pumpkin (60.7% to 46.7%, [-24.9; -3.2]); citrus (42.2% to 29.6%, [-23.7; -1.5]); soft drinks (42.2% to 29.6% [-23.7; -1.5]) and vetkoek (25.4% to 13.4% [-22.2; -1.6]).

Table 4.8 Food Security (Baseline)

Parameters	Control n	Control %	Experimental n	Experimental %	95% CI for percentage diff
Which of these statement best describes the food eaten (Cn= 134, En= 124)					
Enough of the kinds of food (we/I) want to eat	23	17.0	26	20.8	-14.0;6.3
Enough but not always the kind of food (we/I)want to eat	35	25.9	32	25.6	-10.9;11.4
Sometimes not enough to eat	34	25.2	28	22.4	-8.2;11.4
Often not enough to eat	42	31.1	38	30.4	-11.1;12.4
I/We worry whether (my/our) food would run out (Cn= 133, En= 123)					
Often true	59	44.0	62	50.4	-18.5;6.7
Sometimes true	54	40.3	41	33.3	-5.1;19.3
Never true	20	14.9	20	16.3	-10.9;8.2
The food that (we/I) bought just did not last (Cn= 131, En= 121)					
Often true	54	40.6	59	48.4	-20.0;5.2
Sometimes true	57	42.9	37	30.3	4.2;4.8*
Never true	20	15.0	25	20.5	-15.5;4.7
(I/We) could not afford to eat balanced meals (Cn= 132, En= 121)					
Often true	65	48.5	61	50.5	-13.8;11.5
Sometimes true	51	38.1	38	31.2	-5.1;19.2
Never true	16	11.9	22	18.0	-15.6;3.4
In the last six months did (you/other adults in your household) ever cut the size of your meals because there was not enough money for food (Cn= 118, En= 105)					
Yes	73	61.9	58	55.2	-19.8;6.8
No	45	38.1	47	44.8	-6.8;19.8
If yes, how often did it happen (Cn= 72, En= 55)					
Almost every month	35	48.0	29	50.9	-22.0;14.2
Some months but not every month	33	45.2	20	35.1	-8.8;26.7
Only 1 or 2 months	4	5.5	6	10.5	-17.9;5.5
In the last six months did you ever eat less than you felt you should because there was not enough money for food? (Cn= 119, En= 105)					
Yes	86	72.3	70	66.7	-7.0;18.1
No	33	27.7	35	33.3	-18.1;7.0
In the last six months, were you ever hungry but did not eat because there was not enough money for food? (Cn= 119, En= 105)					
Yes	59	49.6	60	57.1	-20.8;6.1
No	60	50.4	45	42.9	-6.1;20.8
In the last six months did you lose weight because there was not enough money for food? (Cn= 110, En= 101)					
Yes	58	48.7	53	50.5	-13.4;14.2
No	52	47.3	48	47.5	-14.2;13.6
In the last six months, did (you/other adults in the household) ever not eat for a whole day because there was not enough money for food? (Cn= 90, En= 75)					
Yes	28	31.1	32	42.7	-26.6;4.0
No	62	68.9	43	57.3	-4.0;26.6

Table 4.8 Food Security (Baseline) (Continue)

If yes, how often did it happen (Cn= 27, En= 29)					
Almost every day	15	55.6	18	62.1	-32.5;20.5
Some months but not every month	6	22.2	8	27.6	-29.0;19.5
Only 1 or 2 months	6	22.2	3	10.3	-10.4;33.8
Are there children under the age of 18 years? (Cn= 135, En= 125)					
Yes	92	68.2	88	70.4	-13.8;9.5
No	43	31.9	37	29.6	-9.5;13.8
(I/We) only relied on only a few kinds of low cost food to feed my/our children because I/we were running out of money to buy food (Cn= 92, En= 87)					
Often true	48	51.6	44	50.6	-13.5;16.7
Sometimes true	34	37.0	29	33.3	-11.0;18.0
Never true	10	10.8	14	16.1	-16.3;5.7
I/We) could not feed (my/our child/children) a balance meal because I/we could not afford to buy food (Cn= 92, En=87)					
Often true	50	53.8	40	46.0	-6.9;23.2
Sometimes true	31	33.7	31	35.6	-16.4;12.6
Never true	11	11.8	16	18.4	-17.9;5.0
My/our child/children were not eating enough because we could not afford enough food (Cn= 92, En= 86)					
Often true	43	46.2	36	41.9	-9.8;20.1
Sometimes true	30	32.6	29	33.7	15.1;13.6*
Never true	19	20.7	21	24.4	-16.4;9.5
In the last six months, did you ever cut the size of any of your children's meals because there was not enough money for food (Cn= 100, En= 81)					
Yes	44	47.8	36	41.9	-9.3;20.8
No	48	52.2	50	58.1	-20.8;9.3
In the last six months, were any children in the household ever hungry, but you just could not afford more food? (Cn= 91, En= 87)					
Yes	27	29.7	23	26.4	-16.9;10.7
No	64	70.3	64	73.6	-9.3;20.8
In the last six months did any children ever skip a meal because there was not enough money for food (Cn= 92, En= 87)					
Yes	21	22.8	22	25.3	-10.7;15.7
No	71	77.2	65	74.7	-15.7;10.7
If yes, how often did it happen (Cn= 21, En= 21)					
Almost every month	12	57.1	13	61.9	-34.5;26.1
Some months but not every month	9	42.9	5	23.8	-12.2;46.1
Only 1 or 2 months	0	0.00	3	14.3	-37.4;7.6
In the last six months, did any children in the household ever not eat for a whole day because there was not enough money for food (Cn= 87, En= 87)					
Yes	11	12.6	17	19.5	-18.6;5.0
No	76	87.4	70	80.5	-5.0;18.6

Cn= n values for control group
En= n values for experimental group

In the experimental group the consumption or purchase of two foods decreased significantly, namely potatoes (94.4% to 87.1% [-14.1; -0.5]) and slap chips (9.1% to 1.7% [-13.5; -1.3]).

Table 4.8 illustrates the reported food security in both the control and the experimental groups at baseline.

In both the control and experimental groups, most of the participants reported that they often do not have enough to eat (31.1% of the control group and 30.4% of the experimental group) and that they worry whether they will run out of food.

In both the groups, respondents reported that it is often true that the food that they buy just does not last (40.6% in control and 48.4% in experimental) and that they cannot afford to eat a balanced meal (48.5% in control and 50.5% in experimental groups).

A large number of participants indicated that they cut the size of their meals because there was not enough money for food (61.9% of the control and 55.8% of the experimental). Those participants that did cut the size of their meals claimed that it happened almost every month (48% of the control and 50.9% of the experimental).

The majority of participants had eaten less over the past 6 months (72.3% of the control and 66.7% of the experimental), because there was not enough money for food. A large percentage of participants stated that they had been hungry in the past 6 months because there was not enough money for food (49.6% for the control and 57.1% for the experimental groups).

Less than fifty percent of participants claimed that they had not eaten for a whole day during the past six months because there was no money for food (31.1% of the control group and 42.7% of the experimental group).

The majority of the households did have children under 18 years of age (68.2% of the control and 70.4% of the experimental groups), and in those households that did have children, not all of them could feed their children a balanced meal, because they could not afford it (53.8% of the control and 46.0% of the experimental) and thus their children were not eating enough (46.2% of the control and 41.9% of the experimental) and they had to cut the size of their meals in the past 6 months (47.8% of the control and 41.9% of the experimental). The majority of participants in both groups, children did not skip some of their meals, because there was not enough money for food (77.2% of the control and 74.7% of the experimental groups), while a small percentage of participants did not give food to their children for a whole day during the past six months because there was not enough money to buy food (12.6% of the control and 19.5% of the experimental).

Significant differences between the control and experimental groups at baseline occurred for only two variables. The percentage of respondents that answered “sometimes true” to the statement “The food that was bought just did not last” was 42.9% in the control group and 30.3% in the experimental group with a 95% CI for the percentage difference of [4.2;4.8]. Secondly, the percentage of respondents that answered “sometimes true” to the statement “my/our child/children were not eating enough because we could not afford enough food” was 32.6% in the experimental group and 33.7% in the control group [15.1;13.6].

The only significant difference in the changes in food security from baseline to post-intervention was with the statement I/We cannot afford to eat a balanced meal, 12.2% (baseline) and 23.7 (post-intervention) of participants in the control group answered never true with a 95% CI for the percentage difference of [1.9;21.0] (Table 4.9). In the experimental group 50.8% answered often true, at baseline and decreased to 39.2% post-intervention [-23.0;-0.4]. Other significant changes that was visible, was in the experimental group, the food that is bought just does not last, and (I/We) do not have money to buy more food, with the answer, often true 49.2% at baseline and decreased to 35.0% post intervention [-26.0;-2.4]).

Table 4.9 Changes in food security from baseline to post-intervention

	Control					Experimental				
	Baseline		Post-intervention		95% CI for % difference	Baseline		Post-intervention		95% CI for % difference
	n	%	n	%		n	%	n	%	
Which of these statement best describes the food eaten?(Cn= 134 ,En=123)										
Enough of the kinds of food (we/I) want to eat	23	17.1	14	10.5	-14,3;0.9	25	20.3	18	14.6	-14.3;2.9
Enough but not always the kind of food (we/I)want to eat	35	26.2	40	29.9	-8.0;15.5	32	26.0	38	30.9	-6.5;16.3
Sometimes not enough to eat	34	25.4	47	35.1	-1.6;21.0	28	22.8	41	33.3	-1.5;22.6
Often not enough to eat	42	31.3	33	24.6	-17.7;4.2	38	30.9	26	21.1	-20.4;0.8
I/We worry whether (my/our) food will run out (Cn= 132 ,En=121)										
Often true	58	43.9	59	44.7	-11.0;12.5	61	50.4	45	37.2	-25.5;0.9
Sometimes true	54	40.9	46	34.9	-18.1;6.0	40	33.1	48	39.7	-5.2;18.4
Never true	20	15.2	27	20.5	-3.6;14.2	20	16.5	28	23.1	-2.3;15.5
The food that is bought just does not last, and (I/We) do not have money to buy more food (Cn=130 ,En=120)										
Often true	54	41.5	51	39.2	-13.7;9.0	59	49.2	42	35.0	-26.0;-2.4*
Sometimes true	56	43.1	49	37.7	-17.1;6.3	36	30.0	47	39.2	-2.6;20.9
Never true	20	15.4	30	23.1	-3.9;14.6	25	20.8	31	25.8	-4.6;14.6
(I/We) cannot afford to eat balanced meals (Cn=131 ,En=120)										
Often true	64	48.9	61	46.6	-14.7;10.1	61	50.8	47	39.2	-23.0;-0.4*
Sometimes true	51	38.9	39	29.8	-12.7;9.6	37	30.8	43	35.8	-5.4;15.4
Never true	16	12.2	31	23.7	1.9;21.0*	22	18.3	30	25.0	-2.0;15.3
Households screened to carry on with questionnaire (Cn=134,En=124)										
	120	89.6	110	82.1	-15.7;0.8	107	86.3	102	82.3	-12.0;3.9
In the last six months did (you/other adults in your household) ever cut the size of your meals or skip meals because there was not enough money for food (Cn= 94 ,En=88)										
Yes	60	63.8	56	59.6	-16.6;8.0	53	60.2	60	68.2	-5.3;21.2
No	34	36.2	38	40.4	-8.0;16.6	35	39.8	28	31.8	-1.2;5.3
If yes, how often did this happen? (Cn=39, En=36)										
Almost every month	19	48.7	17	43.6	-27.7;17.4	21	58.3	16	44.4	-34.4;6.6
Some months but not every month	17	43.6	17	43.6	-23.8;23.8	11	30.6	15	41.7	-8.8;31.0
Only 1 or 2 months	3	7.7	5	12.8	-8.4;18.6	4	11.1	5	13.9	-13.0;18.5
In the last six months did you ever eat less that you felt you should because there was not enough money to buy food? (Cn= 96 ,En=88)										
Yes	70	72.9	67	69.8	-17.1;10.2	61	69.3	61	69.3	-13.2;13.2
No	26	27.1	29	30.2	-10.2;17.1	27	30.7	27	30.7	-13.2;13.2

Table 4.9 Changes in food security from baseline to post-intervention (Continue)

In the last six months, were you ever hungry but did not eat because there was not enough money for food? (Cn=96 ,En= 88)										
Yes	50	52.1	46	47.9	-17.9;9.6	53	60.2	47	53.4	-22.0;7.9
No	46	47.9	50	52.1	-9.6;17.9	35	39.8	41	46.6	-7.9;22.0
In the last six months did you lose weight because there was not enough money for food? (Cn=82 ,En=80)										
Yes	48	58.5	42	51.2	-22.6;7.9	44	55.0	37	46.3	-22.4;4.9
No	34	41.5	40	48.8	-7.9;22.6	36	45.0	43	53.8	-4.9;22.4
In the last six months, did (you/other adults in the household) ever not eat for a whole day because there was not enough money for food? (Cn=59 , En=48)										
Yes	20	33.9	26	44.1	-5.3;25.6	23	47.9	24	50.0	-18.5;22.7
No	39	66.1	33	55.9	-25.6;5.3	25	52.1	24	50.0	-22.7;18.5
If yes, how often did this happen? (Cn=12 ,En=11)										
Almost every month	6	50.0	7	58.3	-38.8;55.5	9	81.8	7	63.6	-45.5;9.2
Some months but not every month	3	25.0	5	41.7	-26.4;59.7	2	18.8	3	27.7	-25.8;44.0
Only 1 or 2 months	3	25.0	0	0	-53.7;3.7	0	0	1	9.1	-12.4;30.6
Are there children under the age of 18? (Cn= 135 ,En= 124)										
Yes	92	68.2	100	74.1	-1.8;13.6	87	70.2	81	65.3	-13.2;2.6
No	43	31.9	35	25.9	-13.6;1.8	37	29.8	43	34.7	-2.6;12.3
(I/We) relied on only a few kinds of low cost foods to feed my/our children because I/we were running out of money to buy food (Cn=83, En= 73)										
Often true	46	55.4	39	47.0	-22.1;5.2	35	48.0	33	57.5	-4.9;24.1
Sometimes true	28	33.7	28	33.7	-14.4;14.4	25	34.3	26	28.9	-19.8;8.8
Never true	9	10.8	16	19.3	-1.7;18.6	13	17.8	14	13.7	-16.5;8.2
(I/We) could not feed (my/our child/children) a balance meal because I/we could not afford it (Cn=83, En= 73)										
Often true	46	55.4	36	43.4	-26.6;25	33	45.2	37	50.1	-7.7;18.7
Sometimes true	28	33.7	27	32.5	-19.8;8.8	26	35.6	28	38.4	-10.5;16.0
Never true	9	10.8	20	24.10	-16.5;8.2	14	19.2	8	11.0	-27.7;5.0
My/our child/children were not eating enough because we could not afford enough food (Cn=83, En=71)										
Often true	40	48.2	29	34.9	-27.1;0.6	29	40.9	30	42.3	-11.9;14.8
Sometimes true	26	31.3	26	31.3	-14.4;14.4	25	35.2	31	43.7	-5.6;22.5
Never true	17	20.5	28	33.7	-0.2;26.7	17	23.9	10	14.1	-23.0;3.3
In the last six months, did you ever cut the size of any of your children's meals because there was not enough money for food (Cn= 83 ,En=72)										
Yes	42	50.6	32	38.6	-26.6;2.5	29	40.3	30	41.7	-13.4;16.2
No	41	49.4	51	61.5	-2.5;26.6	43	59.7	42	58.3	-16.2;13.4

Table 4.9 Changes in food security from baseline to post-intervention (Continue)

In the last six months, were (any children in the household) ever hungry but, you just could not afford more food? (Cn=82 ,En=73)										
Yes	26	31.7	19	23.2	-21.9;4.8	18	24.7	21	28.8	-7.6;15.8
No	56	68.3	63	76.8	-4.8;21.9	55	75.3	52	71.2	-15.8;7.6
In the last six months did any children ever skip a meal because there was not enough money for food (Cn= 83, En= 73)										
Yes	20	24.1	18	21.7	-10.5;16.0	17	23.3	21	28.8	-7.61.18.1
No	63	75.9	65	78.3	-16.0;10.5	56	76.7	52	71.2	-18.1;7.1
If yes, how often did it happen (Cn= 8, En=8)										
Almost every month	5	62.5	8	100	-2.3;77.3	8	100	8	100	
Some months, but not every month	3	37.5	0		-48.3;98.3	0		0		
Only 1 or 2 months	0	0	0			0		0		
In the last six months, did any children in the household ever not eat for a whole day because there was not enough money for food (Cn= 78, En= 73)										
Yes	10	12.8	12	15.4	-7.5;12.6	12	16.4	16	21.9	-3.6;14.6
No	68	87.2	66	84.6	-12.6;7.5	61	83.6	57	78.1	-14.6;3.6

Cn= n values for control group
En= n values for experimental group
*Significant difference

4.6 Anthropometry

For all anthropometric parameters the control and experimental groups were very similar at baseline. Mean weight was 62.0 kg for the control group and 62.2 kg for the experimental group, while mean height was 1.6 cm for both groups. Mean waist circumference was also similar at 85.7cm for the control group and 83.7cm for the experimental group and mean BMI was 24.7 kg/m^2 for both groups. The 95% confidence intervals for the percentage differences between the mean anthropometric variables of the two groups indicate that no significant differences occurred between the two groups at baseline. These values were also similar in the

excluded group. Table 4.10 depicts the anthropometry of the control and the experimental groups at baseline.

Table 4.10 Mean values for anthropometric variables (Baseline)

Parameters	Control			Experimental			95% CI for mean difference
	Mean	Std Dev	Range	Mean	Std Dev	Range	
Weight (kg) Cn=135 En=124	62.0	14.4	31.3-138.4	62.2	14.6	35.3-115.0	-3.8;33
Height (cm) Cn=129 En=118	1.6	0.1	1.4-1.9	1.6	0.1	1.4-1.9	-0.03;0.02
Waist (cm) Cn=130 En=117	85.7	13.5	52.1-133.2	83.7	13.4	54.4-129.0	-1.3;5.4
BMI (kg/m²) Cn=129 En=117	24.7	5.8	13.3-54.7	24.7	6.2	14.4-43.3	-1.5;1.5

Cn= n values for control group
En= n values for experimental group

Table 4.11 indicates the BMI categories (kg/m²) of the control and experimental groups at baseline. About one in ten participants in both groups had a BMI in the underweight category (below 18.5 kg/m2), while 47.3% of the control group and 47.9% of the experimental group had a BMI in the normal category. A large percentage of respondents in both groups were either overweight (26.4% of control group and 21.7% of experimental group) or obese (14.7% in control group and 18.8% in the experimental group). More than half of all respondents had a waist circumference in the high risk category ($\geq$80cm for women and $\geq$94cm for men). As seen with the mean anthropometric variables, there were also no significant differences between the percentage of respondents in the various BMI categories, or in the percentage of respondents with a high risk waist circumference.

Table 4.11 BMI and Waist circumference categories (Baseline)

BMI (Cn=129, En=117)	Control		Experimental		95% CI for percentage difference
	n	%	n	%	
<18.5	15	11.6	14	12.0	-9.3; 8.4
18.5-<25	61	47.3	56	47.9	-13.4,12.3
25-<30	34	26.4	25	21.7	-6.3;16.0
≥30	19	14.7	22	18.8	-14.1;5.8
High risk waist circumference (Cn=130 en En=117)	75	57.7	63	53.9	-9.0;16.6

Cn= n values for control group
En= n values for experimental group

Tabel 4.12 indicates the changes in mean anthropometric values from baseline to post-intervention in the control and experimental groups. For most variables, no significant changes in anthropometric values occurred. The mean weight of the control group, however, increased from 62.2 kg to 64.1 kg with a 95% CI for the percentage change of [0.05;3.6].

Table 4.12 Changes in mean anthropometric values from baseline to post-intervention

Parameters	Control							Experimental						
	Baseline			Post-Intervention			95% CI of mean difference	Baseline			Post-Intervention			95% CI for mean difference
	Mean	Std Dev	Range	Mean	Std Dev	Range		Mean	Std Dev	Range	Mean	Std Dev	Range	
Weight (kg) (Cn= 129 ,En= 119)	62.2	14.5	37.1-138.4	64.1	14.3	34.3-125.0	0.05;3.6*	62.3	14.8	35.3-115.0	63.6	13.8	34.8-106.3	-0.7;3.3
Waist (cm) (Cn=116= ,En= 105)	86.4	13.5	52.1-133.2	85.8	13.4	52.5-133	-3.4;2.1	84.6	11.6	54.4-129.0	84.6	11.6	51.2-144	-1.5;3.6
BMI (kg/m²) (Cn=123 ,En= 112)	24.7	5.8	13.3-54.7	25.4	5.9	12.8-49.5	-0.02;1.4	24.7	6.2	14.4-43.3	25.2	5.8	13.0-42.1	-0.3;1.4

*Significant difference

Table 4.13 illustrates the changes in categorical anthropometric parameters from baseline to post-intervention. In both these groups the BMI looked almost the same (before and after intervention). A large percentage of the participants had a normal BMI (almost fifty percent of participants). There was no significant difference in the BMI, before and after intervention.

More than half of the participants had a high risk waist circumference, although there was no significant difference, before and after intervention. The risk decreased in the control from 61.2 to 56.9% group and increased in the experimental from 53.3% to 59.1%.

Table 4.13 Changes in categorical anthropometric parameters from baseline to post-intervention

Parameters	Control					Experimental				
	Baseline		Post-intervention		95% CI for % difference	Baseline		Post-intervention		95% CI for % difference
	n	%	n	%		n	%	n	%	
BMI (kg/m²) (Cn= 123, En=112)										
<18.5	14	11.4	11	8.9	-8.1;3.2	13	11.6	8	7.1	-10.1;1.2
18.5-<25	58	47.2	60	48.8	-8.6;11.9	54	48.2	52	46.4	-13.0;9.4
25-<30	34	27.6	28	22.8	-14.3;4.5	24	21.4	28	25.0	-7.1;14.2
≥30	17	13.8	24	19.5	-6.8;12.2	21	18.8	24	21.4	-5.0;10.3
High risk waist circumference (cm)										
Cn= 116 , En=105	71	61.2	66	56.9	-13.8;5.2	56	53.3	62	59.1	-4.;16.4

Cn= n values for control group
En= n values for experimental group

Chapter 5: Discussion

5.1 Introduction

In this chapter, the results of the study are discussed in terms of possible reasons for findings and compared with other relevant studies.

5.2 Limitations of the study

The most significant limitation of this study was the logistics related to the food supplement used in the intervention. In this regard, limitations are related to the type of food used as a food supplement; the amount of food supplemented; the distribution of the food in the household; as well as the period of intervention.

Initially the food supplement that was selected by the researcher was tinned pilchards in tomato sauce. This product was chosen due to the high protein and energy content, favourable fat source, high haem iron and vitamin C content, as well as the cultural acceptability and long shelf-life thereof. At the time of intervention, however, a national shortage in the availability of pilchards in tomato sauce was experienced in South Africa, and an alternate food product had to be chosen. Although tinned meatballs and spaghetti also provided a number of the benefits of the pilchards in tomato sauce (energy and protein source with vitamin C), that was found to be highly acceptable in the pilot study, the product was not as beneficial.

In regard to the amount of food supplemented, each household was provided with two tins of meatballs and spaghetti in tomato sauce (400g cans) per week. Participants were encouraged to consume as much of the product as possible, but it

is very likely that it was shared with the other household members and thus the amount consumed by the participant may have been very low. Although it is likely that the food supplement did impact on household food security to a small degree, it was not sufficient to make a significant difference. In addition, it is likely that the provision of the same food supplement for a median period of 15 months may have resulted in lower acceptability and consumption of the product. It may also have been sold by participants.

Most other research related to food supplementation in HIV infected patients have focused on using ready-to-use therapeutic foods such as energy drinks and enriched porridge. Limited information is available on the impact of food as a supplement for HIV individuals, making it difficult to compare results of the current study with other studies in similar circumstances.

Data were collected by fieldworkers who were trained to fulfil this function. In both the control and experimental groups, fieldworkers were adherence supporters who's main function was to encourage adherence to ARV intake in the participants. In addition, these fieldworkers were required to complete questionnaires and take anthropometric measurements during the baseline and follow-up surveys. In the experimental group, they also provided the household with the food supplement.

Before the study commenced, fieldworkers were trained in the procedure to follow when completing questionnaires and taking anthropometric measurements. Although this training was provided over a period of two days by the researcher using a training manual developed specifically for this purpose, the fieldworkers were not formally trained in nutrition or dietetics. During the data cleaning process, results related to triceps skinfold were found to be unreliable and had to be excluded.

There was a group excluded from the study because of a lack of information either at baseline or the follow up period. A total number of 72 black participants and 1 coloured participant was excluded (24 male and 50 female). Some of these values for gender and race were unknown, thus adding up to 72 participants and not 77 as previously mentioned in chapter 4.

Lastly, the clinics that were included in the sampling procedure (and thus the areas from which participants were recruited) were situated in both rural and urban areas. In the reporting of results, these areas have been combined into only two groups – the control and experimental groups. It may have added value to report results of urban and rural areas separately, but the limited numbers included in the study made this difficult to do.

5.3 Socio-demographic status (Household information)

When the control and experimental groups were compared in terms of socio-demographic status they were found to be very similar.

5.3.1 Race, gender, age, marital status and level of education

The majority of participants were female with a mean age of 38 years, and of African race. A large percentage had never been married.

In developing countries, the prevalence of HIV is higher in females than in males (ASSAf, 2007, p. 30; Shisana *et al.,* 2005). According to UNAIDS (2007), younger

women also tend to have the highest prevalence of HIV. The results of this study confirmed these findings. Other possible reasons that the percentage of female respondents that participated was higher than male respondents could be the fact that more women tend to stay home compared to men, due to employment status or family responsibilities and were thus more easily available to participate.

According to the literature, the prevalence of HIV, unemployment and low income is higher in the black African population in South Africa (Seekings and Nattrass, 2005). In addition low levels of education can result in a vicious cycle of unemployment, poverty, food insecurity and HIV (Ladzani, 2009; ASSAf, 2007, p. 25-16; Sibanda *et al.* 2007). About ten percent of all participants in the current study had either never been to school or had achieved a level of education below grade three, while fewer than twenty percent had finished grade 12. A study undertaken in Uganda showed that a child who drops out of school is three times more likely to become HIV infected when he/she reaches their twenties than someone who received basic education (UNAIDS, 2008). According to Stats SA, at the end of 2008, the unemployment rate in the general black population was 25.9%, but even higher in the townships (Stats SA, 2009). Women who are unmarried are more likely to have multiple partners and thus have an increased risk of contracting HIV.

5.3.2 Household information

Housing is a basic human need. Housing can have an effect on a household's health, welfare and social status in communities (Stats SA, 2012). According to Stats SA (2012) there has been an increase in the number of households living in formal

dwellings with the number of households living in traditional dwellings or informal settlements having decreased by almost fifty percent between 1996 and 2011. In the current study the majority of participants lived in a house/dwelling or brick structure on a separate stand or yard, indicating a formal dwelling and thus correlating with the information from Stats SA (2012).

Everyone has the right to have access to sufficient water (Geere *et al.,* 2010). Most of the houses in the current study had taps in the yard and carried water to the dwelling. About 65% had access to a flush toilet and 82% to 87% had electricity. According to Mayosi *et al.* (2012), progress has been made in South Africa regarding access to electricity and piped water. This is a positive change, since proper hygiene and housing are required for patients to fully benefit from ARV's (Riley *et al.,* 2012).

The median household size of three persons per household in both control and experimental groups indicates that overcrowding was not a major problem. Stats SA (2012) reported that the average household size in South Africa has decreased by about 1.1 persons since 1996, the reason for this might be the fact that more houses have been built as part of the Reconstruction and Development Programme.

5.4 Symptoms as a result of ARV's

Both HIV itself and ARV therapy can impact on the health of HIV infected persons, resulting in signs and symptoms that can make it difficult to manage daily activities (Alonzo and Reynolds, 1995). This in turn can have an effect on ability to attend formal education, earn an income and prepare meals.

As a result of HIV infection, patients may experience weight loss and become more susceptible to water as well as food borne pathogens (Dong and Imai, 2012, p. 866). Other symptoms such as fever, thrush, respiratory and skin problems, sweats and fatigue may also be present (Dong and Imai, 2012, p. 866; Hira *et al.,* 2003).

On the other hand, the drugs included in ARV therapy can have both acute and chronic side effects, which can differ from one patient to the next, increasing the risk for non-adherence. In a study done in Brazil between 2009 and 2011, 168 adverse events that were linked with ARV drugs were reported (Lenzi *et al.,* 2012). Fever, diarrhea, nausea, anorexia, headache, sinusitis and lactic acidosis may occur when therapy is initially introduced (Reust, 2011; Tang *et al.,* 2005; Bell, 1998). Other side-effects may include skin rash, pain and renal impairment (Lenzi *et al.,* 2012).

In the longer term, side effects can include changes in body composition, hyperlipidemia, and peripheral neuropathy, as well as reduced bone mineral density (Reust, 2011; Stone *et al.,* 2010; Beadles *et al.,* 2009; Fenton and Silverman, 2008, p.1001; Tang *et al.,* 2005; Bell, 1998).

About one in ten participants in the current study complained about tiredness, which they felt was related to taking ARVs. Some of the other symptoms that were reported as a result of using ARV therapy included diarrhoea, dizziness, skin rash and nausea, although these were seen in very small percentages.

5.5 Food Supplements

Food programs have the potential to decrease food insecurity and increase nutrient intake (Walker and Kawachi, 2012; WHO, 2009) and improving adherence to ARV therapy (WHO, 2009). Nutrition interventions providing food supplements should be adequate and appropriate from the early to advanced stages of HIV infection, to ensure better outcomes (Scarcella *et al*., 2011; WHO, 2009).

Nutritional supplementation plays an important role in the management of patients with HIV/AIDS (Nahar *et al,.* 2009) and for this reason the NSP has been implemented (Supplementation Policy, 2006). In theory all underweight HIV infected patients in South Africa qualify for food aid. The majority of participants in the current study (less than eighty percent) had not received food supplementation from the NSP, which confirms the finding by Nahar *et al. (*2009) that not all patients that qualify for supplementation receive it. Of those that did receive supplementation, all reported that they did eat the supplements that were provided. More than sixty percent in both groups reported that they did not share those supplements with their families.

There are limited studies that reported on food supplementation in HIV. Those that are available mostly reported on the impact of ready-to-use therapeutic supplements, such as the porridge and energy drink provided by the NSP. Ready-to-use therapeutic foods may be more effective than food-aid commodities, as far as weight gain and physical performance are concerned (Bahwere *et al.,* 2009).

5.6 Food consumed or bought by the household

The importance of optimal food intake is often overlooked; although research shows that there is a link between immune function and nutritional status (Kim *et al.,* 2001).

From the list of foods bought and consumed it can be concluded that a large percentage of households included in this study frequently bought and consumed starchy staple foods (mealie meal, rice, bread and potatoes), vegetable oil and sugar. According to the National Food Consumption Survey (NFCS) in South Africa (1999); the most commonly used food was maize, sugar, tea, milk and brown bread (Labadarios *et al.,* 2005), which confers with the results of this study. As far as foods containing protein are concerned, a large percentage of households (>75%) in the current study did purchase and consume dairy products (milk, sour milk or yoghurt), chicken (more than ninty percent) and eggs (>75%). According to Ruel (2003), poorer populations often rely on starchy staple foods containing little or no animal products, dairy foods, and few fruits and vegetables, which can lead to nutrient deficiencies (Ruel, 2003). In this study the amounts of foods consumed were not determined, which makes it difficult to draw conclusions about food intake – it is likely that although dairy, chicken and eggs were consumed as protein sources, the amounts eaten did not meet recommendations. The high percentage of households that had bought and consumed vegetable fats and sugar may also have contributed to the high levels of overweight and obesity in this sample. In addition, dyslipidemia is a common side-effect of ARV treatment and thus fat intake (as well as sugar in the case of hypertriglyceridemia) needs special consideration in patients on HAART. These patients should be educated on the different fat sources, and consume a diet rich in monounsaturated fats and limit the use of saturated and trans fats (which are

high in cheaper cuts), to ensure a lower risk for cardiovascular disease (Lichtenstein *et al*., 2006).

In both the control and experimental groups the percentage of households that bought or consumed breakfast cereals, legumes (dried peas, lentils and beans), and fruits and vegetables were relatively low in the current study, which points to a low variety of healthy foods. The WHO (1998) recommends that a variety of foods should be eaten for good health, and thus it is unlikely that the food intake of the participants in this study could have assured healthy choices. According to a study done on HIV infected individuals in Brazil, vegetable intake in HIV infected participants was low (Duran *et al*., 2008). A diet that is high in fruits and vegetables will meet the requirements for micronutrients, fibre and macronutrients, and such a diet also have the ability to reduce the risk for cardiovascular disease and diabetes (Lichtenstein *et al.,* 2006).

In addition, more costly protein sources such as red meat, fish and cheese were not bought or consumed by a large percentage of participants. Very often, healthier food choices are more expensive and thus not affordable for a large majority of the population (Temple *et al.,* 2011). These results confirm this.

Only a few changes were seen in the foods bought or consumed by the control and experimental groups from baseline to post-intervention. The small number of significant changes in both the control and experimental groups are unlikely to be related to the nutrition intervention that was implemented in the experimental group.

5.7 Food Security

Poverty is one of the major causes of food insecurity (Wolfe *et al.,* 2003). Poverty increases the spread of HIV and HIV increases the risk of poverty, resulting in a vicious cycle (Lange and Van Der Waals, 2002). Food security is most often associated with a patient's income and has an effect on general and nutritional health, coping strategies, risk of developing depression, sexual behaviour and disease progression (Ivers and Cullen, 2011).

In South Africa, household food insecurity remains a significant problem (Rose and Charlton, 2002 a), often related to poverty and underdevelopment (ASSAf, 2007, p. 26). Household food insecurity has been reported in 43% of households in South Africa (Charlton and Rose, 2002 a) and according to USDA (2011), the number of people that are food insecure in sub-Saharan Africa will increase by 17 million between 2011 and 2021. According to the National Food Consumption Survey of 1999, more than half of South African households reported hunger, almost a quarter was at risk of hunger and only a quarter reported being foods secure (Labadarios *et al.*, 2005). Between 21-31% respondents in the current study reported that they often do not have enough to eat; worry whether they will run out of food (almost fifty percent); cannot afford to eat a balanced meal (almost fifty percent); often cut the size of their meals because there was not enough money for food (about sixty percent); and could not afford to feed their children a balanced meal (about fifty percent) confirms high levels of food insecurity in this sample.

Factors that can increase the risk of developing food insecurity include food shortages, inadequate feeding practices, poor living conditions (Burgess *et al.,* 2009, p. 81), illiteracy, unemployment, renting of houses and female headed households

(Bawadi *et al.,* 2012; Huet *et al.,* 2012). The results of this study indicated that a number of these factors were present, namely food shortages and inadequate feeding practices (as indicated by the foods bought or consumed and questions related to food security), poor living conditions (about 35% of participants did not have access to a flush toilet), and illiteracy (about ten percent of participants had never been to school and less than twenty percent had finished school).

Coping strategies that are used when food insecurity is seen in an household include buying on credit to buy food, selling personal assets, skipping meals, limiting portion sizes, buying and preparing limited foods, and parents depriving themselves to feed children (Hamelin *et al.*, 1999) Many of these findings were also true in the participants included in this study.

The fact that very few changes in parameters of food security occurred after the food supplementation intervention, indicates that this intervention did not have a very significant impact on food security. However, small improvements were noted in the experimental group, including a reduction in the percentage of participants that worried about running out of food (50.4% to 37.2%). In addition fewer participants in the experimental group could not afford a balanced meal (50.8% to 39.2%) and fewer reported that it was often true that food did not last (49.2% to 35.0%). These changes could be due to the supplement given to the participants.

5.8 Anthropometry

Anthropometric measurements that were assessed in this study included weight, height, BMI and waist circumference. According to Hurley *et al.* (2011), BMI and waist circumference are good indicators of nutritional status in HIV infected patients that are simple and quick to determine.

Malnutrition and weight loss are often seen in HIV infection and are associated with a reduced chance of survival (Fenton and Silverman, 2008, p.1008). As little as five percent weight loss in HIV infected patients can have a negative effect on disease progression. Weight loss can be ascribed to increased resting energy expenditure, accelerated protein turnover, decreased energy intake, diarrhoea and malabsorption (ASSAf, 2007, p.69; Anabwani and Navario, 2005). In the current study about one in ten participants was underweight according to BMI. Although weight loss and underweight are common in HIV infected patients, weight gain often occurs in those on ARV tratment (Maia *et al.,* 2005).

For all anthropometric parameters, the control and experimental groups were very similar at baseline. Mean weight was 62 kg in both groups, while mean BMI was 24.7 kg/m^2 in both groups, thus falling in the upper range of the normal BMI range of 18.5 kg/m^2 to 24.9 kg/m^2. Arendt *et al.* (2008) reported that HIV infected patients on ARV therapy in Canada had a mean BMI of 26.05 kg/m^2, which is slightly higher than that reported in the current study. Despite about half of participants in the current study having a BMI in the normal weight category, a large percentage in both groups were either overweight (26.4% of control group and 21.7% of experimental group) or

obese (14.7% in control group and 18.8% in the experimental group), which can lead to an increased risk for chronic non-communicable diseases including diabetes, hypertension, cardiovascular disease and dyslipidaemia (Dong and Imai, 2012, p. 878; Nerad *et al*., 2003). In addition weight gain in patients on ARV treatment increases the risk for developing lactic acidosis (Kacher *et al*., 2012).

According to Duran *et al.* (2008), in a study done in Brazil, HIV infected individuals that received HAART who were overweight, usually also had a poor diet, which correlates with the findings of the current study, that showed that foods bought and consumed were often high in starch and fat and low in fruits and vegetables.

Waist circumference is a good indicator of central adiposity (Han *et al.,* 1995). There is a strong link between high waist circumference (≥ 94 cm in men and ≥ 80 cm in women), visceral adipose tissue, and obesity-related health risks (Alberti *et al.*, 2006; Sidney *et al.*, 1999). In patients on HAART, central adiposity is a common finding (Justman *et al*., 2008). In the current study, more than half of all respondents had a waist circumference in the high risk category, putting them at risk for chronic health conditions.

After intervention, no significant changes in anthropometric variables were noted in the experimental group, indicating that the food supplement did not impact on these variables.

Chapter 6: Conclusions and recommendations

6.1 Introduction

In this chapter, the main conclusions that could be drawn from the study are summarised. In addition, recommendations related to food supplementation in HIV infected patients as well as recommendations related to further research are made.

6.2 Conclusion

The following conclusions evolved from the study:

6.2.1 Socio-demographic status (Household information)

When the control and experimental groups were compared in terms of socio-demographic status, they were very comparable.

6.2.1.1 Race, gender, marital status and level of education

- The majority of participants were of African race.
- About eighty percent were female and about twenty were male.
- A large percentage (43% in the control group and 45.5% in the experimental group) had never been married.

- About ten percent of all participants in the study had either never been to school or had achieved a level of education below grade three, while fewer than twenty percent had finished grade twelf.

6.2.1.2 Household information

- The majority of participants in this study lived in a house/dwelling or brick structure on a separate stand or yard.
- Most of the houses had taps in the yard and carried water to the dwelling.
- About 65% had access to a flush toilet and most of the participants had electricity.
- The household size consisted of a median of three persons per household in both groups and the household density was 1.5 persons per room in the control group and two persons per room in the experimental group.

6.2.2 Symptoms as a result of ARV's

- More than thirty percent of participants in both groups, reported experiencing symptoms after taking ARV treatment, that made them feel ill. Some symptoms that were experienced included diarrhea, headache, hypertension and weight loss.
- About one in ten participants complained about tiredness (8.1% for the control group and 10.4% for the experimental group).

- In terms of symptoms experienced as a result of taking ARVs, no significant differences occurred between the control and experimental groups.

6.2.3 Food Supplements

- The majority of participants (less than eighty percent) had not received food supplementation from the government (NSP) at baseline.
- Those participants that did receive supplementation all reported that they did eat the supplements that were provided.
- Although more than sixty percent in both groups reported that they did not share those supplements with their families, a relatively large percentage did (34.8% in the control group and 38.5 in the experimental group).
- In terms of exposure to the NSP, no significant differences occurred between the control and experimental groups.

6.2.4 Food consumed or bought by the household

- Although food and nutrient intake cannot be estimated very accurately from information related to foods bought or consumed, they do give an idea of what foods are available in the household. From this list it can be concluded that a large percentage (more than fifty percent) of households frequently bought and consumed starchy staple foods (mealie meal, rice, bread and potatoes), vegetable oil and sugar.

- As far as foods containing protein are concerned, a large percentage of households did purchase and consume dairy products (milk, sour milk or yoghurt), chicken and eggs.

- In both the control and experimental groups the percentage of households that bought or consumed breakfast cereals, legumes (dried peas, lentils and beans), and fruits and vegetables were relatively low.

- In addition, more costly protein sources such as red meat, fish and cheese were not bought or consumed by a large percentage of participants.

- Only a few random changes were seen in the foods bought or consumed by the control and experimental groups after intervention. This seems to indicate that the nutrition intervention did not have a significant general impact on foods bought or consumed.

6.2.5 Food Security

- In both groups (at baseline) one in three participants reported that they often do not have enough to eat and that they worry whether they will run out of food.
- In both the groups, respondents reported that it is often true that the food that they buy just does not last (40.6% in control and 48.4% in experimental) and that they cannot afford to eat a balanced meal (48.5% in control and 50.5% in experimental groups).

- More than seventy percent of respondents reported that they had eaten less over the past six months.
- Two out of three participants reported that they had experienced hunger in the past six months.
- About half of households that have children, struggled to feed them a balanced meal (about fifty percent) and more than forty percent reported that the children in the household were not eating enough.
- After intervention, significantly more participants in the experimental group worried less about running out of food (50.4% to 37.2%), while significantly fewer could not afford a balanced meal (50.8% to 39.2%), and significantly fewer felt that it was often true that the food that they ate just did not last (49.2% to 35.0%).

Food insecurity was evident in a large percentage of participants. Although some improvements in parameters of food security were observed in the experimental group, these did not point to an overall improvement in food security.

6.2.6 Anthropometry

- At baseline, anthropometric parameters of the control and experimental groups were very similar.
- Mean weight of participants was 62 kg.
- Mean BMI was 24.7 kg/m^2 in both groups.

- About one in every ten participants was underweight.
- About half of the participants had a normal BMI.
- A large percentage of respondents in both groups were, however, either overweight (26.4% of control group and 21.7% of experimental group) or obese (14.7% in control group and 18.8% in the experimental group).
- More than half of all respondents had a waist circumference in the high risk category (range 83.7 cm in the experimental group to 85.7 cm in the control group).
- After intervention, no significant improvements in parameters of anthropometry were seen, except that the mean weight of the control group increased from 62 kg to 64 kg.

6.3 Recommendations

Recommendations regarding food intake and supplementation in HIV infected patients as well as recommendations for further research are discussed in the following section.

6.3.1 Recommendations regarding food intake and supplementation

Effective, affordable and acceptable nutrition interventions for HIV infected patients are critical in the care of HIV infected patients (Piwoz and Preble, 2000). In food

insecure HIV infected patients, food aid can contribute to improved adherence to therapy (Cantrell, *et al*., 2008).

An adequate diet plays an important part in the management of HIV (Duran *et al*., 2008; WHO, 2003) and an optimal nutritional status can contribute to delayed disease progression and improved quality of life (Tomkins, 2005; Wanke, 2005). The WHO (1998) indicates that the chances of eating an adequate diet are increased if a variety of foods are eaten. Despite this, the general South African population does not eat a variety of foods and the most commonly used foods include maize, sugar, tea, milk and brown bread (Labadarios *et al*., 2005).

Currently there are very few programmes available to address food insecurity in HIV infected households in Africa, and most of these are implemented on a small scale. These programmes most often consist of food aid in the form of fortified maize porridge and vitamin and mineral supplements (Panagides *et al*., 2007). As in most food aid programmes, the food supplements often do not reach those that need them most (Nahar *et al*., 2009). It is important that patients that do qualify for supplementations do receive it, in the right amount and on a regular basis.

A lack of knowledge and income amongst HIV infected individuals can also affect food choices and food security (Hendricks *et al*., 2008). Interventions that aim to improve nutrition-related knowledge to enhance nutritional status can thus also contribute to addressing food insecurity (ASSAf, 2007). In addition to education on treatment adherence, education regarding budgeting might be useful, so that patients can use their money wisely (Panagides *et al.,* 2007).

In addition to food support and nutrition education, assistance with the planting of vegetable gardens can impact on food security. In this regard, there is a need for a "learn by doing" approach (Anema *et al.,* 2009). The combination of education, food aid and food gardens has the ability to improve micronutrient status (Duggal *et al.,* 2012; Panagides *et al.,* 2007; Suttajit, 2007).

In addition to contributing to household food security, food gardens can offer an opportunity for income generation. In this way people can be empowered. Women and girls will be less likely to engage in transactional sex and abuse in women and children may be decreased (thus limiting the risk for further HIV transmission).

Despite the fact that the food-based approach used in the current study did not seem to have a major impact (the limitations of the programme should be taken into account), other programmes have shown that a food-based approach can be successful. In Ethiopia a food supplementation programme consisting of local vegetables and fortified staple products assisted in improving micronutrient intake and improving immune function (Collins *et al.,* 2006). A study undertaken in Zimbabwe showed that vegetable gardens, education and nutrition were not integrated, possibly due to a limited availability of resources (Panagides *et al.,* 2007). Lack of integration of all of these factors may also have been the reason that the intervention in the current study did not have a sustainable impact.

According to ASSAf (2007), food aid programmes should be culturally sensitive and make use of local available resources. Ideally, the supplemented food should not replace other foods in the diet, but should provide additional nutrients (ASSAf, 2007).

These supplemented foods or nutrients cannot replace a balanced diet (WHO, 2003).

Ready-to-use therapeutic foods usually consist of a nutrient dense supplement that is formulated for HIV infected individuals (Ivers *et al.,* 2009). As far as weight gain and physical performance are concerned, ready-to-use therapeutic foods may be more effective than foods themselves (Bahwere et al., 2009). It is suggested that ready-to-use therapeutic foods should be given to the HIV infected individual in a household together with food assistance for other household members so that the whole household can benefit, and food insecurity can be addressed (Ivers *et al.,* 2009).

An integrated approach is needed when considering nutrition and HIV. In addition to addressing food insecurity, the focus should be on prevention, positive living, treatment (prophylaxis, ARV treatment, treatment for opportunistic infections) and income generation. All of these need to be implemented in a comprehensive and holistic manner by different sectors (health, agriculture, social welfare, education, private sector). In this way sustainability and community participation in solving problems can be improved (Panagides *et al.,* 2007; WHO, 2003).

6.3.2 Recommendations for further research

In view of the limitations identified in this study (see discussion), the following recommendations for further research can be made.

Firstly, it is recommended that health care workers trained in nutrition (such as nutrition advisors) be used as fieldworkers, for nutrition intervention studies. Health care workers are less likely to require intensive training on survey techniques and anthropometric measurements compared to lay persons, such as the adherence supporters used in this study. In addition, nutrition advisors could provide relevant nutrition education, thus delivering a more integrated intervention.

In this study clinics included in the sample were situated in both rural and urban areas, but data were not analysed separately for rural and urban participants. In future studies a larger sample from both urban and rural areas could be included, making it possible to investigate rural urban differences.

The interaction between HIV, food intake, poverty, benefits of food assistance, the entry and exit criteria for food assistance, and the effects of food assistance on a household are not well documented (Vanable *et al.*, 2006). If this is well understood, more effective and sustainable food aid programmes can be developed (Arrehag *et al.,* 2006). Also not well documented is how food and/or other nutrition support (supplements or education) are shared in a household (Samuels and Rutenberg, 2008).

As previously mentioned, limited information is available on food as a supplement for HIV infected individuals. Most studies focus on supplementation of ready-to-eat foods, which are not always sustainable. These programmes cannot be compared to those supplementing basic foods. However, the type, amount and compliance in

eating those foods are critical factors in the success of such programmes and need to be monitored more carefully. In addition, it might be helpful if participants received their food supplementation at a central point and eat it there, so that actual intake can be recorded. Providing enough food to improve household food security of other members of households is also important.

By supplementing HIV infected patients with a food supplement, household food security can be improved. The results of the study confirmed that food supplementation can be effective in reducing anxiety about food security and can improve the chances of eating a more balanced diet. These benefits not only impact on food availability and associated health implications, but also on social aspects that can make a meaningful contribution to improving quality of life.

References

Aboud, M., Elgalib, A., Kulasegaram, R. and Peters B. 2007. Insulin resistance and HIV infection: a review. Journal of Clinical Practice, vol. 61, no. 3, pp. 463-472.

Alberti, K.G.M.M., Zimmet, P. and Shaw, J. 2006. Metabolic syndrome-a new world-wide definition. A consensus from the International Diabetes Federation. Diabetic Medicine, vol. 23, pp. 469-480.

Almeida, L.B., Segurado, A.C., Duran, A.C. and Jaime P.C. 2011. Impact of a nutritional counseling program on prevention of HAART-related metabolic and morphologic abnormalities. AIDS Care, vol. 23, no. 6, pp. 755-763.

Alonzo, A.A. and Reynolds, N.R. 1995. Stigma, HIV and AIDS: an exploration and elaboration of a stigma trajectory. Saudi Medical Journal , vol. 41, no. 3, pp. 303-315.

Alrajhi, A.A. 2004. Human immunodeficiency virus in Saudi Arabia. Saudi Medical Journal. vol. 25, no. 11, pp. 1559-1563.

Anabwani, G. and Navario, P. 2005. Nutrition and HIV/AIDS in sub-Saharan: an overview. Journal of Nutrition, vol. 21, pp. 96-99**.**

Anema, A., Zhang, W., Wu, Y., Elul, B., Weiser, S.D., Hogg, R.S., Montaner, J.S., El Sadr, W. and Nash, D. 2011. Availability of nutritional support services in HIV care and treatment sites in sub-Saharan African countries. Public Health Nutrition, vol. 2, pp.1-10.

Anema, A., Vogenthaler, N., Frongillo, E.A., Kadiyala, S. and Weiser, S.D. 2009. Food

insecurity and HIV/AIDS: current knowledge, gaps, and research priorities. Current HIV/AIDS Report, vol. 6, no. 4, pp.224-231.

Arendt, B.M., Aghdassi, E., Mohammed, S.S., Fung, L.Y., Jalali, P., Salit, I, E. and Allard, J.P. 2008. Dietary intake and physical activity in a Canadian population sample of male patients with HIV infection and metabolic abnormalities. Current HIV Research, vol. 6, pp. 82-90.

Arrehag, L., de Waal, A. and Whiteside A. 2006. “New variant famine” revisited: chronic vulnerability in rural Africa. Humanitarian Exchange, vol. 33, pp. 7-10.

Argemi, X., Dara, S., You, S., Mattei, J.F., Courpotin, C., Simon, B., Hansmann, Y., Christmann, D. and Lefebvre, N. 2012. Impact of malnutrition and social determinants on survival of HIV infected adultsstarting antiretroviral therapy in a rural HIV care centre in Cambodia. AIDS.

ASSAf (Academy of Science in South Africa). 2007. Scientific inquiry into the nutritional influences on human immunity with special reference to HIV infection and active TB in South Africa.

Babie, E. and Mouton, J. 2001. The practice of social research. Cape Town: Oxford University Press. p. 273.

Bachmann, M.O. and Booysen, F.L.R. 2003. Health and economic impact of HIV/AIDS on South African households: a cohort study. BMC Public Health, vol. 3, p.14.

Bahwere, P., Deconinck, H., Banda, T., Mtimuni, A. and Collins, S. 2011. Impact of

household food insecurity on the nutritional status and the response to therapeutic feeding of people living with human immunodeficiency virus. Patient Prefer Adherence, vol. 5, pp. 619-627.

Bahwere, P., Sadler, K. and Collins, S. 2009. Acceptability and effectiveness of chickpea sesame-based ready-to-use therapeutic food in malnourished HIV-positive adults. Patient Prefer Adherence, vol. 3, pp. 67-75.

Batterham, M.J., Morgan-Jones, J., Greenop, P., Garsia, R., Gold, J. and Caterson, I. 2003. Calculating energy requirements for men with HIV/AIDS in the era of highly active antiretroviral therapy. European Journal of Clinical Nutrition, vol. 57, no. 2, pp. 209-217.

Bawadi, H.A., Tayyem, R.F., Dwairy, A.N. and Al-Akour, N. 2012. Prevalence of food insecurity among women in northern Jordan. Journal Health, Population and Nutrition, vol. 30, no. 1, pp.49-55.

Beadles, W.I., Jahn, A., Weigel, R. and Clutterbuck, D. 2009. Peripheral neuropathy in HIV-positive patients at an antiretroviral clinic in Lilongwe, Malawi. Tropical Doctor, vol. 39, no. 2, pp. 78-80.

Belachew, T., Hadley, C., Lindstrom, D., Getachew, Y., Duchateau, L. and Kolsteren, P. 2011. Food insecurity and age at menarche among adolescent girls in Jimma Zone Southwest Ethiopia: a longitudinal study. Reproductive Biology Endocrinology, vol. 13, no.9, p.125.

Bell, LE. 1998. Women, food and HIV. BETA, pp. 33-35.

Berneis, K., Battegay, M., Bassetti, S., Nuesch, R., Leisibach, A., Bilz, S. and Keller, U. 2000. Nutritional supplements combined with dietary counselling diminish whole body protein catabolism in HIV-infected patients. European Journal for Clinical Investigation, vol. 30, no.1, pp. 87-94.

Bonato, M., Bossolasco, S., Galli, L., Pavei, G., Testa, M., Bertocchi, C., Galvano, E., Balconi, G., Lazzarin, A., Merati, G., La Torre, A. and Cinque, P. 2012. Moderate aerobic exercise (brisk walking) increases bone density in cART-treated persons. Journal Internal AIDS Society, vol. 15, no. 6, p. 18318.

Botros, D., Somarriba, G., Neri, D. and Miller, T.L. 2012. Interventions to address chronic disease and HIV: strategies to promote exercise and nutrition among HIV-infected individuals. Current HIV/AIDS Report, vol. 9, no.4, pp. 351-363.

Bouvier, G. 1998. Nutritional management of diarrhea in HIV disease. Fact Notes (New Orleans La), vol. 10, no. 1, pp. 8-9.

Brown, T.T. 2008. Approach to the human immunodeficiency virus-infected patient with lipodystrophy. The Journal of Clinical Endocrinology and Metabolism, vol. 93, no. 8, pp. 2937-2945.

Bukusuba, J., Kikafunda, J.K. and Whitehead, R.G. 2010. Nutritional knowledge, attitudes, and practices of women living with HIV in eastern Uganda. Journal of Health Population Nutrition, vol. 2, pp. 182-188.

Burgess, A., Bijlsma, M. and Ismael, C. 2009. Community Nutrition; A Handbook for Health

and Development Workers, pp.21-127.

Bushamuka, V.N., de Pee, S., Talukder, A., Kiess, L., Panagides, D., Taher, A. and Bloem, M. 2005. Impact of a homestead gardening program on household food security and empowerment of women in Bangladesh. Food Nutrition Bulletin, vol. 26, no. 1, pp. 17-25.

Cantrell, R.A., Sinkala, M., Megazinni, K., Lawson-Marriott, S., Washington, S., Chi, B.H., Tambatamba-Chapula, B., Levy, J., Stringer, E.M., Mulenga, L. and Stringer, J.S. 2008. A pilot study of food supplementation to improve adherence to antiretroviral therapy among food-insecure adults in Lusaka, Zambia. Journal Acquire Immune Deficincy Syndrome, vol. 49, no. 2, pp. 190-195.

Carney, P.A., Hamada, J.L., Rdesinski, R., Sprager, L., Nichols, K.R., Liu, B.Y., Pelayo, J., Sanchez, M.A. and Shannon, J. 2011. Impact of a Community Gardening Project on Vegetable Intake, Food Security and Family Relationships: A Community-based Participatory Research Study. Community Health.

Charlton, K.E. and Rose, D. 2002. Prevelance of household food poverty in South Africa: results from a large, nationally representative survey. Public Health Nutrition, vol. 5, no. 3, pp. 383-389.

Chopra, M. and Darnton-Hill, I. 2006. Responding to the crisis in sub-Saharan Africa: the role of nutrition. Public Health Nutrition, vol. 9, no. 5, pp. 544-550.

Cluver. L., Orkin, M., Boyes, M., Gardner, F., and Meinck, F. 2011. Transactional sex amongst AIDS-orphaned and AIDS-affected adolescents predicted by abuse and extreme

poverty. Journal Acquired Immune Deficiency Syndrome, vol. 58, no. 3, pp. 336-343.

Cole, S.M. and Tembo, G. 2011. The effect of food insecurity on mental health: panel evidence from rural Zambia. Social Science & Medicine, vol. 73, no. 7, pp. 1071-1079.

Colecraft, E. 2008. HIV/AIDS: Nutritional implications and impact on human development. Proceedings of the Nutrition Society, vol. 67, pp. 109-113.

Collins, S., Sadler, K. Dent, N., et al. 2006. Key issues in the success of community-based management of sever malnutrition. Food Nutrition Bulletin, vol. 27, pp. S49-82.

Cunningham-Rundles, S., McNeeley, D.F. and Moon, A. 2005. Mechanisms of nutrient modulation of the immune response. Journal of Allergy Clinical Immunology, vol. 115, no. 6, pp. 1235-1237.

Dannhauser, A., van Staden, A.M., van der Ryst, E., Nel, M., Marais, N., Erasmus, E., Attwood, E.M., Barnard, H.C. and le Roux, G.D. 1999. Nutritional status of HIV-1 seropositive patients in the Free State Province of South Africa: anthropometric and dietary profile. European Journal of Clinical Nutrition, vol. 53, no. 3, pp. 165-173.

Dean, W.R., Sharkey, J.R., Johnson, C.M. and St John, J. 2012. Cultural repertoires and food-related household technology within Colonia households under conditions of material hardship. International Journal for Equity Health, vol.11, no. 1, p. 25.

De Bem Lignani, J., Sichieri, R., Burlandy, L. and Salles-Costa, R. 2011. Changes in food consumption among the Programa Bolsa Família participant families in Brazil. Public Health Nutrition, vol. 14, no. 5, pp.785-792.

De Olalla, P.G., Manzardo, C., Sambeat, M.A., Ocaña, I., Knobel, H., Humet, V., Domingo, P., Ribera, E., Guelar, A., Marco, A., Belza, M.J., Miró, J.M., Caylà, J.A. and HIV Surveillance Group. 2011. Epidemiological characteristics and predictors of late presentation of HIV infection in Barcelona (Spain) during the period 2001-2009. AIDS Research Therapy, vol. 8, no. 1, pp. 22.

De Paoli, M.M., Mills, E.A. and Grønningsaeter, A.B. 2012. The ARV roll out and the disability grant: a South African dilemma? Journal of the International AIDS Society, vol. 15, p. 6.

De Pee, S. and Bloem, W.M. 2009. Current and potential role of specially formulated food and food supplement for preventing malnutrition amoung 6 to 23 months old children and for treating moderate malnutrition amoung 6-59 months and children. Food and Nutrition Bulletin, vol. 30, no. 3, pp. s434-s463.

De Pee, S. and Semba, R.D. 2010. Role of nutrition in HIV infection: review of evidence for more effective programming in resource-limited settings. Food Nutrition Bulletin, vol. 31, no. 4, pp. 313-44.

(DoH) Department of Health; The South African Antiretroviral Treatment Guidelines, 2010.

(DoH) Department of Health; The South African Antiretroviral Treatment Guidelines, 2004.

Dlamini, J., Ledwaba, L., Mokwena, N., Mokhathi, T., Orsega, S., Tsoku, M., Kowo, H., Proschan, M., Khabo, P., Maja, P. and Hadigan, C. 2011. Lactic acidosis and symptomatic hyperlactataemia in a randomized trial offirst-line therapy in HIV-infected adults in South

Africa. Antiviral Therapy, vol. 16, no.4, pp. 605-609.

Dong, K.R. and Imai, C.M. 2012. Medical Nutrition Therapy for HIV and AIDS, In Krause's Food and Nutrition Therapy. Ed. by Mahan, L.K. and Escott-Stump, S. 13th edition. Philadelphia, Pennsylvania: W.B Saunders Company, pp. 864-881.

Drain, P.K., Kupka, R., Mugusi, F. and Fawzi, W.W. 2007. Micronutrients in HIV-positive persons receiving highly active antiretroviral therapy. American Journal of Clinical Nutrition, vol. 85, pp. 333-345.

Duggal, S., Chugh, T.D. and Duggal, A.K. 2012. HIV and malnutrition: effects on immune system. Clinical and Developmental Immunology.

Duran, A.C.F.L., Almeida, L.B., Segurado, A.A.C. and Jaime, P.C. 2008. Diet quality of persons living with HIV/AIDS on highly active antiretroviral therapy. Journal of Human Nutrition and Dietetics, vol. 21, no. 4, pp.346-350.

Earthman, C.P. 2004. Evaluation of nutrition assessment parameters in the presence of human immunodeficiency virus infection. Journal of Nutrition Clinical Practice, vol. 19, no. 4, pp. 330-339.

Engelson, E.S., Agin, D., Kenya, S., Werber-Zoin, G., Luty, B., Albu, J.B. and Kotler, D.P. 2006. Body composition and metabolic effects of a diet and exercise weight loss regimen on obese, HIV-infected women. Metabolism Clinical and Experimental, vol. 55, pp. 1327-1336.

Enriquez, M. and McKinsey, D.S. 2011. Strategies to improve HIV treatment adherence in

developed countries: clinical management at the individual level. HIV AIDS (Auckl), vol.11, no.3, pp. 45-51.

Faintuch, J., Soeters, P.B., and Osmo, H.G. 2006. Nutritional and metabolic abnormalities in pre-AIDS HIV infection. Nutrition, vol. 22, no. 3, pp.683-690.

FAO (Food and Agriculture Organisation). 2006. The Double Burden of Malnutrition: Case Studies from Six Developing Countries. Issue 84, pp. 269-270

Fawzi, W., Msamanga, G., Spriegman, D., and Hunter, D.J. 2005. Studies of vitamins and minerals and HIV transmission and disease progression. The Journal of Nutrition, vol. 135, no. 4, pp. 938-944.

Feldman, J.G., Minkoff, H., Schneider, M.F., Grange, S.J., Cohen, M., Watts, H., Gandhi, M., Mocharnuk, R.S. and Anastos, K. 2006. Association of cigarette smoking with HIV prognosis among woman in the HAART era: A report from the women's interagency HIV study. American Journal of Public Health, vol. 96, no. 6, pp. 1060-1065.

Fenton, M. and Silverman, E. C. 2008. Medical nutrition therapy for human immunodeficiency virus disease, In Krause's Food and Nutrition Therapy. Ed. by Mahan, L.K. and Escott-Stump, S. 12th edition. Philadelphia, Pennsylvania: W.B Saunders Company, pp. 991-1020.

Fields-Gardener, C. and Ferquesson, P. American Dietetic Association and Dietitians of Canada. 2004. Position of the American Dietetic Association and Dietitians of Canada: Nutrition intervention in the care of persons with human immunodeficiency virus infection.

Journal of the American Dietetic Association, vol. 104, no. 9, pp.1425 -1441.

Freedman, L.S. 1982. Tables of the number of patients required in clinical trials using the Logrank Test. Statistics in Medicine, vol. 1, pp. 121-129.

Ganasegeran, K., Al-Dubai, S.A., Qureshi, A.M., Al-Abed, A.A., Am, R. and Aljunid, S.M. 2012. Social and psychological factors affecting eating habits among university students in a Malaysian medical school: a cross-sectional study. Nutrition Journal, vol. 18, no. 11, p.48.

Geere, J.A., Hunter, P.R. and Jagals, P. 2010. Domestic water carrying and its implications for health: a review and mixed methods pilot study in Limpopo Province, South Africa. Environmental Health, vol. 9, p. 52.

Gerrior, J.L. and Neff, L.M. 2005. Nutrition assessment in HIV infection. Nutrition in Clinical Care, vol. 8, no. 1, pp.6-15.

Gibson, R.S. 2005. Principles of Nutritional Assessment. Second edition. New York: Oxford University Press.

Grinspoon, M.D. 2005. Metabolic syndrome and cardiovascular disease in patients with human immunodeficiency virus. The American Journal of Medicine, vol. 118, no. 2, pp. 23S-28S.

Grinspoon, S., Corcoran, C., Miller, K., Biller, B.M., Askari, H., Wang, E., Hubbard, J., Anderson, E.J., Basgoz, N., Heller, H.M. and Klibanski, A. 1997. Body composition and endocrine function in women with acquired immunodeficiency syndrome wasting. Journal of

Clinical Endocrinol Metabolism, vol. 82, no. 5, pp.1332-1337.

Gulliford, M.C., Mahabir, D. and Rocke, B. 2003. Food insecurity, food choices, and body mass index in adults: nutrition transition in Trinidad and Tobago. Journal of Epidemiology, vol. 32, no. 4, pp.508-16.

Hadley, C. and Patil, C.L. 2008. Seasonal changes in household food insecurity and symptoms of anxiety and depression. American Journal of Physcal Anthropology,vol. 135, no.2, pp. 225-232.

Haile, M. 2005. Weather patterns, food security and humanitarian response in sub-Saharan Africa. Phulosophical Transactions of the Royal Society, vol 360, pp. 2169-2182.

Hamelin, A.M., Hanicht, J.P. and Beaudry, M. 1999. Food Insecurity: Consequences for the household and broader social implications. Journal of Nutrition, vol. 129, no. 2, pp. 525-528.

Hammond, K. 2008. Assessment: Dietary and clinical data, In Krause's Food and Nutrition Therapy. Ed. by Mahan, L.K. and Escott-Stump, S. 12th edition. Philadelphia, Pennsylvania: W.B. Saunders Company, pp. 400.

Han, T.S., van Leer, E.M., Seidell, J.C et al. 1995. Waist circumference action levels in the identification of cardiovascular risk factors: prevalence study in a random sample. BMJ, vol.311, no. 7017, pp. 1401-1405.

Handford, C.D., Tynan, A.M., Rackal, J.M. and Glazier, R.H. 2006. Setting and organization of care for persons living with HIV/AIDS. Cochrane Database System Review, vol. 19, no.3, pp. CD004348.

Hendricks, K.M., Laferriere, R., Houser, R.F. and Knox, T.A. 2005. Dietary intake in HIV-positive persons with and without malabsorption. Nutrition Clinical Care, vol. 8, no. 1, pp. 37-43.

Hendricks, K.M., Mwamburi, D.M., Newby, P.K. and Wanke, C.A. 2008. Dietary patterns and health and nutrition outcomes in men living with HIV infection. The American Journal of Clinical Nutrition, vol. 88, no. 6, pp. 1584-1592.

Hermans, L., Wensing, A., Hoepelman, A., Dutihl, J. and Mudrikova, T. 2012. Delayed HIV testing in internal medicine clinics - a missed opportunity. Neth Journal of Medicine, vol.70, no. 2, pp.69-73.

Hickey, M.S. 1991. Nutrition support of patients with AIDS. The Surgical Clinics of North America, vol. 71, no. 3, pp. 645-646.

Hindin, M.J. 2006. Women's input into household decisions and their nutritional status in three resource-constrained settings. Public Health Nutrition, vol. 9, no. 4, pp. 485-493.

Hinnen, C., Schreuder, I., Jong, E., Duijn, M.V., Dahmen, R. and van Gorp, E.C. 2012. The contribution of adult attachment and perceived social support to depressive symptoms in patients with HIV. AIDS Care.

Hira, S.K., Shroff, H.J., Lanjewar, D.N., Dholkia, Y.N., Bhatia, V.P. and Dupont, H.L. 2003. The natural history of human immunodeficiency virus infection among adults in Mumbai. National Medical Journal of India, vol. 16, no.3, pp. 126-131.

Holstad, M.M., Diiorio, C. and McCarty, F. 2011. Adherence, sexual risk, and viral load in

HIV-infected women prescribed antiretroviral therapy. AIDS Patient Care STDS, vol. 25, no. 7, pp. 431-438.

Hu, W., Jiang, H., Chen, W., He, S.H., Deng, B., Wang, W.Y., Wang, Y., Lu, C.D., Klassen, K. and Zeng, J. 2011. Malnutrition in hospitalized people living with HIV/AIDS: evidence from a cross-sectional study from Chengdu, China. Asia Journal of Clinical Nutrition, vol. 20, no. 4, pp. 544-550.

Huet, C., Rosol, R. and Egeland, G.M. 2012.The prevalence of food insecurity is high and the diet quality poor in Inuit communities. Nutrition, vol. 42, no 3, pp. 541-547.

Hurley, E., Coutsoudis, A., Giddy, J., Knight, S.E., Loots, E. and Esterhuizen, T.M. 2011. Weight evolution and perceptions of adults living with HIV following initiation of antiretroviral therapy in a South African urban setting. South African Medical Journal, vol. 101, no. 9, pp. 645-650.

Idigbe, E.O., Adewole, T.A., Eisen, G., Kanki, P., Odunukwe, N.N., Onwujekwe, D.I., Audu, R.A., Araoyinbo, I.D., Onyewuche, J.I., Salu, O.B., Adedoyin, J.A. and Musa, A,Z. 2005. Management of HIV-1 infection with a combination of nevirapine, stavudine, and lamivudine: a preliminary report on the Nigerian antiretroviral program. Journal for Acquired Immune Deficiency Syndrome, vol. 40, no. 1, pp. 65-69.

Ivers, L.C. and Cullen, K.A. 2011. Food insecurity: special considerations for women. American Journal of Clinical Nutrition, vol. 94, no. 6, pp.1740S-1744S.

Ivers, L.C., Chang, Y., Gregory Jerome J. and Freedberg, K.A. 2010. Food assistance is

associated with improved body mass index, food security and attendance at clinic in an HIV program in central Haiti: a prospective observational cohort study. AIDS Therapy, vol. 7, p. 33.

Ivers, L.C., Cullen, K.A., Freedberg, K.A., Block, S., Coates, J. and Webb, P. 2009. HIV/AIDS, undernutrition, and food insecurity. Clinical Journal for Infectious Diseases, vol. 49, no. 7, pp. 1096-1102.

Justman, J.E., Hoover, D.R., Shi, Q., Tan, T., Anastos, K., Tien, P.C., Cole,S.R., Hyman, C., Karim, R., Weber, K. and Grinspoon, S. 2008. Longitudinal anthropometric patterns among HIV-infected and HIV-uninfected women. Journal of Acquired Immune Deficiency Syndrome, vol. 47, no. , pp. 312-319.

Kacher, L., Ng'ambi, W., Tweya, H. and Speight, C. 2012. Incidence of lactic acidosis toxicity amoung patients on stavudine or zidovudine containing antiretroviral therapy at Lighthouse clinics. Journal of the International AIDS Society, vol. 12, no. 4, pp.18315.

Kadiyala, S. and Gillespie, S. 2003. Rethinking Food Aid to Fight AIDS. FCN Discussion Paper 158, IFPRI

Kadiyala, S. and Gillespie, S. 2004. Rethinking food aid to fight AIDS.Food Nutrition Bulletin, vol. 25, no. 3, pp. 271-282.

Kadiyala, S. and Rawat, R. 2012. Food access and diet quality independently predict nutritional status among people living with HIV in Uganda. Public Health Nutrition, pp. 1-7.

Kadiyala, S., R. Rawat, T. Roopnaraine, F. Babirye & R. Ochai. 2009. Applying a Program

Theory Framework to Improve Livelihood Interventions Integrated with HIV Care and Treatment Programs. Journal of Development Effectiveness, vol. 1, no. 4, pp. 470-491.

Kaiser, L., Baumrind, N. and Dumbauld, S. 2007. Who is food-insecure in California? Findings from the California Women's Health Survey, 2004. Public Health Nutrition, vol.10, no.6, pp. 574-581.

Kalichman, S.C., Amaral, C.M., White, D., Swetsze, C., Kalichman, M.O., Cherry, C. and Eaton, L. 2012. Alcohol and Adherence to Antiretroviral Medications: Interactive Toxicity Beliefs Among People Living With HIV. Journal Association Nurses AIDS Care.

Kalichman, S.C., Cherry, C., Amaral, C., White, D., Kalichman, M.O., Pope, H., Swetsze, C., Jones, M. and Macy, R. 2010. Health and treatment implications of food insufficiency among people living with HIV/AIDS, Atlanta, Georgia. Journal Urban Health, vol. 87, no. 4, pp. 631-641.

Kennedy, R. 2001. The South African National Guidelines on nutrition and people living with TB, HIV/AIDS and other chronic debilitating conditions. Pretoria: Department of National Health, Nutrition Directorate.

Kennedy, R.D. and MacIntyre, U.E. 2003. Development and testing of the South African National Nutrition Guidelines for people living with HIV/AIDS. South African Journal of Clinical Nutrition, vol. 16, no. 1, pp. 12-16.

Kim, J. H., Spiegelman, D., Rimm, E. and Gorbach, S. L. 2001. The correlates of dietary intake among HIV-positive adults. The American Journal of Clinical Nutrition, vol. 74, no.

6, pp. 852-861.

Kim, K. and Frongillo, E.A. 2007. Participation in food assistance programs modifies the relation of food insecurity with weight and depression in elders. Nutrition, vol. 137, no. 4, pp. 1005-1010.

Koethe, J.R. and Heimburger, D.C.2010. Nutritional aspects of HIV-associated wasting in sub-Saharan Africa. Americal Journal of Clinical Nutrition, vol. 91, no. 4, pp. 1138S-1142S.

Kong, M.C., Nahata, M.C., Lacombe, V.A., Seiber, E.E. and Balkrishnan, R. 2012. Association Between Race, Depression, and Antiretroviral Therapy Adherence in a Low-Income Population with HIV Infection. Journal General Internal Medicine.

Kosmiski, L. 2011. Energy expenditure in HIV infection. American Journal of Clinical Nutririon, vol. 94, no. 6, pp. 1677S-1682S.

Kotler, D.P. 2000. Nutritional alterations associated with HIV infection. Journal of Acquired Immune Deficiency Syndromes, vol. 25, pp. S81-S87.

Kruger, A., Lekalakalamokgela, S.E. and Wentzel-Viljoen, E. 2011. Rural and urban older African caregivers coping with HIV/AIDS are nutritionally compromised. Journal of Nutrition in Gerontology and Geriatric, vol. 30, no. 3, pp.274-90.

Kuzwayo, P. 2008. Food and Nutrition Security. Community Nutrition Textbook for South Africa: A rights-based approached. Ed. By NP Steyn & N Temple. 1st edition. South Africa: Chronic Diseases of Lifestyle Unite, pp. 162-192.

Labadarios, D., McHiza, Z.J., Steyn, N.P., Gericke, G., Maunder, E.M., Davids, Y.D. and Parker, W.A. 2011. Food security in South Africa: a review of national surveys. Bulletin of the World Health Organisation, vol. 89, no. 12, pp. 891-899.

Labadarios, D., Steyn, N.P., Maunder, E., MacIntryre, U., Gericke, G., Swart, R., Huskisson, J., Dannhauser, A., Vorster, H.H., Nesmvuni, A.E. and Nel, J.H. 2005.

Lange, J.M.A. and Van Der Waals, F.W. 2002. Prioritising access to antiretroviral therapy in resource-poor settings. Journal of HIV Therapy, vol. 7, no. 3, pp. 59-62.

Lee, R.D and Nieman, D.C. 2003. Nutritional Assessment. Third Edition, Mc Graw Hill Company: New York.

Lenzi, L., Wiens, A. and Pontarolo, R. 2012. Evaluation of adverse events associated with antiretroviral therapy and the relationship to treatment adherence. Internal Journal of Clinical Pharmacology Therapy , vol. 51, no.2, pp. 141-146.

Lewis, E.L., Mosepele, M., Seloilwe, E. andLawler, K. 2012. Depression in HIV-positive women in Gaborone, Botswana. Health Care for Women International, vol. 33, no. 4, pp. 375-386.

Lichtenstein, A.H., Appel, L.J., Brands, M., Carnethon, M., Daniels, S., Franch, H.A., Franklin, B., Kris-Etherton, P., Harris, W.S., Howard, B., Karanja, N., Lefevre, M., Rudel, L., Sacks, F., Van Horn, L., Winston, M. and Wylie-Rosett, J. 2006. Diet and lifestyle recommendations revision, a scienfictic statement from the American Heart Association Nutrition Committee. Circulation, vol. 114, pp. 82-95.

Loevinsohn, M., and S.Gillespie. 2003. HIV/AIDS, Food Security, and Rural Livelihoods: Understanding and Responding. FCN Discussion Paper 157, IFPRI

Longmire-Avital, B., Holder, C.A., Golub, S.A. and Parsons J.T. 2012. Risk Factors for Drinking among HIV-Positive African American Adults: The Depression-Gender Interaction. American Journal Drug Alcohol Abuse.

Luetkemeyer, A.F., Havlir, D.V. and Currier, J.S. 2012. Complications of HIV disease and antiretroviral therapy. Topics in Antiviral Medicine, vol. 20, no. 2, pp. 48-60.

Lynch, G.S., Schertzer, J.D. and Ryall J.G. 2007. Therapeutic approaches for muscle wasting disorders. Pharmacology Therapy, vol. 113, no. 3, pp. 461-487.

Maia, B.S., Engelson, E.S., Wang, J. and Kotler, D.P. 2005. Antiretroviral therapy affects the composition of weight loss in HIV infection: Implications for clinical nutrition. Clinical Nutrition, vol. 24, no. 6, pp. 971-978.

Makoae, M.G. 2011. Food meanings in HIV and AIDS caregiving trajectories: ritual, optimism and anguish among caregivers in Lesotho. Psychology Health and Medicine, vol. 16, no. 2, pp. 190-202.

Mamlin, J., Sylvester, K., Stephen, L., Hannah, T., Fanice, K.J., Gichunge, M.S., Petersen, T., Yuehwern, Y., Paula, B. and Robert, E. 2009. Integrating Nutrition Support for Food-InsecurePatients and Their Dependents Into an HIV Care and Treatment Program in Western Kenya. American Journal of Public Health, vol. 99, no.2, pp. 215-221.

Marcason, W. 2009. What does the term “HIV-associated lipodystrophy” mean? Journal

of the American Dietetic Association, vol. 109, no. 2, pp. 364.

Matthews, L.T., Giddy, J., Ghebremichael, M., Hampton, J., Guarino, A.J., Ewusi, A., Carver, E., Axten, K., Geary, M.C., Gandhi, R.T. and Bangsberg, D.R. 2011. A risk-factor guided approach to reducing lactic acidosis and hyperlactatemia in patients on antiretroviral therapy. PLoS One, vol. 6, no.4, p. e18736.

Mayosi, B.M., Lawn, J.E., van Niekerk, A., Bradshaw, D., Abdool Karim, S.S. and Coovadia, H.M. 2012. Health in South Africa: challenges since 2009. Lancet, vol 380, pp. 2029-2043.

McDermott, A.Y., Shevitz, A., Must, A., Harris, S., Roubennoff, R. and Gorbach, S. 2003. Nutrition treatment for HIV wasting: a prescription for food as medicine. Nutrition Clinical Practice, vol. 18, no. 1, pp.86-94.

Melchior, M., Caspi, A., Howard, L.M., Ambler, A.P., Bolton, H., Mountain, N. and Moffitt, T.E. 2009. Mental health context of food insecurity: a representative cohort of families with young children. Pediatrics, vol. 124, no. 4, pp. e564-572.

Mello, J.A., Gans, K.M., Risica, P.M., Kirtania, U., Strolla, L.O. and Fournier, L. 2010. How is food insecurity associated with dietary behaviors? An analysis with low-income, ethnically diverse participants in a nutrition intervention study. Journal American Dietetic Association, vol. 110, no. 12, pp. 1906-1911.

Metroka, C.E., Truong, P. and Gotto, A.M. 2007. Treatment of HIV-associated dyslipidemia: a role for omega-3 fatty acids. AIDS Read, vol. 17, no.7, pp. 362-4, 367-73.

Mgogwe, J., Semvua, H., Msangi, R., Mataro, C., Kajeguka, D. and Chilongola, J. 2012. The evolution of haematological and biochemical indices in HIV patients during a six-month treatment period. African Health Science, vol.12, no.1, pp. 2-7.

Miller, C.L., Bangsberg, D.R., Tuller, D.M., Senkungu, J., Kawuma, A., Frongillo, E.A. and Weiser, S.D. 2011. Food insecurity and sexual risk in an HIV endemic community in Uganda. AIDS Behavior, vol. 15, no. 7, pp. 1512-1519.

Montessori, V., Press. N., Harris, M., Akagi L. and Montaner J.S.G. 2004. Adverse effects of antiretroviral therapy for HIV infection. Canadian Medical Association Journal, vol. 170, no. 2, pp. 229-238.

Mukolo, A., Villegas, R., Aliyu, M. and Wallston, K.A. 2012. Predictors of Late Presentation for HIV Diagnosis: A Literature Review and Suggested Way Forward. AIDS Behaviour, vol. 17, no. 1, pp. 5-30.

Nagata, J.M., Magerenge, R.O., Young, S.L., Oguta, J.O., Weiser, S.D., Cohen, C.R. 2012. Social determinants, lived experiences, and consequences of household food insecurity among persons living with HIV/AIDS on the shore of Lake Victoria,Kenya. AIDS Care, vol. 24, no. 6, pp. 728-736.

Nahar, S., Mascie-Taylor, C.G. and Begum, H.A. 2009. Impact of targeted food supplementation on pregnancy weight gain and birth weight in rural Bangladesh: an assessment of the Bangladesh Integrated Nutrition Program (BINP). Public Health Nutrition, vol. 12, no. 8, pp.1205-1212.

Nambiar, D., Ramakrishnan, V., Kumar, P., Varma, R., Balaji, N., Rajendran, J., Jhona, L., Chandrasekar, C. and Gere, D. 2011. Knowledge, stigma, and behavioral outcomes among antiretroviral therapy patients exposed to Nalamdana's radio and theater program in Tamil Nadu, India. AIDS Education and Prevention, vol. 23, no. 4, pp. 351-66.

Nanama, S. and Frongillo, E.A. 2012. Altered social cohesion and adverse psychological experiences with chronic food insecurity in the non-market economy and complex households of Burkina Faso. Social Science and Medicine, vol. 74, no. 3, pp.444-451.

National Food Consumption Survey (NFCS): South Africa, 1999. Public Health Nutrition, vol. 8, no. 5, pp. 533-543.

Ncama, B.P., McInerney, P.A., Bhengu, B.R., Corless, I.B., Wantland, D.J., Nicholas, P.K., McGibbon, C.A. and Davis, S.M. 2008. Social support and medication adherence in HIV disease in KwaZulu-Natal, South Africa. International Journal of Nursing Studies, vol. 45, no. 12, pp. 1757-1763.

National Department of Health. 2004. Treatment Guidelines.

Nerad, J., Romeyn, M., Silverman, E., Allen-Reid, J., Dieterich, D., Merchant, J., Pelletier, V.A., Tinnerello, D. And Fenton, M. 2003. General nutrition management in patients infected with human immunodeficiency virus. Clinical Infectious Diseases, vol. 36, pp. S52-S62.

Norval, D.A. 2004. Symptoms and sites of pain experienced by AIDS patients. South African Medical Journal, vol.94, no. 6, pp. 450-454.

Nutrition Supplementation Policy. Department of Health, Free State. 2006.

Nzienqui, U., Zamba, C. and Rey, J.L. 2006. Difficulties of the patients to undergo their ARV treatment at the Libreville outpatient health center, Gabon. Bulletin de la Societe de Pathologie Exotique, vol. 99, no.1, pp.23-27.

Ogalha, C., Luz, E., Sampaio, E., Souza, R., Zarife, A., Neto, M.G., Netto, E. and Brites, C. 2011. A randomized, clinical trial to evaluate the impact of regular physical activity on the quality of life, body morphology and metabolic parameters of patients with AIDS in Salvador, Brazil. Journal Acquired Immune Deficiency Syndrome, vol.57, pp. S179-185.

Ogoina, D., Obiako, R.O. and Muktar, H.M. 2010. HIV Wasting Syndrome in a Nigerian Failing Antiretroviral Therapy: A Case Report and Review of the Literature. Case Report Medicine, p.192060.

Oh, J. and Hegele, R.A. 2007. HIV-associated Dyslipidemia: pathogenesis and treatment. Lancet Infectious Disease, vol. 7, pp. 787-796.

Olley, B.O. 2007. The role of support group and duration of infection in HIV/AIDS patients' knowledge and attitudes to their illness. African Journal of Medicine and Medical Sciences, vol. 36, no. 1, pp. 11-16.

Oppong Asante, K. 2012. Social support and the psychological wellbeing of people living with HIV/AIDS in Ghana. African Journal Psychiatry, vol.15, no. 5, pp. 340-345.

Oqunitibeju, O.O., Van Den Heever, W.M. and Van Schalkwyk, F.E. 2006. Effect of a liquid nutritional supplement on viral load and haematological parameters in HIV-positive/AIDS.

Medical Journal of Biomed Science, vol. 63, no. 3, pp. 134-139.

Oyefara, J.L. 2007. Food insecurity, HIV/AIDS pandemic and sexual behaviour of female commercial sex workers in Lagos metropolis, Nigeria. SAHARA Journal, vol. 4, no. 2, pp. 626-635.

Panagides, D., Graciano, R., Atekyereza, P., Gerberg, L. and Chopra, M. 2007. A review of nutrition and food security approaches in HIV and AIDS programmes in Eastern and Southern Africa. EQUINET, no. 48, pp. 25-31.

Patrick, L. 1999. Nutrients and HIV: part one -- beta carotene and selenium. Alternitive Medicine Review, vol. 4, no. 6, pp.403-413.

Pedral-Sampaio, D.B., Alves C.R., Netto, E.M., Brites, C., Oliveira, A.S. and Badaro, R. 2004. Efficacy and safty of Efavirenz in HIV patients on Rifampin of tuberculosis. Brazilian Journal of Infectious Diseases, vol. 8, no. 3, pp. 211-216.

Peters, B.S., Wierzbicki, A.S., Moyle, G., Nair, D. and Brockmeyer, N. 2012. The effect of a 12-week course of omega-3 polyunsaturated fatty acids on lipidparameters in hypertriglyceridemic adult HIV-infected patients undergoing HAART: a randomized, placebo-controlled pilot trial. Clinical Therapy, vol. 34, no.1, pp. 67-76.

Petoumenos, K. and Worm, S.W. 2011. HIV infection, aging and cardiovascular disease: epidemiology and prevention. Sex Health, vol. 8, no. 4, pp. 465-473.

Phaswana-Mafuya, N., Peltzer, K. and Petros G. 2009. Disability grant for people living with HIV/AIDS in the Eastern Cape of South Africa. Social Work Health Care, vol. 48, no. 5, pp.

533-550.

Piwoz, E. and Prebble, E. 2000. HIV/AIDS and Nutrition: A review of the literature and recommendations for nutritional care and support in Sub-Saharan Africa. Washington DC:USAID

Rabeneck, L., Palmer, A., Knowles, J.B., Seidehamel, R.J., Harris, C.L., Merkel, K.L., Risser, J.M. and Akrabawi, S.S. 1998. A randomized controlled trial evaluating nutrition counseling with or without oral supplementation in malnourished HIV-infected patients. American Dietetic Association, vol. 98, no. 4, pp. 434-438.

Rasmussen, T.A., Jensen, D., Tolstrup, M., Nielsen, U.S., Erlandsen, E.J., Birn, H., Østergaard, L., Langdahl, B.L. and Laursen, A.L. 2012. Comparison of bone and renal effects in HIV-infected adults switching to abacaviror tenofovir based therapy in a randomized trial. PLoS One, vol. 7, no. 3, pp.e32445.

Rawat, R., Kadiyala, S. and McNamara, P.E. 2010. The impact of food assistance on weight gain and disease progression among HIV-infected individuals accessing AIDS care and treatment services in Uganda. BMC Public Health, vol. 7, no. 10, p.316.

Reust, C.E. 2011. Common adverse effects of antiretroviral therapy for HIV disease. American Family Physician, vol. 83, no. 12, pp. 1443-1451.

Riley, E.D., Neilands, T.B., Moore, K., Cohen, J., Bangsberg, D.R. and Havlir, D. 2012. Social, Structural and Behavioral Determinants of Overall Health Status in a Cohort of Homeless and Unstably Housed HIV-Infected Men. PLoS One, vol. 7, no. 4, p. e35207.

Robinson, W., Moody-Thomas, S. and Gruber D. 2012. Patient perspectives on tobacco cessation services for persons living with HIV/AIDS. AIDS Care, vol. 24, no. 1, pp. 71-76.

Rose, D. and Charlton, K.E. 2002a. Prevalence of household food poverty in South Africa: Results from a large national representative survey. Public Health Nutrition, vol. 5, no. 3, pp. 383-389.

Rose, D. and Charlton, K.E. 2002b. Quantitative indicators from a food expenditure survey can be used to target the food insecure in South Africa. The Journal of Nutrition, vol. 132, pp. 3235-3242.

Roubenoff, R. and Wilson, I.B. 2001. Effect of resistance training on self-reported physical functioning in HIV infection. Medicine and Science in Sports and Exercise, vol. 33, no. 11, pp: 1811-1817.

Ruel, M.T. 2003. Operationalizing dietary diversity: A review of measurement issues and research priorities. Journal of Nutrition, vol. 133, no. 11, pp. 3911S-3926S.

Sachdeva, R.K., Sharma, A., Wanchu, A., Dogra, V., Singh, S. and Varma, S. 2011. Dietary adequacy of HIV infected individuals in north India--a cross-sectional analysis. Indian Journal of Medical Research, vol. 134, no.6, pp. 967-971.

Salomon, J., De, T.P. and Melchior, J.C. 2002. Nutrition and HIV infection. British Journal of Nutrition, vol. 87, pp. S111-S119.

Sameuls, F. and Rutenberg, N. 2008. HIV, food and drugs: livelihoods, nutrition and anti-retroviral therapy (ART) in Kenya and Zambia. London: Overseas Development Insitute.

Sattler, F.R., Rajicic, N., Mulligan, K., Yarasheski, K.E., Koletar, S.L., Andrew, Z., Smith, B.A., Zackin, R. and Bistrian, B. 2008. Evaluation of high-protein supplementation in weight-stable HIV-positive subjects with a history of weight loss: a randomized, dubble-blind, multicenter trail, vol. 88, no. 5, pp. 1313-1321

Scarcella, P., Buonomo, E., Zimba, I., Doro Altan, A.M., Germano, P., Palombi, L. and Marazzi, M.C. 2011. The impact of integrating food supplementation, nutritional education and HAART (Highly Active Antiretroviral Therapy) on the nutritional status of patients living with HIV/AIDS in Mozambique: results from the DREAM Programme. Igiene e Sanita Pubblica, vol. 67, no. 1, pp. 41-52.

Scelza, B.A. 2012.Food scarcity, not economic constraint limits consumption in a rural Aboriginal community. Austalian Journal Rural Health, vol. 20, no. 3, pp.108-112.

Schneider, M., Norman, R., Parry, C., Bradshaw, D. and Plüddemann A.2007. Estimating the burden of disease attributable to alcohol use in South Africa in 2000. South African Medical Journal, vol. 97, pp. 664-672.

Schuelter-Trevisol, F., Wolff, F.H., Alencastro, P.R., Grigoletti, S., Ikeda, M.L., Brandão, A.B., Barcellos, N.T. and Fuchs, S.C.2012. Physical activity: do patients infected with HIV practice? How much? A systematic review. Current HIV Research, vol. 10, no. 6, pp. 487-497.

Schwenk, A., Beisenherz, A., Kremer, G., Diehl, V., Salzberger, B. and Fätkenheuer. 1999. Bioelectrical impedance analysis in HIV-infected patients treated with triple antiretroviral

treatment. American Journal of Clinical Nutrition, vol. 70, no. 5, pp. 867-873.

Scrimgeour, A.G. and Condlin, M.L. 2009. Zinc and micronutrient combinations to combat gastrointestinal inflammation. Currenet Opinion in Clinical Nutrition and Metabolic Care, vol. 12, no. 6, pp. 653-60.

Seekings, J. and and Nattrass, N. 2005. Class, race and inequality in South Africa. Yale University Press: Yale.

Seligman, H.K., Davis, T.C., Schillinger, D. and Wolf, M.S. 2010. Food insecurity is associated with hypoglycemia and poor diabetes self-management in a low-income sample with diabetes. Journal of Health Care Poor Underserved, vol. 21, no. 4, pp. 1227-1233.

Semba, R.D. 2006. Nutrition and infection, In Modern nutrition in health and disease. Ed. by Shils, M.E. and Shike, M. 10th edition. Philadelphia, Baltimore: Lippincott Williams & Wilkins, pp. 1405-1407.

Shah, M., Tierney, K., Adams-Huet, B., Boonyavarakul, A., Jacob, K., Quittner, C., Dinges, W., Peterson, D. and Garg, A. 2005. The role of diet, exercise and smoking in dyslipidaemia in HIV-infected patients with lipodystrophy. HIV Medicine, no. 6, pp. 291-298.

Shannon, K., Kerr, T., Milloy, M.J., Anema, A., Zhang, R., Montaner, J.S. and Wood, E. 2011. Severe food insecurity is associated with elevated unprotected sex among HIV-seropositive injection drug users independent of HAART use. AIDS, vol. 25, no. 16, pp.2037-2043.

Sharkey, S.J., Sharkey, K.A., Sutherland, L.R. and Church D.L. 1992. Nutritional status and food intake in human immunodeficiency virus infection. GI/HIV Study Group. Journal Acquired Immune Deficiency Syndrome, vol. 5, no. 11, pp.1091-1098.

Shephard, R.J. 1998. Exercise, immune function and HIV infection. Journal of Sports Medicine and Physical Fitness, vol. 38, no. 2, pp. 101-110.

Sherlekar, S. and Udipi, S.A. 2002. Role of nutrition in the management of HIV infection/AIDS. Journal Indian Medical Association, vol. 100, no. 6, pp. 385-390.

Shisana, O., Rehle, T., Simbayi, L., Parker, W., Zuma, K. and Bhana, A. *et al.,* editors. 2005. South African national HIV prevalence, HIV Incidence, behavior and communication survey. Cape Town: HSRC Press.

Shuter. J. and Bernstein, S.L. 2008. Cigarette smoking is an independent predictor of nonadherence in HIV-infected individuals receiving highly active antiretroviral therapy. Nicotine and Tobacco Research. vol.10, no. 4, pp. 731-736.

Sibanda, L.M., Kalibwani, F. and Kureya, T. 2007. Silent hunger. Policy options for effective responses to the impact of HIV and AIDS on agriculture and food security in the SADC region. Food agriculture and national resources policy analysis network. South Africa.

Sidney, S., Lewis, C.E., Hill, J.O., Quesenberry, C.P., Stamm, E.R., Scherzinger, A., Tolan, K. and Ettinger, B. 1999. Association of total and central adiposity measures with fasting insulin in a biracial population of young adults with normal glucose tolerance: the CARDIA study. Obesity Research, vol. 7, no. 3, pp.265-272.

Singhania, R. and Kotler, D.P. 2011. Lipodystrophy in HIV patients: its challenges and management approaches. HIV AIDS (Auckl), vol.3, pp.135-143.

Solomon, N.S. and Lyden, C.R. 1992. Nutrition for the patient with acquired immunodeficiency syndrome. Clinical Medical Surgury, vol. 9, no. 4, pp. 873-881.

South African Antiretroviral Treatment Guidelines. 2010. Department of Health.

South African National Guidelines on nutrition for people living with TB, HIV/AIDS and other chronic debilitating conditions. 2001. Department of Health.

Spencer, D.C., Harman, C., Naicker., Gorhe, S., Rollins, N., Labadarious, D. Visser, M. and the SA HIV Clinician Society Nutrition Focus Group. 2007. Nutritional guidelines for HIV-infected adults and children in Southern Africa: Meeting the needs. The Southern Journal of HIV Medicine, vol. 3, pp. 22-30.

Stambullin, M., Feliu, S. and Slobodianik, H. 2007. Nutritional status in patients with HIV infection and AIDS. British Journal of Nutrition, no. 98, pp. S140-S143.

Stats SA (Statistics South Africa). 2009. Quarterly Labour Force Survey. Quarter 1, 2009. Statistical release P0211, Pretoria: Statistics South Africa.

Stats SA (Statistics South Africa). 2012. Census 2011: Statistical release. Available from: *www.statssa.gov.za/Publications/P03014/P030142011.pdf* [Accessed: 27 December 2012].

Stein, J.H. 2009. Cardiovascular risk of antiretroviral therapy. The New England Journal of Medicine, vol. 356, no. 17, pp. 1773-1774.

Stein, L., Hechler, D., Jessen, A.B., Neumann, K., Jessen, H.and Beneke, R. 2012. Sports behaviour among HIV-infected versus non-infected individuals in a Berlin cohort. International Journal of STI & AIDS, vol. 23, no.1, pp. 25-29.

Stone, B., Dockrell, D., Bowman, C. and McCloskey, E. 2010. HIV and bone disease. Archives of Biochemistry and Biophysics, vol. 503, no. 1, pp. 66-77.

Sutinen, J. and Yki-Järvinen, H. 2007. Increased resting energy expenditure, fat oxidation, and food intake in patients with highly active antiretroviral therapy-associated lipodystrophy. American Journal of Physiology, Endocrinology and Metabolism, vol. 292, no. 3, pp. E687-692.

Suttajit, M. 2007. Advances in nutrition support for quality of life in HIV+/AIDS. Asia Journal of Clinical Nutrition, vol. 16, no.1, pp.318-322.

Tabi, M. and Vogel, R.L. 2006. Nutritional counselling: an intervention for HIV-positive patients. Journal of Advanced Nursing, vol. 54, no. 6, pp. 676-82.

Tafese, Z., Berhan, Y. and Abebe, H. 2012. Changes in nutritional, functional and immunological status of HIV-infected adults with antiretroviral therapy. Ethiopian Medical Journal, vol. 50, no.1, pp. 75-87.

Talam, N.C., Gatongi, P., Rotich, J. and Kimaiyo, S. 2008. Factors affecting antiretroviral drug adherence among HIV/AIDS adult patients attending HIV/AIDS clinic at Moi Teaching and Referral Hospital, Eldoret, Kenya. Eastern African Journal Public Health, vol. 5, no. 2, pp. 74-78.

Tang, A.M., Jacobson, D.L., Spiegelman, D., Knox, T.A. and Wanke C. 2005. Increasing risk of 5% or greater unintentional weight loss in a cohort of HIV-infected patients, 1995 to 2003. Journal Acquired Immune Deficient Syndrome, vol. 40, no. 1, pp. 70-76.

Temple, N.J., Steyn, N.P., Fourie, J. and De Villiers A. 2011. Price and availability of healthy food: a study in rural South Africa. Nutrition, vol. 27, no. 1, pp. 55-58.

Thuita, F.M. and Mirie, W. 1999. Nutrition in the management of acquired immunodeficiency syndrome. East Africa Medical Journal, vol. 76, no. 9, pp. 507-509.

Thusgaard, M., Christensen, J.H., Mørn, B., Andersen, T.S., Vige, R., Arildsen, H., Schmidt, E.B. and Nielsen, H. 2009. Effect of fish oil (n-3 polyunsaturated fatty acids) on plasma lipids,lipoproteins and inflammatory markers in HIV-infected patients treated with antiretroviral therapy: a randomized, double-blind, placebo-controlled study. Scandinavian Journal Infectious Diseases, vol. 41, no.10, pp. 760-766.

Tiyou, A., Belachew, T., Alemseged, F. and Biadgilign, S. 2012. Food Insecurity and Associated Factors among HIV-infected individuals receiving highly active antiretroviral therapy in Jimma zone Southwest Ethiopia. Nutrition Journal, vol. 11, no.1, p. 51.

Tomazic, J., Silic, A., Karner, P., Vidmar, L., Maticic, M., Poljak, M., Ihan, A. and Janez, A. 2004. Lipodystrophy and metabolic abnormalities in Slovenian HIV-infected patients. Wiener Klinische Wochenschrift, vol. 116, pp. 755-759.

Tomkins, A. 2005. Evidence-based nutrition interventions for the control of HIV /AIDS. South African Journal of Clinical Nutrition, vol. 18, no. 2, pp. 187-191.

Tomkins. A and Watson, F. 1993. Malnutrition and Infection − A review − Nutrition policy discussion paper. no. 5.

Tomlinson, M., Rohleder, P. Swartz, L., Drimie, S., and Kagee, A. 2010. Broadening psychology's contribution to addressing issues of HIV/AIDS, poverty and nutrition: Structural issues as constraints and opportunities. Journal of Health Psychology, vol. 15, no. 7, pp. 972-981.

Trochim, M.K. 2006. Internal Validity. Research Methods Knowledge Base.

Tsai, A.C., Bangsberg, D.R., Emenyonu, N., Senkungu, J.K., Martin, J.N. and Weiser, S.D. 2011. The social context of food insecurity among persons living with HIV/AIDS in rural Uganda. Social Science and Medicine, vol. 73, no. 12, pp. 1717-1724.

Tsai, A.C., Bangsberg, D.R., Frongillo, E.A., Hunt, P.W., Muzoora, C., Martin, J.N. and Weiser, S.D. 2012. Food insecurity, depression and the modifying role of social support among people living with HIV/AIDS in rural Uganda. Social Science and Medicine, vol. 74, no. 12, pp.2012-2019.

United Nations Programme on HIV/AIDS (UNAIDS). 2006. AIDS Epidemic Update.

United Nations Programme on HIV/AIDS (UNAIDS). 2007. AIDS Epidemic Update.

United Nations Programme on HIV/AIDS (UNAIDS). 2008. Report on the global HIV/AIDS epidemic 2008: executive summary.

United Nations Programme on HIV/AIDS (UNAIDS). 2010. Report on the global HIV/AIDS

epidemic 2010.

United Nations Programme on HIV/AIDS (UNAIDS). 2011. Report on the global HIV/AIDS epidemic.

United States Department of Agriculture (USDA). 2011. International Food Security Assessment, 2011-2021. Economic Research Service. Available from: *http://www.ers.usda.gov/publications/gfa22* [Accessed: 28 July 2012].

Van der Sande, M.A., Schim van der Loeff, M.F., Aveika, A.A., Sabally, S., Togun, T., Sarge-Njie, R., Alabi, A.S., Jaye, A., Corrah, T. and Whittle, H.C. 2004. Body mass index at time of HIV diagnosis: a strong and independent predictor of survival. Journal Acquired Immune Deficiency Syndrome, vol.37, no. 2, pp 1288-12894.

Van Devanter, N., Duncan, A., Raveis, V.H., Birnbaum, J., Burrell-Piggott, T. and Siegel, K. 2011. Continued Sexual Risk Behaviour in African American and Latino Male-to-Female Transgender Adolescents Living with HiV/Aids: A Case Study. J AIDS Clinical Research, vol. 20, p. s1.

Van Heerden, I.V. and Parry, C.D.H. 2001. If you drink alcohol, drink sensibly. South African Journal of Clinical Nutrition, vol. 14, no. 3, pp. S71-S77.

Van Staden, A.M. Barnard, H.C. Nel, M. Attwood, E.M. Oosthuizen, G.M. Dannhauser, A. van der Ryst, E. and le Roux, G.D.1998. Nutritional status of HIV-1

seropositive patients in the Free State Province of South Africa--laboratory parameters. The Cental African Journal of Medicine, vol.44, no. 10, pp. 246-250.

Vanable, P.A., Carey, M.P., Blair, D.C. and Littlewood, R.A. 2006. Impact of HIV-related stigma on health behaviours and psychological adjustment amoung HIV-positive men and women. AIDS Behaviour, vol. 110, pp. 473-482.

Vasarhelyi, K., Brandson, E.K., Palmer, A.K., Fernandes, K.A., Zhang, W., Moore, D.M., Montaner, J.S. and Hogg, R.S. 2011. Home is where the HAART is: an examination of factors affecting neighborhood perceptions among people with HIV/AIDS on antiretroviral therapy. AIDS Care, vol. 23, no. 2, pp.245-251.

Venkataramanan, R. 2000. Milk thistle, a herbal supplement, decreases the activity of CYI and uridine diphoshglucuronosyl transferase in human hepatocyte cultures, Drug Metabolism, vol. 28, no. 11, pp. 1270.

Venkataramani, A.S., Maughan-Brown, B., Nattrass, N. and Ruger, J.P. 2010. Social grants, welfare, and the incentive to trade-off health for income among individuals on HAART in South Africa. AIDS Behaviour, vol. 14, no.11, pp. 1393-1400.

Visser, M.E., Maartens, G., Kossew, G. and Hussey, G.D. 2003. Plasma vitamin A and zinc levels in HIV-infected adults in Cape Town, South Africa. British Journal Nutrition, vol. 89, no. 4, pp. 475-482.

Vorasayan, P. and Phanthumchinda, K. 2011. Lactic acidosis associated with severe neuromuscular weakness and stavudine therapy. Journal of the Medical Association of Thailand, vol. 94, no.4, pp. 501-504.

Walker, R.E. and Kawachi, I. 2012. Use of concept mapping to explore the influence of food security on food buying practices. Academical Journal Nutrition Diet, vol. 112, no. 5, pp. 711-717.

Wang, E.A., McGinnis, K.A., Fiellin, D.A., Goulet, J.L., Bryant, K., Gibert, C.L., Leaf, D.A., Mattocks, K., Sullivan, L.E., Vogenthaler, N. and Justice, A.C.; VACS Project Team. 2011. Food insecurity is associated with poor virologic response among HIV-infected patients receiving antiretroviral medications. Journal of General Internal Medicine, vol. 26, no. 9, pp. 1012-1018.

Wanke, C. 2005. Nutrition and HIV in the international setting. Nutrition in Clinical Care, vol. 8, no. 1, pp. 44-48.

Ware, L.J., Wootton, S.A., Morlese, J.M., Gazzard, B.G. and Jackson, A.A. 2002. The paradox of improved antiretroviral therapy in HIV: potential for nutritional modulation? Proceedings of the Nutrition Society, no. 61, pp. 131-136.

Wasti, S.P., Simkhada, P., Randall, J., Freeman, J.V. and van Teijlingen, E. 2012. Factors influencing adherence to antiretroviral treatment in Nepal: a mixed-methods study. PLoS One, vol. 7, no. 5, p. e35547.

Watermeyer, J. 2011. “Now here come the pills that are going to save your life": pharmacists' discussions of antiretroviral drugs in a context of life and death. AIDS Care, vol. 7, pp. 807-813.

Waters, L. and Sabin, C.A. 2011. Late HIV presentation: epidemiology, clinical implications and management. Expert Review Anti Infect Therapy, vol. 9, no. 10, pp. 877-889.

Weinreb, L., Wehler, C., Perloff, J., Scott, R., Hosmer, D., Sagor, L. and Gundersen, C. 2002. Hunger: its impact on children's health and mental health. Paediatrics, vol. 110, no. 4, p. e41.

Weiser, S.D., Fernandes, K.A., Brandson, E.K., Lima, V.D., Anema, A., Bangsberg, D.R., Montaner, J.S. and Hogg, R.S. 2009. The association between food insecurity and mortality among HIV-infected individuals on HAART. Journal Acquired Immune Deficient Syndrome, vol. 52, no. 3, pp. 342-349.

Weiser, S.D., Tsai, A.C., Gupta, R., Frongillo, E.A., Kawuma, A., Senkungu, J., Hunt, P.W., Emenyonu, N.I., Mattson, J.E., Martin, J.N. and Bangsberg, D.R. 2012. Food insecurity is associated with morbidity and patterns of healthcare utilization among HIV-infected individuals in a resource-poor setting. AIDS, vol. 26, no. 1, pp. 67-75.

Weiser, S.D., Tuller, D.M., Frongillo, E.A., Senkungu, J., Mukiibi, N. and Bangsberg, D.R. 2010. Food insecurity as a barrier to sustained antiretroviral therapy adherence in Uganda. PLoS One, vol. 5, no. 4, p. 10340.

Weiser, S.D., Young, S.L., Cohen, C.R., Kushel, M.B., Tsai, A.C., Tien, P.C., Hatcher, A.M., Frongillo, E.A. and Bangsberg D.R. 2011. Conceptual framework for understanding the bidirectional links between food insecurity and HIV/AIDS. American Journal of Clinical Nutrition, vol. 94, no. 6, pp. 1729S-1739S.

Wojna, V., Robles, L., Skolasky, R.L., Mayo, R., Selnes, O., de la Torre, T., Maldonado, E., Nath, A., Meléndez, L.M. and Lasalde-Dominicci, J. 2007. Associations of cigarette smoking with viral immune and cognitive function in. Journal of Neurovirology, vol. 13, no.6, pp.561-568.

Wolfe, W.S., Frongillo, E.A. and Valois, P. 2003. Understanding the experience of food insecurity by elders suggests ways to improve its measurement. Nutrition, vol. 133, no. 9, pp. 2762-2769.

Woods, M.N., Wanke, C.A., Ling, P.R., Hendricks, K.M, Tang, A.M., Knox, T.A., Andersson, C.E., Dong, K.R., Skinner, S.C. and Bistrian, B.R. 2009. Effect of a dietary intervention and n-3 fatty acid supplementation on measures of serum lipid and insulin sensitivity in persons with HIV. American Journal of Clinical Nutrition, vol. 90, no. 6, pp. 1566-1578.

World Health Organization (WHO). 1998. Management of moderate malnutrition in under 5 children by the health sector. [online]. Available from: http://www.who.int/nutrition/topics/MM Consultation agenda.pdf

World Health Organization (WHO): Nutrient requirements for people living with HIV/AIDS, Report of a technical consultation WHO, Geneva, May 2003.

World Health Organization (WHO): Progress on the health-related Millennium Development Goals, 2009

Zachariah, R., Harries, K., Moses, M., Manzi, M., Line, A., Mwagomba, B. and Harries, A.D. 2009. Very early mortality in patients starting antiretroviral treatment at

primary health centers in rural Malawi. Tropical Medicine and International Health, vol. 14. no. 7, pp. 713-721.

Zirpoli, J.C., Lacerda, H.R., Albuquerque, V.M., Albuquerque, M., Miranda Filho Dde, B., Monteiro, V.S., Barros, I.L., Arruda, E.R., Montarroyos, U.R. and Ximenes, R.A. 2012. Angina pectoris in patients with HIV/AIDS: prevalence and risk factors. Brazilian Journal Infectious Diseases, vol. 16, no. 1, pp. 1-8.

Appendix A: Ethical Clearance

FREE STATE PROVINCE

17 October 2007

To whom it may concern,

APPROVAL: Research project on *Effective AIDS Treatment and Support in the Free State province* (FEATS)

The Centre for Health Systems Research & Development has been successful in obtaining a research grant from the World Bank to conduct the above research over the next four years (2007-10). This study builds on and expands the ART research project in the Free State province that the Centre has already been engaged in since early 2004.

The principal contact at the Centre for Health Systems Research & Development for this research project is the following person:

Prof Frikkie Booysen
Flippie Groenewoud Building Room FGG336
Centre for Health Systems Research & Development/Department of Economics
University of the Free State
PO Box 339
Bloemfontein
9300
Email: Booysenf.ekw@ufs.ac.za
Phone: 051 – 401 2623
Fax: 051 – 444 6758
Cell: 083 381 5874

This study has three main objectives, namely to:

- Present a broader view of treatment success
- Develop a more complete model of the determinants of treatment success
- Understand the nature of links between treatment and prevention

More specifically, the research is aimed at enhancing our understanding of treatment success in situations where access to antiretroviral treatment is being scaled up, in other words, in phase I-ARV facilities where treatment already has been available for two to three years and where the numbers of patients on treatment are relatively large.

The following twelve phase I-assessment (combined) sites in the Free State province have been selected to partake in the study:

Batho clinic (Bloemfontein)
Heidedal community health centre (Bloemfontein)
Itumeleng community health centre (Jagersfontein)
Matjhabeng clinic (Welkom)
MUCPP community health centre (Bloemfontein)
Namahali clinic (Phuthadjithaba)

Phomolong clinic (Hennenman)
Refengkgotso clinic (Deneysville)
Tseki clinic (Phuthadjithaba)
Tshiame clinic (Harrismith)
Welkom clinic (Welkom)
Zamdela community health centre (Sasolburg)

The study comprises a patient and household survey. It is envisaged that patient recruitment will commence in October 2007 and that the recruitment phase will last for two/three months. Patients visiting the above clinics or community health care centres and who have initiated antiretroviral treatment in the month prior to this facility visit will be considered eligible for recruitment into the study. During the visit, nursing personnel working at the facility will introduce the study to the patient and will obtain written, informed consent from study participants. At each facility, approximately sixty patients will be recruited into the study (total sample ~650). However, due to low patient numbers at smaller health care facilities, recruitment numbers at smaller facilities may be less than fifty, while numbers at larger facilities may exceed fifty. Following the recruitment phase of the study, trained enumerators will conduct semi-structured face-to-face interviews with patients and with their households. Importantly, consent for the household interviews will be obtained from the patient, while the identity of patients will not be divulged to household respondents during the household interview, for which written, informed consent will also be obtained from all respondents. Furthermore, interviews will also be conducted with a small number (~180) of randomly sampled (comparison) households at each study site, using the same survey instrument. Baseline interviews will be conducted with patients and households during the period October to December 2007, while three more follow-up interviews will be conducted with patients and households over the next twelve to eighteen months.

In addition, the research team will be collecting selected clinical information from the patient files of study participants, with written informed consent to do so being obtained from study participants during the patient interview. These data will be collected at baseline and following the completion of the last round of follow-up interviews with study participants. Patient files kept at treatment (combined) sites will be used for this purpose, which means that the research team, in addition to the above facilities, will also be visiting the following phase I-treatment sites in the Free State province:

Bongani regional hospital (Welkom)
National district hospital (Bloemfontein)
Mofumahadi Manapo Mopeli regional hospital (Phuthadjithaba)
Metsimaholo district hospital (Sasolburg)

The research team will also be conducting brief interviews with selected health care professionals employed at the above health care facilities in order to obtain key information on provider- and facility-level factors that may influence patient outcomes. Similar to the patient and household survey, these interviews will be conducted at baseline (October/November 2007) and at two more six-monthly intervals over the next twelve to eighteen months.

The study also comprises two interventions (this in additional to the support already provided to patients as part of the ART programme) aimed at improving treatment success, namely a nutritional intervention [a random sample of patients at each study site will be receiving a weekly supply of two can of pilchards (high in iron content) in tomato sauce] and an adherence support intervention [treatment-experienced patients (on treatment for at least 12

Head: Health – Prof. P.L. Ramela • PO Box 227, Bloemfontein 9300 • Tel: 051-408 1107, Fax: 051-408 1950 e-mail - RamelaP@fshealth.gov.za • 4th Floor, Bophelo House, Cnr. Maitland Street & Harvey Road, Bloemfontein 9300

months) will be provided with basic training on adherence support and on how to refer patients to other health care workers in cases where they need other services, and will visit randomly selected patients at each study site on a frequent basis to provide them with adherence support]. The two interventions will run for a period of approximately twelve months and will be implemented approximately three to four months after the baseline interviews with study participants. There will be three groups of study participants: those patients receiving the current support and interventions provided as part of the ART programme (~216), those patients receiving only the peer adherence support intervention provided by trained, experienced ART patients (~216), and those patients receiving both the nutritional and peer adherence support intervention (~216).

Physicians at treatment/combined sites will moreover be required to request an Hb test for study participants during routine three- or six-month visits to treatment/combined sites for clinical assessment, when blood are drawn for the purpose of routine CD4 and viral load tests, using a prescribed form. Currently, Hb tests are not requested routinely for all ART. It is necessary however to do so for all study participants, given that Hb represents the principal outcome of the nutritional intervention. These tests are being paid for by the project and an arrangement to this effect has already been made with NHLS representatives in the province.

The Free State Department of Health offers its full cooperation and assistance to the research team in carrying out this important research once the research team has obtained the necessary ethical approval for the research project from the Ethics Committee of the Faculty of Medicine at the University of the Free State. In addition, the Executive Manager: Strategic Health Programs and the Senior Management of the ART programme will prior to the submission of research outputs for conferencing or publication purposes have the opportunity to comment on outputs emanating from the research project.

Yours sincerely

PROF PL RAMELA
HEAD: HEALTH

DATE: 1 NOVEMBER 2007

Head: Health – Prof. P.L. Ramela • PO Box 227, Bloemfontein 9300 • Tel: 051-408 1107, Fax: 051-408 1950 e-mail - RamelaP@fshealth.gov.za • 4th Floor, Bophelo House, Cnr. Maitland Street & Harvey Road, Bloemfontein 9300

Appendix B: Recruitment Form

UNIVERSITEIT VAN DIE VRYSTAAT
UNIVERSITY OF THE FREE STATE
YUNIVESITHI YA FREISTATA

Centre for Health Systems Research & Development
Sentrum vir Gesondheidsisteemnavorsing en Ontwikkeling
FACULTY OF THE HUMANITIES/FAKULTEIT GEESTESWETENSKAPPE

BLOEMFONTEIN 9300
REPUBLIC OF SOUTH AFRICA SA (051) 401-2623
REPUBLIEK VAN SUID-AFRIKA Fax/Faks: SA (051) 444-6758
REPHABLIKE YA AFRIKA BORWA E-✉: BooysenF.EKW@ufs.ac.za

FREE STATE POVERTY AND HELATH SURVEY
HOUSEHOLD RECRUITMENT FORM

Instruction: First locate the key informant in the household:

Dumelang,kene ke kopa ho bua le hloho ya lelapa. Ha a le siyo, le ka mpolella hore ke mang ya ikarabelang ditshenyehelo tsa lelapa, kapa, ya nkang qeto tsa bohlokoa lapeng? Good day, please may I speak to the head of this household? Or, if the head of the household is not present, perhaps you can tell me who is in charge of the finances of this household, or who around here makes most of the important decisions? If [PERSON] is not home, perhaps you can tell me when they are likely to be home so I may call again?

Instruction: On identifying the key informant, introduce the study to this person:

Mme/ntate, o a mengwa ho nka karolo diphuputsong tse tlang ho etswa. Pele o ka nka diqeto, diphuputso di kenyelletsa ho latelang: Dear sir/madam, you are kindly invited to participate in a survey. Before you decide whether to take part, here is what it involves:

- **University ya Free State ka kopanelo le lefapha la bophelo la Free State di tshwere diphuputso mabapi le bofuma le bophelo bo botle ka hare ho metse ya bo lona. Motse wa lona ke o mong o kgethilweng ka hare ho metse e 12, e tlong ho nka karolo, mme lelapa la lona ke le leng la malapa a hlwailweng ho nka karolo.** The University of the Free State – in collaboration with the Free State Department of Health – is doing research to investigate poverty and health in our communities. Your community is one of twelve communities selected to participate in this study and your family has been chosen randomly to partake in this research.
- **Ha ho merokotso e tla lebellwa ho nkeng karolo diphuputsong. Dipalopalo tse tlang ho bokelletswa ke tsona tse tlang ho thusa lefapha la bophelo bo botle le la thekolohelo ho nka diqeto ho seo se lokelwang ho etswa.** There are no known benefits associated with your participation in this research. The data that we obtain from the study will enable us to provide the Departments of Health and Social Development and other policy makers with information, which will be used to inform decision making processes regarding policy.
- **Wena le ba lelapa la hao le tla botswa dipotso tse mmalwa ke sehlopha sa batho ba rupeletsweng. Re tlo bokella lesedi le latelang ho wena le ba lelapa:** You and the members of your household will be asked various questions by a team of trained interviewers. We will be collecting the following information from you and your family members:

	Moikarabeli: Respondent:	**Mofuta wa lesedi:** Type of information:	**Nako:** Duration:
1.	**Hloho ya lelapa kapa emong wa banking qeto lapeng; maloko a lelapa kaofela (for anthropometric measures)** / Household head and/or other key decision makers; and (for anthropometric measures) all household members	Anthropometric measures (e.g. height/weight); socio-demographics; education; disability; morbidity, mortality	**60-90 metsotso** / minutes
2.	**Motho ya ikarabellang ditshenyehelong tsa lelapa** / Person in charge of household finances	Housing; basic services; household assets; food security; expenditure; income; savings; debt	**60-90 metsotso** / minutes
3.	**Maloko a lelapa ≥ 10 dilemo** / Household members ≥ 10 years	24-hour activity schedule	**10-15 metsotso/motho** / minutes/person
4.	**Maloko a lelapa ≥ 15 dilemo** / Household members ≥ 15 years	Work and labour force participation	**15-20 metsotso/motho** / minutes/person
5.	**Maloko a lelapa ≥ 16 dilemo** / Household members ≥ 16 years	Health, health seeking behaviour and health-related issues	**30-45 metsotso/motho** / minutes/person

DIPUISANO DI TLA NKA DIHORA TSE 3-4 HO PHETHELWA. Bana ba ka tlase ho dilemo tse 16 ba lokelwa ho thuswa ke batswadi/bahlokomedi ba bona ha re tla be renka dianthropometric measures le kapuisano ya 24-hour activity schedule. Re tla kopa hape le ho batshehetsi ba bana hore re ka hlwela le ditokomane tsa bona tsa sekolo, ho re thusa ho etsa dipatlisiso tse kenelletseng mabapi le kamoo bofuma bo nkang karolo ka teng maphelong a bana.Ho molemo ho dula o ntse o hopola hore tsena tsohle di tla dula e le lekunutu ka nako tsohle, le kekeng la tsejwa ke malapa a mang. (bana ba ka tlasa 16 ya dilemo batla botswa dipotso ka thoko moo ho senang setho sa lelapa se tlang ho tseba letho, kapa ke motho ho hang ya sa ameheng diphuputsong. Ditokomane mmoho le dikarabo tsa hao di tla bolokwa sebakeng se bolokehileng. THESE INTERVIEWS WILL TAKE APPROXIMATELY 3-4 HOURS IN TOTAL TO COMPLETE. Children younger than 16 years must be assisted by a parent/guardian/caregiver during the taking of the anthropometric measures and when completing the 24-hour activity schedule. We will also ask the parent/guardian/caregiver of school-going children for consent to access these children's school records, which will assist us to make a detailed study of how poverty impacts on children's education. It is important to note that the answers to all these questions will remain confidential and will not be viewed by other household members (with the exception of children < 16 years, we will interview each respondent individually and in a quiet place away from other household members) or by any person/party not directly involved in the study. The forms with your answers and the accompanying signed consent forms will be kept safe in a locked building.

- **Le hoja hona e le dipatlisiso feela,tse ding tsa dipotso di ka amana le maikutlo a batho. Ha batho ba ang batla utlwa bohloko ke tse ding tsa diketsahalo tseo ba tlang ho di hopola. Wena le ba lelapa la hao le ka nna la tlohela ho araba tse ding tsa dipotso tse jwalo. Le na le bolokolohi ba ho ka emisa dipuhisano ka nako *efe* kapa *efe,* kapa ho ikgula diphuputsong ka ntle le ho lahlehelwa ke menyetla efe kapa efe.** Although this is only a survey, some of the questions relate to personal and sensitive issues. Some people may find it upsetting to recall and discuss their experiences. You and any person in your household are however free to decline to answer any specific question if you feel the information is too sensitive or personal. Members of your household, including yourself, are also free to stop the interview at any time and to withdraw from the study, with no consequences.

- **Jwalokaha diphuputso di na le thahasello diphetohong ka nako e telele ho tsa lelapa, thekolohelo le bophelong bo botle, dipuisano di keke tsa fella mona. Re tla boela re tlo le bona hape habedi ka nako ya dikgwedi tse 12. Ho tla lekola hore na ho bile le diphetoho malapeng ka morao ho dipuisano.** As the research team is particularly interested in changes over time in household welfare and in health, your household will not only be interviewed only this once. We will also be visiting you twice more over the next twelve months, this to collect information on similar issues in order to determine how the households' and household members' circumstances have changed during the intervening months.

- **Karolo ya hao diphuputsong ke bo-ithaopi, ha o dumela ho nka karolo, emong le emong wa lelapa ho kenyelletswa le wena o lokela ho saena tokomane e itseng.Dikahare tsa ditokomane di tla hlaloswa ka botlalo ho e mong le e mong wa lelapa. Le na le tokelo ya ho hana ho tswela pele ka diphuputso.** Your participation in this study is voluntary. Should you agree to participate, each of the persons in your household that we will interview, including yourself, is required to sign this informed consent form, the contents of which we will explain again to each person prior to asking them the relevant questions. Individual household members are free to refuse to participate in the survey if they so wish.

Instructions:

After explaining the nature of the study to the respondent(s) and dealing with their enquiries regarding the study, do the following:

(1) In the case of a household that gives consent for the interviews, complete TWO copies of the household interview consent form, ONE on the ENGLISH form and ONE in the respondent's preferred language [English/Sotho/Afrikaans/Xhosa] – keep the ONE copy (English version) and GIVE the other copy in the respondent's preferred language to the key informant.

Complete ONE copy ONLY of the form for households that do NOT give consent for the household interviews AND return the completed consent form to the fieldwork manager together with the set of empty interview instruments!

(2) In the case of households consenting to the interviews, proceed to FIRST complete the CONTACT DETAIL form below (page 3) – make sure that you fill out the entire form (INCLUDING the HOUSEHOLD NUMBER) and that you provide enough information on the form to allow the research team to contact the key informant for the purpose of the follow-up interviews. You may now proceed with the household interviews, first completing the household questionnaire and then the household finances and individual questionnaires

A. CONTACT DETAILS OF KEY INFORMANT IN HOUSEHOLD SURVEY:

HH-number

NOTE: The information below is the personal details of the household head, the main decision maker, or the person in charge of the household's finances. This is the principal contact in the household and is the person you FIRST SPOKE to when introducing the study and from whom you obtained written informed consent to proceed with the household interviews.

FOR OFFICE USE ONLY:

A.1 Lebitso la hao ke mang? What is your first name?

_____ <<

A.2 Sefane sa hao ke mang? What is your surname?

_____ <<

A.3 Ke kopa nomoro ya hao ya ID. Please give me your identity (ID) number.

												<<

NOTE: If the person does not have an ID document, write 'no ID document' above.
If the person holds an ID document or passport from another country, fill in details above.

A.4 O hlahile neng? What is your date of birth?

Day	Month	Year	
		19	<<

A.5 Adresse ya mona ke mang? What is the street address here?

NOTE: Please complete ALL or as MUCH as POSSIBLE of the information below!

1 House number: _____ <<

2 Building/complex name:

3 Street name: _____

4 Neighbourhood: _____

5 Suburb: _____

6 Town/city: _____

A.6 Re kopa ohlalose hore kefihla jwang moo ha re ka batla ho boisana le wena nakong etlang.
Are there any additional directions to reach your home, which we can use to find you when we want to interview you again in the future?

_____ <<

_____

_____

A.7 Nomoro ya hao ya mohala ke mang? What is your telephone or cell phone number?

Code: *Number:*

										<<

Cell phone:

										<<

A.8 Re kopa lebitso la motho emong mo re ka ofumanang teng, ha ho hlokahala? Can you provide me with the name of another person through whom we can reach you or your household, if necessary?

_____

A.9 Nomoro ya motho eo ya mohala ke mang?
What is the telephone and/or cell phone number of this person?

Code: *Number:*

										<<

Cell phone:

										<<

Appendix C: Information document and consent form

UNIVERSITEIT VAN DIE VRYSTAAT
UNIVERSITY OF THE FREE STATE
YUNIVESITHI YA FREISTATA

Centre for Health Systems Research & Development
Sentrum vir Gesondheidsisteemnavorsing en Ontwikkeling
FACULTY OF THE HUMANITIES/FAKULTEIT GEESTESWETENSKAPPE
BLOEMFONTEIN 9300
REPUBLIC OF SOUTH AFRICA SA (051) 401-2623
REPUBLIEK VAN SUID-AFRIKA Fax/Faks: SA (051) 444-6758
REPHABLIKE YA AFRIKA BORWA E-✉: BooysenF.EKW@ufs.ac.za

FREE STATE POVERTY AND HEALTH SURVEY

HOUSEHOLD INTERVIEW

- Die Universiteit van die Vrystaat – in samewerking met die Vrystaatse Departement van Gesondheid – doen navorsing oor armoede en gesondheid in ons gemeenskappe. U gemeenskap is een van twaalf gemeenskappe wat gekies is om deel te wees van die studie en u huishouding is willekeurig gekies om deel te neem aan die studie.

- Daar is geen direkte voordele wat verband hou met u deelname aan die navorsing. Die inligting was ons insamel met behulp van hierdie navorsing sal ons egter in staat stel om die Departemente van Gesondheid en Sosiale Ontwikkeling en ander beleidsmakers van inligting te voorsien wat gebruik sal word om rigting te gee aan besluitnemingsprosesse rakende beleid.

- U en die ander lede van die huishouding sal verskeie vrae gevra word deur ‘n span opgeleide veldwerkers. Ons sal die volgende inligting insamel van u en die ander lede van die huishouding:

	Respondent:	**Tipe inligting:**	**Lengte:**
1.	Hoof van die huishouding en/of sleutel besluitnemers; en (vir antropometriese afmetings) alle lede van die huishouding	Antropometriese afmetings (bv. lengte/gewig); sosio-demografiese inligting; opvoeding; ongeskiktheid; siekte, sterftes	60-90 minute
2.	Persoon in beheer van huishouding se finansies	Behuising; basiese dienste; bates; voedsel sekuriteit; uitgawes; inkomste; besparing; skuld	60-90 minute
3.	Huishoudingslede **≥ 10** jaar	24-uur aktiwiteitskedule	10-15 min/persoon
4.	Huishoudingslede **≥ 15** jaar	Werk en arbeidsmagdeelname	15-20 min/persoon
5.	Huishoudingslede **≥ 16** jaar	Gesondheid, gesondheidsorg gedrag en kennis oor gesondheidsverwante kwessies	30-45 min/persoon

Hierdie onderhoude in totaal sal ongeveer **3-4 ure** neem om te voltooi. Kinders onder die ouderdom van 16 jaar moet bygestaan word deur ‘n ouer/voog/versorger gedurende

die neem van die antropometriese afmetings en met die voltooi van die aktiwiteitskedule. Ons sal ook die ouer/voog/versorger van skoolgaande kinders vra vir toestemming om sodanige kinders se skoolrekords na te gaan, wat ons in staat sal stel om ‘n studie te maak van hoe armoede kinders se opvoeding beïnvloed. U antwoorde op die vrae sal vertroulik bly en slegs persone of partye wat direk betrokke is by hierdie navorsing, sal toegang daartoe hê. Ons sal ook elkeen van die onderhoude met verskillende lede van die huishouding apart en op ‘n stil plek weg van ander lede van die huishouding voer. U naam en enige ander inligting wat dit moontlik sou maak vir enigeen om u te identifiseer, sal nie op die vraelys verskyn nie en u sal slegs deur ‘n nommer identifiseer word. Die vorms met u antwoorde sal in ‘n kabinet toegesluit word en veilig in ‘n gebou bewaar word.

- Alhoewel hierdie slegs ‘n opname is, handel van die vrae wel oor persoonlike en sensitiewe aangeleenthede. Dit mag sekere mense ontstel om oor hierdie sake terug te dink en om hul ervarings te bespreek. Dit staan u en enige ander lid van die huishouding egter vry om te weier om enige spesifieke vraag te beantwoord indien u van die opinie is dat hierdie inligting te sensitief of persoonlik is. Lede van u huishouding, ingesluit uself, is ook geregtig om die onderhoud op enige tydstip te beëindig en aan die studie te onttrek, sonder enige implikasies.

- Die navorsingspan is veral geïnteresseerd in veranderinge in huishoudings se welvaart en gesondheid oor tyd. Daarom gaan ons nie slegs nou onderhoude met u voer nie, maar ook by twee verdere geleenthede in die volgende twaalf maande soortgelyke inligting insamel, dit ten einde vas te stel hoe die huishouding en lede van die huishouding se omstandighede verander het in die afgelope maande.

- U deelname aan hierdie studie is vrywillig. Indien u sou instem om deel te neem aan die navorsing, is dit nodig dat u en elkeen van die ander lede van die huishouding van wie ons inligting sal insamel, hierdie vorm teken. Die inhoud daarvan sal telkens aan elke persoon verduidelik word alvorens die relevant vrae aan hom/haar gestel word. Individuele lede van die huishouding is vry om nie aan die studie deel te neem nie indien hulle dit so verkies.

Indien u op enige tydstip addisionele inligting rakende hierdie studie sou benodig, kan u enige van die volgende persone kontak:

Naam:	Telefoon nommer:
Prof. Frikkie Booysen	051 401 2623 / 083 381 5874
Die Direkteur: SGSN&O	051 401 2181

FREE STATE POVERTY AND HEALTH SURVEY

CONSENT FORM: HOUSEHOLD INTERVIEW

RESPONDENT:

Ek,

_____

[VOLLE NAME VAN RESPONDENT IN HOOF LETTERS]

• het al die bogaande inligting gelees en verstaan;	Ja	Nee
• het die geleentheid gehad om die inligting te bespreek en om vrae te vra;	Ja	Nee
• neem vrywillig deel aan hierdie studie;	Ja	Nee
• bevestig dat ek 'n kopie van hierdie vorm ontvang het	Ja	Nee

Handtekening van respondent: Datum:

_____ _____

ONDERHOUDVOERDER:

Ek,

_____

[VOLLE NAME VAN ONDERHOUDVOERDER IN HOOF LETTERS]

• het die volle aard en doel van die studie aan die respondent verduidelik;	Ja	Nee
• bevestig dat ek 'n kopie van hierdie vorm aan die respondent gegee het	Ja	Nee

Handtekening van onderhoudvoerder: Datum:

_____ _____

UNIVERSITEIT VAN DIE VRYSTAAT
UNIVERSITY OF THE FREE STATE
YUNIVESITHI YA FREISTATA

Centre for Health Systems Research & Development
Sentrum vir Gesondheidsisteemnavorsing en Ontwikkeling
FACULTY OF THE HUMANITIES/FAKULTEIT GEESTESWETENSKAPPE
BLOEMFONTEIN 9300
REPUBLIC OF SOUTH AFRICA SA (051) 401-2623
REPUBLIEK VAN SUID-AFRIKA Fax/Faks: SA (051) 444-6758
REPHABLIKE YA AFRIKA BORWA E-✉: BooysenF.EKW@ufs.ac.za

FREE STATE POVERTY AND HEALTH SURVEY

HOUSEHOLD INTERVIEW

- The University of the Free State – in collaboration with the Free State Department of Health – is doing research to investigate poverty and health in our communities. Your community is one of twelve communities selected to participate in this study and your family has been chosen randomly to partake in this research.

- There are no known benefits associated with your participation in this research. The data that we obtain from the study will enable us to provide the Departments of Health and Social Development and other policy makers with information, which will be used to inform decision making processes regarding policy.

- You and the members of your household will be asked various questions by a team of trained interviewers. We will be collecting the following information from you and your family members:

	Respondent:	**Type of information:**	**Duration:**
1.	Household head and/or other key decision makers; all household members (for anthropometric measures)	Anthropometric measures (e.g. height/weight); socio-demographics; education; disability; morbidity, mortality	60-90 minutes
2.	Person in charge of household finances	Housing; basic services; household assets; food security; expenditure; income; savings; debt	60-90 minutes
3.	Household members **≥ 10** years	24-hour activity schedule	10-15 min/person
4.	Household members **≥ 15** years	Work and labour force participation	15-20 min/person
5.	Household members **≥ 16** years	Health, health seeking behaviour and knowledge on health-related issues	30-45 min/person

These interviews will take approximately **3-4 hours** to complete in total. Children younger than 16 years must be assisted by a parent/guardian/caregiver during the taking of the anthropometric measures and when completing the 24-hour activity schedule. We will also ask the parent/guardian/caregiver of school-going children for

consent to access these children's school records, which will assist us to make a detailed study of how poverty impacts on children's education. It is important to note that the answers to all these questions will remain confidential and will not be viewed by other household members (with the exception of children < 16 years, we will interview each respondent individually and in a quiet place away from other household members) or by any person/party not directly involved in the study. The forms with your answers and the accompanying signed consent forms will be kept safe in a locked building.

- Although this is only a survey, some of the questions relate to personal and sensitive issues. Some people may find it upsetting to recall and discuss their experiences. You and any person in your household are however free to decline to answer any specific question if you feel the information is too sensitive or personal. Members of your household, including yourself, are also free to stop the interview at any time and to withdraw from the study, with no consequences.

- As the research team is particularly interested in changes over time in household welfare and in health, your household will not only be interviewed only this once. We will also be visiting you twice more over the next twelve months, this to collect information on similar issues in order to determine how the households' and household members' circumstances have changed during the intervening months.

- Your participation in this study is voluntary. Should you agree to participate, each of the persons in your household that we will interview, including yourself, is required to sign this informed consent form, the contents of which we will explain again to each person prior to asking them the relevant questions. Individual household members are free to refuse to participate in the survey if they so wish.

Should you require any additional information concerning this study, you are welcome to contact any of the following persons:

Name:	Phone number:
Prof Frikkie Booysen	051 401 2623 / 083 381 5874
The Director: CHSR&D	051 401 2181

FREE STATE POVERTY AND HEALTH SURVEY

CONSENT FORM: HOUSEHOLD INTERVIEW

RESPONDENT:

I,

_____

_

[FULL NAME OF RESPONDENT IN BLOCK LETTERS]

• have read and understood all the above information;	Yes	No
• was given the opportunity to discuss this information and to ask questions;	Yes	No
• volunteer to take part in this study;	Yes	No
• confirm that I have received a copy of this consent form	Yes	No

Signature of respondent: Date:

_____ _____

INTERVIEWER:

I,

_____

_

[FULL NAME OF INTERVIEWER IN BLOCK LETTERS]

• have explained the nature and purpose of the study to the respondent in full;	Yes	No
• confirm that I have given the respondent a copy of this consent form	Yes	No

Signature of interviewer: Date:

_____ _____

UNIVERSITEIT VAN DIE VRYSTAAT
UNIVERSITY OF THE FREE STATE
YUNIVESITHI YA FREISTATA

Centre for Health Systems Research & Development
Sentrum vir Gesondheidsisteemnavorsing en Ontwikkeling
FACULTY OF THE HUMANITIES/FAKULTEIT GEESTESWETENSKAPPE
BLOEMFONTEIN 9300
REPUBLIC OF SOUTH AFRICA SA (051) 401-2623
REPUBLIEK VAN SUID-AFRIKA Fax/Faks: SA (051) 444-6758
REPHABLIKE YA AFRIKA BORWA E-✉: BooysenF.EKW@ufs.ac.za

FREE STATE POVERTY AND HEALTH SURVEY

HOUSEHOLD INTERVIEW

- University ya Free State ka kopanelo le lefapha la bophelo la Free State di tshwere diphuputso mabapi le bofuma le bophelo bo botle ka hare ho metse ya bo lona. Motse wa lona ke o mong o kgethilweng ka hare ho metse e 12, e tlong ho nka karolo, mme lelapa la lona ke Ie leng la malapa a hlwailweng ho nka karolo.

- Ha ho merokotso e tla lebellwa ho nkeng karolo diphuputsong. Dipalopalo tse tlang ho bokelletswa ke tsona tse tlang ho thusa lefapha la bophelo bo botle le la thekolohelo ho nka diqeto ho seo se lokelwang ho etswa.

- Wena le ba lelapa la hao le tla botswa dipotso tse mmalwa ke sehlopha sa batho ba rupeletsweng. Re tlo bokella lesedi le latelang ho wena le ba lelapa:

	Moikarabeli:	**Mofuta wa lesedi:**	**Nako:**
1.	Hloho ya lelapa kapa emong wa banking qeto lapeng; maloko a lelapa kaofela (for anthropometric measures)	Anthropometric measures (e.g. height/weight); socio-demographics; education; disability; morbidity, mortality	60-90 metsotso
2.	Motho ya ikarabellang ditshenyehelong tsa lelapa	Housing; basic services; household assets; food security; expenditure; income; savings; debt	60-90 metsotso
3.	Maloko a lelapa **≥ 10** dilemo	24-hour activity schedule	10-15 metsotso /motho
4.	Maloko a lelapa **≥ 15** dilemo	Work and labour force participation	15-20 metsotso /motho
5.	Maloko a lelapa **≥ 16** dilemo	Health, health seeking behaviour and knowledge on health-related issues	30-45 metsotso /motho

Dipuisano di tla nka dihora tse **3-4 ho phethelwa**. Bana ba ka tlase ho dilemo tse 16 ba lokelwa ho thuswa ke batswadi/bahlokomedi ba bona ha re tla be renka dianthropometric measures le kapuisano ya 24-hour activity schedule.Re tla kopa hape le ho batshehetsi ba bana hore re ka hlwela Ie ditokomane tsa bona tsa sekolo,ho re thusa ho etsa dipatlisiso tse kenelletseng mabapi Ie kamoo bofuma bo nkang karolo ka

teng maphelong a bana.Ho molemo ho dula o ntse o hopola hore tsena tsohle di tla dula e Ie lekunutu ka nako tsohle, Ie kekeng la tsejwa ke malapa a mang. (bana ba ka tlasa 16 ya dilemo batla botswa dipotso ka thoko moo ho senang setho sa lelapa se tlang ho tseba letho, kapa ke motho ho hang ya sa ameheng diphuputsong.Ditokomane mmoho le dikarabo tsa hao di tla bolokwa sebakeng se bolokehileng.

- Le hoja hona e le dipatlisiso feela,tse ding tsa dipotso di ka amana le maikutlo a batho. Ha batho ba ang batla utlwa bohloko ke tse ding tsa diketsahalo tseo ba tlang ho di hopola. Wena le ba lelapa la hao le ka nna la tlohela ho araba tse ding tsa dipotso tse jwalo. Le na le bolokolohi ba ho ka emisa dipuhisano ka nako *efe* kapa *efe,* kapa ho ikgula diphuputsong ka ntle le ho lahlehelwa ke menyetla efe kapa efe.

- Jwalokaha diphuputso di na le thahasello diphetohong ka nako e telele ho tsa lelapa, thekolohelo le bophelong bo botle, dipuisano di keke tsa fella mona. Re tla boela re tlo le bona hape habedi ka nako ya dikgwedi tse 12. Ho tla lekola hore na ho bile le diphetoho malapeng ka morao ho dipuisano.

- Karolo ya hao diphuputsong ke bo-ithaopi, ha o dumela ho nka karolo, emong le emong wa lelapa ho kenyelletswa le wena o lokela ho saena tokomane e itseng.Dikahare tsa ditokomane di tla hlaloswa ka botlalo ho e mong le e mong wa lelapa. Le na le tokelo ya ho hana ho tswela pele ka diphuputso.

Ha o hloka lesedi bakeng sa diphuputso, o ka letsetsa batho ba latelang:

Mabitso:	Nomoro ya ho letsa:
Prof Frikkie Booysen	051 401 2623 / 083 381 5874
The Director: CHSR&D	051 401 2181

FREE STATE POVERTY AND HEALTH SURVEY

CONSENT FORM: HOUSEHOLD INTERVIEW

MOARABEDI:

Nna,

_____

_

[LEBITSO LEFELETSI]

• kebadile ka utlwisisa lesedi le kahodimo kaofela;	Ee	Tjhe
• ka fumantshwa monyetla waho buisana ka lesedi ke botsa le dipotso;	Ee	Tjhe
• ke ithaopile honka karolo diphuphutsong tsena;	Ee	Tjhe
• ke a dumela hore kefumane kopi (copy) ya tokomane ena	Ee	Tjhe

Tekena: Letsatsi

_____ _____

MOPHUPHUTSI:

Nna,

_____

[LEBITSO LEFELETSI]

• ke hlaisitse maemo le molemo wa diphuphutso ho moikarabeli ka botlalo;	Ee	Tjhe
• ka mofa le lengolo la tumellano	Ee	Tjhe

Tekena: Letsatsi:

_____ _____

UNIVERSITEIT VAN DIE VRYSTAAT
UNIVERSITY OF THE FREE STATE
YUNIVESITHI YA FREISTATA

Centre for Health Systems Research & Development
Sentrum vir Gesondheidsisteemnavorsing en Ontwikkeling
FACULTY OF THE HUMANITIES/FAKULTEIT GEESTESWETENSKAPPE
BLOEMFONTEIN 9300
REPUBLIC OF SOUTH AFRICA SA (051) 401-2623
REPUBLIEK VAN SUID-AFRIKA Fax/Faks: SA (051) 444-6758
REPHABLIKE YA AFRIKA BORWA E-✉: BooysenF.EKW@ufs.ac.za

EFFEKTIEWE VIGS BEHANDELING EN ONDERSTEUNING (FEATS) STUDIE
PASIËNT ONDERHOUD

U word vriendelik uitgenooi om deel te neem aan 'n studie. Voor u besluit om deel te neem, hier is wat die studie behels:

- Die Universiteit van die Vrystaat – in samewerking met die Vrystaatse Departement van Gesondheid – doen huidiglik navorsing oor die impak van antiretroviral behandeling op pasiënte en hul families se lewensomstandighede.
- Daar is geen direkte voordele wat kan spruit uit u deelname aan die navorsing. Die inligting was ons insamel met behulp van hierdie navorsing sal ons in staat stel om die Departement van Gesondheid en ander van inligting te voorsien wat die implementering en bestuur van die antiretrovirale behandelingsprogram kan verbeter.
- Hierdie onderhoud sal ongeveer 30 minute duur. U antwoorde op die vrae sal vertroulik bly en slegs persone of partye wat direk betrokke is by hierdie navorsing, sal toegang daartoe hê. U sal anoniem wees. U naam en enige ander inligting wat dit moontlik sou maak vir enigeen om u te identifiseer, sal nie op die antwoordstel verskyn nie en u sal slegs deur 'n nommer identifiseer word. Die vorms met u antwoorde sal in 'n kabinet toegesluit word en veilig in 'n gebou gestoor word.
- Ons moet die yster-inhoud van u bloed toets teen einde vas te stel hoe ARM behandeling u gesondheid en produktiwiteit beïnvloed. Daarom sal die susters 'n hemaglobien toets aanvra wanneer u die kliniek of hospitaal besoek vir u 3- of 6-maandelikse roetine opvolgbesoek, waar hulle ook bloed trek om u CD4 en virale lading te toets. Hierdie toets is deel van die roetine monitering in die ARM behandelingsprogram. Dit is belangrik om te beklemtoon dat die susters nie ekstra bloed van u sal trek nie, maar slegs die bloed wat getrek word om u CD4 en virale lading te toets, sal gebruik om hierdie addisionele toets te doen.
- Alhoewel hierdie slegs 'n opname is, handel van die vrae wel oor persoonlike en sensitiewe aangeleenthede. Dit mag sekere mense ontstel om oor hierdie sake terug te dink en om hul ervarings te bespreek. Dit staan u egter vry om te wyer om enige spesifieke vraag te beantwoord indien u van die opinie is dat hierdie inligting te sensitief of persoonlik is. U is ook geregtig om die onderhoud op enige tydstip te

beëindig sonder dat die toekomstige voorsiening van enige dienste aan u of u toekomstige toegang tot ARV behandeling beïnvloed word.

- Indien u instem om deel te neem, benodig ons ook u toestemming om u huishouding te nader vir ‘n onderhoud. Hierdie onderhoud sal deur ander veldwerkers gevoer word en sal apart van hierdie onderhoud en op ‘n ander tydstip geskied. U identiteit en die feit dat u ARM behandeling ontvang sal op geen stadium ter sprake kom of openbaar gemaak word tydens hierdie onderhoud. Die studie sal aan u huishouding bekendgestel word as ‘n studie oor armoede en gesondheid in die Vrystaat en die studie sal nie ‘n eksklusiewe MIV/VIGS fokus hê nie. Dit is ook belangrik dat u aan hierdie onderhoud deelneem, want ons gaan by hierdie onderhoud vrae aan u en u huishouding stel wat ons nie in hierdie onderhoud vra nie omrede ons die onderhoude kort wil hou.
- Indien u sou instem om deel te neem, benodig ons ook toestemming om u kliniek- en hospitaalrekords na te gaan ten einde die resultate van u CD4, virale lading en hemaglobien toetse asook ander kliniese inligting, te bekom.
- Aangesien die navorsingspan veral geïnteresseerd is in die lang-term ondervindige van pasiënte op ARM behandeling en in hoe behandeling hul lewens en die van hul families beïnvloed, gaan ons nou ‘n onderhoud met u voer maar ook weer in ongeveer ses maande se tyd.
- U deelname aan hierdie studie is vrywillig. U mag aan hierdie studie onttrek op enige stadium gedurende die onderhoud. Indien u sou instem om deel te neem aan die navorsing, is dit nodig dat u hierdie vorm teken. Ek sal ‘n paar minute neem om die kontakbesonderhede van u wat die verpleegster aan ons verskaf het, te verifiëer, waarna ons die kort onderhoud kan doen.

Indien u op enige tydstip addisionele inligting rakende hierdie studie sou benodig, kan u enige van die volgende persone kontak:

Naam:	Telefoon nommer:
Prof. Frikkie Booysen	051 401 2623 / 083 381 5874
Die Direkteur: SGSN&O	051 401 2181

EFFEKTIEWE VIGS BEHANDELING EN ONDERSTEUNING (FEATS) STUDIE
TOESTEMMINGSVORM: PASIËNT ONDERHOUD

PASIËNT:

Ek, _____

[VOLLE NAME VAN DIE PASIËNT IN BLOKLETTERS]

verklaar hiermee dat:

▪ ek die bostaande inligting gelees het en dit verstaan;	Ja	Nee
▪ ek die geleentheid gehad het om die inligting te bespreek en om vrae te stel;	Ja	Nee
▪ ek vrywillig aan hierdie studie deelneem;	Ja	Nee
▪ ek toestemming verleen aan die verpleegpersoneel by die ARM kliniek om 'n hemaglobien toets aan te vra as deel van die roetine moniteringstelsel in die ARM program;	Ja	Nee
▪ ek toestemming verleen aan die navorsingspan om die huishouding waarin ek woonagtig is te nader vir 'n onderhoud;	Ja	Nee
▪ ek toestemming verleen aan die navorsingspan om my kliniek- en hospitaalrekords na te gaan;	Ja	Nee
▪ ek 'n afskrif van hierdie toestemmingsvorm ontvang het.	Ja	Nee

Handtekening van pasiënt: Datum:

_____ _____

VELDWERKER:

Ek, _____

[VOLLE NAME VAN DIE VELDWERKER IN BLOKLETTERS]

verklaar hiermee dat:

▪ ek die aard en doel van die studie aan die pasiënt verduidelik het; en	Ja	Nee
▪ ek die pasiënt 'n afskrif van hierdie toestemmingsvorm gegee het.	Ja	Nee

Handtekening van veldwerker: Datum:

_____ _____

UNIVERSITEIT VAN DIE VRYSTAAT
UNIVERSITY OF THE FREE STATE
YUNIVESITHI YA FREISTATA

Centre for Health Systems Research & Development
Sentrum vir Gesondheidsisteemnavorsing en Ontwikkeling
FACULTY OF THE HUMANITIES/FAKULTEIT GEESTESWETENSKAPPE
BLOEMFONTEIN 9300
REPUBLIC OF SOUTH AFRICA SA (051) 401-2623
REPUBLIEK VAN SUID-AFRIKA Fax/Faks: SA (051) 444-6758
REPHABLIKE YA AFRIKA BORWA E-✉: BooysenF.EKW@ufs.ac.za

EFFECTIVE AIDS TREATMENT AND SUPPORT (FEATS) STUDY
PATIENT INTERVIEW

You are kindly invited to participate in a survey. Before you decide whether to take part, here is what it involves:

- The University of the Free State – in collaboration with the Free State Department of Health – is doing research to assess the experiences of people using anti-retroviral drugs and on the impacts of ARV treatment on patients and patients' households.
- There are no known benefits associated with your participation in this research. The data that we obtain from the study will enable us to provide the Department of Health and others with information to improve the implementation and management of the anti-retroviral treatment programme.
- This interview will take approximately 30 minutes. The answers you provide will remain confidential and will not be viewed by any persons or parties not involved in this study. Your name and the information that would enable someone to identify the respondent will not be recorded on the answer sheet and you will only be identified by a number. The forms with your answers will also be kept in a locked building.
- We also need to test the iron content of your blood in order to determine how ARV treatment affects your health and productivity. For this reason, the nursing staff will when you visit the clinic or hospital the next time for your three- or six-monthly follow-up, where they draw blood to do a CD4 and viral load test, also request a haemoglobin test. This test is part of the system of routine monitoring in the ARV treatment programme. Importantly, the nursing staff will not draw extra bloods from you, but will use the bloods drawn for the CD4 and viral load tests to do this additional test.
- Although this is only a survey, some of the questions relate to personal and sensitive issues. Some people may find it upsetting to recall and discuss their own experiences. You are however free to decline to answer any specific question if you feel the information is too sensitive or personal. You are also free to stop the interview at any time without affecting future services you receive at any health facility or your future access to anti-retroviral treatment.

- Should you agree to participate, we also require consent to approach your household for an interview. The interview with your household will be conducted by other researchers and will be conducted separately from this interview and at a different time. Your identity or the fact that you are receiving ARVs will not at any time be revealed during the process of conducting this interview with your family. The study will be introduced to your family as a study on the welfare and health of households in the Free State province and the study will not have an exclusive HIV/AIDS focus. It is important moreover that you yourself also participate in the household interview, because we will ask you and your family members some questions that we will not ask you now, because we want to keep these interviews as short as possible.
- Should you agree to participate, we also require consent to access your clinic and hospital records in order to obtain the results of your CD4, viral load and haemoglobin tests as well as other clinical information of importance to the study.
- As the research team is particularly interested in the longer term experiences of patients on ARVs and on how treatment affects their lives and that of their families, you and your household will not only be interview now, but will also be interviewed again in approximately six months' time.
- Your participation in this study is voluntary. You may withdraw from this study at any given moment during this interview. Should you agree to participate, you are required to sign this form. We also need to take a minute or two to verify the information you provided to the ARV nurse who recruited you into the study, after which we will conduct the short interview.

Should you require any additional information concerning this study at any time, you may contact any of the following researcher(s):

Name:	Phone number:
Prof Frikkie Booysen	051 401 2623 / 083 381 5874
The Director: CHSR&D	051 401 2181

EFFECTIVE AIDS TREATMENT AND SUPPORT (FEATS) STUDY
CONSENT FORM: PATIENT INTERVIEW

PATIENT:

I,

_____

_

[FULL NAME OF PATIENT IN BLOCK LETTERS]

▪ have read and understood all the above information;	Yes	No
▪ was given the opportunity to discuss this information and ask questions;	Yes	No
▪ volunteer to take part in this study;	Yes	No
▪ give permission to the nursing staff at the ARV facility to request a haemoglobin test as part of the routine monitoring system in the ARV programme;	Yes	No
▪ give permission to the research team to approach my household for an interview;	Yes	No
▪ give permission to the research team to access my clinic/hospital records; and	Yes	No
▪ confirm that I have received a copy of this consent form.	Yes	No

Signature of patient: Date:

_____ _____

FIELDWORKER:

I,

_____

_

[FULL NAME OF FIELDWORKER IN BLOCK LETTERS]

▪ have explained the study to the patient; and	Yes	No
▪ have given the patient a copy of this consent form.	Yes	No

Signature of fieldworker: Date:

_____ _____

UNIVERSITEIT VAN DIE VRYSTAAT
UNIVERSITY OF THE FREE STATE
YUNIVESITHI YA FREISTATA

Centre for Health Systems Research & Development
Sentrum vir Gesondheidsisteemnavorsing en Ontwikkeling
FACULTY OF THE HUMANITIES/FAKULTEIT GEESTESWETENSKAPPE
BLOEMFONTEIN 9300
REPUBLIC OF SOUTH AFRICA SA (051) 401-2623
REPUBLIEK VAN SUID-AFRIKA Fax/Faks: SA (051) 444-6758
REPHABLIKE YA AFRIKA BORWA E-✉: BooysenF.EKW@ufs.ac.za

EFFECTIVE AIDS TREATMENT AND SUPPORT (FEATS) STUDY
PUISANO LE MOKUDI

O memellwa ho nka karolo diphuputsong. Pele o ka nka qeto ya ho nka karolo ,di kenyelletsa tse latelang:

- University ya Free State - mmoho Ie Lefapha la Bophelo bo Botle -di etsa diphuputso ho lekola tsebo ya batho ba sebedisang meriana e thibellang ho nama ha HIV Ie seabe sa yona mahaeng a bona.
- Ha ho moropotso o amanngwang Ie ho, nka karolo ha hao dipihuputsong.Dipalo-palo tse tlang ho fumanwa di tla thusa Lefapha la Bophelo bo botle ho matlafatsa phano Ie taolo ya menana ena.
- Puisano e tla nka metsotso e ka bang 30. Dikarabo tseo o tla fana ka tsona e tla ba lekunutu, di keke tsa bonwa ke motho kapa batho bao e seng karolo ya diphuputso hohang.Lebitso kapa lesedi Ie ka etsang hore o tsejwe ha Ie na ho hlahiswa ditokomaneng tsa diphuputso, ho tla sebediswa dinomoro feela.Ditokomane tse nang Ie lesedi la hao di tla bolokwa sebakeng se bolokehileng.
- Re kopa Ie ho etsa Ie teko ya tswekere mading a hao ho bona hore na meriana ena e ama bophelo ba hao jwang mmoho Ie tsela ya hao ya ho ikatisa.Ka lebaka lena, baoki ka mehla yohle nakong ya kgwedi tse tharo kapa tse tsheletseng ha o etela sepetlele ba tla etsa diteko mading a hao ho hlahloba masole a mmele, sekgahla sa tswaetso ,mmoho Ie tshepe mmeleng wa hao. Dihlahlobo tsena ke karolo ya ho hlahloba mmele kgahlanong Ie meriana eo o tla be o enwa. Baoki ba tla sebedisa madi a mang ho a hutseng ho wena ho etsa diteko tseo tse ding.
- Le ha e Ie diphuputso feela, tse ding tsa dipotso di hlokolosi haholo.Batho ba bang ba ka fumana di ba ama ha ba hopola diketsahalo tse fetileng. O na Ie hona ho ka se arabe dipotso tsa mofuta o jwalo .o dumelletswe hore o ka nna wa kgina dipuisano nako e nngwe Ie e nngwe ho sa tlo setisa ditshebeletso tseo o ntseng o di fumantshwa sebakeng se fe kapa sefe.
- Ha o dumela ho nka karolo, re kopa tumellano ya ho ka etela lelapa la hao ho ya tshwara dipuisano Ie bona.Dipuisano di tla tshwarwa ke e mong wa bo-radiphuputso di sa kopanyelletsa Ie tsena.ka nako e fapaneng. Ho keke ha kenyelleswa lebitso la hao kapa hona ho hlahisa hore o ntse o enwa meriana ena. Diphuputso di tla tsebiswa ho lelapa la hao e Ie karolo ya bohlokwa thekolohelong

ya province ya Free State hape di keke tsa kgesolla ntlha ya HIV/AIDS. Ho bohlokwa hore Ie wena o be teng dipuisanong tse tla be di kenyeleditse Ie ba lelapa, hoba re tla o botsa Ie ba lelapa dipotso tseo re ne re keke ra o botsa tsona o Ie mong, ka lebaka la hore ha re batle ho senya nako

- Ha o dumela ho nka karolo re kopa Ie tumellano ya ho lekola tokomane ya hao ya sepetlele Ie ya tliniki ho fumana sephetho sa sekgahla sa tshwaetso,masole a mmele,tshepe e mmeleng wa hao, ekasita Ie masedinyana a mang a molemo diphuputsong.
- Jwaloka ha diphuputso dina Ie kgahleho ho bakudi ba nwang meriana, kamoo eba tshwarang ka teng Ie kamoo e amang malapa a bona ka teng,dipuisano tsena ha di felle mona, di tla phetwa hape ka morae ho dikgwedi tsheletseng. karolo ya hao diphuputsong tsena ke bo - ithaopi, O ka nna wa ikgula ka nako e nngwe Ie e nngwe.Ha o dumela ho nka karolo o lokela ho saena tokomane e latelang.Re kopa motsotso kapa e mmedi ho netefatsa lesedi lea o Ie fileng mooki tliniking ya meriana ena,yena ya o huletseng dipuisanong tsena. Ka morao ho moo re tla buisana ha nyenyane.
- Ho nka karolo hahao dipatlisisong tsena ke ho ithaopa.Oka tlohela ho nka karolo ya dipuisano nako le nako. Ha o dumela ho nka karolo,o lokela ho saena/tekena foromo ena.Hape re hloka ho nka motsotso kapa e mebedi ho etsa bonnete ba molaetsa oo o nehelaneng ka ona ho mooki wa ARV ya o kgethileng bakeng sa dipatlisiso, hamorao re tla tswellisa puisano e kgutswane.

Ha o batla lesedi Ie fetisisang mona ka diphuputso,letsetsa batho ba latelang:

Name:	Phone number:
Prof Frikkie Booysen	051 401 2623 / 083 381 5874
The Director: CHSR&D	051 401 2181

EFFECTIVE AIDS TREATMENT AND SUPPORT (FEATS) STUDY
LENGOLO LA TUMELLANO: PUISANO LE MOKUDI

PATIENT:

Nna ,

_____

[MABITSO KA BOTLALO A MOKUDI KA MONGOLO O MOHOLO]

▪ Ke badile le ho utlwisisa molaetsa o ka hodimo;	Ee	Tjhe
▪ Ka newa monyetla wa ho buisana ka molaetsa ona le ho botsa dipotso;	Ee	Tjhe
▪ Ke ithaopa ho nka karolo dipatlisisong tsena;	Ee	Tjhe
▪ Ke fana ka tumello ho baoki lefapheng la di ARV ho etsa diteko tsa boemo ba tshepe mading jwaloka karolo tlhokomelong ya kamehla lenaneng la tsamaiso la di ARV;	Ee	Tjhe
▪ Ke fana ka tumello ho ba-dipatlisiso/ba-diphuputso ho buisana le ba lelapa la ka;	Ee	Tjhe
▪ Ke fana ka tumello ho ba-dipatlisiso/ba-diphuputso ho fumantshwa dingolwa tsa ka tsa bophelo bookelong;	Ee	Tjhe
▪ Ke tiisetsa hore ke fumane lengolo la tumellano ena.	Ee	Tjhe

Mabitso a mokudi: Letsatsi:

_____ _____

FIELDWORKER:

Nna,

_____

[MABITSO KA BOTLALO A MOSEBELETSI WA LETSHOLO KA MONGOLO O MOHOLO]

▪ Ke hlalositse maemo le molemo ba dipatlisiso ho mokudi ka botlalo ka mo fa lengolo la tumellano.	Ee	Tjhe

Mabitso a mokudi: Letsatsi:

_____ _____

Appendix D: Household Questionnaire

HOUSEHOLD QUESTIONNAIRE
Free State Poverty and Health Survey

B

Fieldworker: Record the household's number in the space to the right:

SECTION A: ADMINISTRATIVE INFORMATION

FOR OFFICE USE ONLY:

(a) Visits:	Visit 1:	Visit 2:	Visit 3:
(i) Interviewers' names:	1.	1.	1.
	2.	2.	2.
(ii) Date:	D D M M 2 0 Y Y	D D M M 2 0 Y Y	D D M M 2 0 Y Y
(iii) Time interview started:	:	:	:
(iv) Outcome:	Completed 1	Completed 1	Completed 1
	Not at home 2	Not at home 2	Not at home 2
	Postponed or rescheduled 3	Postponed or rescheduled 3	Postponed or rescheduled 3
	Partly completed 4	Partly completed 4	Partly completed 4
	Refused 5	Refused 5	Refused 5
	Moved from study area 6	Moved from study area 6	Moved from study area 6
	Vacant dwelling 7	Vacant dwelling 7	Vacant dwelling 7
	Other (specify below)	Other (specify below)	Other (specify below)
(v) Other comments:			
(b) In-field editing:	1st edit:	2nd edit:	3rd edit:
(i) Date:	D D M M *2 0* Y Y	D D M M *2 0* Y Y	D D M M *2 0* Y Y
(ii) Pages to complete/correct:			
(iii) Name			
(iv) Signature:	*Fieldwork manager*	*Fieldwork manager*	*Fieldwork manager*
(c) Capturing:	1st capture:	2nd capture:	
(i) Capturer's name:			
(ii) Date:	D D M M *2 0* Y Y	D D M M *2 0* Y Y	
(iii) Signature:			

Instructions:

The objective of this survey is to collect information on poverty and health in the Free State.

The questionnaire must be administered to selected households by teams of TWO interviewers, which preferably will be composed of a man and a woman.

The interviewers may face some obstacles, among others:

(a) Refusal by the principal informant (e.g. the household head/person in charge of household finances) to cooperate.

(b) Failure to establish contact with the selected family.

If the team faces one of these difficulties, it must proceed to fill out section 1 of the questionnaire and inform the fieldwork coordinator, which will advise the research team how to proceed.

The procedure to be followed is:

(a) Locate the selected family and introduce yourselves to the principal informant (e.g. the household head/person in charge of household finances), using the relevant consent form.

(b) Read the relevant consent form to the principal informant(s) from whom the team will be collecting the selected information.
It is very important to make sure that people understand the purpose and nature of the study prior to consenting to the interview.

(c) Once consent has been obtained from the principal informant, the person must complete and sign the necessary consent form.
Only then may you proceed completing this questionnaire and other the related individual/household questionnaires.

(d) You need to fill out the questionnaire in detail and, if necessary, clearly explain to the respondent(s) the nature and purpose of each question.

RESPONDENT(S): The household head, together with other household members, will answer this questionnaire.

This questionnaire consists of the following sections: Page(s):

1. Anthropometrics 3-4

2. Socio-demographics 5-7

3. Education 8-10

4. Disability 11

5. Morbidity 12-13

6. Mortality 14-16

7. End 17

SECTION 1: ANTHROPOMETRICS

Instructions: The household INCLUDES ALL those persons who meet ALL THREE of the following CRITERIA:

(a) They lived under this 'roof' or within the same structure at least FOUR NIGHTS per WEEK out of the past MONTH.
(b) When they are together they share food from a common source, i.e. they EAT TOGETHER.
(c) They CONTRIBUTE to or SHARE in the common RESOURCE POOL.

FIRST assemble the household members (refer above definition). Introduce the section by saying: **'Re tla thabela ho metha motho e mong la e mong ya dulang ka tlung le bana. Re hloka dintlha tsena hore re tle re tsebe boemo ba bophelo ba batho ba dulang ka tlung. Ho tla nka metsotswana ho metha e mong le e mong.'** 'We would like to take the measurements of the members of this household, including infants and children. We need this information to calculate various health measures. It will only take a couple of minutes to take the measures for each person.'

IMPORTANT: Weigh people with as little clothing as possible – adults should wear ONE layer of clothing ONLY, with heavy items such as jackets and belts being taken off.
Record the amount of clothing children wear when making the measurement. Measure infants in a nappy ONLY – if the nappy is wet, first ask the mother to change the baby's nappy.

ID	**1.1** List the FIRST name(s) ONLY of ALL those individuals who are part of this household according to the above definition, STARTING with the head of the household:	**1.2** Measured Y = Yes N = No NOTE: Circle ONE code ONLY.	**1.3** Why was [NAME] not measured? 1 = At school 2 = At work 3 = Not present 4 = Ill 5 = Handicapped/deformed 6 = Refused Other (please specify) NOTE: Record ONE code ONLY.	**1.4** Weight (kg) NOTE: Measure ALL members of the household. Record up to FIRST decimal (e.g. 60,6kg). For babies, report up to TWO decimals (e.g. 6,15kg).	**1.5** Height (m) NOTE: Measure ALL members of the household. Record up to TWO decimals (e.g. 1,65m).	**1.6** Was [NAME] measured standing OR lying down? 1 = Standing 2 = Lying down NOTE: Circle ONE code ONLY.
1.		Y N				1 2
2.		Y N				1 2
3.		Y N				1 2
4.		Y N				1 2

SECTION 1: ANTHROPOMETRICS (CONTINUED)

Instructions:

REFER to the NOTES below for information regarding WHO in the household you need to do WHICH particular measurements for, with a distinction in the case of some measures being drawn between household members aged 7 years and older *VERSUS* household members younger than 7 years.

IMPORTANT: Weigh people with as little clothing as possible – adults should wear ONE layer of clothing ONLY, with heavy items such as jackets and belts being taken off.
Record the amount of clothing children wear when making the measurement. Measure infants in a nappy ONLY – if the nappy is wet, first ask the mother to change the baby's nappy.

ID	Name	**1.7** Upper-arm circumference (cm) NOTE: Measure ALL members of the household. Record up to FIRST decimal (e.g. 6,6cm).	**1.8** Triceps skin-fold (cm) NOTE: Measure ALL members of the household. Measure the skin-fold on the LEFT ARM of the person. Record up to FIRST decimal (e.g. 6,6cm).	**1.9 O delemo tse 7 kapa hodimo?** Is [NAME] 7 years or older? Y = Yes N = No **Yes ➔ 1.11** **No ➔ 1.10**	**1.10** Head circumference (cm) NOTE: Only measure members of the household who are UNDER 7 YEARS. Record up to FIRST decimal (e.g. 6,6cm). **➔ Section 2**	**1.11** Waist circumference (cm) NOTE: Measure ALL members of the household who are 7 YEARS AND OLDER. Record up to FIRST decimal (e.g. 6,6cm).	**1.12** Hip circumference (cm) NOTE: Measure ALL members of the household who are 7 YEARS AND OLDER. Record up to FIRST decimal (e.g. 6,6cm).	**1.13** Wrist circumference (cm) NOTE: Measure ALL members of the household who are 7 YEARS AND OLDER. Record up to FIRST decimal (e.g. 6,6cm).
1.				Y N				
2.				Y N				
3.				Y N				
4.				Y N				
5.				Y N				
6.				Y N				
7.				Y N				
8.				Y N				
9.				Y N				
10.				Y N				
11.				Y N				
12.				Y N				
13.				Y N				

SECTION 2: SOCIO-DEMOGRAPHICS

Instructions: The household INCLUDES ALL those persons who meet ALL THREE of the following CRITERIA:

(a) They lived under this 'roof' or within the same structure at least FOUR NIGHTS per WEEK out of the past MONTH.
(b) When they are together they share food from a common source, i.e. they EAT TOGETHER.
(c) They CONTRIBUTE to or SHARE in the common RESOURCE POOL.

ID	**2.1** Again, list the FIRST names ONLY of all those individuals who are part of the household according to the above definition, STARTING with the head of the household: NOTE: Make sure you record the names in the same order as on page 3 above.	**2.2 Ba amana jwang le hlooho ya lelepa?** What is [NAME'S] relationship to the household head? 02 = Molekane / Spouse or partner, 03 = Ngwanaka / Child (own/adopted) 04 = Ngwaneso / Sibling (brother/sister) 05 = Motswadi / Parent 06 = Ntatemoholo, nkhono / Grandparent 07 = Setlogolo / Grandchild 08 = Babang ba lelapa / Other family member 09 = Mosebeletsi / Maid or servant 10 = Mohiri / Lodger 11 = Ba seng ba lelapa / Non-related person NOTE: Do NOT read out the options Record ONE code ONLY.	**2.3 Motho e mong le e mong o wela ka tlasa morabe o feng?** How would [NAME] describe him/herself in terms of population group? 1 = African 2 = Coloured 3 = Indian 4 = White 5 = Other NOTE: READ out the options above. Record ONE code ONLY.	**2.4 Ke monna kapa mosadi?** What is [NAME'S] gender? M = Male F = Female NOTE: Circle ONE letter ONLY.	**2.5 Ba dilemo di kae letsatsi latswalo lefitileng?** What was [NAME'S] age in YEARS at their last birthday? NOTE: Record answer in YEARS. Infants = 0 years. **≥ 16 years ➔ 2.6** **< 16 years ➔ 2.10**	**2.6 Na ba nyetswe kapa ha ba nyalwa?** What is [NAME'S] marital status at present? 1 = **O nyetse ka molao kapo kerekeng** / Married civil/religious 2 = **O nyetse kasetso** / Married traditional/customary 3 = **O nyetse babangata** / Polygamous marriage 4 = **Re dula moho** / Living together as partners 5 = **Ha re so nyalane** / Never married 6 = **Mohlolohadi** / Widower/widow 7 = **Re arohane** / Separated 8 = **Re hlalane** / Divorced NOTE: READ out the options above. Record ONE code ONLY. If married BOTH civil/religious AND traditional/customary, then record 'civil/religious' (=1). **1, 2, 3, 4 ➔ 2.7** **5, 6, 7, 8 ➔ 2.10**
01.		**01**	1 2 3 4 5	M F		
02.			1 2 3 4 5	M F		
03.			1 2 3 4 5	M F		
04.			1 2 3 4 5	M F		
05.			1 2 3 4 5	M F		
06.			1 2 3 4 5	M F		
07.			1 2 3 4 5	M F		
08.			1 2 3 4 5	M F		
09.			1 2 3 4 5	M F		
10.			1 2 3 4 5	M F		
11.			1 2 3 4 5	M F		
12.			1 2 3 4 5	M F		
13.			1 2 3 4 5	M F		

SECTION 2: SOCIO-DEMOGRAPHICS (CONTINUED)

Instructions:

Complete for ALL household members.

ID	Name	**2.7 Na molekane o dula mona?** Does the spouse or partner of [NAME] live here? Y = Yes N = No NOTE: Circle ONE option ONLY. **Yes → 2.8** **No → 2.9**	**2.8 Ha ibe ee, ke mang molekane wa [libitso]?** If YES, who in the household is the spouse of [NAME]? NOTE: write the spouse's person code from the household roster in the space below. **→ 2.10**	**2.9 Ha ibe tjhe, molekane o hokae?** If NO, what can you tell me about the spouse's current whereabouts? 88 = Deceased 98 = Living elsewhere 99 = Don't know NOTE: Circle ONE option ONLY.	**2.10 Na ntate wa bona wa tswalo o dula mona?** Does the BIOLOGICAL father of [NAME] live here? Y = Yes N = No NOTE: Circle ONE option ONLY. **Yes → 2.11** **No → 2.12**	**2.11 Ha ibe ee, kemang ntate wa hae?** If YES, who in the household is the BIOLOGICAL father of [NAME]? NOTE: write the father's person code from the household roster in the space below. **→ 2.13**	**2.12 Ha ibe tjhe, molekane o hokae?** If NO, what can you tell be about the BIOLOGICAL father's current whereabouts? 88 = Deceased 98 = Living elsewhere 99 = Don't know NOTE: Circle ONE option ONLY.	**2.13 Na mme wa bona wa letswele o dula mona?** Does the BIOLOGICAL mother of [NAME] live here? Y = Yes N = No NOTE: Circle ONE option ONLY. **Yes → 2.14** **No → 2.15**	**2.14 Ha ibe ee, kemang mme wa hae?** If YES, who in the household is the BIOLOGICAL mother of [NAME]? NOTE: write the mother's person code from the household roster in the space below. **→ 2.16**	**2.15 Ha ibe tjhe, molekane o hokae?** If NO, what can you tell be about the BIOLOGICAL mother's current whereabouts? 88 = Deceased 98 = Living elsewhere 99 = Don't know NOTE: Circle ONE option ONLY.
01.		Y N		88 98 99	Y N		88 98 99	Y N		88 98 99
02.		Y N		88 98 99	Y N		88 98 99	Y N		88 98 99
03.		Y N		88 98 99	Y N		88 98 99	Y N		88 98 99
04.		Y N		88 98 99	Y N		88 98 99	Y N		88 98 99
05.		Y N		88 98 99	Y N		88 98 99	Y N		88 98 99
06.		Y N		88 98 99	Y N		88 98 99	Y N		88 98 99
07.		Y N		88 98 99	Y N		88 98 99	Y N		88 98 99
08.		Y N		88 98 99	Y N		88 98 99	Y N		88 98 99
09.		Y N		88 98 99	Y N		88 98 99	Y N		88 98 99
10.		Y N		88 98 99	Y N		88 98 99	Y N		88 98 99
11.		Y N		88 98 99	Y N		88 98 99	Y N		88 98 99
12.		Y N		88 98 99	Y N		88 98 99	Y N		88 98 99
13.		Y N		88 98 99	Y N		88 98 99	Y N		88 98 99
14.		Y N		88 98 99	Y N		88 98 99	Y N		88 98 99
15.		Y N		88 98 99	Y N		88 98 99	Y N		88 98 99

SECTION 2: SOCIO-DEMOGRAPHICS (CONTINUED)

Instructions:

Complete for ALL household members.

ID	Name	**2.16 Ke beke tse kae selemong se fetileng [libitso] a sa dule hae?** Did [NAME] at any one time spend a WEEK or LONGER away from the household in the past YEAR? Y = Yes N = No **Yes → 2.17** **No → 2.19**	**2.17 Ha ibe ee, ke beke tse kae selemong se fetileng tseo ba di qetileng ba sa dule hae?** If YES, how many WEEKS at a time (i.e. during any one trip) did [NAME] spend away from the household in the past YEAR? NOTE: Include FULL weeks ONLY.	**2.18 Ho bao ba qetileng nako ba sa dule hae, lebaka le leholo la bona e ne e le eng?** What was the MAIN reason for [NAME'S] absence from the household? 1 = O a sebetsa / Employment 2 = O batlana lemosebetsi / Looking for work 3 = O sekolong / Schooling 4 = Kemoithuti / Student 5 = Mabaka a leng a hae / Personal reasons 6 = O baleha dintwa / Escape violence 7 = O tshaketse maloko a lelapa / Visiting family 8 = O tshaketse metswalle / Visiting friends 9 = O dula le molekane / Living with partner/spouse 10 = Tjhankaneng / Prison 11 = Phomollong / Vacation 12 = O sepetlele / In hospital Tseding / Other (please specify) NOTE: Do NOT read out the options above. Record ONE code ONLY, i.e. the MAIN reason.	**2.19 Ke mang ya fihlileng dilemong tse 5 tse fetileng ho dula le lona?** Did [NAME] move here during the past FIVE YEARS? Y = Yes N = No **Yes → 2.20** **No → Section 3**	**2.20 Ha ebe ee, o ne a ntse a dula kae pele?** If YES, where was [NAME'S] LAST place of residence? **(a) Lebitso la toropo kapa la motse:** Name of town or village:	**(b) Lebitso la Porovinse:** Name of province:
01.		Y N			Y N		
02.		Y N			Y N		
03.		Y N			Y N		
04.		Y N			Y N		
05.		Y N			Y N		
06.		Y N			Y N		
07.		Y N			Y N		
08.		Y N			Y N		
09.		Y N			Y N		
10.		Y N			Y N		
11.		Y N			Y N		
12.		Y N			Y N		
13.		Y N			Y N		
14.		Y N			Y N		
15.		Y N			Y N		
16.		Y N			Y N		

SECTION 3: EDUCATION

Instructions: Complete for ALL household members.

ID	Name	**3.1 Ba feletse kae ka dithuto?** What is the HIGHEST educational qualification successfully COMPLETED by [NAME]? 0 = No formal schooling 1 = Grade 1/Sub A 2 = Grade 2/Sub B 3 = Grade 3/Standard 1/ABET 1 4 = Grade 4/Standard 2 5 = Grade 5/Standard 3/ABET 2 6 = Grade 6/Standard 4 7 = Grade 7/Standard 5/ABET 3 8 = Grade 8/Standard 6 9 = Grade 9/Standard 7/ABET 4 10 = Grade 10/Standard 8/NTC I 11 = Grade 11/Standard 9/NTC II 12 = Grade 12/Standard 10/NTC III 13 = Certificate 14 = Diploma 15 = Bachelors degree/B Tech 16 = Post graduate diploma 17 = Honours degree 18 = Masters or PhD degree Other (please specify) NOTE: Do NOT read out the options above. Record ONE code ONLY. Do NOT report qualifications enrolled for CURRENTLY, i.e. ONLY actually COMPLETED qualifications.	**3.2 Na ba kena sekolo hona jwale?** Is [NAME] CURRENTLY enrolled in some form of formal education (INCLUDING distance and correspondence education)? Y = Yes N = No NOTE: Circle ONE option ONLY. **Yes ➔ 3.4** **No ➔ 3.3**	**3.3 Ha ebe tjhe, ke lebaka lefe le leholo le etsang hore ba se kene sekolo?** If NO, what is MAIN reason why [NAME] is not enrolled for any form of education? 1 = Monyane haholo / Too young 2 = O tsofetse / Too old 3 = Ltura haholo / Too expensive 4 = O batla mosebetsi / Needed to find a job/work 5 = Wakula/ha itekanelang melleng / Ill or disabled 6 = O ne ale melleng / Became pregnant 7 = O hlolwa kemosebetsi wasekolo / Could not cope with school work 8 = O qetile ka sekolo / Completed education 9 = O sebetsa hae kapo polasing / Have to work at home/on the farm Tseding / Other (please specify) NOTE: Do NOT read out the options above. Record ONE code ONLY, i.e. the MAIN reason. **➔ Section 4**	**3.4 Ha ebe ee, ba boemong bof sekolong?** If YES, which of the following educational institutions does [NAME] currently attend? 1 = **Pre-school / crèche** 2 = **Primary school** 3 = **Secondary school** 4 = **University** 5 = **Technikon** 6 = **College** 7 = **Adult education / literacy classes** **Tseding / Other** (please specify) NOTE: READ out the options above. Record ONE option ONLY. **If 2 or 3 ➔ 3.5** **If 4, 5, 6 ➔ 3.7** **If 1, 7, Other ➔ Section 4**
01.			Y N		
02.			Y N		
03.			Y N		
04.			Y N		
05.			Y N		
06.			Y N		
07.			Y N		
08.			Y N		
09.			Y N		
10.			Y N		
11.			Y N		
12.			Y N		
13.			Y N		

SECTION 3: EDUCATION (CONTINUED)

Instructions: Complete for ALL household members attending school, university, technikon or college.

ID	Name	**3.5 Ha ebe ba kena sekolo sa primary 179asin secondary ha 179asin sekolong matsatsi a makae kgweding tse tharo tse fetileng?** If [NAME] is in PRIMARY or SECONDARY school (i.e. grade 1-12), how many DAYS of school did he/she MISS during the LAST school year? NOTE: EXCLUDE public or school holidays and the time when teachers were on strike this year, i.e. ONLY count the days missed when the school was actually 'on' or 'open'. **Zero or none ➔ 3.7** **1+ ➔ 3.6**	**3.6 Lebaka-baka le entseng hore ba se ke ba ya sekolong ke eng?** What was the MAIN reason why [NAME] missed school on these occasions? 1 = [NAME] a ne a kula/ was sick or ill 2 = [NAME] a ne a sena dipalangwa / did not have transport 3 = A ne a sena tjhelete ya dipalangwa / Could not afford transport 4 = [NAME] a na sebetsa / had to work 5 = [NAME] a na etsa mosebetsi waka tlung / ran household errands 6 = [NAME] a na hlokometsi mokudi / cared for an ill person 7 = Ha patala tjhelete ya sekolo / school fees not paid 8 = [NAME] ha tsowa / overslept Tseding /Other (please specify) NOTE: Do NOT read out the options above. Record ONE option ONLY, i.e. the MAIN reason.	Read out: **'Ha o re ba kena sekolo, yunivesiti, tecknicon kapa college.'** 'You say that [NAME] is attending school, university, technikon or college.' **3.7 Lebitso la sekolo se ba se kenang ke mang?** What is the NAME of the school, university, technikon or college that [NAME] is attending? 98 = Refused 99 = Don't know	**3.8 Sekolo seo se motseng ofe 179asin toropong efe?** In which TOWN or VILLAGE is the school, university, technikon or college situated? 98 = Refused 99 = Don't know
01.					
02.					
03.					
04.					
05.					
06.					
07.					
08.					
09.					
10.					
11.					
12.					
13.					

SECTION 3: EDUCATION (CONTINUED)

Instructions: Complete for ALL household members attending school, university, technikon or college.

ID	Name	**3.9 Ba kena sekolo nako tsohleo ya sekolong matsatsi ohle ha sekolo se kene) kapa ba se kena kadinako tse khetheileng (o ithuta antse asebetsa kapa a etsa hohong)?** Is [NAME] attending this facility on a FULL-TIME (i.e. he/she goes there almost every day when 'school' is on) OR on a PART-TIME basis (i.e. he/she studies while working or involved in some other activity)? NOTE: Circle ONE option ONLY.	**3.10 Ba sebedisa eng ho ya sekolong?** What is the form of transport [NAME] normally uses to get to school, university, technikon or college? 1 = Bese / Bus 2 = Tekes / Taxi 3 = Terene / Train 4 = Bisekele / Bicycle 5 = Koloi / Car or motorbike 6 = Tsamaya ka maoto / Walk 7 = Mokhatlo wa dipalangwang / Car 'pool' / Lift club Tseding/Other (please specify) NOTE: Do NOT read out the options above. Record ONE option ONLY.	**3.11 Ho nka nako e kae ho ya le ho kgutla sekolong ka letsatsi?** How long does it normally take [NAME] to GO to and RETURN FROM this place of education during any ONE day (EXCLUDING time spent at school, college or university)? NOTE: Record answer in hours and minutes (e.g. '2' hours and '20' minutes).	**3.12 Na o a patala?** Do you have to pay for this transport? Y = Yes N = No NOTE: Circle ONE option ONLY. **Yes ➔ 3.13** **No ➔ Section 4**	**3.13 O patala bokae ho ya le ho kgutla sekolong?** If YES, how much does it cost [YOU/NAME] on average to make ONE RETURN trip between this place of education and home? NOTE: Record in Rand ONLY, i.e. no cents.
01.		Full-time Part-time		Hours minutes	Y N	Rand/RETURN trip
02.		Full-time Part-time		Hours minutes	Y N	Rand/RETURN trip
03.		Full-time Part-time		Hours minutes	Y N	Rand/RETURN trip
04.		Full-time Part-time		Hours minutes	Y N	Rand/RETURN trip
05.		Full-time Part-time		Hours minutes	Y N	Rand/RETURN trip
06.		Full-time Part-time		Hours minutes	Y N	Rand/RETURN trip
07.		Full-time Part-time		Hours minutes	Y N	Rand/RETURN trip
08.		Full-time Part-time		Hours minutes	Y N	Rand/RETURN trip
09.		Full-time Part-time		Hours minutes	Y N	Rand/RETURN trip
10.		Full-time Part-time		Hours minutes	Y N	Rand/RETURN trip
11.		Full-time Part-time		Hours minutes	Y N	Rand/RETURN trip
12.		Full-time Part-time		Hours minutes	Y N	Rand/RETURN trip
13.		Full-time Part-time		Hours minutes	Y N	Rand/RETURN trip
14.		Full-time Part-time		Hours minutes	Y N	Rand/RETURN trip

SECTION 4: DISABILITY

Instructions:

FIRST ask the key informant **question 4.1**.

NOTE: EXCLUDE pregnancy or injury. Circle the ONE appropriate option ONLY.

4.1 Na honale emong wa lelapa ya sa itekanelang kapo ya kulang?
Does any member of the household suffer from any form of PERMANENT disability or ailment?

Yes	No
→ 4.2	→ Section 5

NOTE: Circle the 'person code' of each person mentioned, using the household roster in Section 2, AND write the person's name in pencil in the second column, next to the corresponding number. Next, ask the following questions for each person who reportedly suffered from a permanent disability or ailment. If more than one person suffers from a disability, ask ALL the questions in regards to that person before proceeding to ask the same set of questions for the next person who suffers from a disability. Then proceed to the next person, etc.

ID	**4.2 Rekopa mabitso a batho ba sa itekanelang kapo yakulang.** Please name each person who suffers from any form of permanent disability or ailment: NOTE: Prompt fully by asking: **'Honale babang na?'** 'Anybody else?'	**4.3 Ke ho se itekanele ha mofuta ofe?** What type(s) of disability do [YOU] or does [NAME] have? 1 = **Pono (ho se bone kapa ho bonela haufi)** / Sight (blind /severe visual limitation) 2 = **Kutlo (ho se utlwe 181asin ho ba le bothata ba ho utlwe)** / Hearing (deaf, very hard of hearing) 3 = **Puo (ho se kgone ho bua)** / Communication (speech impairment) 4 = **Mmele (o hloka setulo se mabili,dithupa tsa ho tsamaya, etc)** / Physical (needs wheelchair, crutches, etc) 5 = **Kelello (bothata ba ho ithuta)** / Intellectual (serious difficulties in learning) 6 = **Maikutlo (boitshwaro, kelello)** / Emotional (behavioural, psychological) NOTE: READ out the options above. Record ALL applicable options.	**4.4 Na ho se itekanele hona ho o setisa ho nka karolo mesebetsing ya letsatsi le letsatsi?** Does this disability prevent [YOU/NAME] from full participation in life and its activities (such as in schooling, work, social life, etc)? Y = Yes N = No NOTE: Record ONE option ONLY.
01.			Y N
02.			Y N
03.			Y N
04.			Y N
05.			Y N
06.			Y N
07.			Y N
08.			Y N
09.			Y N
10.			Y N
11.			Y N
12.			Y N
13.			Y N

SECTION 5: MORBIDITY

Instructions:

FIRST ask the key informant **question 5.1**.

NOTE: EXCLUDE pregnancy or injury. Circle the ONE appropriate option ONLY.

5.1 Ha o nahana ka kgwedi e fetileng, ho na le e mong ka tlung ya kileng a kula kgweding e fetileng?
Think about the last month: Has any member of the household been ill or sick during the past MONTH?

Yes	No
→ 5.2	→ Section 6

NOTE: Circle the 'person code' of each person mentioned, using the household roster in Section 2, AND write the person's name in pencil in the second column, next to the corresponding number. Next, ask the following questions for each person who reportedly was ill in the past month. If more than one person has been ill, ask ALL the questions in regards to that person before proceeding to ask the same set of questions for the next person who has been ill.

ID	**5.2 Kakopo bolelal mabitso a batho ba kileng a kula kgweding e fetileng:** Please name each person who has been sick during the past MONTH: NOTE: Prompt fully by asking: **'Honale babang na?'** 'Anybody else?'	**5.3 Matsatsing a 30 a fetileng na o ile kapa e mong o ile a kula?** How many of the past 30 days have [YOU] or has [NAME] been ill? NOTE: Record the number of days. Remember number cannot > 30 days.	**5.4 Ke matsatsi a makae [lebitso] a ileng a sitwa ho etsa mesebetsi e tlwaeleileng ka baka la ho kula?** How many of these days have [YOU] or has [NAME] NOT been able to do what you do or he/she normally does because of this illness? NOTE: Record the number of days. Remember number cannot > answer in question 5.3.
01.			
02.			
03.			
04.			
05.			
06.			
07.			
08.			
09.			
10.			
11.			
12.			
13.			
14.			

SECTION 5: MORBIDITY (CONTINUED)

Instructions:

Circle the 'person code' of each person mentioned, using the household roster in Section 2, AND write the person's name in pencil in the second column, next to the corresponding number. Next, ask the following questions for each person who reportedly was ill in the past month. If more than one person has been ill, ask ALL the questions in regards to that person before proceeding to ask the same set of questions for the next person who has been ill.

ID	Name	**5.5 Na ho na le motho eo le dulang le ena ya setseng a mo hlokomela ha a ntse a kula?** Has anyone in the household CARED for this person AT HOME during their illness? Y = Yes N = No NOTE: Circle the ONE appropriate letter ONLY. **Yes → 5.6** **No → Section 6**	**5.6 Ha ebe ee, ke mang?** If YES, who in the household cared for the ill person? NOTE: Using the household roster and given the person(s) names, also write down the appropriate person code. Prompt the respondent to make sure it was this particular person and make sure you record all the caregivers, even if this person only spent ONE hour caring for the ill.	**5.7 Ka kakaretso, o qetile dihora tsekae a hlokometse mokudi?** On average, how many HOURS per DAY has [NAME] spent caring for this person when they were ill? NOTE: Ask this question for EACH of the persons whose name and person code you recorded in question 5.6. Record the HOURS per DAY this person on average spent caring for the ill person.				
				1st person	2nd person	3rd person	4th person	5th person
01.		Y N		hrs/day	hrs/day	hrs/day	hrs/day	hrs/day
02.		Y N		hrs/day	hrs/day	hrs/day	hrs/day	hrs/day
03.		Y N		hrs/day	hrs/day	hrs/day	hrs/day	hrs/day
04.		Y N		hrs/day	hrs/day	hrs/day	hrs/day	hrs/day
05.		Y N		hrs/day	hrs/day	hrs/day	hrs/day	hrs/day
06.		Y N		hrs/day	hrs/day	hrs/day	hrs/day	hrs/day
07.		Y N		hrs/day	hrs/day	hrs/day	hrs/day	hrs/day
08.		Y N		hrs/day	hrs/day	hrs/day	hrs/day	hrs/day
09.		Y N		hrs/day	hrs/day	hrs/day	hrs/day	hrs/day
10.		Y N		hrs/day	hrs/day	hrs/day	hrs/day	hrs/day
11.		Y N		hrs/day	hrs/day	hrs/day	hrs/day	hrs/day
12.		Y N		hrs/day	hrs/day	hrs/day	hrs/day	hrs/day
13.		Y N		hrs/day	hrs/day	hrs/day	hrs/day	hrs/day

SECTION 6: MORTALITY

Instructions: **FIRST** ask **question 6.1**.

NOTE: The deceased MUST at the time of their death have met the THREE criteria for being a member of the household (refer Section 2 of the questionnaire)!

Circle the ONE appropriate option ONLY.

6.1 Na ho na le motho ya hlokafetseng eo le neng le dula le ena kgweding tse 12 tse fetileng?
Has anyone who lived in this household died or passed away in the past 12 months?

Yes	No
→ 6.2	→ Section 7

NOTE: If **YES**, record the name(s) of the deceased and ask the following questions for each person who had died. Record the answers in the rows. PLEASE make sure that you record the information for the same individual next to that individual's LETTER (a, b, etc) on each of the pages – to ensure that you do, FIRST copy the name of the person (recorded under question 6.2) onto the first column of each subsequent page of Section 5 that says 'Name' and put the same name next to the same letter (a, b, etc) on each page. If more than one person has died, ask ALL the questions for that person before proceeding to ask the same set of questions for the second person who had died. Then proceed to the next person, etc.

	6.2 Ha ebe ee, Ngola lebitso la hae? If YES, record the FIRST NAME of the person here:	**6.3 Boema ba hae e ne e le bofe ka lapeng?** What was [NAME'S] position in the household? 01 = Hloho ya lelapa / Head 02 = Molekane/ Spouse/partner 03 = Ngwanaka / Child (own/adopted) 04 = Ngwaneso / Sibling (brother/sister) 05 = Motswadi / Parent 06 = Ntatemoholo, Nkhono / Grandparent 07 = Setlogolo / Grandchild 08 = Ba bang ba lelapa / Other family member 09 = Mosebeletsi / Maid or servant 10 = Mohiri / Lodger 11 = Ba bang 184asing ba lelapa / Other non-related persons NOTE: Do NOT read out the options above. Record ONE option ONLY.	**6.4 E ne e le motona kapa motshehadi?** Was [NAME] a man or a woman? M=Male F=Female NOTE: Circle the ONE correct letter ONLY.	**6.5 O ne a na le dilemo tse kae ha a hlokahala?** How old was [NAME] at the time of their death? NOTE: Record in YEARS.	**6.6 Ba feletse kae ka dithuto?** What is the HIGHEST educational qualification successfully COMPLETED by [NAME]? 0 = No formal schooling 1 = Grade 1/Sub A 2 = Grade 2/Sub B 3 = Grade 3/Standard 1/ABET 1 4 = Grade 4/Standard 2 5 = Grade 5/Standard 3/ABET 2 6 = Grade 6/Standard 4 7 = Grade 7/Standard 5/ABET 3 8 = Grade 8/Standard 6 9 = Grade 9/Standard 7/ABET 4 10 = Grade 10/Standard 8/NTC I 11 = Grade 11/Standard 9/NTC II 12 = Grade 12/Standard 10/NTC III 13 = Certificate 14 = Diploma 15 = Bachelors degree/B Tech 16 = Post graduate diploma 17 = Honours degree 18 = Masters or PhD degree Other (please specify) NOTE: Do NOT report qualifications enrolled for, ONLY COMPLETED qualifications. Do NOT read out the options above. Record ONE code ONLY.
a.			M F	years	
b.			M F	years	
c.			M F	years	
d.			M F	years	

SECTION6: MORTALITY (CONTINUED)

Instructions:

Ask the following questions for each person who had died. Record the answers in the rows. PLEASE make sure that you record the information for the same individual next to that individual's LETTER (a, b, etc) on each of the pages – to ensure that you do, FIRST copy the name of the person (recorded under question 6.2) into the first column of each subsequent page of Section 7 that says 'Name' and put the same name next to the same letter (a, b, etc) on each page. If more than one person has died, ask ALL the questions for that person before proceeding to ask the same set of questions for the second person who had died. Then proceed to the next person, etc.

	Name	**6.7 O hlokafetse neng?** When did [NAME] die?	**6.8 O kutse nako e kae pele a hlokahala?** How long was [NAME] ill for before he/she died?	**6.9 O bontshitse matshwao afe a bokulo pele a hlokahala?** Can you describe the symptoms that [NAME] suffer(ed) from just before he/she passed away? 01 = Diarrhoea 02 = Weight loss 03 = Fever 04 = Skin rash 05 = Weakness 06 = Chills (feeling hot/cold) 07 = Vomiting 08 = Coughing blood 09 = Genital sores 10 = Abdominal pain 11 = Difficulty breathing 12 = Swelling of feet 13 = Chest pain 14 = Wheezing/whistling in chest Other (please specify) NOTE: Do NOT read out the options above. Record ALL APPLICABLE codes.	**6.10 Na o ne a sebetsa ka nako e a ne a hlokahala?** Was [NAME] employed or working prior to his/her death? Y = Yes N = No NOTE: Circle the ONE correct letter ONLY.	**6.11 O ne a kenya bokae ka tlung pele a kula kapa a hlokahala?** How much money did [NAME] contribute PER MONTH to the household prior to his/her illness and/or death? NOTE: Include ALL income sources, INCLUDING social welfare grants. If nothing, record ZERO or '0'.	**6.12 Pele a hlokahala, ho na le motho a tsebisitsweng?** Prior to [NAME'S] death, was someone consulted about his/her illness? Y = Yes N = No NOTE: Circle the correct letter. **Yes → 6.13** **No → 6.15**
a.		Year Month	Months Weeks		Y N	Rand per month	Y N
b.		Year Month	Months Weeks		Y N	Rand per month	Y N
c.		Year Month	Months Weeks		Y N	Rand per month	Y N
d.		Year Month	Months Weeks		Y N	Rand per month	Y N

SECTION 6: MORTALITY (CONTINUED)

Instructions:

Ask the following questions for each person who had died. Record the answers in the rows. PLEASE make sure that you record the information for the same individual next to that individual's LETTER (a, b, etc) on each of the pages – to ensure that you do, FIRST copy the name of the person (recorded under question 6.2) into the first column of each subsequent page of Section 7 that says 'Name' and put the same name next to the same letter (a, b, etc) on each page. If more than one person has died, ask ALL the questions for that person before proceeding to ask the same set of questions for the second person who had died. Then proceed to the next person, etc.

	Name	**6.13 Ha ebe ee, o tsebisitse mang kgetlo la ho qetela pele a hlokahala?** If YES, who was consulted the LAST time before [NAME] died? 01 = Leloko la lelapa kapo motswalle (eo eleng mosebeletsi wa tsa bophelo) / Family or friend (who is a health care worker) 02 = Ngaka eitsebetsang / Private doctor 03 = Ngaka ya setso / Traditional healer 04 = Kliniki / Government clinic/health centre 05 = Sepetlele samuso / Government hospital 06 = Sepetlele se kathoko / Private hospital 07 = Bathaopi / Community health worker 08 = Khemisisti / Pharmacy 09 = Mooki aitsebetsang / Private nurse 98 = Haketsebe / Don't know Tseding/ Other (please specify) NOTE: Do NOT read out the options above. Record ONE option ONLY, namely the LAST person consulted before the person's death.	**6.14 Ho ya ka setsebi sa bophelo seo a ileng a se bona, o itse bothata bo kae?** According to the health professional consulted, what was the nature of [NAME'S] illness? 01 = Tuberculosis 02 = Asthma 03 = Malaria 04 = Rheumatic heart disease 05 = High blood pressure 06 = Measles 07 = Hepatitis B 08 = Kidney problems 09 = Stroke 10 = Cirrhosis of the liver 11 = Diarrhoea/gastroenteritis 12 = Flu 13 = Fever 14 = Cancer 15 = Allergy 16 = Diabetes 17 = HIV/AIDS 18 = Mental illness 19 = Dysentery 20 = Gonorrhoea 21 = Malnutrition 22 = Meningitis 23 = Polio 24 = Syphilis 25 = Tetanus 26 = Typhoid 27 = Urinary tract infection 28 = Witchcraft Other (please specify) NOTE: Do NOT read out the options above. Record ALL APPLICABLE codes. ➔ **Section 7**	**6.15 Ha ebe tjhe, hobaneng a sa tsebisa motho e mong kapa a sa aya ngakeng?** If NO, what was the MAIN reason why [NAME] did not consult or see someone or go somewhere for treatment? 1 = O ne asa battle ho bona motho / Did not want or need to see someone 2 = Itura haholo / Too expensive 3 = A ne a sena tjhelete elekaneng ya dipalangwa / Insufficient money for transport 4 = Ane a satsebe hore ayekae / Did not know where to go 5 = Ane asa tsebe tsela / Knew where to go, but not how to get there 6 = Nako enesamudumele / Hours were not convenient 7 = Ane a tla lahlehelwa kemoholo / Would lose pay from work 8 = A sabui puo yaka / Did not speak my language 9 = Batho babangata baemetse ho mobona / Too many people waiting to be seen Tseding / Other (please specify) NOTE: Do NOT read out the options above. Record ONE option ONLY, i.e. the MOST IMPORTANT reason.
a.				
b.				
c.				
d.				
e.				

➔ **BEFORE concluding this interview and completing Section 7 below, read through the entire questionnaire again. Make sure that you have asked all the relevant questions, that you followed the instructions on the questionnaire to the letter (including the skips), and that you recorded the respondents' answers correctly. If NOT, revisit these questions or issues NOW, because this may be the LAST OPPORTUNITY you will have to ask these people some questions in order to clarify these issues!**

SECTION 7: END

7.1 Re leboha haholo ha o nkile karolo le nako ya hao ho araba dipotso tsa rona. O hopole hore honale diputso tseding tse wena le babang balelapa letla diarabang bekeng elatelang kapa tse pedi ka tsa ditjhelete tsa lelapa, hosebetsa letsabophelo lemaitshwaro a maloko a lelapa.
We really appreciate the fact that you are participating in our study and that you have taken the time to answer our questions. We wish to remind you that we will be conducting further interviews with you and other members of this household over the next week or two in order to collect information on household finances and on the activities, labour force participation, and health-related knowledge and behaviour of individual members of your household.

7.2 Time interview ended: : :

Appendix E: Household welfare and wealth Questionnaire

QUESTIONNAIRE: Household welfare and wealth
Free State Poverty and Health Survey

B

➔ **Fieldworker**: Record the household's number in the space to the right

FOR OFFICE USE ONLY:

SECTION A: ADMINISTRATIVE INFORMATION

	Visit 1:	Visit 2:	Visit 3:
(a) Visits:			
(i) Interviewers' names:	1. 2.	1. 2.	1. 2.
(ii) Date:	D D M M 2 0 Y Y	D D M M 2 0 Y Y	D D M M 2 0 Y Y
(iii) Time interview started:	:	:	:
(iv) Outcome:			
	Completed 1	Completed 1	Completed 1
	Not at home 2	Not at home 2	Not at home 2
	Postponed or rescheduled 3	Postponed or rescheduled 3	Postponed or rescheduled 3
	Partly completed 4	Partly completed 4	Partly completed 4
	Refused 5	Refused 5	Refused 5
	Moved from study area 6	Moved from study area 6	Moved from study area 6
	Vacant dwelling 7	Vacant dwelling 7	Vacant dwelling 7
	Other (specify below)	Other (specify below)	Other (specify below)
(v) Other comments:			
(b) In-field editing:	1st edit:	2nd edit:	3rd edit:
(i) Date:	D D M M *2 0* Y Y	D D M M *2 0* Y Y	D D M M *2 0* Y Y
(ii) Pages to complete/ correct:			
(iii) Name			
(iv) Signature:	*Fieldwork manager*	*Fieldwork manager*	*Fieldwork manager*
(c) Capturing:	1st capture:	2nd capture:	
(i) Capturer's name:			
(ii) Date:	D D M M *2 0* Y Y	D D M M *2 0* Y Y	
(iii) Signature:			

Instructions:

The objective of this questionnaire is to collect information on poverty and health in the Free State.

The questionnaire must be administered to selected households by teams of TWO interviewers, which preferably will be composed of a man and a woman.

The interviewers may face some obstacles, among others:

(a) Refusal by the principal informant (the household head/person in charge of household finances) to cooperate.

(b) Failure to establish contact with the selected family.

If the team faces one of these difficulties, it must proceed to fill out section 1 of the questionnaire and inform the fieldwork coordinator, which will advise the research team how to proceed.

The procedure to be followed is:

(a) Locate the selected family and introduce yourselves to the principal informant, using the relevant consent form.

(b) Read the relevant consent form to the principal informant(s) from whom the team will be collecting the selected information.
It is very important to make sure that people understand the purpose and nature of the study prior to consenting to the interview.

(c) Once consent has been obtained from the principal informant, the person must complete and sign the necessary consent form.
Only then may you proceed completing this questionnaire and the related individual questionnaires.

(d) You need to fill out the questionnaire in detail and, if necessary, clearly explain to the respondent(s) the nature and purpose of each question.

RESPONDENT(S): The person in charge of household finances will answer this questionnaire.

This questionnaire consists of the following sections: Page(s):

1. Housing 3

2. Basic services 4-5

3. Durable assets 6

4. Non-food expenditure 7

5. Food security 8-10

6. Food consumption 11-12

7. Non-employment income 13

8. Remittances 14-15

9. Household debt 16

10. Household savings 17

11. End 18

SECTION 1: HOUSING

Introduce this section by saying, '**Jwale ke tlo o botsa dipotso ka kantlo.**' 'Now I will ask you some questions about your house.'

NOTES:

1.1 Ke efe ho tse latelang e hlalosang ka botlalo mofuta wa ntlo oo ho dulwang ho ona:
Which of the following best described the MAIN type of dwelling the family is occupying:

READ out the options.

Circle the ONE appropriate code ONLY.

If 'other', please provide a brief but accurate description.

Dwelling/house or brick structure on a separate stand or yard	1
Traditional dwelling/hut/structure made of traditional materials	2
Flat or apartment in a block of flats	3
Town/cluster/semi-detached house (simplex, duplex or triplex)	4
Unit in retirement village	5
Dwelling/house/flat/room in backyard	6
Informal dwelling/shack in backyard	7
Informal dwelling/shack/ not in backyard, e.g. informal/squatter settlement	8
Room/flatlet	9
Caravan/tent	10
Hostel	11

Other (please specify): _____

Record ONE option ONLY.

1.2 Na ntlo eo ke ya batho ba dulang ho yona?
Does the household own this dwelling? Y / N

→ 1.3 → 1.5

Record ONE option ONLY.

1.3 Ha ebe ee, na le ntse le e kolota?
If YES, does the household have a bond or loan on this dwelling? Y / N

→ 1.4 → 1.7

If do not know, record 'don't know'.

1.4 Ha eba ee, le kolota bo kae?
If YES, how much is still owed on the bond or loan? [ ][ ][ ][ ][ ][ ]

→ 1.7

Record ONE option ONLY.

1.5 Na le patala rente ya ho dula moo?
Does the household have to pay rent to live here? Y / N

→ 1.6 → 1.7

1.6 Ha eba ee, le patala rente e kae ka kgwedi?
If YES, how much rent is the household supposed to pay per month? [ ][ ][ ][ ]

NOTES:

1.7 Ke disebadiswa dife tse sebediswang ba keng sa marulelo, mabota, le fatshe?
What are the main materials used for the roof, wall and floor?

Do NOT read out the options.

Where possible, verify and/or report answers based on visual observation.

Circle ALL applicable codes, but NOT more than THREE codes for each item.

	Roof	Walls	Floor
Bricks	1	1	1
Cement block	2	2	2
Pre-fabricated	3	3	3
Corrugated iron	4	4	4
Wood	5	5	5
Plastic	6	6	6
Cardboard	7	7	7
Mixture of mud and cement	8	8	8
Wattle and daub	9	9	9
Tile	10	10	10
Carpet			11
Linoleum			12
Mud	13	13	13
Thatching	14	14	14
Asbestos	15	15	15
Other	16	16	16

EXCLUDE bathrooms, toilets and passage, but include kitchen, lounge and dining room.

Count rooms divided by room dividers or other means.

1.8 Ntlo eo e na le diphaposi (ho sakenyele ntlwana ya boithusetso, lephatjhisi) tse kae?
How many rooms (EXCLUDING bathrooms, toilets and passage) does the dwelling have? [ ]

Answer to 1.10 may not EXCEED answer in question 1.9.

1.9 Batho ba dulang moo ba sebedisa diphaposi tsa horobala tse kae?
How many of these rooms does the household occupy, i.e. use for sleeping? [ ]

SECTION 2: BASIC SERVICES

Re tlo bua kametsi asebediswang kelelapa honwa,hopheha, hoihlapisa, kapo hohlatswa diphahlo kapo ntho tseding tsa katlung.
In this section we are going to talk about the water used by the household for drinking, cooking, bathing, or washing clothes, and other household purposes like these.

NOTES:

2.1 Na metsi ao le a nwang a tswa sebakeng sele seng le a le hlapang ka ona le ho hlatswa ka ona? Does the water used for drinking come from the same source as the water used for other purposes such as bathing or washing clothes?

READ out the options.
Record ONE option ONLY.

Ee haholo. Mostly yes	1
Ka makgetlo a mang. Sometimes	2
Tjhe haholo. Mostly no	3

2.2 Metsi ao le a nwang le a fumana kae?
What is the source of water used MOST OFTEN in the household for drinking?

READ out the options.
Record ONE option ONLY.
If 'other', please provide a brief but accurate description.

Piped - internal (inside dwelling)	1
Piped - yard tap (in yard)	2
Water carrier/tanker	3
Piped - public tap/kiosk (free)	4
Piped - public tap/kiosk (paid for)	5
Borehole (owned by household)	6
Borehole (other)	7
Rainwater tank	8
Flowing river/stream	9
Dam/stagnant water	10
Well (non-borehole)	11
Protected spring	12

Other (please specify):

2.3 Na le kgona ho fumana metsi ba keng sa mesebetsi yohle ya ka tlung?
Is the household able to get all the water it needs for normal household purposes?

READ out the options.
Record ONE option ONLY.

Ee haholo. Mostly yes	1
Ka makgetlo a mang. Sometimes	2
Tjhe haholo. Mostly no	3

2.4 Na metsi a latwa ho tswa kantle ho ya ka tlung letsatsi le letsatsi?
Does the household have to fetch and carry water to the house each day?

Record ONE option ONLY.

Y	N
→ 2.5	→ 2.7

NOTES:

2.5 Ha eba ee, ke bohole bo bo kae moo metsi a latwang?
If YES, about how far away is the water that has to be fetched?

READ out the options.
Record ONE option ONLY.

Katlase ho 100m. Less than 100m	1
Ho feta 100m fela katlase ho 500m. More than 100m, but less than 500m	2
Ho feta 500m fela ka tlase ho 1km. More than 500m, but less than 1Km	3
Ho feta 1km fela ka tlase ho 5km. More than 1km, but less than 5Km	4
5km kapo hodimo. 5Km or more	5

2.6 Ke mang ya latang metsi ha ngata?
Who in the household USUALLY fetches the water?

Prompt for up to THREE people by asking: 'Ho na le emong? ' 'Anybody else?'

One plastic drum = 25 litres

One paraffin 'gogogo' = 20 litres.

	(a) Lebitso la motho a latang metsi ke mang? What is the FIRST name of the person fetching the water?	NOTE: Record the individual's person code (from the household roster):	**(b) Ka kakaretso, o lalata metsi ha kae ka letsatsi?** On average, how many trips does [NAME] make PER DAY to fetch water?	**(c) Ho nka nako e kae ho ya le ho kgutla ho lata metsi?** How long does [NAME] take in total to fetch water each trip there and back, i.e. during ONE RETURN trip?	**(d) Ka kakaretso, o lata metsi a makae ka tsela eo letsatsi le letsatsi?** How much water does [NAME] on average have to fetch in this way every day?
1st person:			Number of trips:	Minutes:	Litres:
2nd person:			Number of trips:	Minutes:	Litres:
3rd person:			Number of trips:	Minutes:	Litres:

NOTES:

2.7 Le sebedisa ntlwana ya mofuta ofe?
What kind of toilet does the household use?

Do NOT read out the options.

Record ONE option ONLY. If possible, also see if you can OBSERVE the toilet in order to determine the type of toilet facility.

Flush toilet	1
Improved pit latrine-with ventilation (VIP)	2
Other pit latrine (without ventilation)	3
Bucket toilet	4
Chemical toilet (porta-potty; NOT VIP)	5
None	6

NOTE: Do NOT read out the options.

2.8 Ntlwana eo e ho kae?
Where is the toilet?

Record ONE option ONLY. If possible, also see if you can OBSERVE the toilet in order to determine where the toilet is located.

Inside dwelling	1
Outside dwelling, BUT on stand	2
Outside dwelling, BUT off stand	3

→ **2.9**

NOTES:

Record ONE option ONLY.

READ out activity to the right, but NOT the energy sources below.

Record ONE option ONLY for each activity, i.e. cooking, lighting, and heating of water and home.

Potso tse latellang ke ka sebediso ya mollo ka tsela tse fapaneng lapeng lena.
In this section, we are going to talk about different kinds of energy that this household uses for different purposes.

2.9 Na lena le motlakase? Is the household connected to an electricity supply? Y / N

2.10 Ke tlo o balla le nane la mesebetsi e fapaneng ya ka tlung. Ke se sebediswa sefe sa mollo seo o se sebedisang haholo ba keng sa mesebetsi ya ka tlung. Next, I am going to read a list of different household activities. For each one I would like you to tell me what the MAIN source of energy is.

	(a) Ho pheha Cooking	**(b) Ho khanyisa** Lighting	**(c) Futhumatsa metsi** Heating water	**(d) Futhumatsa ntlu** Heating your home
Wood	1	1	1	1
Paraffin	2	2	2	2
Charcoal/coal	3		3	3
Electricity from grid	4	4	4	4
Electricity from generator	5	5	5	5
Candles	6	6	6	6
Gas from bottle (LPG)	7	7	7	7
Car battery	8	8	8	8
Dry battery (e.g. torch)	9	9	9	9
Dung	10	10	10	10
Other (specify):				

At LEAST ONE answer is [1] → **2.11**

ALL FOUR answers are [2] to [10] or 'Other' → **Section 3**

2.11 If WOOD is reported as a MAIN source of energy for ANY activity, ask **'Ke mang ya latang patsi ha ngata?'** 'Who in the household USUALLY fetches the wood?

Prompt for up to 3 people by asking: 'Ho na le emong?' Anybody else?'

	(a) Lebitso la motho ya latang patsi ke mang? What is the FIRST name of the person fetching the wood?	NOTE: Record individual's person code (from the household roster):	**(b) Ka kakaretso, o lata patsi ha kae ka letsatsi?** On average, how many trips does [NAME] make PER DAY to fetch wood?	**(c) Ho nka nako e kae ho ya le ho kgutla ho lata patsi?** How long does it take [NAME] in total to fetch wood each trip there and back, i.e. for ONE RETURN trip?
1st person:			Number of trips:	Minutes:
2nd person:			Number of trips:	Minutes:
3rd person:			Number of trips:	Minutes:

SECTION 3: DURABLE ASSETS

Introduce the section by saying: **'Ke na le lenane la dintho tseo le ka bang le tsona ka tlung. Ho na le motho ka tlung ya nang le tse ding tsa tse latelang'.**
'I have a list of household items here which someone in the household may own.

NOTES:

Then ask question 3.1. READ out each asset type or item and circle the appropriate code for YES or NO, given the respondent's answer. Where the respondent answers YES, then ask question 3.2, followed by question 3.3. Record the appropriate numbers in the space provided for 'quantity'. Where required, indicate the appropriate UNIT of MEASUREMENT for 'quantity'.'

No:	Item:	**3.1 Na oteng lelapeng a naleng tse latelang?** Does anyone in the household own the following [ITEM]?		**3.2 Ha ibe ee dikae kapalo?** If YES, how MANY [ITEM] does the household own?	**3.3 Kapalo dikae tse sebetsang?** How many of [QUANTITY] are in working condition?	No:	Item:	**3.1 Na oteng lelapeng a naleng tse latelang?** Does anyone in the household own the following [ITEM]?		**3.2 Ha ibe ee dikae kapalo?** If YES, how MANY [ITEM] does the household own?	**3.3 Kapalo dikae tse sebetsang?** How many of [QUANTITY] are in working condition?	Unit of measurement:	
01	Car/bakkie	Y	N			26	Land	Y	N			Square meters	Hectares
02	Truck	Y	N			27	Hoe/machete/sickle	Y	N				
03	Trailer	Y	N			28	Axes	Y	N				
04	Tractor	Y	N			29	Picks	Y	N				
05	Plough	Y	N			30	Shovels/spades	Y	N				
06	Motorcycle	Y	N				Other tools or farming equipment (specify):	Y	N				
07	Bicycle	Y	N										
08	Animal drawn cart	Y	N										
09	Boat	Y	N										
10	Radio / radio cassette recorder / hi-fi stereo	Y	N										
11	Electric stove/oven	Y	N										
12	Gas stove/oven	Y	N										
13	Primus cooker	Y	N			31	Cattle	Y	N				
14	Refrigerator/freezer	Y	N			32	Goats	Y	N				
15	Television (TV)	Y	N			33	Horses	Y	N				
16	Video recorder	Y	N			34	Donkeys	Y	N				
17	Electric washing machine	Y	N			35	Sheep	Y	N				
18	Electric tumble dryer	Y	N			36	Pigs	Y	N				
19	Electric dishwasher	Y	N			37	Chickens	Y	N				
20	Geyser	Y	N				Other farm animals (specify):	Y	N				
21	Electric generator	Y	N										
22	Electric kettle	Y	N										
23	Fixed telephone	Y	N										
24	Mobile/cell phone	Y	N										
25	Sewing machine	Y	N										

SECTION 4: NON-FOOD EXPENDITURE

Introduce the question by saying, **'Ke tla rata ho o botsa ka dintho tse sa jeweng tseo o di rekileng bakeng sa hao/ motho e mong eo o dulang le ena kgweding e fetileng.'**
'I would like to ask you about non-food items YOU (AND ONLY YOU) may have purchased or paid for YOURSELF or ANYONE ELSE IN YOUR HOUSEHOLD in the PAST MONTH.'

NOTE: ASK question for EACH item of expenditure mentioned in the following lists. READ out each item. If nothing was spent on an item, write "0" zero. If the person reports that the spending on this item is somewhere between amount X and Y, record the range, with the smaller value first and the larger value second (e.g. '100 – 600').

4.1 Le sebedisitse bo kae kgweding e fetileng ba keng sa tse [LATELANG]?
How much did the household spend in TOTAL on [ITEM] last MONTH?

	Energy and basic services:		Rand per MONTH:
1.	Wood		
2.	Paraffin		
3.	Charcoal/coal		
4.	Candles		
5.	Gas		
6.	Purchasing/charging batteries		
7.	Petrol/diesel oil for generators		
8.	Water	NOTE: If the person cannot recall the amounts, ask if you can see their municipal bill.	
9.	Electricity		
10.	Municipal rates		
11.	Water, electricity and municipal rates **IF** paid together		
12.	Other energy sources (describe):		

4.2 Kgwedi e fetileng o sebedisitse bo kae ho tse [LATELANG]?
In the last MONTH, how much did you spend on [ITEM]?

	Personal items:	Rand per MONTH:
13.	Cigarettes, tobacco	
14.	Beer, wine, spirits	
15.	Entertainment (cinema, sports, music, eating out, takeaways, etc.)	
16.	Personalised care items (e.g. soap, shampoo, etc.)	
17.	Newspapers/books/stationery (EXCLUDING education)	
18.	Telephone /cellular phone	
	Regular transport costs:	
19.	Petrol, oil and car service	
20.	Buses, taxis, trains and air tickets	
	Miscellaneous:	
21.	Washing powder	
22.	Childcare (including toys; excluding education)	
23.	Church contributions/memberships of organisations	
24.	Lottery	
25.	Domestic worker, gardener, other labour	

4.3 Selemo se fetileng o sebedisitse bo kae ho tse [LATELANG]?
In the past YEAR, how much did the household spend in TOTAL on [ITEM]?

	Household items:	Rand per YEAR:
26.	Kitchen equipment (e.g. pots and pans, lamps, torches, etc)	
27.	Home maintenance and repairs to the dwelling	
28.	Bedding, sheets, blankets and towels	
29.	Furniture and other household appliances	
	Clothing and shoes (EXCLUDING expenditure on school clothes):	
30.	Shoes for adults and children	
31.	Clothes for adults and children	
32.	Material to make clothing	
	Health and care (EXCLUDING payments to medical aid; ONLY include direct out of pocket expenditure on health care and other care):	
33.	Dentists, doctors or nurses	
34.	Hospital fees	
35.	Medical supplies (e.g. medicines, bandages, etc)	
36.	Traditional healer's fees	
	Education (INCLUDING expenses on education for ALL household members):	
37.	School or class fees	
38.	School uniforms / school colours for sports	
39.	Books / stationary	
40.	Board and lodging	
41.	Other school-related expenses	
	Other items:	
42.	Vacations/holidays	
43.	Luxury goods (e.g. jewellery, watches)	
44.	Weddings/engagement	
45.	Funerals	
46.	Circumcision ceremonies	
47.	Other traditional/cultural ceremonies	

SECTION 5: FOOD SECURITY

NOTES:

If the household consists of ONE person ONLY, use "I", "MY", and "YOU" when asking the questions. Otherwise, use "WE", "OUR" and "YOUR".

Introduce the section as follows:
'Dipotso tse latelang di mabapi le dijo tse jelweng ka lelapeng la hao kgweding tse tsheletseng tse fetileng le hore na o kgona ho reka dijo tse o di hlokang.'
'These next questions are about the food eaten in your household in the last SIX months, and whether you were able to afford the food you need.'

5.1 Ke dipolelo dife ho tse latelang tse hlalosang dijo tse jelweng ka lelapeng la hao kgweding tse tsheletseng tse fetileng:
Which of these statements best describes the food eaten in your household in the last SIX months:

READ out each of the responses.

Record ONE response ONLY.

Mefuta e lekaneng ya dijo tseo re batlang ho di ja	Enough of the kinds of food [WE/I] want to eat	1
Dijo di lekane empa e se mefuta eo re e batlang	Enough but not always the kinds of food [WE/I] want to eat	2
Ka nako tse ding ha di a lekana	Sometimes not enough to eat	3
Hangata ha di a lekana	Often not enough to eat	4
Ha ke tsebe	Do not know or refused	98

READ: **'Jwale ke tlo o balla dipolelo tseo batho ba nang le tsona ka seemo sa bona sa dijo. Dipolelong tsena, ke dife tseo eneng ele nnete haholo, nnete ka nako engwe, kapa e se nnete ha hao dikgweding tse 6 tse fetileng.'** 'Now I'm going to read you several statements that people have made about their food situation. For these statements, please tell me whether the statement was often true, sometimes true, or never true for [YOU/YOUR HOUSEHOLD] in the last SIX months.'

READ out each of the statements.

Record ONE response ONLY for each of the statements.

Statement:	Often true **Nnete haholo**	Sometimes true **Nnete ka nako enngwe**	Never true **Ha se nnete**	Do not know or refused **Ha ke tsebe**
5.2 Ke/re a tshwenyehile hore dijo di tla feela pele re ba le tjhelete ya ho reka tse ding. [I/WE] worried whether [MY/OUR] food would run out before [I/WE] got money to buy more.	1	2	3	98
5.3 Dijo tseo re neng re di rekile ha di a nka nako, jwale ke sena tjhelete ya ho reka tse ding. The food that [I/WE] bought just did not last, and [I/WE] did not have money to buy more food.	1	2	3	98
5.4 Re ne re sena tjhelete e lekaneng ho reka dijo tsa mefuta yohle. [I/WE] could not afford to eat balanced meals.	1	2	3	98

CHECK:

(a) Was the answer to question 5.1 above ''Often not enough to eat [4]"?	Y	If YES to at least ONE of these checks, ➔ **5.5**	N	If NO to both these checks, ➔ **5.12**
(b) Was at least ONE of questions 5.2 to 5.4 answered "often true [1]" OR "sometimes true [2]"?	Y		N	

NOTES:

5SECTION 5: FOOD SECURITY (CONTINUED).

5 Dikgweding tse 6 tse fetileng, na o ile wa fokotsa dijo kapa wa seke wa ja hobane ho sena tjhelete e lekaneng ya ho reka dijo?
In the last SIX months, did [YOU/OTHER ADULTS IN YOUR HOUSEHOLD] ever cut the size of your meals or skip meals because there was not enough money for food?

Do NOT read out the responses.

Record ONE response ONLY.

Yes Ee	No Tjhe	Don't know Ha ke tsebe
➔ 5.6	➔ 5.7	➔ 5.7

NOTES:

5.6 Ha eba ee, e etsahala ha kae?
IF YES, how often did this happen?

READ out each of the responses.

Record ONE response ONLY.

Kgwedi engwe le e engwe Almost every month	1
Ka kgwedi tse ding Some months but not every month	2
Kgwedi e lenngwe kapa tse pedi Only 1 or 2 months	3
Ha ke tsebe Do not know	98

Do NOT read out the responses.

Record ONE response ONLY for each of the three questions.

	Yes Ee	No Tjhe	Don't know Ha ke tsebe
5.7 Kgweding tse 6 tse fetileng, o ile wa ja ha nyane feta ka moo o neng o batla ka teng hobane ho sena tjhelete e lekaneng ho reka dijo? In the last SIX months, did you ever eat less than you felt you should because there was not enough money to buy food?			
5.8 Kgweding tse 6 tse fetileng, o ile wa lapa wa se kgone ho ja hobane ho sena tjhelete e lekaneng ho reka dijo? In the last SIX months, were you ever hungry but did not eat because there was not enough money for food?			
5.9 Kgweding tse 6 tse fetileng, na o ile wa theoha mmeleng hobane o sena tjhelete e lekaneng ya ho reka dijo? In the last SIX months, did you lose weight because there was not enough money for food?			

CHECK:

Did the respondent answer YES to ANY ONE of question 5.5 and questions 5.7 to 5.9?

Y	➔ 5.10
N	➔ 5.12

NOTES:

5.10 Kgweding tse 6 tse fetileng, na le ile la seje letsatsi kaofela hobane ho sena tjhelete e lekaneng ya ho reka dijo?
In the last SIX months, did [YOU/OTHER ADULTS IN YOUR HOUSEHOLD] ever not eat for a WHOLE DAY because there was not enough money for food?

Do NOT read out the responses.

Record ONE response ONLY.

Yes Ee	No Tjhe	Don't know Ha ke tsebe
➔ 5.11	➔ 5.12	➔ 5.12

NOTES:

5.11 Haeba ee, e etsahetse ha kae?
IF YES, how often did this happen?

READ out each of the responses

Record ONE response ONLY.

Kgwedi engwe le e engwe Almost every month	1
Ka kgwedi tse ding Some months but not every month	2
Kgwedi e lenngwe kapa tse pedi Only 1 or 2 months	3
Ha ke tsebe/Do not know 98	

SECTION 5: FOOD SECURITY (CONTINUED)

➔ **FIRST ASK THIS QUESTION BEFORE PROCEEDING TO ASKING QUESTION 5.13 (where relevant)**:

5.12 Na honale bana balelapa ba katlase ho delimo tse 18 / 'Are there any children in the household under the age of 18?'

Y	➔ 5.13
N	➔ Section 6

Then introduce the questions below as follows: **'Jwale ke tlo o balla dipolelo tseo batho ba dientseng mabapi le boemo ba dijo ba bana ba bona, ke kopa o bolele hore na dipolelo tsena ke nnete ha ngata, nnete ka nako engwe, kapa ha se nnete kgweding tse 6 tse fetileng ka bana bohle ba dulang ha hao ba dilemo tse ka tlase ho 18.'**

'Now I am going to read you several statements that people have made about the food situation of their children. For these statements, please tell me whether the statement was OFTEN true, SOMETIMES true, or NEVER true in the last SIX months for your children and/or for the children living in the household who are younger than 18 years.'

NOTES:

READ out each of the responses.

Record ONE response ONLY for each of the questions.

	Often true **Nnete haholo**	Sometimes true **Nnete ka nako enngwe**	Never true **Ha se nnete**	Do not know or refused **Ha ke tsebe**
5.13 Re tshepetse dijong tsa theko e tlase ho fepa bana ba rona hobane rer fellwa ke tjhelete. [I/WE] relied on only a few kinds of low-cost foods to feed [MY/OUR] child/children because [I WAS/WE WERE] running out of money to buy food.	1	2	3	98
5.14 Ha re kgone ho fa bana ba rona dijo tsa mefuta e fapaneng hobane re kgone. [I/WE] could not feed [MY/OUR CHILD/CHILDREN] a balanced meal, because [I/WE] could not afford that.	1	2	3	98
5.15 Bana ba rona ba ne ba sa je ho lekana hobane ha re kgone ho reka dijo tse lekaneng. [MY/OUR CHILD/CHILDREN] were not eating enough because [I/WE] just could not afford enough food.	1	2	3	98

Do NOT read out the responses.

Record ONE response ONLY for each of the three questions.

	Yes Ee	No Tjhe	Don't know Ha ke tsebe
5.16 Kgweding tse 6 tse fetileng, na o ile wa fokotsa dijo tsa emong wa bana ba hao hobane ho ne ho sena tjhelete e lekaneng ho reka dijo? In the last SIX months, did you ever cut the size of any of your children's meals because there was not enough money for food?			
5.17 Kgweding tse 6 tse fetileng, e mong wa bana ba hao o ile a lapa me wa seke wa kgona ho reka dijo? In the last SIX months, were [ANY CHILDREN in this household] ever hungry but you just could not afford more food?			

5.18 Kgweding tse 6 tse fetileng emong wa bana o ile a sitwa hoja hobane ho sena tjhelete e lekaneng ho reka dijo?
In the last SIX months, did [ANY CHILDREN] ever skip meals because there was not enough money for food?

Do NOT read out the responses.

Record ONE response ONLY.

Yes Ee	No Tjhe	Don't know Ha ke tsebe
➔ 5.19	➔ 5.20	➔ 5.20

NOTES:

5.19 Haeba ee, e etsahetse ha kae?
IF YES, how often did this happen?

READ out each of the responses.

Record ONE response ONLY.

Kgwedi engwe le e engwe Almost every month	1
Ka kgwedi tse ding Some months but not every month	2
Kgwedi e lenngwe kapa tse pedi Only 1 or 2 months	3
Ha ke tsebe Do not know	98

Do NOT read out the responses.

Record ONE response ONLY.

	Yes Ee	No Tjhe	Don't know Ha ke tsebe
5.20 Kgweding tse 6 tse fetileng, na emong wa bana o kile a seje letsatsi kaofela hobane ho sena tjhelee e lekaneng ho reka dijo? In the last SIX months, did [ANY CHILDREN in this household] ever not eat for a whole day because there was not enough money for food?			

SECTION 6: FOOD CONSUMPTION

NOTES:

Ask question 6.1 for each item on the list. In other words, READ out each item. If YES, then ask questions 6.2 to 6.5 for each of the items marked with a YES.

For question 6.4, we want to know whether any of the foods were received in the form of a gift or as payment for work. For question 6.5, we want to know if the household was able to consume any of the foods listed as a result of it being produced by the household.

In this section, we look at the patterns of food consumption. This should include all the food that you has purchased for yourself or for others as well as the food consumed by all members of the household from gifts or own produce, BUT should EXCLUDE any food that has been bought for resale or to exchange for commercial purposes. Introduce this section by saying, **'Ke na le mefuta ya dijo eo batho ba ka tswa ba di jele bekeng/ kgweding e fetileng. Ke tla rata ho tseba hore na di rekilwe/ di jelwe kgweding e fetileng.'** 'I have a list of different kinds of food that people may have eaten during the past week or month. As I read each one, I would like you to tell me whether or not the item was bought or consumed in this household during the past month'.

			6.1 Na sejo seo se ile sa rekwa/ sa jewa ka tlung kgwedi e fetileng? Was [ITEM] bought or consumed by the household in the PAST MONTH? NOTE: READ out each item's description AND unit of measurement. **Yes → 6.2** **No → Next item**		**6.2 Na le se reka ka beke/ kgwedi?** Does the household usually buy or receive [ITEM] weekly OR monthly? NOTE: Record ONE option ONLY.	**6.3 Le sebedisitse bo kae/ le rekile e kae ka beke/ kgwedi e fetileng?** What was the amount spent OR quantity purchased in the last [week/month]? NOTE: Record both the value and quantity of the purchased food. Quantities should be reported in the unit of measurement for the particular item.		**6.4 O fumane bokae ele mpho kapa tefo beke/ kgwedi e fetileng?** How much was received as a gift OR as payment in the last [week/month]? NOTE: Record both the value and quantity of the gift/produce. Quantities should be reported in the unit of measurement for the particular item. When valuing the gift or own produce used, ask the respondent, '**Re batla ho tseba hore dintho tseo odefiweng kapo o direkileng mabenkeleng ine ile bokae?**' 'We want to know how much you think it would have cost the household to buy what you received OR used in the shop or at the local market or store?'		**6.5 O jele tse kae/ tse bo kae ho tseo o itemetseng tsona beke/ kgwedi e fetileng?** How much was eaten from own produce of [ITEM] in the last [week/month]?	
No.	Food item:	Unit:	Yes/No		Weekly/Monthly	Value (Rand)	Quantity	Quantity	(Rand)Value	Quantity	Value (Rand)
01	Maize grain/samp	Kilograms	Y	N	W M						
02	Mealie meal/Maize flour	Kilograms	Y	N	W M						
03	Rice	Kilograms	Y	N	W M						
04	White/brown bread	Loaves	Y	N	W M						
05	White flour	Kilograms	Y	N	W M						
06	Breakfast cereal	Kilograms	Y	N	W M						
07	Died Peas/Lentils/Beans	Kilograms	Y	N	W M						
08	Potatoes	Kilograms	Y	N	W M						
09	Tomatoes	Kilograms	Y	N	W M						
10	Sweet Potatoes/Other Roots	Kilograms	Y	N	W M						
11	Vegetable Oil	Litres	Y	N	W M						
12	Margarine/Butter/Ghee/Other fats	Kilograms	Y	N	W M						
13	Cheese	Kilograms	Y	N	W M						
14	Jam	Units	Y	N	W M						
15	Fresh Milk/Sour Milk/Yoghurt	Litres	Y	N	W M						
16	Baby Formula / Milk Powder	Kilograms	Y	N	W M						
17	Sugar	Kilograms	Y	N	W M						

SECTION 6: FOOD CONSUMPTION (CONTINUED)

NOTES:

Ask question 6.1 for each item on the list. In other words, READ out each item. If YES, then ask questions 6.2 to 6.5 for each of the items marked with a YES. For question 6.4, we want to know whether any of the foods were received in the form of a gift or as payment for work. For question 6.5, we want to know if the household was able to consume any of the foods listed as a result of it being produced by the household.

			6.1 Na sejo seo se ile sa rekwa/ sa jewa ka tlung kgwedi e fetileng? Was [ITEM] bought or consumed by the household in the PAST MONTH?	**6.2 Na le se reka ka beke/ kgwedi?** Does the household usually buy or receive [ITEM] weekly OR monthly?	**6.3 Le sebedisitse bo kae/ le rekile e kae ka beke/ kgwedi e fetileng?** What was the amount spent OR quantity purchased in the last [week/month]?		**6.4 O fumane bokae ele mpho kapa tefo beke/ kgwedi e fetileng?** How much was received as a gift OR as payment in the last [week/month]?		**6.5 O jele tse kae/ tse bo kae ho tseo o itemetseng tsona beke/ kgwedi e fetileng?** How much was eaten from own produce of [ITEM] in the last [week/month]?	
			NOTE: READ out each item's description AND unit of measurement. **Yes → 6.2** **No → Next item**	NOTE: Record ONE option ONLY.	NOTE: Record both the value and quantity of the purchased food. Quantities should be reported in the unit of measurement for the particular item.		NOTE: Record both the value and quantity of the gift/produce. Quantities should be reported in the unit of measurement for the particular item. When valuing the gift or own produce used, ask the respondent, '**Re batla ho tseba hore dintho tseo odefiweng kapo o direkileng mabenkeleng ine ile bokae?**' 'We want to know how much you think it would have cost the household to buy what you received OR used in the shop or at the local market or store?'			
No.	Food item:	Unit:	Yes/No	Weekly/Monthly	Value (Rand)	Quantity	Quantity	(Rand)Value	Quantity	Value (Rand)
18	Mutton/Beef/Pork	Kilograms	Y N	W M						
19	Chicken	Kilograms	Y N	W M						
20	Eggs	Single (i.e. one egg = 1)	Y N	W M						
21	Fish (fresh/frozen)	Kilograms	Y N	W M						
22	Tinned fish (including canned pilchards)	Kilograms	Y N	W M						
23	Pumpkin/squash	Kilograms	Y N	W M						
24	Other vegetables	Kilograms	Y N	W M						
25	Bananas	Kilograms	Y N	W M						
26	Apples	Single (i.e. one apple = 1)	Y N	W M						
27	Citrus fruit	Kilograms	Y N	W M						
28	Soft drinks	Litres	Y N	W M						
29	Fruit juice	Litres	Y N	W M						
30	Simba and other chips	Grams	Y N	W M						
31	'Slap' chips	Grams	Y N	W M						
32	Vetkoek	Single (e.g. 1 vetkoek)	Y N	W M						
33	Sweets	Grams	Y N	W M						
34	Other (please specify):		Y N	W M						
35			Y N	W M						
36			Y N	W M						
37			Y N	W M						
38			Y N	W M						

SECTION 7: NON-EMPLOYMENT INCOME

NOTES:

EXCLUDE any money received from family or friends in this section: these are recorded in section 8 on remittances.

If a member of the household has received assistance from a particular source, please make sure that you go on to ask for the estimated MONTHLY value of that assistance.

In this section we are going to talk about any money or any form of assistance that members of the household may have received from sources which do NOT involve EMPLOYMENT of some kind. There are many ways in which the household can receive money without being employed. For example, pension payments, charity, unemployment insurance fund, government disability grants, and other forms like that.

Introduce this section by saying, **'Ke tlo o balla mekgwa e fapaneng e o batho ba fumanang dithuso tsa ditjhelete, na hona le emong ya fumantshwang dithuso tsa ditjhelete kapa tjhe.'** 'I will read a list of the different ways in which people can receive money or assistance, and I'd like you to indicate whether any member of the household did, in fact, receive such assistance or not.'

No	Item:	**7.1 Na e mong wa lelapa o ile a fumana dithuso ho tswa ho e nngwe ya tse latelang?** Did any member of the household receive income or any money from any of the sources listed below? NOTE: Record ONE option ONLY. **Yes → 7.2 No → Next item**	**7.2 Ke ba ba kae ba fumaneng tjhelete ho tswa moo?** If YES, how many members of the household (i.e. of those listed on the household roster) received income from this source? NOTE: Record the number of household members receiving income from this source.	**7.3 Motho ka mong o ile a fumana tjhelete e kae kgwedi e fetileng?** How much was received by each of these persons LAST MONTH? NOTE: Record the MONTHLY amount received by each person in the respective columns.				
				1st person:	2nd person:	3rd person:	4th person:	5th person:
A.	**Private sources of income:**							
01	Pension or provident fund (including public sector pension)	Y N						
02	Interest earnings, incl. dividends, interest from savings, loans	Y N						
B.	**Social welfare grants:**							
03	Old age pension	Y N						
04	Disability grant	Y N						
05	Child support grant	Y N						
06	Foster care grant	Y N						
07	Other social welfare grants	Y N						
C.	**Other government sources of income:**							
08	Workmen's compensation	Y N						
09	Unemployment insurance fund	Y N						
10	Other government sources of income (describe):	Y N						
D.	**Other sources of income:**							
11	NGO cash transfers	Y N						
12	Other sources of income (describe):	Y N						

SECTION 8: REMITTANCES RECEIVED BY THE HOUSEHOLD

NOTES:

Record ONE option ONLY.

➔ 8.1 Na hona le leloko kapa motho yo eseng setho sa lelapa a romeletseng tjhelete kapa dijo kapa a thusitseng ka ntho tse itseng ka tlung kgweding tse 12 tse fetileng? Are there any family or other persons who are NOT members of this household (i.e. **they are NOT on the household roster**) who sent money or food, or made any other kind of contribution to this household in the past 12 months (INCLUDING money borrowed from family/other persons)?

Y	N
➔ 8.2	➔ 8.6

List the FIRST name ONLY of those persons making contributions to the household. Ask questions 8.3 to 8.5 for each of the listed persons, one at a time.

8.2 Ka kopo bolela mabitso a batho ba rometseng tjhelete kapa dijo kapa bafaneng ka ntho tseitseng lelapeng kgweding tse 12 tse fetileng mme balesiyo hae?
Please name each person who has SENT money or food or MADE some OTHER kind of CONTRIBUTION to the household in the past 12 months WHILE ABSENT from the household:
In the case of persons who currently are members of the household, report the relevant person code from the household roster in the space to the right:

1st Person:	2nd Person:	3rd Person:	4th Person:	5th Person:

Do NOT read out the options.

8.3 O amana jwang le emong wa batho ba dulang moo?
What is [NAME]'s relationship to any member of the household?

1 = Wife/husband/partner
2 = Father/mother
3 = Son/daughter
4 = Brother/Sister
5 = Other family
6 = Not related

If the person is related to more than one person in the household, use the FIRST applicable code.

Record ONE code ONLY.

Record ONE option ONLY.

8.4 Kgweding tse 12 tse fetileng, na o ile a romela / fana ka tjhelete ka tlung?
In the past 12 months, did [NAME] send or give MONEY to the household?

Y	N	Y	N	Y	N	Y	N	Y	N
➔ (a)	➔ 8.5	➔ (a)	➔ 8.5	➔ (a)	➔ 8.5	➔ (a)	➔ 8.5	➔ (a)	➔ 8.5

(a) Le e fumane makgetlo a ma kae? Number of times received money?

(b) Le fumane bo kae kgweding tse 12 tse fetileng? How much received in the past 12 months?

(c) Le fumane bo kae matsatsing a 30 a fetileng? How much received in the past 30 days?

(d) Le tlameile le kgutlise tjhelete ena? Are you expected to pay this money back?

Y	N	Y	N	Y	N	Y	N	Y	N

Record ONE option ONLY.

8.5 Kgweding tse 12 tse fetileng, na [bitso] o thusitse ka tsela e itseng ka tlung?
In the past 12 months, did [NAME] make a contribution in KIND to the household?

Y	N	Y	N	Y	N	Y	N	Y	N
➔ (a)	➔ Next person	➔ (a)	➔ Next person	➔ (a)	➔ Next person	➔ (a)	➔ Next person	➔ (a)	➔ 8.6

(a) Le di fumane makgetlo a ma kae? Number of times received goods?

(b) Kgweding tse 12 tse fetileng, e ne ele ditho tsa bo kae?
Value of goods received in the past 12 months?

Ask the respondent, **'Nkabe ile bokae horeka ntho tseno kabolona kweding tse 12 tse fetileng?'** 'We want to know how much you think it would have cost the household to buy all the things that [NAME] sent or gave the household in the past 12 months?'

Ask question for goods received in past 30 days.

(c) Matsatsi a 30 a fetileng, e ne e le dintho tsa bo kae?
Value of goods received in the past 30 days?

(d) A le tllamehile ho digutlisa kapa lidipatala?
Are you expected to give back or pay for this contribution?

Y	N	Y	N	Y	N	Y	N	Y	N
→ Next person		→ Next person		→ Next person		→ Next person		→ 8.6	

SECTION 8: REMITTANCES MADE BY THE HOUSEHOLD

NOTES:

Record ONE option ONLY.

→ 8.6 Na hona le leloko kapa motho yo eseng setho sa lelapa ya fumaneng tjhelete kapa dijo kapa a thusitsweng ka ntho tse itseng ho tloha lelapeng lena kgweding tse 12 tse fetileng?
Are there any family or other persons who are NOT members of this household (i.e. they are NOT on the household roster) who have received money, food or any other assistance from this household in the past 12 months (INCLUDING money lent to family/other persons)?

Y	N
→ 8.7	→ Section 9

List the FIRST name ONLY of those persons receiving contributions from the household. Ask questions 8.8 to 8.10 for each of the listed persons, one at a time.

8.7 Ka kopo bolela mabitso a batho ba fumaneng tjhelete kapa dijo kapa thuso eitseng ho tswa lapeng lena kgweding tse 12 tse fetileng mme balesiyo hae? Please name each person who has RECEIVED money, food or any other assistance from this household in the past 12 months WHILE ABSENT from the household:

In the case of persons who currently are members of the household, report the relevant person code from the household roster in the space to the right:

1st Person:	2nd Person:	3rd Person:	4th Person:	5th Person:

Do NOT read out the options.

8.8 O amana jwang le ba lelapa lena?
What is [NAME]'s relationship to any member of the household?

If the person is related to more than one person in the household, use the FIRST applicable code.

Record ONE code ONLY.

1 = Wife/husband/partner
2 = Father/mother
3 = Son/daughter
4 = Brother/Sister
5 = Other family
6 = Not related

Record ONE option ONLY.

8.9 Kgweding tse 12 tse fetileng, lelapa le romeletse kappa lefile [bitso] tjhelete?
In the past 12 months, did the household send or give MONEY to [NAME]?

(a) O e rometswe makgetlo a ma kae? Number of times [NAME] was sent money?

(b) Kgweding tse 12 tse fetileng, o rometswe bo kae? How much sent in the past 12 months?

(c) Matsatsi a 30 a fetileng, o rometswe bo kae? How much sent in the past 30 days?

(d) Na [bitso] otlamehile apatale tjhelete eno? Do you expect [NAME] to repay the money?

Record ONE option ONLY.

8.10 Kgweding tse 12 tse fetileng, na bang ba lelapa ba thusitseng?
In the past 12 months, did the household make a contribution in KIND to [NAME]?

(a) Le di rometse ka makgetlo a ma kae? Number of times [NAME] was sent goods?

(b) Kgwedi tse 12 tse fetileng le rometse tsa bo kae? Value of goods sent in past 12 months?

Ask the respondent, **'Nkabe ile bokae horeka ntho tse lifaneng ka tsona kweding tse 12 tse fetilen?'** 'We want to know how much you think it would have cost the household to buy all the things that the household sent or gave [NAME] in the past 12 months?'

Ask question for goods received in past 30 days.

(c) Matsatsi a 30 a fetileng le rometse tsa bo kae? Value of goods sent in the past 30 days?

(d) Na otlamehile a kgutlise kapa apatale ntho tseno? Do you expect [NAME] to give back or pay for this contribution?

Y	N	Y	N	Y	N	Y	N	Y	N
→ (a)	→ 8.10	→ (a)	→ 8.10	→ (a)	→ 8.10	→ (a)	→ 8.10	→ (a)	→ 8.10
Y	N	Y	N	Y	N	Y	N	Y	N
Y	N	Y	N	Y	N	Y	N	Y	N
→ (a)	→ Next person	→ (a)	→ Next person	→ (a)	→ Next person	→ (a)	→ Next person	→ (a)	→ Section 9
Y	N	Y	N	Y	N	Y	N	Y	N
→ Next person		→ Next person		→ Next person		→ Next person		→ Section 9	

SECTION 9: HOUSEHOLD DEBT

NOTES:

Record ONE option ONLY.

➔ **9.1 Na hona le motho ya kolotang sebaka se itseng / motho e mong o seng setho sa lelapa?**
Does any member of this household owe cash or goods to any institution or to an individual who is not a household member?

Y	N
➔ 9.2	➔ Section 10

Record YES or NO next to each source of credit. For those sources of credit where the answer was YES, ask questions 9.4 and 9.5. EXCLUDE money owed to other household members.

	9.2 'Ke tlo o balla batho bao o ka kadimang tjhelete ho bona. Ha ke ntse ke le bala, ke kopa o bontshe hore na ke bafe bao o bakolotang.' 'I am going to read through a list of possible lenders. As I read through the list, please indicate whether or not money is owed to that source.' NOTE: READ out each item. INCLUDE the debt owed on the bond on the house in which the respondent is living, but EXCLUDE lay-buys. Source of credit/lender:	**9.3 Na le kolota?** Does the household owe money to [SOURCE]? NOTE: Record ONE option ONLY. **Yes ➔ 9.4** **No ➔ Next item**	**9.4 Ke bo kae kaofela ha e felletse?** If YES, how much does the household owe [SOURCE] in total, i.e. how much would it have to pay TODAY to settle this particular debt?	**9.5 Ho ya ka ditlhophiso tseo le di entseng le mokadime, o tshwanela ho patala tjhelete e kae ka kgwedi?** What is the MONTHLY repayment required to settle this debt as per current arrangements with the lender?
01	Relative or a friend	Y N		
02	Government (including SARS/municipal rates)	Y N		
03	Landlord	Y N		
04	Banks or building society	Y N		
05	Non-governmental organization (NGO)	Y N		
06	Micro/money lender	Y N		
07	Stokvel / savings club / burial society	Y N		
08	Funeral parlour/undertaker	Y N		
09	Employer	Y N		
10	Hire purchase	Y N		
11	Shop credit (including clothing accounts)	Y N		
12	Other (Specify):	Y N		

SECTION 10: HOUSEHOLD SAVINGS

NOTES:

Record ONE option ONLY.

➔ **10.1 Na ho na le e mong ya patalang INSURANCE kapa ya ntseng a boloka tjhelete ka tsela e itseng?**
Does any member of this household make regular contributions to an insurance policy or save money in some other way?

Y	N
➔ 10.2	➔ Section 11

Record YES or NO next to each type of savings. For those types of savings where the answer was YES, then proceed to ask questions 10.4 and 10.5.

	10.2 'Ke tlo o balla mefuta e fapaneng ya ho boloka. Ha ke ntse ke o balla lenane lena, ke kopa hore o bontshe hore na ho na le motho ya bolokang tjhelete ka mokgwa ona ho e latelang.' 'I am going to read through a list of possible types of savings. As I read through the list, please indicate whether or not the household currently makes any contribution to this type of savings.' NOTE: READ out each item. Include ALL payments to insurance, including short-term insurance, life insurance, and medical insurance. Type of savings:	**10.3 Na hona le emong ya bolokang ka tsela ena?** Does any member of the household make regular contributions to [TYPE]? NOTE: Record ONE option ONLY. **Yes ➔ 10.4** **No ➔ Next item**	**10.4 Kgweding e fetileng o bolokile bo kae?** If YES, how much did the household contribute to [TYPE] in the past month?	**10.5 Ho fihlela nako ena le bolokile bokae hape INSURANCE e boleng bo bo kae kapa le tlo fumana bo kae ho ya ka moo le le patetseng ke teng?** What is the current, total value of the contributions that the household has made to [TYPE] and/or what is the amount of cover that the household is insured for and/or the amount of money the household stand to receive given its contributions?
01	Bank or post office savings account	Y N		
02	Retirement / annuity policy / provident fund	Y N		
03	Life insurance	Y N		
04	Unit trusts and shares	Y N		
05	Stokvels or informal savings associations	Y N		
06	Short-term insurance (e.g. car, household goods)	Y N		
07	Lay-buys	Y N		

08	Other savings (describe):	Y N		

➔ **BEFORE concluding this interview and completing section 11 below, read through the entire questionnaire again. Make sure that you have asked all the relevant questions, that you followed the instructions on the questionnaire to the letter (including the skips), and that you recorded the respondents' answers correctly. If NOT, revisit these questions or issues NOW, because this may be the LAST OPPORTUNITY you will have to ask these people some questions in order to clarify these issues!**

SECTION 11: END

11.1 Re leboha haholo ha o nkile karolo le nako ya hao ho araba dipotso tsa rona. Ho bontsha teboho ya rona re tla o fa mpho ya boleng ba R100 eo ka yona o ka rekang lebenkeleng la Shopite/Checkers. Horere tsebe hore ke bomang ba tshwanelang ho fumana mpho ena, re kopa o ngole lebitso la hao, otekene la ho bontsha mohla wa kajeno meleng e ka tlase. O hopole hore honale diputso tseding tse wena le babang balelapa letla diarabang bekeng elatelangkapo tse pedi ka tsa ditjhelete tsa lelapa, hosebetsa letsabophelo lemaitshwaro a maloko a lelapa.

We really appreciate the fact that you are participating in our study and that you have taken the time to answer our questions. As a small token of our appreciation, we would like to give you this store gift voucher of R100. You can use this voucher at any Shoprite/Checkers store anywhere in the country to buy yourself or your family some food or other things. As we need to comply with the necessary financial controls, please can you sign or write your name on the line below as proof that you have received this voucher. We wish to remind that we will be conducting further interviews with you and other members of this household over the next week or two in order to collect information on the activities, labour force participation, and health-related knowledge and behaviour of individual members of your household.

Name of respondent: _____ Name of fieldworker: _____

Signature: _____ Signature: _____

Date: D D M M 2 0 Y Y Date: D D M M 2 0 Y Y

11.2 Time interview ended: :

Ke leboha hape ka nako ya hao!!
Thank you again for your time!!

Appendix F: Patient Questionnaire

➔ **BEFORE proceeding with this interview, obtain written, informed consent from the respondent (refer consent form for detail)!!**

Read out: **O kopiwe hore o nke karolo mo dipatlisiso tse na. Hlokomela hore ha o araba mo o dumela honka karolo dipatlisiso tsena.**

O tla dula o sa tsejwe hobane dipatlisiso tsena e tlaba sephiri ka nako tsohle. You have been asked to participate in a research study. Please note that by completing this questionnaire you are agreeing to participate in this study. You will remain anonymous and your data will be treated confidentially at all times. You may withdraw from this study at any given moment.

PATIENT QUESTIONNAIRE
FEATS study

B

OFFICE USE ONLY:

1. INTERVIEW PARTICULARS (in BLACK pen):

1.1 Patient number (assigned by fieldwork manager following recruitment of patient – refer 2.1 on recruitment form):

1.2 Name of field worker:_____

1.3 Date of interview:

Day	Month	Year
		200

1.4 Time interview started:

:

1.5 Health facility:

Matjhabeng (Welkom)	1	MUCPP (Manguang)	6	Zamdela (Sasolburg)	11
Welkom (Welkom)	2	Tseki (Phuthadjithaba)	7	Refengkhotso (Deneysville)	12
Phomolong (Hennenman)	3	Tshiame (Harrismith)	8		
Batho (Manguang)	4	Namahali (Phuthadjithaba)	9		
Heidedal (Heidedal)	5	Itumeleng (Jagersfontein)	10		

1.6 District:

Lejweleputswa	1
Motheo	2
Fezile Dabi	3
Thabo Mofutsanyana	4
Xhariep	5

2. ADMINISTRATIVE INFORMATION

2.1 Site visit editing (in **GREEN** pen): Signature:

Name & date:

Corrections required on page(s):

Accepted

2.2 Data coding (in **RED** pen): Signature:

Name & date:

Corrections required on page(s):

Completed

2.3 Data capturing (first capture):

Date: By:

2.4 Data capturing (second capture):

Date: By:

2.5 Additional comments:

Date: By:

Date: By:

3. VERIFICATION OF ELIGIBILITY FOR INCLUSION IN THE STUDY

NOTES:

First ASK the person questions 3.1 to 3.3.

If ANY ONE of the answers to CHECKS 1, 2 or 3 is 'NO', thank the respondent for

3.1 O hlahile neng? What is your date of birth?

Letsatsi / Day	Kgwedi / Month	Selemo / Year
		19

DD / MM / 19

/ /

CHECK 1:

Was the patient 18 years of age or older on the date of recruitment into the study (refer to 1.2 on the recruitment form for the recruitment date)?

No	0
Yes	1

3.2 O ntse o fumana di ARV ha jwale jwaloka programa ya mmuso?

Are you currently receiving ARV medication as part of government's ART programme?

No	0

CHECK 2:

Does the person live WITHIN the town where the facility at

No	0

his/her time and DISCONTINUE the interview.

Yes	1

which the person was recruited, is situated (refer to address in 2.8 on the recruitment form)?

Yes	1

3.3 HA a re EYA, O qadile neng ho nwa di drugs tsa di ARV jwalo ka karolo ya mmuso?
If YES, when did you FIRST start taking ARV drugs as part of government's treatment programme?

ONLY continue with the interview if ALL THREE the checks are marked 'YES'.

Letsatsi / Day	Kgwedi / Month	Selemo / Year
		20

CHECK 3:
Had the patient been on treatment for FIVE WEEKS (35 days) or shorter on the date of recruitment into the study (refer to 1.2 on the recruitment form for the recruitment date)?

No	0
Yes	1

/ /

4. PAST EMPLOYMENT STATUS

OFFICE USE ONLY:

NOTES:

Re rata ho tseba ka ditaba tsa hao tsa mosebetsi wa hao o fetileng.
We would like some information about your past employment status.

4.1 Kgetlong la pele ha o ne ofumana hore o hiv positive, ana one o sebetsa?
At the time when you FIRST tested positive for HIV, what was your employment status?

Do NOT read out the options.

Please mark ONE option ONLY.

Ka botlalo	Employed full-time	1
Ka nakwana	Employed part-time	2
Wa koropisa	Employed casually	3
Ho sa sebetse/empa o batlile lehokgona ho sebetsa	Unemployed, but willing and able to work	4
Ha o sebetse , obatla ho sebetsa empao sa gone	Unemployed, willing to work, but not able to work	5
HA osebetse,hao batle ,ebile hawa ikemisetsa ho sebetsa	Unemployed, but not willing or able to work	6

4.2 Kgetlong lapele ha o ne o qala ho nka di ARV jwalo ka karolo ya programa ya mmuso, A o ne o sebetsa?
At the time when you FIRST started taking ARV drugs as part of government's treatment programme, what was your employment status?

Do NOT read out the options.

Please mark ONE option ONLY.

Ka botlalo	Employed full-time	1
Ka nakwana	Employed part-time	2
Wa koropisa	Employed casually	3
Ho sa sebetse/empa o batlile lehokgona ho sebetsa	Unemployed, but willing and able to work	4
Ha o sebetse , obatla ho sebetsa empao sa gone	Unemployed, willing to work, but not able to work	5
HA osebetse,hao batle ,ebile hawa ikemisetsa ho sebetsa	Unemployed, but not willing or able to work	6

5. HIV TESTING

Ke tlo o botsa dipotso tse iitseng maelana le nako eo o neng o etsa diteko mme wa fumana hore o HIV positive. I am now going to ask you some questions in respect of the time you FIRST tested positive for HIV.

5.1 O entse diteko selemong sefe? When did you FIRST test positive for HIV?

Kgwedi / Month	Selemo / Year

/

5.2 O entse diteko sebakeng sefe hokae?
Where did you have this test the FIRST time you tested positive for HIV [type of provider]?

Do NOT read out the options.

Please mark ONE option ONLY.

Tliniki ya mmuso	Government clinic/community health centre	1
Sepetlele sa mmuso	Government hospital	2
Ngaka e itshebetsang	Private doctor/GP	3
Sepetlele se e seng mmuso/se ikemetsing	Private hospital	4
Hae	At home	5
Tse ding(hlalosa)	Other (please specify):	

5.3 Ke eng eo susumeleditseng hore onke diteko kgetlong la pele?
What prompted you to take this test the FIRST time you tested positive for HIV?

Do NOT read out the options.

Please mark ONE option ONLY, i.e. the MAIN or MOST IMPORTANT reason.

Ke ne ke kula	Became ill	1
Karola ya bophelo bo botle	Part of routine health/medical screening	2
Buimana	Pregnancy	3
Ka baka la insuranse	For insurance purposes	4
Ho fumana meriana ya di ARV	To access ARV medication	5
Ho fumane molekane a na le tswaetso	Spouse/partner found to be infected	6
Ngwana ofumanwe a na le tswaetso	Child found to be infected	7
Ke hlabilwe ke nalete/setoko	Needle prick/stick	8
Thobalano e sa bolokehang	Unprotected sex	9

Peto/thobalano ya dikgoka	Rape/forced sex	10
Tlhaselo(ho hlaselwa le ntwa ya matsoho;ntle le peto)	Assault (physical violence/attack; NOT rape)	11
Ha ke hopole	Cannot remember	98
Tse ding(hlalosa)	Other (please specify):	

5.4 Ke mang ya ileng a o kgothaletsa ho etsa diteko kgetlong la pele?
Who convinced you to take this test the FIRST time you tested positive for HIV?

Do NOT read out the options.

Please mark ONE option ONLY, i.e. the MAIN or MOST IMPORTANT person.

Ke ile ka inkela diqeto	Own choice/decision	1
Mosebeletsi wa tsa bophelo bo bot le(baoki,dingaka)	Health care worker (e.g. doctor/nurse)	2
Molekane	Spouse/partner	3
Ba leloko	A family member	4
Insuranse/	Insurance agent/broker	5
Ha ke hopole	Cannot remember	98
Tse ding(hlalosa)	Other (please specify):	

NOTE:

READ out EACH of the questions AND responses.

Circle ONLY the ONE correct number for each response.

Ask the questions in NUMERICAL ORDER.

OFFICE USE ONLY:

6. MENTAL HEALTH

Bahlahlobi ba lemohile hore maikutlo a bapala karolo e bohlokwa ho mahloko a mangata. Ha rona re ne re tseba ka maikutlo ana re ne re tla kgona ho o thusale ho feta. Dipotso tsena tse latelang ka morao ho mona, di ngotse ka tsela eo di tla re thusa rona bahlahlobi, ke tla o balla tsona le dihlaloso tsa bohlokwa ba tsona. Ke kopa o hlalose hore na ho tsona ke efe eo amileng haholo bekeng e fetileng. Ha o nahana ka karabo o se ke wa nka nako etelele. Seo o se nahanang pele ka kelellong ya hao ke sona se lokileng.

Researchers are aware that emotions play an important part in most illnesses. If we as researchers know about these feelings we will be able to help you more. The questions below are designed to help us as researchers know how you feel. I will read each item and the relevant responses to you. Please tell me which response comes closest to how you have been feeling in the PAST WEEK. When thinking about your response, do not take too long: your first reaction probably is more accurate than a long thought out response.

6.1 Ke ikutlwa ke tsetsepane methapo ya botho:
I feel tense or 'wound up':

Kanako tsohle	Most of the time	3	6.1
Ka nako tsohle	A lot of the time	2	
Nako le nako	Time to time, occasionally	1	
Ho hang	Not at all	0	

6.2 Ke ntse ke natefelwa ke tseo ke di ratang:
I still enjoy the things I used to enjoy:

Haholo-holo	Definitely as much	0	6.2
Eseng hakalo	Not quite so much	1	
Hanyane	Only a little	2	
Ho hangl	Not at all	3	

6.3 Ke ikutlwa ke tshohile ekare ho na le ntho etla etsahala:
I get a sort of frightened feeling like something awful is about to happen:

Haholo-holo	Very definitely and quite badly	3	6.3
Ee, empa e seng haholo	Yes, but not too badly	2	
Hanyane empa ha e ntshwenye	A little, but it doesn't worry me	1	
Hohang	Not at all	0	

6.4 Ke kgona ho tsheha le ho bona lehlakore le tshehisang dinthong: I can laugh and see the funny side of things:

Ka bongata bo ke bo kgonang	As much as I always could	0	6.4
E seng haholo jwale	Not quite so much now	1	
E seng hakalo kalo jwale	Definitely not so much now	2	
Hoahng	Not at all	3	

6.8 Ke ikutlwa ke tepelletse:
I feel as if I am slowed down:

Ha holoholo ka nako tsohle	Nearly all of the time	3	6.1
Kgafetsa kgafetsa	Very often	2	6.8
Ka nako tse ding	Sometimes	1	
Ho hangl	Not at all	0	

6.9 Ke na le ho ba le letswalo ke sa ikutlwi hantle:
I get a sort of frightened feeling like 'butterflies in the stomach':

Ho hang	Not at all	0	6.2
Ka nakoengwe	Occasionally	1	6.9
Hangata nyana	Quite often	2	
Hangata ngata	Very often	3	

6.10 Ha ke sa kgathalla tjhebeho ya ka:
I have lost interest in my appearance:

Hantle	Definitely	3	6.3
Ha ke itlhokomele jwale ke ha ke thswanetse	I don't take as much care as I should	2	6.10
Ha ke e nnkelle hlohong hakalo	I may not take quite as much care	1	
Ke ntse ke itlhokomela jwale ka pele	I take just as much care as ever	0	

6.11 Ke ikutlwa ke sa phutholoha eka nka dula ke tsamaya:
I feel restless as if I have to be on the move:

Haholo-holo	Very much indeed	3	6.4
Hangata	Quite a lot	2	6.11
E seng haholo	Not very much	1	
Hohang	Not at all	0	

6.5 Ke na le menahano e kgathatsang:
Worrying thoughts go through my mind:

Nako e ngata-ngata	A great deal of the time	3
Nako e ngata	A lot of the time	2
Mohlang le mohlang	From time to time but not too often	1
Nako e itseng	Only occasionally	0

6.6 Ke ikutlwa ke thabile:
I feel cheerful:

Hohang	Not at all	3
E seng hangata	Not often	2
Mohlang	Sometimes	1
Hangata	Most of the time	0

6.7 Ke kgona ho dula ke phomole ke kgatholohe:
I can sit at ease and feel relaxed:

Haholo	Definitely	0
Kgafetsa-kgafetsa	Usually	1
E seng hangata	Not often	2
Hohang	Not at all	3

6.12 Ke na le morolo wa ho ithabisa dinthong:
I look forward with enjoyment to things:

Jwale ka pele	A much as I ever did	0
Hanyane ho feta pele	Rather less than I used to	1
Ka nnete hanyane ho feta pele	Definitely less than I used to	2
Hohang	Hardly at all	3

6.13 Ke ba le letswalo:
I get sudden feelings of panic:

Hangata ka nnete	Very often indeed	3
Hangata	Quite often	2
E seng hangata	Not very often	1
Hohang	Not at all	0

6.14 Ke kgona ho dula ke thabela ho bala, ho mamela radio kapa hoshebella t.v.: I can enjoy a good book or radio or TV programme:

Hangata-ngata	Often	0
Ke nako tse ding	Sometimes	1
E seng hangata	Not often	2
Nakong e itseg	Very seldom	3

6.5
6.12
6.6
6.13
6.7
6.14

OFFICE USE ONLY:

NOTES:

7. ANTI-RETROVIRAL TREATMENT AND TREATMENT ADHERENCE

Di potso tse latelang di mabapi le kalafo ya hao e fetileng ya meriana ya di ARV i.e pele o kena programeng ya mmuso (re sa bale PMTCT le PEP).

The following questions relate to your PREVIOUS ARV treatment, i.e. prior to enrolling in government's treatment programme (EXCLUDING PMTCT & PEP).

7.1 O kile wa fumana di ARV pele o kena programeng ya mmuso?
Have you PREVIOUSLY received ARV treatment BEFORE starting government's treatment programme?

Please mark ONE option ONLY.

No	0	→ 7.6
Yes	1	→ 7.2

ONLY include previous ARV treatment outside of the current public sector ART programme.

7.2 O qadile neng ho nka di ARVs? When did you FIRST start taking ARVs?

Day	Month	Year
		20

/ /

7.3 O na le nako e kae o sebedisa di ARVs?
For approximately how long were you on ARV treatment?

Weeks	Months	Years

/ /

7.4 O ile wa kgaotsa kapa wa tlohela ha o ne qala ka meriana ya hao programong ya mmuso?
Did you interrupt or discontinue your treatment prior to commencing your current treatment in government's ARV treatment programme?

Please mark ONE option ONLY.

No	0	→ 7.6
Yes	1	→ 7.5

7.5 O ile wa kgaotsa nako e kae ha o hopola?
For approximately how long did you interrupt your ARV treatment?

Weeks	Months	Years

Dipotso tse latelang di mabapi le meriana ya hao hona jwale programong ya mmuso ka di ARV.
The following questions relate to your CURRENT ARV treatment in government's ARV treatment programme.

7.6 Ke ka makgetlo a makae o utlwa o na le mathata kapa boima ha o tlameha ho nka meriana ya hao ka nako? Ka nako re hlalosa hore, ho feta dihora tse pedi kapa tse pedi kamorao ha nako eo o tlamehileng ho nwa meriana jwalo ka haa o hlaloseditswe?

Do NOT read out the options below.

How often do you feel that you have difficulty taking your ARV medications on time? By 'on time' we mean no more than two hours before or two hours after the time you are supposed to take your pills, as prescribed?

Please mark ONE option ONLY.

Ka nako tsohle	All the time	1
KA nako tse ding	Most of the time	2
HA ho etsahale	Rarely	3
Ho hang	Never	4

7.7 Mahareng,Ke matsatsi a makae bekeng, eo ekareng o ile wa hloleha ho nwa meriana ya hao?

Do NOT read out the options below.

On average, how many days PER WEEK, would you say that you missed at least ONE dose of your ARV medications?

Please mark ONE option ONLY.

Mehlaena	Every day	1
Matsatse a 4 hoya ho a 6 bekeng	4-6 days per week	2
Matsatsi a 3 hoya a 7 bekeng	2-3 days per week	3
Hangwe bekeng	Once a week	4
Ka tlase hp beke	Less than once a week	5
Hohang	Never	6

7.8 Ke nako efe eo o ileng wa fetwa ke honwa pidisi ya hao ya di ARVs?

Do NOT read out the options below.

When was the LAST time you missed at least ONE dose of your ARV medications?

Please mark ONE option ONLY.

Kahare ho beke a fitileng	Within the past week	1
Bekeng e le 1 ho ya ho tse 2	1-2 weeks ago	2
Bekeng tse 3 ho ya ho tse 4	3-4 weeks ago	3
Mahareng akgwedi ho ya ho tse 3 tse fetileng	Between 1 and 3 months ago	4
Hofeta kgweding tse tharo	More than 3 months ago	5
Hohang	Never	6

7.9 Ke matsatsing a ma kae bekeng e fetileng ao o sakang wa nwa meriana ya hao ka tsela e nepahetseng? How many days, during the LAST WEEK, have you NOT taken all your drugs appropriately (i.e. exactly as prescribed by the doctor)?

Please mark ONE option ONLY.

0	1	2	3	4	5	6	7

NOTES:

7.10 O ka ipeya hore o kgona ho nwa meriana boemong bofe kgweding e fetileng jwale kaha o ne o tlamehile, Sekaleng sa 0 ho fihlela ho 10; moo 0 e bolelwa hore "HA ke nwe dipidisi" 10 yona e bolela hore "Ke nwa dipidisi ka nako e lokileng le palo e lokileng ya dipidisi"?

Please mark ONE option ONLY.

How would you rate your adherence in the PAST MONTH to taking your ARV medication as you are supposed to, on a scale of zero to ten, where 0 means "I take no pills" and 10 means "I take all my pills on the right time and at the right dosage"?

OFFICE USE ONLY:

0	1	2	3	4	5	6	7	8	9	10

7.11 Ke dintho dife tse tharo tsa bohlokoa tseo o hopotsang ho nwa meriana ya hao?

Record as much DETAIL as possible.

What are the THREE most important things that help you to remember to take your ARV medication?

1 ----------

2 ----------

3 ----------

If nothing, record 'none' and ➔ **7.13**.

7.12 Ho tsona dintho tseo o di boletseng tse tharo, ke efe ho tsona e bohlokwa eo e o hopotsang ka meriana?

Note the NUMBER ONLY of the relevant answer above.

Of the things that you have listed, which is the ONE most important thing that helps you remember to take your ARV medication?

7.13 Ke mabaka a feng a mararo a bohlokoa a etsang hore o lebala ho nwa meriana ya hao?

Record as much DETAIL as possible.

What are the THREE most important reasons why you sometimes forget to take your ARV medication as prescribed?

If nothing,

1 ----------

record 'none' and ➔ 8.1.

2 _____

3 _____

Note the NUMBER ONLY of the relevant answer above.

7.14 Mabakeng ao o a boletseng ka hodimo, ke lefe ho ona la bohlokwa le etsang hore o lebale ho nwa meriana?

Of the reasons you have listed, which is the ONE most important reason you sometime forget to take your ARV medication?

_____

8. SIDE-EFFECTS TO ANTI-RETROVIRAL TREATMENT

Jwale ke rata ho o botsa dipotso mabapi le di side effects tseo o yeng o be le tsona ha o nwa meriana ya di ARV.

Now I need to ask you some questions about the side effects you may experience when taking your ARV drugs.

Mark ONE option ONLY.

8.1 Ho ye ho etsahale hore o ikutlwe o se hantle ka baka la di ARV?

Do you sometimes feel worse as a result of having to take your ARV drugs?

No	0	➔ **Section 9**
Yes	1	➔ **8.2**

ONLY record up to five symptoms, i.e. the most common symptoms. Describe the side-effects in as much detail as possible.

READ out the options for question 8.3. Mark ONE option ONLY.

	8.2 Ke matshwao a fe ao o fumanang ka lebaka la ho sebedisa di ARV? Which symptoms do you typically experience as a result of taking your ARV drugs? Hlalosa / Description of side effects:	**8.3 A o tshwenya ka tsela e jwang?** How disruptive is this particular symptom to you? **Hohang** Not at all	**Matsatsi a mang** Somewhat	**Haholo** Very
1		1	2	3
2		1	2	3
3		1	2	3
4		1	2	3
5		1	2	3

NOTES:

Answers apply to the LAST visit to the particular facility for this PARTICULAR PURPOSE, i.e. to collect your ARV medication OR to have a routine ARV treatment check-up. Ask questions for BOTH types of visits.

Do NOT read out the options. Please mark ONE option ONLY.

If nothing was spent record, 'ZERO' or '0'. If the person cannot remember record, 'do not know'.

9. VISITS TO HEALTH CARE FACILITIES FOR COLLECTION OF ARV DRUGS AND FOR MONITORING AND FOLLOW-UP

OFFICE USE ONLY:

Karolo ena e buwa ka maeto a hao dibakeng tsa phano ya di ART. This section deals with your visits to designated ART facilities.

	Lata dipidisi kgetlong la ho qetela? Collect your ARV medication the LAST time?	**Ho ya dihlahlobong kgetlong la hoqetela (cd4 le viral load)?** Have your LAST routine ARV check-up and CD4 and viral load test?
9.1 O ya sebakeng sefe sa bophelo bo botle [….....]? At which specific health care facility did you […….....]?	[Write name of the facility here]	[Write name of the facility here]
9.2 O ile neng kgetlong la ho qetela [SEBAKA]? When was your LAST visit to [FACILITY] for this purpose?	Month: / Year:	Month: / Year:
9.3 O fihlile jwang moo [SEBAKA]? How did you get to [FACILITY]?	Ke tsamaya ka maoto / Walked 1	Ke tsamaya ka maoto / Walked 1
	Ke tsamaya ka tekesi / Bese / Took a taxi or bus 2	Ke tsamaya ka tekesi / Bese / Took a taxi or bus 2
	Ka koloi yaka / Used own transport 3	Ka koloi yaka / Used own transport 3
	Ke ile ka kopa motho a ntlise / Got a free lift with someone else 4	Ke ile ka kopa motho a ntlise / Got a free lift with someone else 4
	Ka koloi ya sepetlele / Dept of Health commuter transport/ambulance 5	Ka koloi ya sepetlele / Dept of Health commuter transport/ambulance 5
	Ke patetse motho e mong hore a ntlise / Paid someone else (excl. a taxi) to bring me 6	Ke patetse motho e mong hore a ntlise / Paid someone else (excl. a taxi) to bring me 6
	Tseding (Hlalosa): / Other (specify):	Tseding (Hlalosa): / Other (specify):
9.4 Ha o ne o tlamehile ho patala, o sebedisitse bokae ho fihla moo? If you had to pay, how much did it cost you to get there, i.e. to make a SINGLE trip?	Rand per SINGLE trip:	Rand per SINGLE trip:
9.5 O nkile nako e kae ho fihla moo kliniking, ho tloha nakong eo o tlohang lapeng? How long did it take you to get to [FACILITY] from the time you left home to the time you arrived there, i.e. to make a SINGLE trip?	Hours: / Minutes:	Hours: / Minutes:

Read OUT the types of costs. If nothing was spent record, 'ZERO' or '0'. If the person cannot remember record, 'do not know'.

9.6 Ke eng hape eo o e patalletseng ha o ne ole kliniking? [SEBAKENG]?
What other costs did you incur during your last visit to [FACILITY]?

Tjhelete ya ho hlahlobiwa / Consultation fee	Cost per VISIT (Rand)	Cost per VISIT (Rand)
Bodulo / Accommodation	Cost per VISIT (Rand)	Cost per VISIT (Rand)
Dijo / Subsistence	Cost per VISIT (Rand)	Cost per VISIT (Rand)
Ditshenyehelo tse ding / Other costs	Cost per VISIT (Rand)	Cost per VISIT (Rand)

NOTES:

	COLLECTION OF ARV MEDICATION	ROUTINE ARV CHECK-UPS AND TESTS	OFFICE USE ONLY:
Do NOT read out the options. Please mark ONE option ONLY. **9.7 O ile wa hlolwa ke ho ya mosebetsing ka hobane o tshwanela ho ya kliniking?** Did you miss work as a result of having to visit [FACILITY]?	Yes 1 → 9.8; No, but employed 2 → 9.10; No, but not employed 3 → 9.10	Yes 1 → 9.8; No, but employed 2 → 9.10; No, but not employed 3 → 9.10	
Please mark ONE option ONLY. **9.8 Ha eba karabo ya hao ke Ee, o ile wa lahlehelwa ke dihlapiso?** If YES, did you loose income as a result?	No 0 → 9.10; Yes 1 → 9.9	No 0 → 9.10; Yes 1 → 9.9	
If nothing was spent record, 'ZERO' or '0'. If the person cannot remember record, 'do not know'. **9.9 Ha eba karabo ya hao ke Ee, o ile walahlehelwa ke dihlapiso tse kae?** If YES, how much income did you loose as a result?	Rand:	Rand:	
9.10 O ile wa ema nako e kae pele o ka fumana thuso? How long did you have to wait during your last visit at [FACILITY] to see the nurse, doctor or other health care worker?	Hours: Minutes:	Hours: Minutes:	
Please mark ONE option ONLY. **9.11 Kgweding tse tsheletseng tse fetileng, na oile wa tsamaya tliliniki o sa fumana thuso?** In the past SIX months, have you ever left [FACILITY] without being helped?	No 0 → 9.13; Yes 1 → 9.12	No 0 → 9.13; Yes 1 → 9.12	
9.12 Ha karabo ya hao e le Ee, hobaneng o ile wa tsamaya osa thuswa? If YES, why did you leave [FACILITY] without being helped?	MAIN reason why not helped:	MAIN reason why not helped:	

Please mark ONE option ONLY.

9.13 Kgweding tse tsheletseng tse fetileng, na oile wa fosa ho ya dihlahlobong tsa baoki?
In the past six months, have you ever missed an appointment at [FACILITY]?

No	0	→	9.15
Yes	1	→	9.14

MAIN reason why you missed an appointment:

No	0	→	9.15
Yes	1	→	9.14

MAIN reason why you missed an appointment:

9.14 Ha karabo ya hao e le Ee, hobaneng o ile wa fosa ho ya hlahlobong?
If YES, why did you miss an appointment?

NOTES:

9.15 Ka kakaretso, o kgotsofetse ha kae ke tse latelang:
In GENERAL, how satisfied are you with the following:

READ out EACH of the statements AND the responses.

Please circle ONE option ONLY for each of the statements.

	COLLECTION OF ARV MEDICATION				ROUTINE ARV CHECK-UPS AND TESTS			
	Ha ke a kgotsofala hohang Very dissatisfied	**Ha ke a kgotsofala** Dissatisfied	**Ke kgotsofetse** Satisfied	**Ke kgotsofetse haholo** Very satisfied	**Ha ke a kgotsofala hohang** Very dissatisfied	**Ha ke a kgotsofala** Dissatisfied	**Ke kgotsofetse** Satisfied	**Ke kgotsofetse haholo** Very satisfied
Thuso ya ditlhare e ho fanwang ka yona Medical care provided	1	2	3	4	1	2	3	4
Tsela eo ditletlebo di sebetswang Complaint procedure	1	2	3	4	1	2	3	4
Bohlweki ba sebaka seo Cleanliness	1	2	3	4	1	2	3	4
Lekunutu phaposing ya tlhatlhobo Privacy during examinations	1	2	3	4	1	2	3	4
Hlompho ho tswa ho basebeletsi Respect shown to you by staff	1	2	3	4	1	2	3	4
Lekunutu la polokelo ya di file tsa hao Confidentiality of your medical record	1	2	3	4	1	2	3	4
Dintlha tsa bophelo mabapi le HIV Health information provided about HIV/AIDS	1	2	3	4	1	2	3	4
Dintlha tse o di fumang ka botlalo ka ARVs Information provided about ARV medication	1	2	3	4	1	2	3	4

OFFICE USE ONLY:

	Monyetla wa ho botsa bathusi dipotso Opportunity to ask questions to service providers	1	2	3	4	1	2	3	4		
	Puo e sebediswang ha o thuswa Language used during consultations	1	2	3	4	1	2	3	4		
	Nako e ho bulwang ka yona Hours that [SITE] is open	1	2	3	4	1	2	3	4		
	Nako e o e emang pele o ka thuswa Waiting time before consultations	1	2	3	4	1	2	3	4		
Please mark ONE option ONLY.	**9.16 Na o nale ditletlebo / mathata ka ditshebeletso tse fanwang moo?** Do you have any complaints of or problems with the services provided at this facility?	No	0	➔	**Section 10**	No	0	➔	**Section 10**		
		Yes	1	➔	**9.17**	Yes	1	➔	**9.17**		
Do NOT record ANY positive perceptions or compliments.	**9.17 LEMOHA: Haeba karabo yahao e le Ee, ke mathata a mofuta ofe?** If YES, what is the nature of your problem or complaint?	Description of MAIN complaints or problems:				Description of MAIN complaints or problems:					

NOTES:

List the FIRST name ONLY of this person, or, alternatively, describe the relationship. Record 'n/a' if fewer than three persons. Ask these questions for each person.

10. DISCLOSURE TO SIGNIFICANT OTHERS

OFFICE USE ONLY:

Jwale ke tla o botsa dipotso maelana le mokgwa kapa tsela eo o buileng le batho ba bang ka boemo ba hao ba HIV.
Next I will ask you questions regarding the extent to which you have talked to others of your HIV status.

	1.	2.	3.	
10.1 Ke bomang batho ba bararo ba bohlokwa bophelong ba hao? Who are the THREE MOST IMPORTANT people in your life?	_____	_____	_____	1 2 3
Do NOT read out the options. Mark ONE option ONLY. **10.2 Le kopantshwa ke eng le motho o?** What is this person's relation to you?	Molekane 1 Motswadi (mme/ntate) 2 Ngwana hao 3 Ngwana heno (ausi/aubuti) 4 Ba bang ba leloko 5 Motswalle 6 Mosebetsi mmoho 7 Tseding (Hlalusa):	Spouse/partner 1 Parent (mother/father) 2 Child 3 Sibling (brother/sister) 4 Other family member 5 Friend 6 Colleague at work 7 Other (specify):	Molekane 1 Motswadi (mme/ntate) 2 Ngwana hao 3 Ngwana heno (ausi/aubuti) 4 Ba bang ba leloko 5 motswalle 6 Mosebetsi mmoho 7 Tseding (Hlalusa):	
Mark ONE option ONLY. **10.3 A motho eo o wa tseba hore o HIV positive?** Does this person know that you are HIV positive?	No 0 → 10.4 Yes 1 → 10.5 Do not know 2 → 10.4	No 0 → 10.4 Yes 1 → 10.5 Do not know 2 → 10.4	No 0 → 10.4 Yes 1 → 10.5 Do not know 2 → 10.4	
Do NOT read out the options. Based on the reason described by the respondent, ONLY mark the ONE most applicable code. **10.4 Hao so ka o ipolela maemo a hao ho motho enwa. O kare ke lefe lebaka le bohlokwa le o thibeletsang hore o seke wa buwa?** If you have NOT yet disclosed your HIV status to this person, what would you say is the ONE MOST IMPORTANT reason keeping you from doing so?	Tokelo ya hoba le lekunutu la hao 1 Wa ikahlola/ ho thata ho amohela status sa hao 2 Ha le kgone hoba le dipuisano 3 Tshabo ya ho nyahlatsuwa 4 O batla ho sireletsa motho enwa a seke a utlwa bohloko 5 Tseding (Hlalusa): → Section 11	Right to privacy 1 Self-blame/difficulty accepting own HIV status 2 Communication difficulties 3 Fear of rejection 4 Want to protect the person from the worry/pain 5 Other (specify): → Section 11	Tokelo ya hoba le lekunutu la hao 1 Wa ikahlola/ ho thata ho amohela status sa hao 2 Ha le kgone hoba le dipuisano 3 Tshabo ya ho nyahlatsuwa 4 O batla ho sireletsa motho enwa a seke a utlwa bohloko 5 Tseding (Hlalusa): → Section 11	
Do NOT read out the options. Based on the reason described by the respondent, ONLY mark the ONE most **10.5 Ha o dumela, o kare ke lefe lebaka le bohlokwa le entseng hore o mojwetse ka maemo a HIV ho motho enwa?** If YES, what would you say is the ONE MOST	Ke e kutlwile nka re nkajwetsa motho 1 Ke mosebetsi waka u jwetsa bathu babang 2 Ho lika maikutlo abathu ba bang 3 Ke motswale kapa wa leloko 4	Just had to share this information with someone 1 Duty to tell other person 2 Test other person's reaction 3 Close/supportive relationship 4	Ke e kutlwile nka re nkajwetsa motho 1 Ke mosebetsi waka u jwetsa bathu babang 2 Ho lika maikutlo abathu ba bang 3 Ke motswale kapa wa leloko 4	

applicable code.	IMPORTANT reason you disclosed your HIV status to this particular person?	Une ana le bona bothata bona	5	Similarity/shared experiences	5	Une ana le bona bothata bona	5	
		Tseding (Hlalusa):		Other (specify):		Tseding (Hlalusa):		

NOTES:		1.		2.		3.		OFFICE USE ONLY: 1 2 3
Do NOT read out the options. Based on the event described by the respondent, ONLY mark the ONE most applicable code – where necessary probe to clarify the circumstances surrounding the disclosure event.	**10.6 O mo jwetsitse jwang kapa o mo lemohisitse jwang ka boemo ba hao ba HIV?** How did you tell this person or made this person aware of your HIV status?	Ke mojweditse matlhong re u tlwana (i.e Kafoni)	1	Told the person personally and directly (i.e. during a face-to-face or telephonic conversation)	1	Ke mojweditse matlhong re u tlwana (i.e Kafoni)	1	
		Ke mojweditse empa asa nkutlwi (e.g. mo ngoletsi SMS)	2	Told the person personally, but indirectly (e.g. in a letter or SMS)	2	Ke mojweditse empa asa nkutlwi (e.g. mo ngoletsi SMS)	2	
		Kebasietsi dilo tse dikabafang mohlala(e.g dipilisi)	3	Left non-verbal clues (e.g. left pills around)	3	Kebasietsi dilo tse dikabafang mohlala(e.g dipilisi)	3	
		Ke mokopile hore etsame lena hoa u etsa ditiko empa ke ntse ke tseba ma emo aka	4	Asked this person to go with for an HIV test, although already knowing my own status	4	Ke mokopile hore etsame lena hoa u etsa ditiko empa ke ntse ke tseba ma emo aka	4	
		Re ele ho etsa ditiko moho kaba ka tsiba ma emo aka a HIV kena le e na motho enwa	5	Went for an HIV test together and learnt my own HIV status only then, together with this person	5	Re ele ho etsa ditiko moho kaba ka tsiba ma emo aka a HIV kena le e na motho enwa	5	
		Ke kopile motho wa boraro hoe a mo jwetse	6	Directly asked a third person to tell this person	6	Ke kopile motho wa boraro hoe a mo jwetse	6	
		Ke file motho wa boraro mohlala ho re a mo jwetse	7	Indirectly hinted to a third party to tell the person	7	Ke file motho wa boraro mohlala ho re a mo jwetse	7	
		Ke tshepile motho wa boraro hore o tla ba jwetsa kahofela babatlang ho tsiba	8	Trusted a third party who knows will tell everyone who needs to know	8	Ke tshepile motho wa boraro hore o tla ba jwetsa kahofela babatlang ho tsiba	8	
		Tseding (Hlalusa):		Other (specify):		Tseding (Hlalusa):		
	10.7 Ke neng kgetlong la pele ha o ne o jwetsa batho ka boemo ba hao? WHEN did you FIRST disclose your HIV status to this person?	Month:		Month:		Month:		
		Year:		Year:		Year:		

	10.8 Ebe ho bohlokwa ho rona ho utlwisisa ditlamorao tsa ho ipolela. Kekopa o re hlalosetse hore na motho enwa eo o mo jwetsitseng ka maemo a hao o ile a o fetola jwang: It is important for us to understand consequences of disclosure. Please can you tell me the extent to which the following reactions characterised the person's INITIAL response on learning your HIV status:	**Hohang** Never	**Ka nako tse ding** Some-times	**Ka nako tsohle** Always	**Hohang** Never	**Ka nako tse ding** Some-times	**Ka nako tsohle** Always	**Hohang** Never	**Ka nako tse ding** Some-times	**Ka nako tsohle** Always	
READ out each of the	**(a) [MOTHO] a ileng a o utlwisisa** / [PERSON] was understanding	0	1	2	0	1	2	0	1	2	

statements AND the response scales. Circle ONE applicable code ONLY for each statement.												
	(b) [MOTHO] a ileng ampha tshehetso ya maikutlo / [PERSON] provided emotional support to me	0	1	2	0	1	2	0	1	2		
	(c) [MOTHO] a ileng a o khesa / [PERSON] rejected me	0	1	2	0	1	2	0	1	2		
	(d) [MOTHO] a ileng a o kwatela / [PERSON] was angry with me	0	1	2	0	1	2	0	1	2		
	(e) [MOTHO] a ileng a o swabela/ [PERSON] was disappointed in me	0	1	2	0	1	2	0	1	2		
	(f) [MOTHO] a ileng ampha tshehetso melleng / [PERSON] provided physical support to me	0	1	2	0	1	2	0	1	2		

NOTES:

	1.			2.			3.			OFFICE USE ONLY:		
										1	2	3
10.9 Ke hofihlela boemong bofe hore diketsa tse latelang ho tswa ho motho enwa maelana le wena kabaka la hoba HIV. To what extent do the following reactions characterise the CURRENT response of this person to your HIV status:	**Hohang** Never	**Ka nako tse ding** Some-times	**Ka nako tsohle** Always	**Hohang** Never	**Ka nako tse ding** Some-times	**Ka nako tsohle** Always	**Hohang** Never	**Ka nako tse ding** Some-times	**Ka nako tsohle** Always			
READ out each of the statements AND the response scales. Circle ONE applicable code ONLY for each statement.												
(a) [MOTHO] a ne a o utlwisisa / [PERSON] is understanding	0	1	2	0	1	2	0	1	2			
(b) [MOTHO] o mphile tshehetso ya maikutlo / [PERSON] provides emotional support to me	0	1	2	0	1	2	0	1	2			
(c) [MOTHO] a ile a o khesa / [PERSON] rejects me	0	1	2	0	1	2	0	1	2			
(d) [MOTHO] a ile a o kwatela [PERSON] is angry with me	0	1	2	0	1	2	0	1	2			
(e) [MOTHO] a ile a o swabela / [PERSON] is disappointed in me	0	1	2	0	1	2	0	1	2			
(f) [MOTHO] o mphile tshehetso melleng / [PERSON] provides physical support to me	0	1	2	0	1	2	0	1	2			

11. STIGMA , DISCRIMINATION AND COPING WITH HIV/AIDS

Karolo ena e nale dipotso mabapi le monahano wa hao mabapi le, HIV/AIDS le ka tsela eo wena o kgonang ho phela le yona. Ha hona potso e nepahetseng le e fosahetseng.

This section contains questions about perceptions related to HIV and AIDS and how you have personally dealt with living with HIV and AIDS. There are no correct or wrong answers to these statements.

11.1 Ke ho fihlela hora o dumellana kapa ho hanana le dipotso tse latelang, ha o hopola ka mehopolo eo wena kapa ba bang malebana le HIV/AIDS: KAKOPO, O SEKE WA NKA DINTLHA TSENA JWALOKA TSEBO MAELANA LE HIV/AIDS.

To what extent do you agree/disagree with the following statements reflecting the perceptions that you or others may have of HIV and AIDS: PLEASE, DO NOT TAKE THESE STATEMENTS AS INFORMATION ABOUT HIV and AIDS.

READ out each of the statements AND the responses.

Circle ONE applicable code ONLY for each statement.

	Statement:	Ha ke dumele hohang Strongly disagree	Ha ke dumele Disagree	Ke a dumela Agree	Ke dumela haholo Strongly agree	
1	**Ke ile ka utlwiswa bohloko ka tsela eo batho bankileng ka teng maelana le ha ke nale HIV/AIDS** / I have been hurt by how people reacted to learning I have HIV/AIDS	1	2	3	4	
2	**Ke kemisetse ho ithabisa le batho ka lebaka maitshwaro a bona ha ba utlwa hore ke na le HIV/AIDS** / I have stopped socialising with some people because of their reactions to my having HIV/AIDS	1	2	3	4	
3	**Ke lahlehetswe ke metswalle ka lebaka la hore ke ba jwetse ka boemo ba ka** / I have lost friends by telling them I have HIV/AIDS	1	2	3	4	
4	**Ke kgetha ka hloko hore na ke bolella bomang ka boemo ba ka** / I am very careful who I tell that I have HIV/AIDS	1	2	3	4	
5	**Kea tshwenyeha hore batho ba tsebang ka boemo baka ba tla bolella ba bang** / I worry that people who know I have HIV/AIDS will tell others	1	2	3	4	
6	**Ke ikutlwa ke se motle jwalo ka batho ba bang hobane ke na le HIV/AIDS**/ I feel that I am not as good a person as others because I have HIV/AIDS	1	2	3	4	
7	**Tshwaetso ena e etsa hore ke ikutlwe ke sa hlweka/ ditshila**/ Having HIV/AIDS makes me feel unclean	1	2	3	4	
8	**Tshwaetso ena e nketsa eke ke motho ya mobe**/ Having HIV/AIDS makes me feel that I'm a bad person	1	2	3	4	

NOTES:

11.2 Bontsha hore na dipolelong tse latelang ke dife tse botshang hore na o kgona jwang ho phela le lefu lena la HIV/AIDS. Bontsha hore na wa dumellana le polelo ka ho araba ka EE kapa TJHE:

Please can you tell me which of the following statements describes how you are currently dealing with living with HIV and AIDS by answering 'yes' or 'no' to each of the following statements:

OFFICE USE ONLY:

READ out each of the statements AND the responses.

Circle ONE applicable code ONLY for each statement.

	Statement:	Ee Yes	Tjhe No	
1	**Na o lekile ho ithuta ha holwanyane ka HIV/AIDS** You have tried to learn more about HIV and AIDS	1	0	
2	**Na o amohetse boemo ba hao** You have accepted it	1	0	
3	**Na o nahana ka batho ba hlokang ho o feta** You think about people who are less fortunate than you	1	0	
4	**Na o nahana ka dintho tse o hahang** You look on the bright side	1	0	
5	**Na o itukisetsa bokamoso** You make plans for the future	1	0	
6	**Na o leka ka thata ho itebatsa** You try to push it out of your mind	1	0	
7	**Na o nahana ka nako tse fetileng ha hone ho le monate** You think about better times in the past	1	0	
8	**Na o nwa jwala kapo usebedisa dithethefatse ho ho kokobetsa maikutlo** You make yourself feel better by drinking or taking recreational drugs	1	0	
9	**Ha o batle ho dula le batho ba bang** You avoid being with people	1	0	
10	**O tswela pele ka bophelo jwalo ka ha eka haho letho le fetohileng** You go on with your life as if nothing has happened	1	0	
11	**O boloka maikutlo a hao ka ho wena** You keep your feelings to yourself	1	0	
12	**O ikutlwela bohloko** You feel sorry for yourself	1	0	
13	**Ha o batle ha batho ba bang ba tseba ha ho le thata** You keep others from knowing how bad things are	1	0	
14	**O ikutlwa ole mosito hoo ekareng o ka senya dintho** You feel so angry that you want to hit or smash something	1	0	
15	**O batla kgothatso le kutlwisiso ho tswa ho metswalle** You seek sympathy and understanding from friends	1	0	
16	**O kopa dikeletso ho tswa ho metswalle le ba lelapa** You ask friends or relatives for advice	1	0	

12. ACCESS TO AND USE OF NUTRITIONAL SUPPLEMENTS PROVIDED IN THE ART PROGRAMME

Mona dipotso di mabapi le tsela ya phepo programeng ya goromente ha ba fana ka.
Now I need to ask you some questions about the nutritional supplement government provides to patients on ARV treatment.

12.1 Na o fumana dithuso tsa dijo tse fuwang bakudi e le karolo ya programa yaphekulo kaARV?
Are you CURRENTLY receiving the FOOD SUPPLEMENTS distributed to patients as part of government's ARV treatment programme?

Mark ONE option ONLY.

No	0	➔ 12.6
Yes	1	➔ 12.2

12.2 O qadile neng ho fumana dijo?
When did you FIRST start receiving these FOOD SUPPLEMENTS?

Record month AND year.

Month | 20 | Year

12.3 A wena o wa di sebedisa di thuso tsa dijo?
Do you yourself actually eat any of this FOOD SUPPLEMENT?

Mark ONE option ONLY.

No	0
Yes	1

12.4 Na o arolelana dijo tse le batho bao o dulang le bona?
Do you share these FOOD SUPPLEMENTS with others?

Mark ONE option ONLY.

No	0	➔ 12.6
Yes	1	➔ 12.5

OFFICE USE ONLY:

NOTES:

12.5 O arolelana dijo tse le batho bafe o dulang le bona?
With whom do you share these FOOD SUPPLEMENTS?

Do NOT read out the options.

Mark ALL APPLICABLE options.

Molekane Spouse/partner	1
Motswadi (mme/ntate) Parents (mother/father)	2
Bana ba ka Children	3
Bana beso (abuti/ausi) Siblings (brother/sister)	4
Batho ba bang ba lelapa Other family relations	5
Batho bao eseng ba lelapa empa re dula le bona Other non-family household members	6
Tseding (Hlalusa): Other (specify):	

➔ Section 13

ONLY refer to receipt of supplements while ON ARV treatment.

12.6 Haeba ha o fumane dijo hona jwale, naibe okile wa di fumana nakong e fetileng ho tswa programeng ya mmuso ya di ARV?
If NOT CURRENTLY receiving these FOOD SUPPLEMENTS, had you PREVIOUSLY received the FOOD SUPPLEMENTS distributed to patients as part of government's ARV treatment programme?

Mark ONE option ONLY.

No	0	➔ Section 13
Yes	1	➔ 12.7

12.7 O qetetse neng ho fumana dijo tseo?
When did you STOP receiving these FOOD SUPPLEMENTS?

Record month AND year.

Month | 20 | Year

12.8 Ka nako eo, ke nako e kae eo oneng o fumana dijo kantle ho tshitiso?
At the time, for how long had you received the food supplements WITHOUT ANY INTERRUPTION?

Months | Years

12.9 Ho ya ka tsebo ya hao, ke baka lefe le leholo-holo le entseng hore o seke wa hlola o fumana dijo tseo?
In your experience, what was the ONE most important reason why you STOPPED receiving these FOOD SUPPLEMENTS?

12.10 Na wena o ile wa sebedisa/dija dijo tseo?
Did you yourself actually eat any of this FOOD SUPPLEMENT?

Mark ONE option ONLY.

No	0
Yes	1

12.11 Na o ile wa arolelana dijo tseo le batho bao o dulang le bona?
Did you share these FOOD SUPPLEMENTS with others?

Mark ONE option ONLY.

No	0	➔ **Section 13**
Yes	1	➔ **12.12**

12.12 Ke bomang bao o ileng wa arolelana dijo tseo le bona?
With whom did you share these FOOD SUPPLEMENTS?

Do NOT read out the options.

Mark ALL APPLICABLE options.

Molekane Spouse/partner	1
Motswadi (mme/ntate) Parents (mother/father)	2
Bana ba ka Children	3
Bana beso (abuti/ausi) Siblings (brother/sister)	4
Batho ba bang ba lelapa Other family relations	5
Batho bao eseng ba lelapa empa re dula le bona Other non-family household members	6
Tseding (Hlalusa): Other (specify):	

NOTES:

OFFICE USE ONLY:

13. ADHERENCE AND OTHER SUPPORT

Dipotso tse latelang di mabapi le dithuso/sapoto eo o e fumanang. E kaba dithuso dife kapa dife kantle ho tseo o difumanang ho tswa tliliniking/sepetlele.
This section contains questions about the adherence support you receive, EXCLUDING support received from health care workers or any other person when VISITING a health care facility such as a clinic or hospital.

13.1 Na o kile waba le motho ya o thusang (ya o hopotsang ha ele nako ya ho nwa dipilisi)?
Have you EVER PREVIOUSLY had a treatment buddy or supporter (i.e. someone helping you to see that you take your ARV medication)?

Mark ONE option ONLY.

No	0
Yes	1

If the person has more than one treatment supporter, ONLY record details for the PRIMARY buddy, i.e. the person HELPING the patient MOST.

13.2 Hona jwale, na o na le motho ya othusang (ya o hopotsang ha ele nako ya ho nwa dipidisi)?
Do you CURRENTLY have a treatment buddy or supporter (i.e. someone helping you to see that you take your ARV medication)?

No	0	➔ **13.15**
Yes	1	➔ **13.3**

Do NOT read out the options.

ONLY READ out the options for

13.3 Le amana jwang le motho eo? How is your treatment buddy or supporter related to you?		**13.4 Ke motho ya motona/ motshehadi?** What is the sex of this person?	**13.5 Motho eo o dilemo di kae?** How old is this person?	**13.6 O kgotsofetse ha kae ke mokgwa oo motho eo a o thusang ka oona?** How satisfied are you with the support provided by your treatment buddy or supporter?
Motswadi Parent	1			
Molekane Spouse/partner	2			

question 13.6.

Mark ONE option ONLY for each of questions 13.3 to 13.6.

Ngwaneso Sibling	3							
Motswalle Friend	4							
Ngwanaka Child	5							
Moahisane Neighbour	6	Male	Female					
Ba bang (hlakisa): Other (specify):		1	0		1	2	3	4

13.7 Motho eo o o thusa ho le ho kae?

How often does this person help you take your ARV medication?

Do NOT read out the options.

Mark ONE option ONLY.

Ka nako yohle	At every dose time	1
Hoseng	In the mornings	2
Mantsibuya	In the afternoons	3
Bosiu	In the evenings	4
Eseng ka mehla	At irregular intervals	5
Tse ding (hlakisa):	Other (specify):	

13.8 Na motho eo o tsamayathupelo ya tshebediso ya ARV?

Did this person attend ARV drug readiness training?

Mark ONE option ONLY.

No	0
Yes	1

13.9 Ke nako e kae motho eo e le mothusi wa hao?

How long has this person been your treatment buddy or supporter?

	Months
	Years

13.10 Le kopanela kae le mothusi eo wa hao?

Where do you and your treatment buddy or supporter normally meet?

Do NOT read out the options.

Mark ONE option ONLY.

If patient and buddy lives in same house, used code '3'.

Tliniking	At the clinic	1
Ha hae	At his/her home	2
Ha ka	At your own home	3
Mosebetsing	At work	4
Kerekeng	At church	5
Toropong	In town	6
Tse ding (hlakisa):	Other (specify):	

NOTES:

OFFICE USE ONLY:

13.11 Na motho eo o sebedisa di ARV?

Is this person on ARV treatment?

Mark ONE option ONLY.

No	0
Yes	1

13.12 Na wena (ka kopanelo le lelapa) le kile la fana ka dimpho, la etsetsa kapa la patala mothusi ditshebeletsong tsa hae?

Do you (or your family) ever give presents to, do things for, or pay your treatment supporter or buddy for the services they provide to you?

Mark ONE option ONLY.

No	0	➔ 13.15
Yes	1	➔ 13.13

13.13 O ka hlalosa dimpho kapa ditshebeletso tseo lelapa la hao kapa wena le di fileng mothusi wa hao?

Please can you describe the presents, services and/or payments you (or your family) gives your treatment buddy or supporter?

Please provide as much detail as possible.

If the person cannot remember record, 'do not know'.

13.14 Dimpho kapa ditshebeletso tseo dika etsa bokae ha o nahana?
What is the TOTAL estimated value of the presents, services and/or payments you (or your family) have given to your treatment buddy or supporter in the PAST MONTH?

Rand per MONTH

13.15 Na o kile wa etelwa ke mosebeletsi wa tsa bophelo lapeng?
Have you EVER PREVIOUSLY had a community or lay health worker visit you at home?

Mark ONE option ONLY.

No	0
Yes	1

If visited by more than one, ONLY record information of the MOST RECENT community or lay health worker to visit the respondent.

13.16 Hona jwale, na hona le motho ya tswang lekaleng la bophelo ya o etelang?
Do you CURRENTLY have a community or lay health worker (e.g. lay counsellor, home-based carer) who visits you at home?

Mark ONE option ONLY.

No	0	➔ **13.26**
Yes	1	➔ **13.17**

13.17 Ke motho ya motona/motshehadi eo ya o etelang?
What is the sex of the community health worker assigned to you?

Mark ONE option ONLY.

Male	1
Female	0

13.18 Ke ho tloha neng motho eo a o hlokometse/ke nako e kae?
Since when have you had this community health worker to care for and support you at home?

Month:	Year:

13.19 Ke ha kae motho eo a o etelang? How regularly does this person visit you?

Do NOT read out the options. Mark ONE option ONLY.

Daily	5-6 times/week	3-4 times/week	Twice/week	Once/week	Less frequently
1	2	3	4	5	6

13.20 Motho eo o o etela nako e kae? On average, how long do these visits last?

Hours Minutes

13.21 Motho eo ha a o etetse o etsang?
What does this person usually do when he/she visits you?

Describe in as much detail as possible.

NOTES:

OFFICE USE ONLY:

13.22 O kgotsofetse ha kae ke tlhokomelo eo motho eo a o fang yona?
How satisfied are you with the care and support provided by this person?

READ out the options. Mark ONE option ONLY.

Ha kea kgotsofala ho hang Very dissatisfied	Ha kea kgotsofala Dissatisfied	Ke kgotsofetse Satisfied	Ke kgotsofetse haholo Very satisfied
1	2	3	4

13.23 Na wena (ka kopanelo le lelapa) le kile la fana ka dimpho, la etsetsa kapa la patala moithaopi ditshebeletsong tsa hae?
Do you (or your family) ever give presents to, do things for, or pay the community or lay health worker for the services they provide to you?

Mark ONE option ONLY.

No	0	➔ **13.26**
Yes	1	➔ **13.24**

Please provide as much detail as possible.

13.24 O ka hlalosa dimpho kapa ditshebeletso tseo lelapa la hao kapa wena le di fileng moithaopi wa hao?
Please can you describe the presents, services and/or payments you (or your family) gives the community or lay health worker?

_____
_____
_____
_____
_____

If person cannot remember record, 'do not know'.

13.25 Dimpho kapa ditshebeletso tseo dika etsa bokae ha o nahana?
What is the TOTAL estimated value of the presents, services and/or payments you (or your family) have given to the community or lay health worker in the PAST MONTH?

Rand per MONTH

13.26 Na o kile wa eba karolo ya batho ba tshehetsanang ba phelang ka HIV/AIDS (i.e. moo batho ba phelang le HIV/AIDS ba buang ka mathata a ho phela le HIV/AIDS le ditlhare tsa bona tsa ARV)?
Have you EVER PREVIOUSLY participated in a SUPPORT GROUP for people living with HIV/AIDS (i.e. where PLWA meet to discuss issues and problems related to living with HIV, AIDS and/or their ARV treatment)?

Mark ONE option ONLY.

No	0	→ **13.32**
Yes	1	→ **13.27**

If the patient belonged to more than one group previously, ONLY record information on the LAST group.

Do NOT read out the options.

ONLY read OUT the options for question 13.28.

Mark ONE option ONLY for each of questions 13.27 to 13.30.

13.27 Ha ebe ee, le kopanela kae? If YES, where did this group meet?		**13.28 O kgotsofetse ha kae ke tshehetso e o e fumag moo?** How satisfied were you with this support group?				**13.29 Le kopana ha kae?** How often did this group meet?					**13.30 Ke mang ya hlophisang tsamaiso le kopano ya lona?** Who organised and/or coordinated the group's meetings?	
		Kgotsofetse haholo Very satisfied	**kgotsofetse** Satisfied	**Ha ke a kgotsofala** Dissatisfied	**Ha ke a kgotsofala hohang** Very dissatisfied	E fetang hang ka beke More than once per week	Hang ka beke Once per Week	2-3 ka kgwedi 2-3 times per month	Hang ka kgwedi Once per month	Hang ka kgwedi Less frequently		
Tliliniking At the clinic	1	1	2	3	4	1	2	3	4	5	Nna Self	1
Lelapa la hao Own home	2										Lefapha la bophelo Dept of Health	2
Ha motho e mong Someone else's home	3										Lefapha leo eseng la mmuso / NGO	3
Mosebetsing At work	4										Kerekeng Church	4
Kerekeng At church	5										Mosebetsing Workplace	5
Tseding (Hlalosa): Other (specify):											Tseding (Hlalosa): Other (specify):	

NOTES:

OFFICE USE ONLY:

Please provide as much detail as possible.

13.31 O ka hlalosa hobaneng ose karolo ya batho ba tshehetsanang?
Please can you explain why you are not a member of this support group any more?

13.32 Na o karolo ya batho ba tshehetsanang ba phelang le HIV/AIDS (e.g moo batho ba phelang le HIV/AIDS ba kopanang ba bua ka mathata a ho phela le HIV/AIDS le ditlhare tsa ARV)?
Do you CURRENTLY participate in a SUPPORT GROUP for people living with HIV/AIDS (e.g. where PLWA meet to discuss issues and problems related to living with HIV, AIDS and/or their ARV treatment)?

Mark ONE option ONLY.

No	0	➔ 13.33
Yes	1	➔ 13.36

13.33 Ha ebe thje, o ka thabela ho ba karolo ya batho ba etshehetsanang ba phelang ka HIV/AIDS kapa ba sebedisang ditlhare tsa ARV?
If NO, would you like to participate in a support group for people living with HIV/AIDS and/or people on ARV treatment?

Mark ONE option ONLY.

No	0	➔ 13.34
Yes	1	➔ 13.35

13.34 Ka kopo hlakisa karabo ya hao?
Please can you explain your answer?

➔ Section 14

If the person is not willing to spend anything, record 'ZERO'.

13.35 O ikemiseditse ho patala bokae ha otla kopana le batho ba tshehetsanang?
How much would you be willing to pay or spend to visit or meet with such a support group?

Rand per VISIT or MEETING

➔ Section 14

If the person belongs to more than one group, ONLY record information on the group the patient participates in MOST FREQUENTLY.

Do NOT read out the options.

ONLY read OUT the options for question 13.37.

Mark ONE option ONLY for each of questions 13.36 to 13.39.

13.36 Ha ebe ee, le kopanela kae? If YES, where does this group meet?		**13.37 O kgotsofetse ha kae ke tshehetso e o e fumag moo?** How satisfied are you with this support group?				**13.38 Le kopana ha kae?** How often does this group meet?					**13.39 Ke mang ya hlophisang tsamaiso le kopano ya lona?** Who organises and/or coordinates the group's meetings?	
Tliliniking At the clinic	1	**Kgotsofetse haholo** Very satisfied	**kgotsofetse** Satisfied	**Ha ke a kgotsofala** Dissatisfied	**Ha ke a kgotsofala hohang** Very dissatisfied	E fetang hang ka beke More than once per week	Hang ka beke Once per Week	2-3 ka kgwedi 2-3 times per month	Hang ka kgwedi Once per month	Hang ka kgwedi Less frequently	Nna Self	1
Lelapa laka Own home	2										Lefapha la bophelo Dept of Health	2
Ha motho e mong Someone else's home	3										Lefapha leo eseng la mmuso / NGO	3
Mosebetsing At work	4										Kerekeng Church	4
Kerekeng At church	5	1	2	3	4	1	2	3	4	5	Mosebetsing Workplace	5

Tseding (Hlalosa): Other (specify):		Tseding (Hlalosa): Other (specify):

NOTES:

OFFICE USE ONLY:

13.40 Na batho ba tshehetsanang ba kenyeletsa:
Does the support group include:

READ out each of the statements.

Mark ONE option ONLY for each statement.

(a) Maloko a fumanang kalafo ya ARV	Members who are on ARV treatment	Yes	No	
(b) Maloko a tsebang hore a nale kokwana ya HIV empa ba se kalafong ya ARV	Members who know they are HIV-positive, but are not on ARV treatment	Yes	No	
(c) Maloko atsebang hore ha ba na kokwana hloko ya HIV	Members who know they are NOT HIV-positive	Yes	No	
(d) Maloko a sa tsebeng hore ba na le kokwana hloko ya HIV	Members who do not know if they are infected with HIV	Yes	No	

13.41 Na batho ba tshehetsanang ba etsa tse latellang:
Does the support group EVER do any of the following:

READ out each of the statements.

Mark ONE option ONLY for each statement.

(a) E fane ka dikgohlopo	Distribute condoms	Yes	No	
(b) E etele dikolo kapa dibaka tse ding tsa thuto, ho fana ka puo mabapi le HIV kapa AIDS	Visit schools or other institutions to talk about HIV and AIDS	Yes	No	
(c) E etele dibaka tsa thitelo, matlo a baeti kapa dibaka tseding ho bolella batho ho itshireletsa kgatlanong le tswaetso ya HIV	Visit bars, hotels and other 'hot spots' to tell people how to protect themselves against HIV infection	Yes	No	

13.42 Hore obe leloko kapa ho nka karolo ho batho ba tshehetsanang o:
In order to belong to or participate in the activities of the support group, do you:

READ out each of the statements.

Mark ONE option ONLY for each statement.

(a) O tsamaya sebaka ho tloha hae	Travel more than a short walk from your home	Yes	If YES for any ONE of these → 13.44	No	If NO for ALL of these → 13.43
(b) O patella dipalangwang ho ya dikopanong tsa support group	Pay for transport to the place where the support group meets	Yes		No	
(c) O lefella dijo le sebaka mo dikopano ditshwarelwang teng	Pay for food at the place where the support group meets	Yes		No	
(d) O lefella botho hoba leloko la support group kapa makeno	Pay some money to the support group as a membership/entrance fee	Yes		No	

If the person is not willing to pay or spend anything, record 'ZERO'.

13.43 O ka kgotsofalela ho lefa bokae ho etela kapa ho ba setho sa batho ba tshehetsanang?
How much would you be willing to pay or spend to visit or meet with the support group?

Rand per VISIT or MEETING

→ **Section 14**

If the person cannot remember how much was paid or spent, record 'do not know'.

13.44 O patetse bokae ka o fela ho etela le hoya dikopanong tsa batho ba tshehetsanang?
How much did you pay or spend in TOTAL for your LAST visit or meeting with the support group?

Rand per VISIT or MEETING

13.45 O ka kgostofalela ho patala ho feta moo ha o ya dikopanong tsa batho ba tshehetsanang?
Would you be willing to pay or spend MORE to visit or meet with the support group?

Mark ONE option ONLY.

No	0	➔ **Section 14**
Yes	1	➔ **13.46**

13.46 O ka kgostofalela ho patala tjhe lete e kae ho feta moo ha o ya dikopanong tsa batho ba tshehetsanang?
How much MORE would you be willing to pay or spend to visit or meet with the support group?

Rand per VISIT or MEETING

➔ **BEFORE concluding this interview and completing section 14 below, read through the entire questionnaire again. Make sure that you have asked all the relevant questions, that you followed the instructions on the questionnaire to the letter (including the skips), and that you recorded the respondent's answers correctly. If NOT, revisit these questions or issues NOW, because this may be the LAST OPPORTUNITY you will have to ask the person some questions in order to clarify these issues!**

14. END

OFFICE USE ONLY:

14.1 Re leboha haholo ha o nkile karolo le nako ya hao ho araba dipotso tsa rona. Ho bontsha teboho ya rona re tla o fa mpho ya boleng ba R50 eo ka yona o ka rekang lebenkeleng la Shopite/Checkers. Horere tsebe hore ke bomang ba tshwanelang ho fumana mpho ena, re kopa o ngole lebitso la hao, otekene la ho bontsha mohla wa kajeno meleng e ka tlase.

We really appreciate the fact that you are participating in our study and that you have taken the time to answer our questions. As a small token of our appreciation, we would like to give you this store gift voucher of R50. You can use this voucher at any Shoprite/Checkers store anywhere in the country to buy yourself or your family some food or other things. As we need to comply with the necessary financial controls, please can you sign or write your name on the line below as proof that you have received this voucher.

Name of patient: _____ Name of fieldworker: _____

Signature: _____ Signature: _____

Date: D D M M 2 0 Y Y Date: D D M M 2 0 Y Y

14.2 Time interview ended:

: :

Ke leboha hape ka nako ya hao!!
Thank you again for your time!!

Appendix G: Pilot Study

Male	
Female	

File number

_____

Age:

_____

Clinic:

_____

1. Do you eat spaghetti and meatballs in tomato sauce?

_____

2. What kind (brand) do you eat?

_____

3. How often do you eat it?

_____

4. How much do you eat at a time?

_____

5. Do you like it?

_____

6. If you could would you like to eat it every week?

_____

Appendix H: Anthropometric Manual

Manual for the anthropometric evaluation of nutritional status: FEATS

Corinna Walsh RD (SA), PhD, Department of Nutrition and Dietetics, Faculty of Health Sciences, University of the Free State

Objective

The objective of this manual is to:

- describe the basic techniques used to assess anthropometric measurements in children and adults

References

Gibson RS. 2005. Principles of Nutritional Assessment. Second edition. New York: Oxford University Press.

Lee RD and Nieman DC. 2003. Nutritional Assessment. Third edition. New York: McGraw-Hill.

Introduction

Anthropometry involves obtaining physical measurements of an individual, and relating these to standards that reflect, amongst others, their health and nutritional status. In this way malnutrition (both undernutrition and overnutrition) can be identified, growth can be monitored and the impact of intervention programmes can be determined.

For the FEATS study, anthropometric measurements include:

Adults: weight; height; upper-arm circumference, waist, hip and wrist circumference, skinfolds (triceps, biceps, supraileak and subscapular)

Children: weight; height; upper-arm circumference; head circumference

All of these need to be measured using the correct techniques to ensure reliability of the results obtained (Gibson, 2005; Lee and Nieman, 2003).

Techniques:

Weight:

Weight will be measured using a digital electronic scale to the nearest 0.1kg. The scale must be placed on a flat, hard surface. The scale should be zeroed before using. Subjects should be barefoot and wear the minimum clothing. Subjects should stand still in the middle of the scale, with both feet on the scale. Weight should be equally distributed on both feet.

Height:

Height/length will be determined using a stadiometer to the nearest 0.5cm. The subject has to be barefoot and wear minimal clothing, to facilitate correct positioning of the body. The subject must stand with his/her heals together, arm must be to the side, legs must be straight, the subjects shoulders should be relaxed and the subject should look straight in front of him, the Frankford horizontal plane. If possible the heels, buttocks, shoulder blades and the back of the head should be against the stadiometer. But this is not possible for all subjects due to obesity. To make sure the measurement is true, measure a subject twice. If height cannot be measured the knee height will be taken (Lee & Nieman, 2003, p. 166).

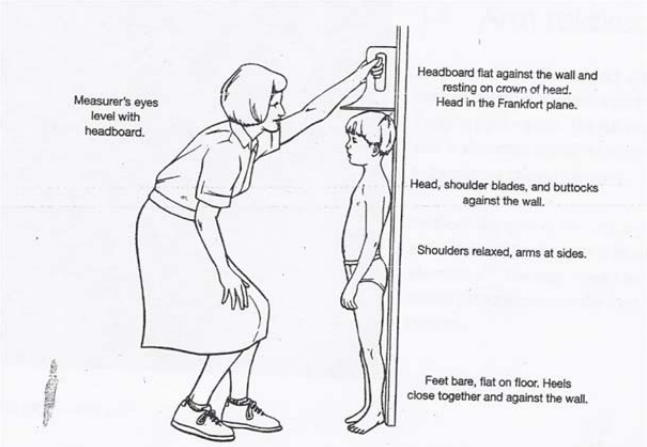

Figure 6.3 Body position when measuring stature.

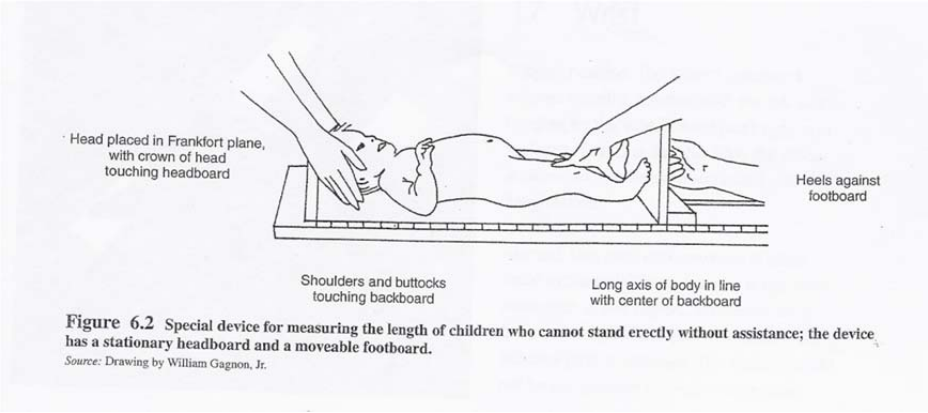

Figure 6.2 Special device for measuring the length of children who cannot stand erectly without assistance; the device has a stationary headboard and a moveable footboard.
Source: Drawing by William Gagnon, Jr.

Circumferences:

Waist and hip circumference should be measured using a flexible tape measure. Participants will be in a standing position, maintaining close contact with the skin.

The hip will be defined as the widest circumference over the great trochanters and the waist will be the part located midway between the lower rib and the ileac crest (Lee & Nieman, 2003, p. 184).

The upper arm and wrist circumference positions are indicated in the sketches.

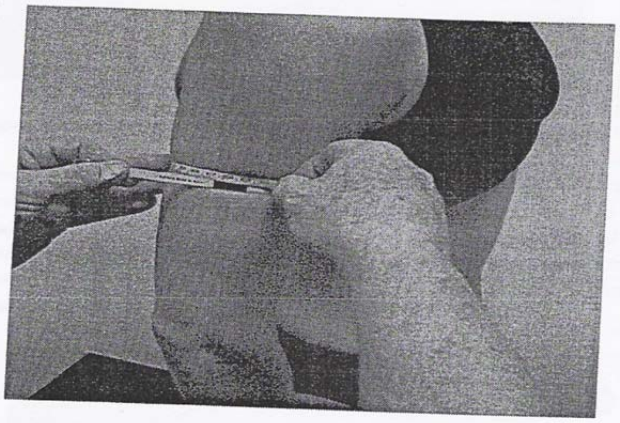

Figure 48. Arm girth — relaxed®.

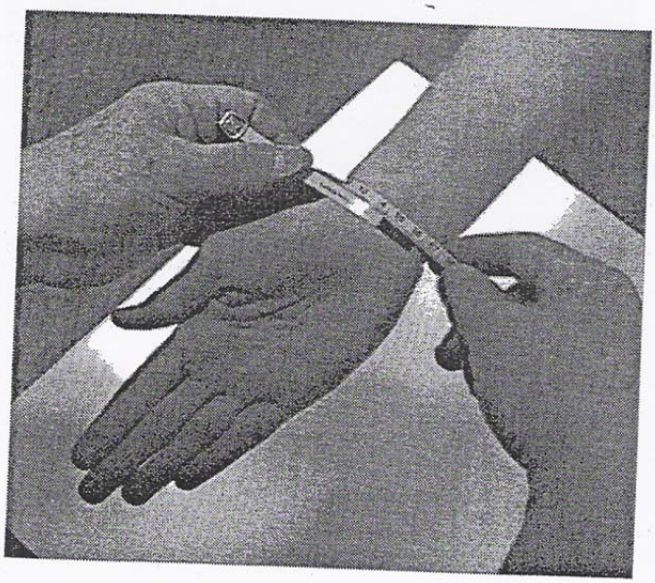

Figure 51. Wrist girth.

Skinfolds:

Skinfold measurement will be measured using a calliper. Read the calliper dial, 4 seconds after the calliper tip has been applied to the skinfold. Mark the site where the skinfold should be measured. The skinfold, should be grasped by the thumb and index finger of the left hand, about 1.5cm in. The skinfold should be pulled away from the body. Calliper should be held in the right hand. The calliper dial should face upwards. The calliper should be placed 1.5cm in. A minimum of two measurements should be taken. Measurements should be at least 15 second apart (Lee & Nieman, 2003, p. 188-190).

Positions of landmarks and skinfolds are indicated in the sketches:

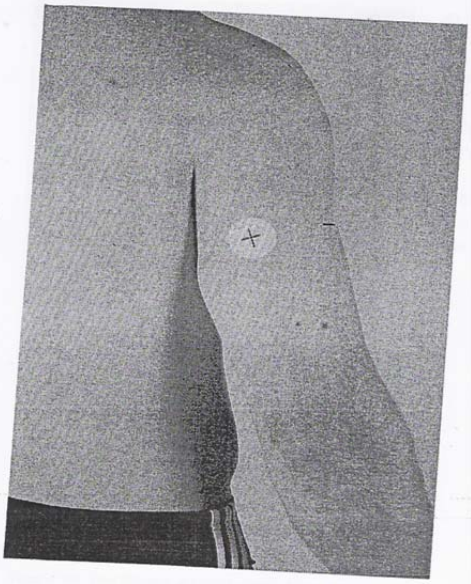

Figure 15. The Triceps skinfold site®. The horizontal line to the right is the marked Mid-acromiale-radiale® site.

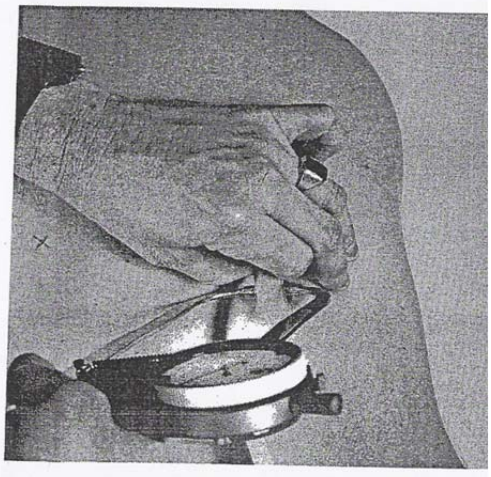

Figure 38. Triceps® skinfold.