# Integrating nutrition and food assistance into HIV care and treatment programmes

## OPERATIONAL GUIDANCE

**World Food Programme**
**World Health Organization**



**DRAFT FOR FEEDBACK**
**NOT FOR CITATION**

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This document is distributed in draft form with the intent of seeking broad public comment. Those who wish to contribute in reviewing this document, please contact Dr. Micheline Diepart, WHO/HIV/ATC at the email address: diepartm@who.int. (tel +41 22 7915486). They will receive an invitation to join the review group and a link to the web site.

We wish to thank the many colleagues internationally who have contributed to the process so far, recognizing that the wording of the draft guidance does not imply final endorsement by WHO or WFP.

# Contents

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# Preface

As part of a comprehensive response to treatment, care, and support of people living with HIV (PLHIV), food and nutrition programmes are being developed and implemented in many countries. Following on the World Health Assembly resolution 57.14, WHO and WFP are working together to assist countries in integrating food and nutritional support into national HIV programmes and strategies. This document is a first step toward addressing requests made by countries for tools and guidance on how to design and implement food and nutritional support for PLHIV.

This guide focuses specifically on food and nutritional support to HIV care and treatment programmes. The Getting Started series of guidelines produced by the HIV Service of WFP deals with other types of targeted activities and issues related to food and nutrition programmes, such as prevention of mother-to-child transmission (PMTCT), treatment of tuberculosis (TB), working with the transport sector, and gender considerations. To complement the information provided in this manual, WHO publications on nutrition and HIV may be accessed at the following website:
http//: www. who.int/nutrition/topics/hivaids/en/index.html.

***This manual is proposed to guide the planning and implementation of food assistance programmes within countries. It is a common tool for national bodies, implementing NGOs, and WHO and WFP country staff.***

**Specific aims**

- To ensure that food and nutritional support are integrated in the comprehensive response to HIV and part of the national programmes and strategic planning;
- To increase understanding of the concepts and terms of food and nutrition as they relate to HIV care and treatment;
- To provide answers to commonly asked questions about food and nutritional support;
- To address some of the issues that programmers are struggling with as they try to form policy and make decisions related to programmatic implementation; and
- To identify a common framework for monitoring and evaluating food and nutrition interventions in the context of care and treatment.

**Audience**

- National and regional authorities, (governments, policymakers);
- Programme managers, national and international NGOs;
- WFP, WHO, and other UN staff and implementing partners, community members, NGOs, and people dealing with various aspects of care and treatment programmes.

# Executive Summary

Nutrition plays a vital role in the immune systems of all people, including people living with HIV (PLHIV). Good nutrition strengthens the immune system, while HIV infection and poor nutrition have the cumulative effect of damaging it.

People living with HIV and AIDS are more vulnerable to malnutrition than the general population, and their nutritional status is a good predictor of mortality risk. Malnutrition in PLHIV often occurs against a background of poverty and lack of access to food. Food and nutrition support that helps ensure adequate intake of both macronutrients and micronutrients may help keep PLHIV well for longer. Integrating food and nutrition support in comprehensive prevention, treatment, and care can help fill an important need faced by many people living with HIV.

Access to antiretroviral drugs to control HIV is increasing in resource-poor settings, and antiretroviral therapy (ART) should be considered a lifetime commitment to help sustain a person's immune status. Appropriate dietary and nutrition counselling is critical for all people at all stages of HIV, including for those who are on antiretroviral therapy.

The interactions between nutrition and antiretroviral treatment are numerous, yet are insufficiently addressed. Improving the nutritional status of this group has the potential to enhance effectiveness of antiretroviral therapy (ART), in particular by using nutritional counselling to manage some side effects of medications. Providing the adequate amount of food has shown to be critical, particularly at the initiation of treatment, as antiretroviral drugs increase appetite, and some need to be taken with food. Adhering to treatment is a challenge that can often be overcome through providing proper support, including nutrition support as a key component.

Decisions about what type of food and nutrition support to provide and how to provide it are best made at the country level. Food support should generally be provided based on ascertained need, while government priorities, resource availability, capacity of implementing partners, and availability of complementary resources often influence decision-making about the type of programmes that are implemented. Establishing effective food and nutrition support programmes is a process that often requires the strengthening of linkages between health structures, communities, and social support providers.

A universally applicable "HIV food ration" for use in food assistance programmes for PLHIV does not exist. Selection of appropriate food commodities and rations for food programmes implemented as part of HIV care and treatment must occur at the country level, considering beneficiaries' nutritional needs, their ability to access other food sources of adequate quantity and quality, and the objectives of food support. Challenges to implementing food support as part of HIV care and treatment include determining eligibility criteria, food support duration, and how best to link the support to longer-term socio-economic support mechanisms.

Today, there is increased awareness of the importance of integrating monitoring and evaluation (M&E) of food and nutrition support components into HIV care and treatment programmes. However, experience in this area still limited. It is therefore crucial to agree on basic principles and to harmonize data collection and reporting of indicators as much as possible. M&E is essential to demonstrating the benefits of nutrition and food assistance in the context of HIV care and treatment programmes.

## List of Acronyms and Abbreviations

| | |
|---|---|
| AIDS | Acquired Immune Deficiency Syndrome |
| AFASS | Acceptable, Feasible, Affordable, Sustainable and Safe |
| AMPATH | Academic Model for the Prevention and Treatment of HIV |
| ART | Antiretroviral Therapy |
| ARV | Antiretroviral [drugs] |
| AVSI | Association of Volunteers in International Service |
| BMI | Body Mass Index |
| CBO | Community-Based Organization |
| CD4 | Helper T cell of the immune system; component of t lymphocytes (immune system cells) |
| CRS | Catholic Relief Services |
| CSB | Corn-Soya Blend |
| CTC | Community Therapeutic Care |
| DIAL-IRD | Développement institutions & Analyses de long terme—Institut de recherche pour le développement |
| DSM | Dried Skim Milk |
| FAO | Food and Agriculture Organization |
| FANTA | Food and Nutrition Technical Assistance |
| FBF | Fortified Blended Food |
| FPI | Family Preservation Initiative |
| HCW | Health Care Worker |
| HHI | HAART 'n' Harvest Initiative |
| HIV | Human Immunodeficiency Virus |
| IMEA | Institut de Médecine et d'Epidémiologie Appliquée |
| IRB | Institutional Review Board |
| Kcal | Kilocalorie |
| LTSH | Landside, Transport Storage and Handling |
| M & E | Monitoring and Evaluation |
| MOPH | Ministry of Public Health |
| MSF | Médecins Sans Frontières |
| MUAC | Mid Upper Arm Circumference |
| NGO | Nongovernmental Organization |
| ODOC | Other Direct Operational Costs |
| OI | Opportunistic Infection |
| ORS | Oral Rehydration Solution |
| OVC | Orphans and Vulnerable Children |

| | |
|---|---|
| PEM | Protein Energy Malnutrition |
| PEP | Post-Exposure Prophylaxis |
| PITC | Provider-Initiated HIV Testing and Counselling |
| PLHIV | People Living with Human Immunodeficiency Virus |
| PMTCT | Prevention of Mother-to-Child Transmission |
| RDA | Recommended Daily Allowance |
| RMR | Resting Metabolic Rate |
| RUTF | Ready-to-Use Therapeutic Foods |
| STI | Sexually Transmitted Infection |
| TAG | Technical Assistance Group |
| TB | Tuberculosis |
| UNAIDS | Joint United Nations Programme on HIV/AIDS |
| UNICEF | United Nations Children's Fund |
| VCT | Voluntary Counselling and Testing |
| WFP | World Food Programme |
| WHO | World Health Organization |
| WSB | Wheat-Soya Blend |

## Key Definitions

**HIV** (human immunodeficiency virus) is a retrovirus that can lead to *acquired immunodeficiency syndrome* (AIDS), a condition in humans in which the immune system begins to fail, leading to life-threatening opportunistic infections.

**AIDS** (acquired immunodeficiency syndrome) is a collection of symptoms and infections resulting from specific damage to the human immune system caused by the human immunodeficiency virus (HIV).

**Food security** "exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life" (FAO 2003).

**Nutrition security** is an outcome of secure access to food coupled with a sanitary environment, adequate health services, and knowledgeable care to ensure a healthy life (Greenblott 2007).

**Food support** is a component of nutritional support that involves the provision of food or food supplements. It may be appropriate in situations of food insecurity, where people do not have enough to eat.

Food support can be provided through different modalities—for example, in rehabilitation centres, through linkages with treatment centres, or through community organizations providing home-based care. People living with HIV (PLHIV) may be prescribed food support in the early stages of ART, which is known to be a particularly vulnerable period. Food support may also be provided to families affected by HIV.

Food support is generally provided for only a limited period of time, until people are able to provide for their own food needs. Ideally, it should be linked to livelihood support, which enables people who are recovering to reengage in sustainable livelihood activities.

**Nutrition Support** may or may not include the provision of food. Nutrition support interventions also include:

* nutrition assessment;
* education;
* counselling on specific eating behaviours;
* prescription of targeted nutrition supplements (e.g., micronutrient supplementation);
* linkages with food-based interventions and programmes.

# Introduction

Food and nutritional support is part of a comprehensive approach to prevention, treatment, and care, and strengthens the process of scaling up access to HIV antiretroviral therapy. At the 2005 World Summit, the UN member states agreed to:

***"Develop… and implement… a package for HIV prevention, treatment and care with the aim of coming as close as possible to the goal of universal access to treatment by 2010 for all those who need it."***

This manual was designed to be adapted to a variety of local contexts and to enable appropriate decisions about planning and allocating available food resources. The dynamics of food and nutrition insecurity vary dramatically throughout the world, according to environmental, geographical, economic, social, psychological, and individual health factors. Similarly, HIV epidemics exhibit regional diversity, and have different interrelationships with food security. For locally based planning, it is important to take into account the nature of the epidemic, food assistance needs, food availability, food preparation methods, and patterns of consumption.

## What are the roles of WFP and WHO in responding to the HIV/AIDS crisis?

A UN system division of labour for technical support to countries implementing their annual AIDS action plans was published in 2005. Under "Scaling Up Interventions: Treatment, Care and Support". WFP is the lead agency in dietary/nutrition support, while WHO is leading the health sector response. This manual is a joint response of WHO/WFP to address the critical elements of food and nutrition and their relationship with HIV treatment and care.

*"AIDS patients in the Western world have never been allowed to starve whilst receiving antiretroviral treatment. We shouldn't allow it to happen elsewhere either."*

Dr Lee Jong-Wook and James T Morris,
*New York Times*, April 2005

WHO has taken the lead in scaling up prevention, treatment, and care through its "3 by 5 Initiative," the first step toward universal access. With the goal of making the greatest possible contribution to prolonging survival and restoring the quality of life for PLHIV, the WHO initiative provides access to ART as a human right, and within the context of a comprehensive response to HIV, details how life-long ART can be provided to PLHIV in resource-limited settings. Core principles of the initiative include urgency, equity, and sustainability. The involvement of multiple stakeholders within health systems' and the communities is central to this process.

By end of 2007, about 3 million people worldwide were accessing ART through simplified drug regimens and decentralized delivery of ARVs, with services that called on community participation and support. Trends in treatment scale-up have been particularly encouraging in sub-Saharan Africa, which is now estimated to have more than 1 million people on ART, with coverage at 23 percent. In East, South and South-East Asia, 235,000 people are now on treatment. Coverage is now estimated at 16 percent, representing more than a three-fold increase since 2003. This approach is based on

decentralized care and treatment, simplified regimens, and the participation of the communities, including PLHIV themselves.

Availability and access to treatment for all—"universal access"—depends on a number of factors, particularly the availability of testing and treatment services with trained health workers, cost, supply, storage, and legal endorsement. In recent years, through the 3 by 5 Initiative, advocacy by PLHIV groups, civil society, governments, and the international community has resulted in increased access to ART, including in resource-limited settings. The simplification of drug regimens and treatment guidelines, the availability of trained service providers at community level, and the involvement of communities and PLHIV have made the provision of ART at a decentralized level more feasible. The production of generic ARTs and medications for management of opportunistic infection (OI) and the procurement of HIV pre-qualified drugs and tests have considerably reduced the costs and have increased access.

In many resource-poor settings, HIV coexists with malnutrition, and food is often identified as the most immediate and critical need of PLHIV. Food intake is particularly critical when PLHIV begin their ART, as some medications are better tolerated with food.

In many settings the success of prevention, care, and treatment programmes is being hindered by HIV-related food insecurity, poverty, and malnutrition. Particularly in the countries hit hardest by the pandemic, it is not uncommon for agencies such as WFP to be approached by health partners whose patients are in need of food. In response, WFP is increasingly developing and implementing projects and activities with these partners to provide food to HIV-affected communities. Food is sometimes provided through or in tandem with HIV ART, home-based care (HBC), prevention of mother-to-child transmission (PMTCT) projects, tuberculosis (TB) treatment, rehabilitation, and palliative care programmes.

As the food aid arm of the United Nations, WFP is in a position to support the implementation of food and nutritional support programmes in the fight against HIV. It can also provide the logistical and technical expertise needed to help partners successfully implement related programmes. Great progress has been made over the past several years in mainstreaming HIV considerations into the emergency and development activities that make up the bulk of WFP's activities.

WHO and WFP have a shared interest in ensuring that food and nutrition interventions are based on solid evidence. In this regard, more operational research is needed. Given the pilot nature of many of these targeted activities, WFP and WHO also have a role to play in supporting the monitoring and documentation of the outcomes and impacts of the food and nutritional support being implemented as part of care and treatment programmes.

# Chapter 1: Basics about HIV and antiretroviral therapy

HIV infection is now recognized as a crisis affecting all aspects of a person's life (social, cultural, economic), and his/her family and community. In many areas throughout the world, particularly in sub-Saharan Africa, the HIV pandemic has had an unprecedented and devastating impact on food and nutrition security. While the global response to HIV is framed around the three pillars of prevention, care and treatment, and mitigation, it is essential that the response be broader, and the scale adequate, to address all the impacts of the pandemic. Thus, food and nutritional interventions must be integrated in any multi-sectoral response.

## What is HIV?

HIV is an acronym for *human immunodeficiency virus*. HIV attacks and damages the body's immune system, which is the body's defence against infection. As a cure does not yet exist, a person infected with HIV has the virus for life. Many people living with HIV remain without signs or symptoms of disease for many years and, not knowing they are infected, may pass on the virus to others.

Transmission of HIV can occur through:

- Engaging in sexual intercourse without a condom (unprotected or unsafe sex) with an infected person (male or female);
- Exposing non-intact skin or mucus membranes to the infected blood (e.g., through occupational exposure, the sharing of injecting equipment, receiving a blood transfusion with infected blood, unsafe piercing, tattooing, or traditional rites that involve blood), tissues, or body fluids of an infected person;
- Passing the virus to a baby during pregnancy, labour, delivery, or breast feeding.

HIV cannot be transmitted through general day-to-day contact with an infected person. Despite the fact that more than 40 million people are living with HIV worldwide, there have been no recorded cases of casual transmission of HIV, such as by shaking hands, using a toilet seat, or sharing food and drink.

Within weeks after being infected with HIV, many patients will develop an initial infection, a flu-like illness with symptoms such as fever, skin rash, swollen glands, and sore throat. With or without this primary infection ("seroconversion illness'), people may be living with HIV for many years without any signs or symptoms of disease (asymptomatic). However, as the HIV infection progresses, the immune system weakens and the infected person is at an increased risk of developing more serious illnesses, including opportunistic infections (OIs) HIV-related cancers, and constitutional disease (affecting the entire body with a widewpread array of symptoms).. This stage is called AIDS (acquired immunodeficiency syndrome). The clinical staging (and blood test results) will guide the service provider in when to recommend commencing ART, or when the therapy should be modified to best manage the HIV infection. (Appendix 1 describes the stages of HIV.)

Once started, ART should be continued for life. It is not a cure but rather a treatment to slow or reverse the progression of the infection, thus making HIV a chronic managed disease.

## How can someone know (s)he is infected with HIV?

Testing is necessary to determine if someone is HIV positive. After being infected with the virus, someone living with HIV may stay well for many years before developing any symptoms of advancing HIV disease or of AIDS. It is important to know one's status in order to know how to live with the virus—how to take appropriate care of oneself, prevent transmission to others, and access care and treatment services, including food and nutritional support, to reduce the risk of disease progression. The several different types of blood tests for HIV involve the detection of antibodies produced by the person after infection. Testing is performed based on informed consent, meaning that appropriate pre- and post-test counselling should be provided to anyone who undergoes an HIV antibody test. Directly after exposure and for up to three months, there may be a very low level of antibodies in the blood and the test may remain negative. This is known as the "window period."

Testing could be initiated by the affected person (voluntary counselling and testing [VCT]) or proposed by a service provider (provider-initiated HIV testing and counselling [PITC]).

## How does one measure the progression of HIV infection?

### *CD4 Cell Count test*

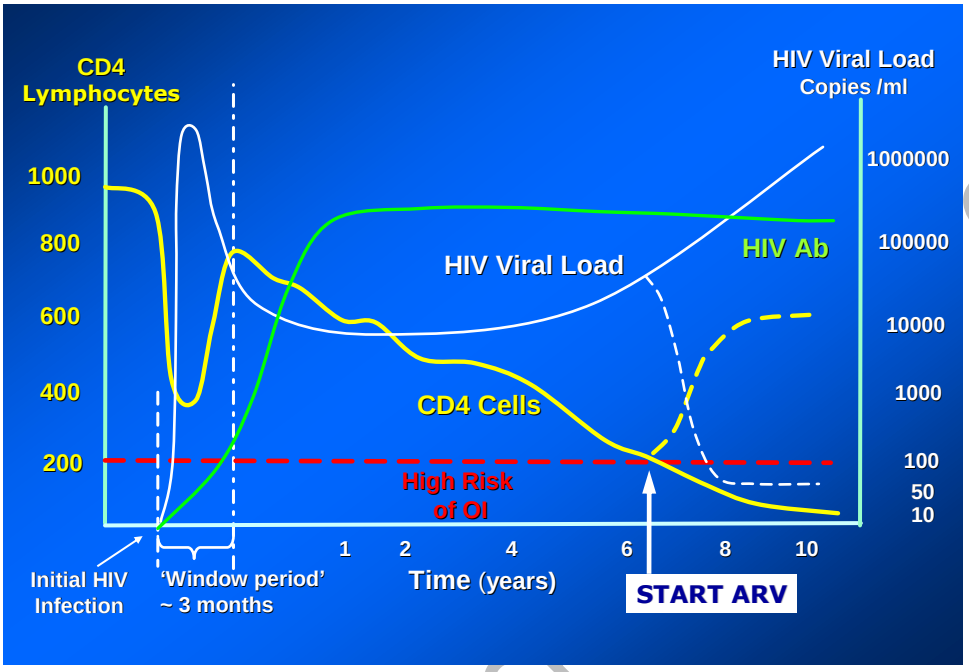
When a person knows that he/she has HIV infection, clinical examination and specific blood tests can estimate the stage and progression of the infection and the extent to which their ART regime is effective in controlling the virus. Most tests, however, are expensive to perform and are not always available or affordable. A test often used in HIV management is the CD4 cell count test (or T cell count), which measures the number of immune system cells known as CD4 T cell lymphocytes in the bloodstream. CD4 T cells are vital in mounting an effective immune response to infection. The CD4 count indicates how much damage has occurred to the immune system. A normal CD4 count will range between 500 and 1200 cells/$mm^3$. When a person has a CD4 count below 200 cells/$mm^3$, he/she is at greater risk of an opportunistic infection associated with AIDS. Opportunistic infections are rarely encountered with CD4 counts greater than 200 cells/$mm^3$.

### *HIV viral load test*

Another useful test for HIV management is the HIV "viral load" test. The viral load test estimates the number of HIV particles, or copies, per millilitre of blood. The viral load reflects how much the virus is replicating in the blood. This test complements the CD4 count test in indicating how effective treatment is, as effective ART should result in a significant lowering of viral load. A high viral load (more than 100,000 copies/ml) suggests that HIV is replicating rapidly in the blood. A low viral load, (fewer than 10,000 copies/ml) is more likely to correlate with a lower rate of disease progression. Although the HIV viral load test is very sensitive, it cannot detect extremely small amounts of virus in the bloodstream (e.g., fewer than 50 copies per millilitre is "undetectable" in most cases). It will also not detect the level of HIV in certain cells or bodily organs.

Figure 1 illustrates how CD4 T lymphocyte count and HIV viral load may change over time. The red line indicates a CD4 count of 200, below which there is a higher risk of opportunistic infection. When ARV therapy is successful, the CD4 count increases and viral load decreases, as indicated by the dotted yellow and white lines. The goal of therapy is to achieve an "undetectable" viral load, as this is associated with the best response to therapy.

**Figure 1. HIV Disease Progression**




## Treatment

There are four main categories of medications used in HIV management:

- *Opportunistic infection (OI) prophylaxis:* medications to prevent opportunistic infections;
- *OI treatment:* medications to treat opportunistic infections;
- *Antiretroviral therapy (ART):* medications to reduce HIV in the body. These can be used in prevention, to reduce the risk of transmission from mother to child during pregnancy, labour, and delivery (PMTCT), and in post-exposure prophylaxis (PEP), that is, after someone has been exposed to potentially infectious blood on non-intact skin or mucous membranes. The most common use of ART is for treatment of AIDS; and
- *Palliative therapy:* medications to control pain and other symptoms of disease.

### *Opportunistic Infection Prophylaxis and Treatment*

Studies have shown that some medications can prevent illness and death from OI when given to PLHIV at risk of infection (Grimwade 2006). To prevent OI, PLHIV may be given medication as prevention or to reduce the risk of relapse after treatment. (The most common agent used is Cotrimoxazole)

Treatments exist for the most common opportunistic infections associated with HIV. Once the person is begins experiencing symptoms and/or is diagnosed through tests, the opportunistic

infection needs be treated promptly. Drugs commonly used to treat and prevent opportunistic infections are listed in Appendix 2. It is normal for PLHIV to be taking prophylaxis and treatment for opportunistic infections and ART at the same time. This may involve ingesting a significant number of tablets a day. The complexity and potential side effects of this combination of drugs can pose many challenges to PLHIV and those managing their condition. Adherence to OI prophylaxis and treatment is critically important to ensuring maximum response to the therapy.

### *What drugs are used to control HIV?*

Antiretroviral therapy drugs control HIV by inhibiting the replication and development of HIV inside the host cells. A combination of medications (usually three drugs) is necessary to efficiently control long-term viral replication and prevent drug resistance

By reducing HIV replication and viral load, ARVs can delay or reverse immune deterioration, improving survival and quality of life. See Appendixes 2 and 3 for further details.

### *When should PLHIV begin treatment?*

WHO currently recommends that PLHIV commence treatment based on the clinical staging and the CD4 count. If the clinical signs and symptoms meet those of stage IV, ART should be initiated regardless of the CD4 count.

More detailed WHO recommendations for commencing antiretroviral therapy are described in Appendix 1 (page 79).

### *What to consider when deciding whether to initiate antiretroviral therapy*

Some of the major factors that should be considered when deciding whether to initiate ART include:

1. **Patient consent and understanding of what ART is and of its possible side effects.** Not all people with HIV require ART and not all will choose to take ART even if it is clinically indicated.
2. **Adherence.** Once commenced, ART should not be discontinued without thorough assessment of the person's condition. It is important that the person has adequate resources to start ART and is ready and able to adhere to lifelong treatment.
3. **Support.** ART medications are sometimes difficult to take due to timing of doses and the emergence of side effects. It is beneficial that the patient have the support of a treatment buddy, or someone with ART experience, especially during the initial stages of treatment.
4. **Treatment follow-up.** It is important to monitor the person's reaction to ART (specifically the decrease in opportunistic infections, increase in CD4 count, and weight gain), which can indicate the therapy's efficacy. In some cases, the treatment regime may have to be changed or discontinued as a result of adverse side effects. Take note that toxicity and side effects are not an indication of treatment efficacy.

### *What are some barriers to PLHIV use of antiretroviral therapy?*

In resource-poor settings, barriers that prevent people from accessing treatment include:

- lack of awareness of HIV status (according to UNAIDS, only about 11 percent of HIV-infected people worldwide are aware of their status);
- lack of physical access to testing and health care services;
- the cost of health care (which may include drugs, tests, transport, or incidental costs linked to the treatment or the disease);
- priorities of household expenditure, such as food; and
- stigma and fear associated with HIV.

**For women:** Women often have problems accessing ART for reasons including but not limited to: lack of transport, short opening hours and long waiting time at clinics, fear of violence, needing their husband's permission, and fear of stigma. They also may not get their fair share of food. Integration of HIV services with sexual and reproductive health services, such as family planning and antenatal care, can help to address women's special needs and reduce stigma. Mainstreaming gender in all food and nutritional programmes is crucial and even more critical in the context of HIV, given that gender norms and inequalities influence all aspects of the pandemic

**For children:** It is often difficult for children to access medication. Testing before 18 months may not give an accurate indication of HIV status and therefore raises issues about the commencement of ART in infants. In addition, paediatric formulations of ART are not widely accessible and are often more expensive than adult formulations. Most paediatric formulations are liquids, and some require cold storage and refrigerated transport. Many are fixed combinations, which present limitations in dose adjustment. Often it is difficult for a child to understand the importance of adherence to ART and of maintaining good nutritional intake.

### *What is treatment adherence and how is it measured?*

Treatment adherence refers to the ability of a PLHIV to continuously take the medication as required to maintain the suppression of HIV. A high level of adherence to ART is necessary for the medications to be effective over a long period (WHO 2003). Generally, this means the medications need to be taken correctly most of the time—that is, for at least 95 percent of the time (Paterson 2000).

**Good adherence involves:**
Taking the correct medication (and, when possible, WHO pre-qualified drugs);
Taking the medication at the right time of day, every day;
Taking the correct dosage every time; and
Following other instructions on how to take the medication (e.g., with or without food or drink).

If a person does not adhere to ART, HIV may not be suppressed and will continue to replicate. The virus may even develop resistance to the ART, the result of which is treatment failure. Most ART regimens require a person to take several tablets at different times of the day, each possibly with different requirements. (For example, 2 tablets every morning and evening, 12 hours apart, with food.)

Some regimens may require that the medication be taken only once a day. Although these may appear to foster better adherence, there is a greater risk of resistance developing if any dosages are missed. Table 1 highlights why a greater level of adherence is required for once-daily regimens compared with regimens taken more frequently.

### *How can adherence to antiretroviral therapy be supported?*

The best strategy to support adherence is appropriate treatment counselling and monitoring, and the presence of family, friends, or a "treatment buddy" (often somebody who is on ART himself or at least familiar with it). This support is particularly important at the start of ART, as some side effects, such as nausea and vomiting, may jeopardize treatment adherence and weaken the person taking ART. As the person gets used to taking the medicine, side effects will decrease and the patient will gain weight, start feeling better, and be able to care for himself.

### *How can adherence to antiretroviral therapy be measured?*

Optimally, patient adherence to treatment should be above 95 percent. If a patient is adherent to ART, significant improvements should occur. The indicators for these include:

- Improved well-being, including gain in appetite and body weight (weight loss is a common feature of advanced HIV) where adequate food support is available;
- Laboratory findings indicating that the CD4 count has increased and the viral load has decreased, with the target being an undetectable level;
- The number of tablets remaining decreasing over a set period of time (Table 1 indicates how pill counting may be associated with adherence assessment); and
- Side effects associated with ART observed and reported on the patient's chart.

**Table 1. Number of missed doses of antiretrovirals per month for adherence to be below 95%**

| Prescribed daily dose | Number of doses missed per month that would result in adherence falling below 95% |
|---|---|
| 1 | 1 |
| 2 | 3 |
| 3 | 4 |

## *What factors affect adherence?*

Both external and individual factors may influence people's ability to seek treatment and adhere to the recommended medication regime.

**External**

- ART not readily available;
- Lack of support and encouragement from healthcare workers, family, or friends;
- Difficulties in accessing service providers, due to their cost and location;
- Lack of food.

**Individual**

- Side effects (e.g., nausea, vomiting, and diarrhoea) and loss of appetite;
- Failure to believe medications will work;
- Misunderstanding and lack of information about how to take the medicines correctly;
- Difficulty in remembering to take the medications, as a result of HIV-related mental conditions, OIs, or side effects from the ART;
- Use of illicit drugs or alcohol;
- Stigma and fear of disclosing HIV status to others (e.g., work colleagues); and
- Feelings of depression, anxiety, or social isolatation.

Numerous studies in countries throughout the world including Brazil, Uganda, South Africa, and Haiti have shown that provision of simplified and standardized treatment through decentralized services can lead to high levels of adherence comparable to those in industrialized countries . (WHO, Public Health approach 2003; Grinsztejn et al 2007; Byakika-Tusiime 2005; Nachega 2004; Koenig 2004).

Food supplementation in some settings may improve adherence to treatment. A recent study in Zambia found that providing food support to food-insecure patients increased adherence during the first six months of treatment (Megazzini 2006). Nutritional strategies to help manage side effects may also help improve adherence to ART treatment.

## *Where are antiretroviral medications currently provided?*

Antiretroviral therapy is provided through a range of health care settings such as hospitals and provincial/district/community health centres. ART needs to be first prescribed by an experienced health care worker (HCW) with support from nurses, counsellors, pharmacists, and nutritionists when and where possible.

## What is comprehensive HIV care and treatment and what services are included?

HIV services include a comprehensive set of prevention, treatment, and care services for PLHIV at all stages of infection. The needs of PLHIV are not limited to clinical management. People living with and affected by HIV, including families and children, face various difficulties in their lives, including physical, psychological, occupational, economical, and social problems. Comprehensive care (sometimes referred to as the continuum of care) refers to the various health care, welfare, and social support services provided to meet these needs. Figure 2 describes the following key elements in HIV prevention care and treatment:

- Prevention of HIV transmission, including the prevention of MTCT during pregnancy, delivery, and infant care;
- Reproductive health services, particularly pre- and antenatal care to assist pregnant and lactating women; condom provision; and sexual transmitted infection (STI) treatment;
- Access to testing, including voluntary counselling and testing (VCT), and provider-initiated testing and counselling.

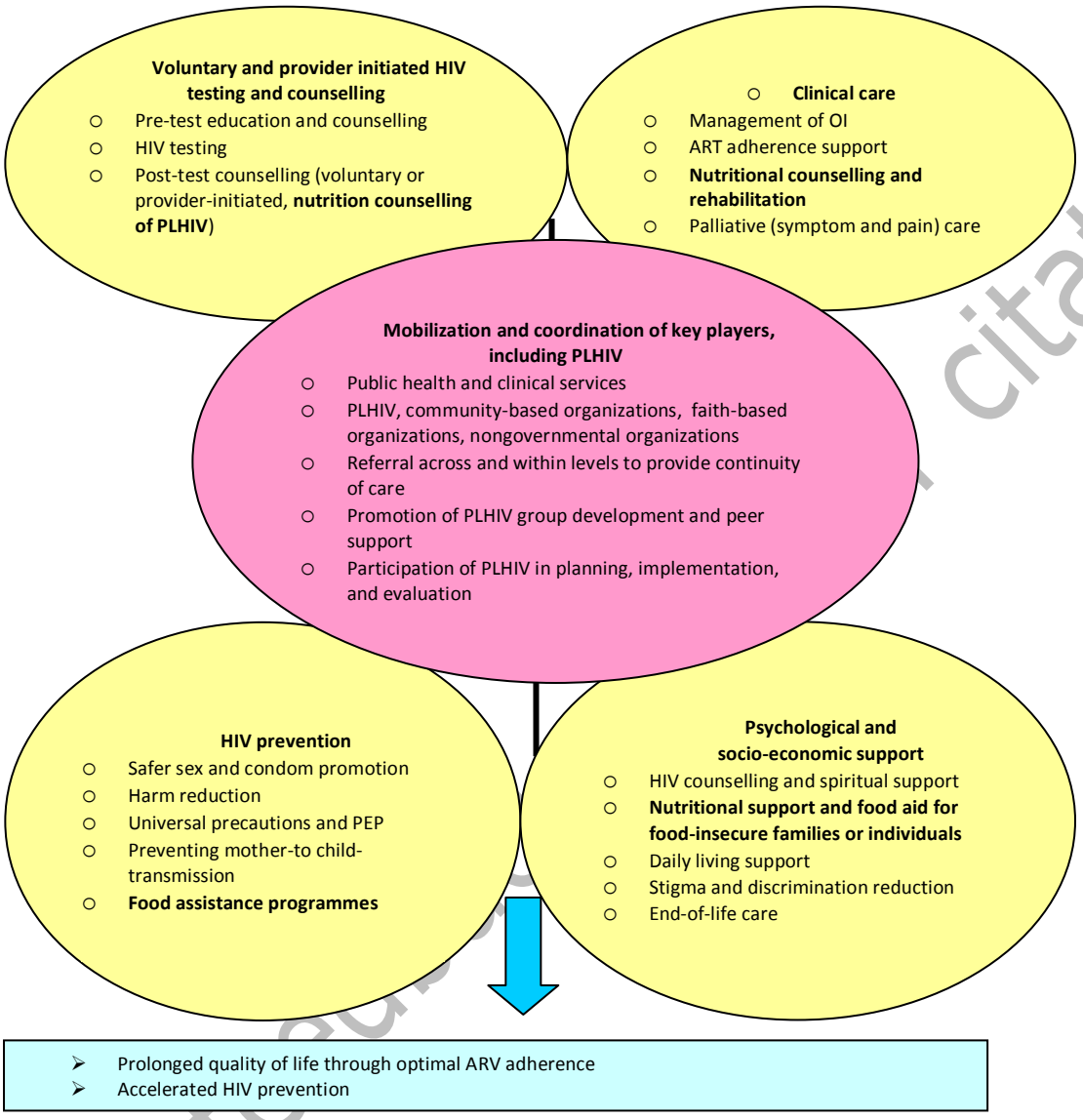
**Clinical care and treatment includes:**

- Health services to manage and treat opportunistic infections, STIs, diarrhoea, TB, and malaria, which can all worsen malnutrition;
- Provision of ART and follow-up services;
- Patient counselling and education;
- Growth monitoring and basic child health services to promote the health of infants and young children;
- Clinical management of severely malnourished children; and
- Nutrition assessment, counselling, and support, including rehabilitation feeding.

**Socioeconomic support includes:**

- Food support/assistance Food rations for the families of those on treatment may be an important strategy, especially where main earners are incapacitated by their sickness. Food provided to individuals on treatment after nutritional recovery may be necessary as a 'buffer' until they can re-engage in income earning activities.
- Peer support and community-based support groups;
- Livelihoods support and training, to help individuals reengage in income-earning activities; and
- Microfinance, vocational training, school feeding programmes, and programmes that help HIV-affected households maintain their income, savings, and overall livelihood security.

**Figure 2*:* Overview of the key elements in HIV care and treatment**




Source: Modified and adapted from World Health Organization (Regional Office for the Western Pacific), *HIV/AIDS Care and Treatment Guide for Implementation*, December 2004, p 13.

## What is the rationale for including nutrition and food support in comprehensive care and treatment programmes?

Living with HIV is often associated with a loss in earnings and increased poverty. Due to an increase in metabolism, PLHIV require more food intake than someone not affected by HIV. Adequate nutrition is critical to maintain an acceptable quality of life through all the stages of disease. Programme implementers often anecdotally claim that food assistance may help PLHIV on treatment recover more quickly, reduce some side effects of ART, and improve adherence to medications. However, quantitative evidence to support such claims is currently lacking (see page 27 for a review).

Incorporating food and nutrition considerations into care and treatment programmes has the potential to improve longer-term outcomes for PLHIV. These include improved adherence to ART, reduced severity of symptoms, health maintenance, and improved quality of life.

Lack of food may also lead people to engage in risky sexual behaviours in order to feed their families (transactional sex), potentially increasing the risk of HIV transmission (Weiser, 2007). This suggests that food security interventions, particularly focused in areas of high HIV prevalence, may also have a role to play in preventing the spread of the pandemic (Rollins, 2007).

## Summary of key points from Chapter 1

- A person has HIV infection for life. There is no cure for HIV.
- Treatments are available to control the viral replication and to prevent and treat most opportunistic infections.
- Not all people with HIV require antiretroviral treatment. The decision about when to initiate treatment is based on clinical staging and CD4 count.
- Taking antiretroviral therapy is a lifetime commitment. Adhering to treatment is a challenge that can often be overcome through the provision of proper support interventions.
- The goal of comprehensive care is to create a continuum of care, support, and treatment where PLHIV can access appropriate services in a timely manner to meet their physical, psychological, and social needs.
- Nutritional support is an essential component of HIV comprehensive treatment and care programmes. Food support is a type of nutritional support that can play an important role for many PLHIV.
- Implementers of antiretroviral programmes have an important role in responding to the needs of PLHIV at different stages of the disease.

# Chapter 2: The role of nutrition and food assistance in care and treatment

## Why is food and nutritional support important for HIV care and treatment programmes?

Over the past decade, much knowledge has accumulated about the relationships among HIV, nutritional status, treatment, and food and nutritional support. The following section outlines the current understanding of the relationship between antiretroviral therapy and nutritional status. This section also provides an overview of existing evidence for nutrition and food interventions and the associated practicalities of implementing them.

### *What is the relationship between nutrition and HIV infection?*

PLHIV are more vulnerable to malnutrition than the general population. As HIV disease progresses, a progressive deterioration of nutritional status is often observed. Initially, nutritional causes were proposed to explain AIDS when the first cases were reported in the early 1980s, as it appeared to be a disease resulting from essential nutrient deficiencies. In Africa during this period, AIDS was locally known as "Slim Disease", because of the severe weight loss commonly experienced by PLHIV. This weight loss, also known as "wasting syndrome," was one of the first identified clinical features of AIDS.

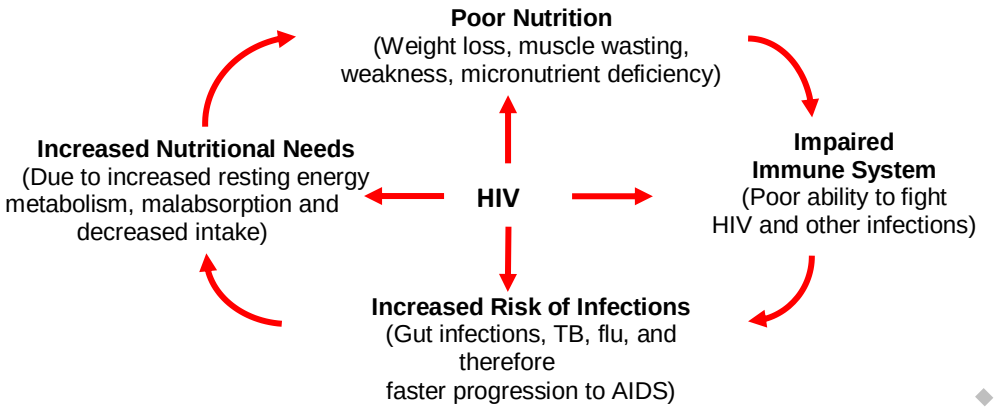
Figure 3 demonstrates the cycle of malnutrition in the context of HIV. Malnutrition impairs immune function and reduces the body's resistance to infection (Scrimshaw 1997). HIV and malnutrition are closely interlinked and have a cumulative effect in damaging the immune system.

Several nutritional indicators, including weight loss (Palenicek 1995; Tang 2002; Mangili 2006), low body weight/muscle mass (Severe 2005; Kotler 1989; Suttmann 1995), anaemia (Mocoft 1999), and low serum albumin (Feldman 2003), have been associated with reduced survival in PLHIV. A large study in West Africa found that body mass index (BMI) following diagnosis of HIV could predict death to a similar extent as the CD4 cell count test (measurement of immunity). PLHIV with lower body weights had an increased risk of death (van der Sande 2004).

Like other infections, HIV also appears to impair micronutrient status. "Micronutrient status" refers to the amount of vitamins and minerals available to the body. Needed only in small amounts, these substances help the body systems function normally. An insufficient intake of micronutrients may accelerate HIV disease progression (Friis 2005).

Many people in resource-limited settings experience pre-existing malnutrition, and HIV will only worsen their nutritional status and chance of survival.

**Figure 3. Cycle of Malnutrition and Infection in HIV**




*Adapted from RCQHC and FANTA Project 2003, Nutrition and HIV/AIDS: A Training Manual*

### *What factors contribute to malnutrition in PLHIV?*

The cycle of malnutrition shown in Figure 3 is not unique to HIV, but PLHIV experience a number of conditions that make them more vulnerable to malnutrition. It is not always possible to identify one single cause of declining nutritional status or malnutrition in HIV. Primary and secondary malnutrition may exist, together worsening the effect on health. Table 2 describes the difference between primary and secondary malnutrition.

**Table 2. Primary vs. Secondary Malnutrition**

| |
|---|
| **Primary malnutrition** is caused by inadequate consumption of food and essential nutrients due to: food being unavailable or inaccessible or poor eating habits.<br><br>**Secondary malnutrition** results from infection or disease, leading to increased energy expenditure and malabsorption, or poor utilization, of nutrients as a result of increased nutritional requirements or excessive excretion (diarrhoea).<br><br>People living with HIV often experience *both* primary and secondary malnutrition. |

### *Lack of access to sufficient quality and diversity of food*

Among PLHIV, poor dietary intake and malnutrition often occur against a background of poverty and lack of food at the household level. Food insecurity often manifests when one or more working-age adults begin to experience symptoms of illness that prevent them from engaging in their normal work activities. Households may sell assets or resort to other strategies to try to meet their needs. Lack of access to food may become worse as the household spends money for medical care, transport, or funeral expenses.

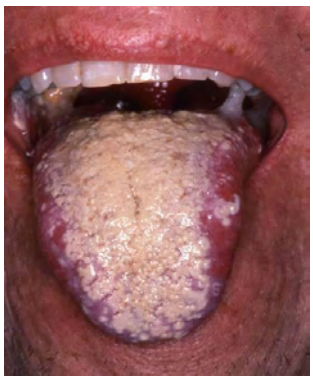
While wasting is one of the main concerns associated with lack of access to food, it is also important to consider the dietary quality and *diversity* of an individual or household. In many resource-poor settings, the majority of energy in the diet comes from staples and tubers. One of the main coping strategies households have during times of stress is to reduce consumption of meat, oil, and vegetables. Studies in many African settings have shown that small-scale farmers affected by HIV-associated labour shortages may plant crops that are less labour intensive but also less nutritious (Donovan 2003; Yamano and Jayne 2004; Shah 2001). Note: It is important to consider food consumption patterns when planning rations.

### Inadequate food intake

Inadequate food intake is caused by many different conditions. In addition to lack of food, the desire to eat may be reduced in PLHIV by various factors, including but not limited to:

- Anorexia, or loss of appetite;
- Oral candidiasis, mouth or gastrointestinal tract ulceration/irritation, making eating and swallowing uncomfortable;
- Infections resulting in reduced appetite, nausea, vomiting;
- Metabolic effects of malnutrition and medications;
- Psychosocial factors, including depression and lack of emotional support; and
- Side effects of antiretroviral drugs, such as nausea and diarrhoea.

Loss of appetite, leading to reduced food intake (and nutrients), is one of the main reasons PLHIV lose weight (Macallan, 1995) . Reduction in dietary intake may lead to growth failure in HIV-positive children (Arpadi 2000) and wasting in HIV-positive adults (Macallan 1999). Inadequate food intake prevents recovery from malnutrition.



*Oral Candidiasis can causes severe pain and discomfort, which reduces appetite and intake.*

### Malabsorption

When sufficient food is taken, sometimes the body is not able to absorb the nutrients due to a failure of the digestive system. Malabsorption relates to difficulty in digestion or absorption of nutrients from food substances. The term used to describe the organs in the body responsible for digesting and absorbing nutrients from food is the *gastrointestinal system.*

Intestinal malabsorption leading to energy (kcal) and nutrient losses is common among PLHIV (Griffin 1990; Macallan 1993). Possible causes for malabsorption include:

- the direct impact of HIV on the intestines;
- the effect of opportunistic infections (described in section 1.3)l
- diarrheoa; and
- malignancies and other diseases of the gastrointestinal system.

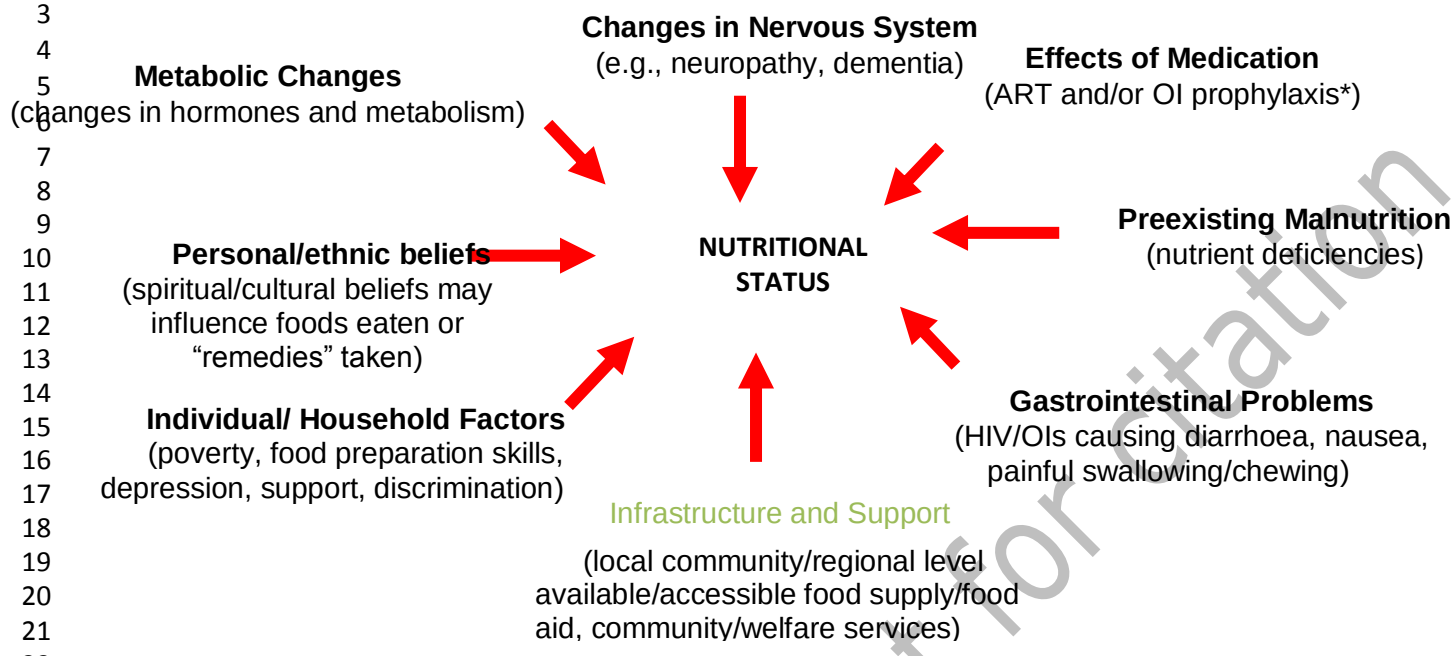
Chronic weight loss and malabsorption in HIV is often related to gastrointestinal diseases, which cause severe diarrhoea (Amadi 2001; Macallan 1993). PLHIV with more severe malabsorption have lower body weights (Keating 1995).

### Increased energy expenditure

PLHIV have a resting metabolic rate (RMR) approximately 10 percent higher compared to HIV-negative adults, and their RMR is even higher when they have secondary or opportunistic infections (Macallan 1995; Hommes 1990; Hommes 1991; Grunfeld 1992; Melchior 1991; Melchior 1993). Increased energy expenditure often leads to weight loss in PLHIV, even when they maintain their usual food intake after acquiring HIV, and during all stages of the disease. This weight loss is further worsened with the onset of AIDS.

Several factors amplify and complicate the problem of malnutrition in PLHIV. Figure 4 summarizes the common factors affecting their nutritional status.

**Figure 4. Common factors affecting nutritional status in PLHIV**




Many of the factors illustrated in Figure 1 are not necessarily the direct effect of HIV infection but relate to a broader range of issues at the individual, household, and community levels.

## What is the impact of antiretroviral therapy on dietary intake and nutritional status?

One of the most important observations about the interaction between antiretroviral therapy and nutritional status is that initiating ART often leads to a reversal of symptoms caused by HIV, such as malnutrition and loss of body mass (including muscle mass). Increased appetite, improved food intake, and reduced viral load improve nutritional status. This improvement is associated with reduced morbidity and mortality from HIV/AIDS-related causes (Raiten 2005).

A number of food interactions influence the absorption and utilization of antiretroviral therapy and impact food digestion, absorption, and assimilation (Castleman 2003). There can be adverse interactions between certain foods and treatments. PLHIV who are on ART or taking other OI medications need to be careful about what foods they eat. Some drugs, such as nevirapine and lamivudine, can be taken without regard to food, whereas others should be taken with plenty of liquid and no food (e.g., Indinavir and didanosine). Alcohol and certain foods, such as some types of grapefruit, have the capacity to interact with some medications. Drug-food interactions affect how the drugs are used by the body, and therefore some foods should never be taken with ARVs. Finally, some drugs affect the body's nutrient intake. Patients receiving these drugs will require additional nutritional counselling to prevent these problems. Appendix 5 provides a complete reference of food interactions. Suggested steps to support dietary management of interactions between ART and food and nutrition are described in "Food and Nutritional Implications of Antiretroviral Therapy in Resource Limited Settings" (Castleman 2003).

Nutritional status is also affected by medications commonly taken to treat tuberculosis (TB), one of the most frequent opportunistic infections. For example, the TB medication called Isoniazid inhibits the metabolism of vitamin $B_6$ (which is required to metabolize fat and protein). Another antibiotic, called rifampin, alters vitamin D metabolism and can lead to weakened bones. Therefore vitamin $B_6$ and vitamin D supplementation may need to be considered for PLHIV also taking treatments for TB.

It is also known that certain antiretroviral drugs can produce side effects and metabolic complications that may have a significant impact on health and well-being (Castleman 2003). Some of the more common side effects include diarrhoea, loss of appetite, bloating, nausea, and unexplained weight change.

There is a growing amount of evidence documenting the long-term complications of ART in a significant proportion of adults, children, and infants living with HIV. These metabolic complications include disorders such as lipodystrophy, dyslipidaemia, insulin resistance, abnormalities in glucose tolerance, lactic acidosis, mitochondrial toxicity, and bone demineralization. These complications may be related to particular drugs and may require adaptation of diet or a change in the drug regimen. These side effects may have serious consequence in terms of adherence to ART, increased risk of chronic diseases, including cardiovascular disease and diabetes, and reduced quality of life. These metabolic effects not only impact the health and wellbeing of PLHIV but may necessitate a shift to another antiretroviral therapy regimen.

### *What we do not know*

Despite advances in the knowledge about interactions between ART and nutritional status, many questions remain unanswered. The consequences and efficacy of ART among individuals with preexisting (primary) malnutrition are unclear. The effects of underlying malnutrition on the absorption and metabolism of all or individual antiretroviral therapy medications are not fully understood (Castleman 2003). It is also unclear whether nutritional supplementation can prevent or reduce the occurrence of complications or side effects due to antiretroviral therapy. An extensive review undertaken recently found that more studies were needed to determine whether ART ameliorated micronutrient deficiencies (Drain et al. 2007).

Among infants and children, the impact of acute or chronic severe malnutrition on immune function and response to ART, including experience of side effects, is not well understood. Further research and monitoring are also required to understand the potential impact that antiretroviral therapy may have on growth among infants and children, particularly in resource-poor settings.

More work is also required to better identify the potential interaction of ART with nutritional status during pregnancy and lactation. This is particularly relevant for lactating mothers in resource-constrained settings, where breastfeeding is the only feasible or safe method of infant feeding.

In many parts of the world, supplementation using herbal and alternative therapies is a common practice for many PLHIV. Although the effects of these supplements are becoming clearer, much remains to be learned about the interactions between these traditional therapies and antiretroviral therapy medication (Castleman 2003).

## Can food and nutrition support make HIV treatment more effective?

### *What evidence is there related to malnutrition and mortality of people going onto treatment?*

Many researchers have documented a strong link between nutritional status (BMI, anaemia) and mortality risk of people going onto treatment (Paton 2006, Mshana 2006). A study of PLHIV in Singapore examined the impact of malnutrition at the initiation of antiretroviral therapy treatment (Paton 2006). The stage of disease, number of previous opportunistic infections, CD4 count and Viral Load were all significantly associated with Body Mass Index (BMI)/weight). The authors of this study concluded that malnutrition was significantly associated with reduced survival in patients commencing ART.

Severe wasting is a common feature in HIV infected children, and significantly increases the risk of mortality as shown in a recent meta-analysis of data from 10 countries (3Cs4kids, 2008). A study in Malawi found that children with mild malnutrition (low body weight for their height) were twice as likely to die in the first three months of treatment compared with those with healthy body weight, a risk that increased to six times for those suffering from severe malnutrition (ref 58). Children with severe acute malnutrition require urgent therapeutic feeding to prevent life threatening problems. WHO recommends that HIV infected children who are severely malnourished and eligible for treatment be stabilized before initiating treatment.

### *What evidence is there that food supplementation improves treatment outcomes?*

Despite much anecdotal evidence of the value of food supplementation in improving treatment outcomes among adults, to date, there has been little conclusive published evidence to demonstrate the impact of food supplementation on mortality or weight gain of adults on treatment in developing country settings. Nutrition interventions using macronutrient supplements in patients with TB (tuberculosis) initiated at the same time as commencing anti-TB drugs significantly improved lean body weight and physical function[(38)]. Many of the few existing studies on adults have been methodologically flawed (for example, not differentiating between individuals on treatment and those not on treatment within the study sample or failing to examine whether food supplements provided were actually consumed by the population). Several well-done studies are in the process of completion, and will help to build the evidence base related to the influence of food on outcome and impact level indicators such as weight gain, survival, and adherence. However, ethical concerns about 'inequitable beneficence'—or withholding food from a malnourished control group while another group is given food, have been raised. The expansion of treatment of malnutrition as a standard of care in many countries does mean that many studies in the future will compare outcomes associated with different foods or approaches, rather than providing food to one group of people and comparing it to another population not receiving food.

While few studies have been published in the peer reviewed literature, some have been presented at conferences or published by organizations. One controlled trial of food insecure adults in Zambia commencing antiretroviral therapy did find a significant impact on adherence rates, though in the final analysis, no impact was observed on weight gain or CD4 count. (Megazzini et al, 2006) . At the same time, various studies have been undertaken to investigate the impact of food supplementation among home-based care clients not on antiretroviral therapy, though few have been well designed. A targeted evaluation by Catholic Relief Services (CRS) in Zambia comparing food beneficiaries with a control group not receiving supplements found positive effects of food supplementation on quality of life scores, food consumption scores, and mid-upper arm circumference measures (MUAC) (CRS 2007).

### *What evidence is there in terms of the relationship between micronutrient supplementation and treatment outcomes?*

Although results are not always consistent, some studies have indicated slower disease progression among people taking micronutrient supplements (Fawzi 2004, Abrams 1993, Tang 1993, Tang 1996, Kanter 1999, Tang 1997). Two studies in developing countries, one in Tanzania and one in Thailand, found slower disease progression among populations receiving high dose multivitamin supplementation (Fawzi 2004; Jiamton et al, 2003). In adults, multivitamin supplementation has resulted in significantly lower viral loads, reduced incidence of complications such as oral thrush or gastrointestinal effects including nausea and diarrhoea in PLHIV in Africa (Fawzi 2004). However, more evidence is required to confirm these data and to establish the optimal dietary and supplemental intake of vitamins and minerals to reduce progression of HIV to AIDS and mortality (Friis 2005).

Vitamin supplementation in HIV infected women may improve growth in their infants and improve birth weights* but may have adverse effects on PMTCT (Villamor 2005). Zinc supplementation in HIV infected children was recently found to reduce morbidity caused by diarrhoea (Bobat 2005) In addition regular megadoses of vitamin A to HIV-positive children under 5 years of age have also been shown to reduce diarrhoeal morbidity (Coutsoudis 1995) and death rates (Fawzi 1999, Friis 2005).

Conclusions from WHO's Consultation on Nutrition and HIV in 2005 (Friis 2005) included:

- micronutrient status and intake may affect HIV transmission, progression and morbidity.
- some micronutrient supplements may be beneficial and others may have adverse effects,
- the same micronutrient supplement may be beneficial in some settings and have adverse effects in others (Fris 2005)

An extensive review (Drain et al, 2007) observed that there is lack of evidence based on available studies (most studies having major limitations) to determine whether ART ameliorates micronutrient deficiencies, nor to recommend or refute the benefit of providing micronutrient supplements to HIV positive persons receiving treatment. Because certain micronutrients may cause harm, randomized placebo controlled trials are needed.

**WHO recommends that all children and adults receive one recommended daily allowance (RDA) of micronutrients, regardless of their HIV status. This is best provided by food, including fortified foods, but where the micronutrient content of the daily diet is inadequate, a daily multi-micronutrient supplement is required (one RDA is recommended).** Currently WHO does not recommend micronutrients above the level of recommended micronutrients for healthy non-HIV-infected persons of the same age, sex, and physical activity level (Mannheimer 2002).

### *What evidence is there of the relationship between food insecurity, food and nutritional support, and uptake/adherence to treatment?*

There is growing evidence that providing food as part of a comprehensive approach to HIV treatment may increase uptake of services. In many resource-poor settings where food support is not offered, anecdotal comments such as "I don't know how I will feed the increased appetite that comes with taking the drugs" are commonly heard. Recently, quantitative and qualitative studies in peer-review journals have further substantiated claims that lack of food is an important obstacle to people seeking treatment in some resource poor settings including Rwanda and Tanzania. (Au 2006, Mshana 2006)

Nutrition related side effects, such as nausea and vomiting can have a significant impact on people's ability to adhere to antiretroviral therapy, particularly during the early phase of treatment (Chen 2003). Anecdotal evidence suggests that nutrition counselling may be helpful to maximise antiretroviral therapy tolerance and adherence. In clinical practice, dieticians report that PLHIV experience relief of symptoms from dietary and lifestyle changes. Lifestyle changes may include eating regular meals, taking medication with or without meals as recommended or eating different types of foods to reduce the side effects of antiretroviral therapy.

## What type of food and nutrition interventions should be integrated into comprehensive care and treatment?

The following strategies are recommended as part of the standard of quality HIV care and treatment:

**Clinical evaluation of nutritional status** should be part of standard clinical evaluation of PLHA and should take into account measurements such as body weight and height.

**Nutrition counseling:** Nutrition counselling can assist PLHIV to make nutritious, affordable and culturally appropriate food choices. Dietary counselling, especially when provided early, improves the body weight of PLHIV (Chlebowski 1995, van Niekerk 2000) and should be part of routine follow-up for all HIV-infected adults and children being considered for antiretroviral therapy and those currently on antiretroviral therapy (Raiten 2005). As much as possible, dietary counselling should be part of comprehensive ART services (but should not be a condition for initiating such services).

**Assessment of individual and household intake** can be an important part of treatment, as it takes into account external factors that may affect nutritional status and the efficacy of ART. Dietary supplement intake (including use of herbal and botanical therapies) should be recorded as these can potentially cause drug/supplement interactions. This may in turn affect the efficacy, safety and/or compliance to ART and participation in government-sponsored food and/or micronutrient supplementation programmes (Raiten 2005).Health care providers, nutritionists, programme designers and peer educators should be encouraged to provide nutrition counseling and provide advice on how to minimise side effects and complications associated with medication.

**Food support**, as part of a nutrition support intervention can be an important component of comprehensive HIV care, particularly in areas where malnutrition and food insecurity are common. Food and nutrition support is not necessarily the same thing (see box) and while nutritional counselling is always appropriate, food support should be focused on people who lack access to adequate food or who require nutritional rehabilitation.

**Table 3. What is the difference between nutrition support and food support?**

As part of a nutrition support intervention, food can be an important component of comprehensive HIV care, particularly in areas where malnutrition and food insecurity are common. Food support and nutrition support are not necessarily the same thing, and while nutritional counselling is always appropriate, food support should be focused on people who lack access to adequate food or who require nutritional rehabilitation.

Nutritional support may or may not include the provision of food. Nutritional support interventions include nutrition assessment, education, counselling on specific eating behaviours, prescription of targeted nutrition supplements (e.g., therapeutic feeding/nutritional rehabilitation, micronutrient supplementation), and linkages with food-based interventions and programmes.

Food support is one component of nutritional support that may be appropriate for individuals or population groups facing food insecurity. Food support can be provided through different modalities—for example, the provision of food for nutritional rehabilitation can occur directly in medical facilities or through linkages with community organizations providing food as part of home-based care programmes. Food support may have different objectives as well—in some cases it is provided to improve the nutritional status of people going on to treatment, while in others it may also be provided to HIV-affected households to reduce the burden of HIV on household food and livelihood security. Food support is generally provided for only a limited period time until people are able to provide for their own food needs. Ideally, it should be linked to livelihood support, which enables people who are recovering to re-engage in sustainable livelihood activities.

### *Examples of nutrition support interventions*

Different steps and strategies for providing nutritional components of comprehensive care programmes include:

- Food and nutritional needs analysis: assessment of factors affecting nutritional status (such as symptoms and metabolic complications), dietary requirements and food intake should be conducted at all stages of care and treatment for PLHIV. This may include nutritional risk screening of PLHIV and assessment of food security (see Appendix 6 for an example of one tool being used in the field).
- Integrating weight monitoring and other indicators in patient follow up.
- Therapeutic feeding for management of moderate and severe malnutrition.
- Individual, group or household nutrition education and counselling (by dieticians other trained health care workers or peer groups) to prevent weight loss and promote nutritional recovery when it occurs, to manage nutritional complications of common OIs and symptoms, and to manage side effects of ARVs and other medications.
- Water, hygiene and food safety interventions and counselling

### *Examples of food support interventions*

In terms of HIV treatment, there are a number of modalities for delivering food support to PLHIV. These may include provision of nutritional or micronutrient supplements to meet basic nutritional requirements of HIV-affected individuals or households determined as being in need. Since the recommended daily allowance for micronutrients is seldom met in resource-poor settings, it is important that any food supplements given be fortified or a micronutrient supplement provided.

Table 4 outlines examples of food support interventions integrated as part of HIV care. As outlined in Table 5, consideration of the potential effects of the disease can help determine the interventions that will mitigate its effects.

**Table 4. Examples of food support related to HIV Care**

| | |
|---|---|
| Food for Treatment Programmes (HIV) | Food rations may be provided during the early phases of initiating ART, with objectives related to improving adherence, minimizing side effects, aiding weight gain, and providing a safety net to households. |
| Food for Treatment Programmes (TB) | Food support is often used as a strategy to encourage TB patients to complete the full duration of their TB medication. |
| Home- Based Care | Food support, usually in the form of individual foods (such as rice, oil, salt), is provided to people requiring home-based care. Interventions may also include nutrition screening, basic medical care, counsellingcounselling, and welfare support. |

| | |
|---|---|
| Supplementary Feeding | Food rations are provided to specific groups who may be malnourished or vulnerable to malnutrition (such as pregnant women or orphans and vulnerable children (OVC). Sometimes rations are also used as an incentive to encourage patients to return for follow-up care (e.g., PMTCT). |
| Therapeutic feeding | Specialized foods (usually energy- and nutrient- dense foods) are provided in order to rehabilitate children with severe acute malnutrition. They are often energy and nutrient dense. |

**Table 5. Examples of nutrition and food interventions according to HIV disease progression**

| Intervention | Asymptomatic HIV | Symptomatic HIV and AIDS | Families affected by HIV |
|---|---|---|---|
| Nutrition assessment and dietary counselling | Nutrition for health maintenance and positive living; to maintain weight and prevent food- and waterborne infections | Nutrition management of HIV-related symptoms or medication side effects; to maintain food intake with symptoms | Counselling on special food and nutritional needs of orphans, vulnerable infants, and young children |
| Prescribed/ targeted nutrition supplementation | Daily micronutrient supplement for high-risk groups (e.g., pregnant and lactating women) | Targeted supplementary/ therapeutic) feeding for at-risk groups, including moderately and severely malnourished adults and children, and TB patients | In addition to targeted food supplements for PLHIV, food may be used as support for their families or for food-insecure households, including those made food-insecure by HIV. |

### *Examples of Livelihood Support in HIV care and treatment*

There are a number of modalities in using food to support other livelihood interventions, including:

- training (e.g., gardening, education in agriculture, cooking)
- provision of tools and physical inputs
- safety nets

The Academic Model for the Prevention and Treatment of HIV (AMPATH) is Kenya's most comprehensive initiative to combat HIV. AMPATH has implemented programmes that foster economic and food security for HIV-infected persons and their families. Examples of these programmes are shown in Table 6.

**Table 6. Examples of livelihood support interventions**

| | |
|---|---|
| **Family Preservation Initiative (FPI)** | Training in income security and occupational skills to get HIV-positive patients and their families back to self-reliance |

| | |
|---|---|
| | (autonomy). |
| **HAART and Harvest Initiative** | A programme to ensure food security for HIV-positive patients and their families. This initiative includes demonstration farms that foster and teach appropriate and relevant agricultural techniques. Produce from the demonstration farms and the high-production farm—fruits, vegetables, milk, eggs—are given to needy PLHIV for up to six months. WFP complements AMPATH's food basket with corn, beans, and oil.<br><br>For further information on lessons from this initiative refer to Byron 2006. |

## What are some of the practicalities of implementing food and nutrition interventions?

### *Nutrition Assessment*

WHO recommends that nutritional management be a critical part of management of HIV. Some groups may be vulnerable to food insecurity and malnutrition. Some of these at-risk groups include:

- child-headed households;
- households where the primary breadwinner has advancing HIV disease;
- households where grandparents are the primary caregivers; and
- households with OVC, particularly those with more than one child.

Collecting appropriate indicators as part of an individual or family nutrition assessment can help determine the most appropriate nutrition intervention. The information can also be used to evaluate the effectiveness of the intervention. When conducting a nutrition assessment, the following information may be collected:

**At population level**

- Facilities for food storage and preparation;
- Social support and financial security for individual and household members;
- Food security assessment; and
- Access to food and clean water.

**At individual level**

All the above indicators plus the following clinical evaluation indicators (collected as part of a clinical exam) but for sampling purpose in population assessment

- Physical concerns and presence of illness/symptoms affecting food intake, such as (but not limited to) nausea, vomiting, diarrhoea, constipation, lack of appetite, sore mouth, difficulty chewing or swallowing, and low energy levels;
- Current medications, especially antiretrovirals, antifungals, and antibiotics;
- Baseline dietary intake (collected via diet history interview or food frequency checklists);

- Measurement of weight and height to allow calculation of the BMI according to the formula here (may require adjustment due to variation in body shape by setting):

$$\frac{\text{Weight (kg)}}{\text{Height (m)}^2}$$

- Mid Upper Arm Circumference (MUAC) measured with a tape measure; and
- Laboratory tests, including: CD4 count, albumin, haemoglobin, cholesterol, and glucose.

In many settings, information may be difficult to collect due to a lack of time, skills, and equipment. For further details about the type of information to collect, refer to the M&E section in Chapter 5 (page 63).

BMI is the most frequently used measure of adult malnutrition in care and treatment programmes in developing country contexts. A low BMI has been demonstrated to be strongly associated with mortality risk for people going on to HIV treatment.

MUAC is another oft-used indicator, especially for monitoring nutritional status in patients who may be too weak or sick to stand up on scales to be weighed.

**Table 7: Classification of Adult Malnutrition Using Body Mass Index (BMI)***

| | |
|---|---|
| Mild | $17 \leq$ BMI<18.5 |
| Moderate | $16 \leq$ BMI <17 |
| Severe | BMI < 16 |

*In pregnant women or adults with oedema, BMI is not an accurate measurement, as weight gain is not related to nutritional status. Note that this table reflects classifications used in the general population. Technical discussions are currently ongoing about how best to classify malnutrition among PLHIV based on BMI information.

## Nutrition and food support: what are the needs of PLHIV?

A balanced intake of carbohydrates, protein, fat, and micronutrients is necessary for all people to maintain their health. Carbohydrates should provide about 70 percent of energy requirements, proteins 10–13 percent, and fat 16–18 percent of the daily energy body intake.

PLHIV have increased nutritional requirements for total energy and for number of micronutrients. Supplementation is one strategy used to address these additional nutritional needs. It may take the form of macronutrient or micronutrient supplements, or a combination of the two. Although the quantity of each nutrient increases in the diet of PLHIV, the proportion of the ration's macronutrients should remain the same.

*Macronutrient supplementation*: Macronutrient supplementation is the provision of foods or special nutritional products that are high in energy and come in the form of carbohydrates, proteins, and/or fat. This type of nutrition support may be required for PLHIV who have limited access to foods; however, little evidence exists at present to advocate for a particular formula of supplementation to treat weight loss and malnutrition. Many of these specialized macronutrient supplements are also expensive. According to WHO (Friis 2005), there is an urgent need to develop and test a series of nutritional supplements for the maintenance and improvement of nutritional status in PLHIV.

*Micronutrient supplementation*: Strategies for enhancing individuals' or groups' intake of vitamins and minerals may be achieved by promoting the consumption of whole foods rich in micronutrients, fortified foods (often cereal-based food or liquid formula with added micronutrients), or micronutrient supplements (e.g., multivitamins).

## What nutritional needs of PLHIV should be considered when integrating food support into HIV comprehensive care programmes?

Nutritional support that helps ensure adequate intake of macronutrients (foods that provide fuel for the body) and micronutrients (vitamins and minerals) may help keep PLHIV well for longer and improve their response to treatment.

The type of nutrition support depends on the nutritional needs of the individual and the stage of disease and other concurrent illnesses or infections. Weight loss and malnutrition may persist even among PLHIV on antiretroviral therapy (Vorster 2004; Grinspoon 2003; Batterham 2002). But a person who is starting ART may also gain weight even without increasing food intake.

### *Energy requirements*

Adequate energy intake is a key factor in PLHIV engaging in normal activities and maintaining a stable weight. For populations fully dependent on food assistance, WFP uses an initial planning figure of 2100 kilocalorie (kcal) per person to estimate the average energy requirements of **non-HIV-infected populations**. This figure is then adjusted upward or downward based on population composition and environmental factors (UNHCR, UNICEF, WFP, WHO, 2002). Table 7. Age- and sex-specific energy requirements for non-HIV-infected persons (engaged in light activity). Table 7 summarizes the WHO estimates of basic energy requirements by age and sex for populations engaged in light activity. Note that energy requirements increase during pregnancy and lactation.

**Table 7. Age- and sex-specific energy requirements for non-HIV-infected persons (engaged in light activity)**

| | Male | Female | Average |
|---|---|---|---|
| **Age group (yrs)** | **Daily energy requirement (kcal)** | **Daily energy requirement (kcal)** | **Daily energy requirement (kcal)** |
| **0–4** | 1 320 | 1 250 | 1 286 |
| **5–9** | 1 980 | 1 730 | 1 858 |
| **10–14** | 2 370 | 2 040 | 2 207 |
| **15–19** | 2 700 | 2 120 | 2 415 |
| **20–59** | 2 460 | 1 990 | 2 229 |
| **60+** | 2 010 | 1 780 | 1 889 |
| **Pregnant** | | +285 (additional) | |
| **Lactating** | | +500 (additional) | |
| *Source:* WHO. The management of nutrition in major emergencies, Geneva, 2000 | | | |

For PLHIV, energy needs also increase depending on the stage of HIV disease:

**Asymptomatic HIV:** During the asymptomatic stage of HIV infection (i.e., stage 1 of HIV; see Appendix 3), PLHIV should increase their energy (kcal) intake by 10 percent over the level recommended for healthy non-HIV-infected persons of the same age, sex, and physical activity level. This requires their consuming more food. Examples of the amounts of extra food required for an adult based on an average daily 2200 kcal diet are included in Table 8. Each example provides approximately 220 kcal.

**Table 8. Examples of foods providing approximately 220 kcal**

| Food | Amount |
|---|---|
| Soya oil | ~ 5 tsp (25 g) |
| Lentils (dried) | 5 Tb (75 g) |
| Beans, soya (dried) | ~ 4 Tb (65 g) |
| Rice (raw) | ~¼ cup (60 g) |
| Maize cereal, corn-soya blend (CSB), wheat-soya blend (WSB) | 60 g |
| Dried skim milk (DSM), enriched/plain | 60 g |

**Symptomatic HIV:** During later stages of HIV infection, when symptoms are present (i.e., stage 2 and later), PLHIV should increase their energy intake by 20 to 30 percent over the level recommended for healthy non-HIV-infected persons of the same age, sex, and physical activity level. This is irrespective of whether the person is on ART. (Based on 2200 kcal as the average requirement for uninfected adult populations, this would equate to 2640 to 2860 kcal per day for PLHIV developing AIDS.) The energy requirements may vary and increase for specific groups, such as men, pregnant and lactating mothers, and growing children.

**Table 9. Calculating macronutrient requirements: an example**

A 20% energy increase required by HIV-positive men in the age group 2059 years adds up to: 20% x 2460 = 492 kcal. Of this energy, 10–12% should be provided by protein = 59 kcal (at 12%), and at least 17% should be provided by fat = 84 kcal. This translates to 15 g of additional protein and 9 g of additional fat to be consumed.

The total energy requirement for this group is thus: 2460 + 492 = 2952 kcal
The total protein requirement for this group is thus: 74 + 15 = 89 g
The total fat requirement for this group is thus: 46 + 9 = 55 g

### Protein requirements

The increase in energy required by PLHIV should be accomplished in part by their eating more protein. During periods of infection, the body may lose stores of protein (body cell mass). Despite some research showing improvements in body cell mass (muscle stores; [Schwenk 1999]) and total body weight (Charlin 2002; Tabi 2005) with increased protein intake, further research is still required to determine whether PLHIV have additional protein needs compared to HIV-negative people. In line with WHO recommendations, protein should provide at least 10 to 12 percent of total energy.

PLHIV often have pre-existing protein-energy malnutrition (PEM), resulting from inadequate food intake or poor food utilization. This type of deficiency is caused by lack in the diet not just of protein but also of total energy from food. Therefore, foods must be balanced to contain adequate protein as well as energy. Food assistance may help PLHIV with PEM, or those at risk of PEM, to achieve adequate dietary intake and improved nutritional status.

It may be more feasible to increase dietary protein from plant sources. Protein foods of animal origin tend to be more expensive and do not always store well.

### Fat requirements

Fat requirements for PLHIV are the same as those for the general population (at least 17 percent of total energy). However, dietary fat can help increase the total energy intake of PLHIV, especially when food is scarce.

Attention to the type of fat eaten is recommended for those patients at risk of ART-related problems, including high cholesterol/triglycerides and diabetes. Unsaturated fats (polyunsaturated and monounsaturated) are preferred in these instances. For example, soya oil would be recommended instead of palm oil.

**Table 10. Energy and macronutrient requirements of PLHIV**

| Nutrient/Population Group | Recommendation* |
|---|---|
| ***Energy*** | |
| Asymptomatic HIV+ adults | Increase of ~10% |
| Adults with symptomatic HIV infection or AIDS (including pregnant/ lactating women) | Increase of ~20–30% |
| Asymptomatic HIV+ children | Increase of ~10% |
| Children experiencing weight loss (regardless of HIV status) | Increase of ~50–100% |
| Children with severe acute malnutrition | No change from WHO guidelines |
| ***Protein*** | |
| All population groups | No change indicated to date in the relative proportion of protein, though absolute quantities would increase with increased energy intake(10–12% of total energy intake) |
| ***Fat*** | |
| Individuals who are HIV- or HIV+ but not taking antiretroviral drugs | No change indicated to date (> 17% of total energy intake) |

*Compared with normal dietary requirements from WHO; *Source:* WHO, Nutrient requirements for people living with HIV/AIDS, Geneva, 2003.

### Micronutrient requirements

Micronutrient deficiencies are common in HIV-infected persons. This may be due to the reduced absorption or increased nutrient losses that occur from the early stages of HIV infection (Ullrich 1994).

There is emerging evidence that HIV replication accelerates in the body when there are high levels of oxidative stress (i.e., the accumulation of chemical waste products in the body, which occurs as part of the body's normal metabolic processes). This can lead to cellular damage. Adequate intake of a number of micronutrients such as vitamins A, E, C, selenium, and zinc can help reduce levels of oxidative stress in the body. Similarly, deficiencies in some micronutrients may increase levels of oxidative stress, which can result in impaired immune system function and disease progression (Schreck 1991). Oxidative stress has been documented in PLHIV despite adequate micronutrient intake (Schreck 1991; Batterham 2001).

Adequate micronutrient intake could be achieved through consuming a diverse range of foods rich in micronutrients. Where available, fruits/vegetables and/or fortified food should be eaten daily. Further research is needed to establish the required intake of individual micronutrients to maintain normal nutritional status in PLHIV at different stages of HIV, with and without antiretroviral treatment (Friis 2005), and to inform and guide the provision of micronutrients particularly in pregnant women. Micronutrients are discussed in further detail in Chapter 2.

**Since the recommended daily allowance for micronutrients is seldom met in resource-poor settings, it is important for programmers to consider providing fortified foods or multiple micronutrient supplements with the objective of reaching the recommended dietary allowance (RDA)**

## What foods or products are recommended for HIV comprehensive care programmes?

With the exception of severely malnourished adults requiring therapeutic feeding, most PLHIV can achieve adequate dietary intake through daily consumption of starchy staples (e.g., rice, maize, potato, cassava, banana, or yam) with cooked legumes (e.g., beans, peas), nuts and nut butters, fat and oil, fruits, and vegetables. If available, animal-based protein such as meat and chicken should also be incorporated regularly. For people experiencing mouth sores or difficulty eating solid foods, porridge-based or blended foods (or a mix of cereals and pulses) may be particularly useful.

Some food products and nutrient supplements have been produced and marketed specifically for people living with HIV. Due to the lack of sufficient evidence of the benefit of specialized products over lower-cost commodity products currently used in nutritional and food supplement programmes, the best option is to use existing locally produced food and the products customarily used in WFP and other food support programmes (e.g., staples, pulses, oil, and fortified blended foods). WFP's ration planning guide for HIV activities outlines many of the important considerations associated with the ration planning process (WFP 2008).

Although too few studies have been performed to give solid evidence and to inform policies, it is known that nutrient-dense ready-to-use therapeutic foods (RUTF) may lead to impressive and rapid weight gain among severely malnourished people (adults and children) with symptomatic AIDS, even those at the WHO-determined HIV stages 3 and 4. More studies are under way to confirm those results (Table 20). What is less certain is the extent to which food supplementation leads to increases in lean body mass and/or survival.

## How can nutritional management improve tolerance to antiretroviral therapy?

A lack of food is often mentioned as the most likely cause of non-adherence to antiretroviral therapy in developing country settings (Marston 2004). Increasing access to ART may be of limited benefit if people lack access to safe water or food. Food and nutrition support may help increase ART effectiveness and reduce the likelihood that drug resistance will develop due to non-adherence.

Dietary advice should be adapted to the local context, taking into consideration available foods and other household conditions. Nutritional management must be specific to the drugs taken because of the variation in ART-food interactions.

### *What longer-term side effects of antiretroviral therapy can be managed by dietary change?*

In severely malnourished people, the management of malnutrition (by ensuring adequate food consumption) takes priority over managing the long-term effects of antiretroviral therapy, such as hyperlipidemia (high blood fats) or weakening of bones (osteoporosis). In some cases it may be appropriate for PLHIV to receive advice on dietary change or be given modified food packages to reduce the impact of these side effects. Table 8 outlines nutrition interventions for the management of metabolic complications of HIV disease and ART. Even for those not suffering from malnutrition, it is important to include counselling on metabolic and other side effects due to ARVs. Overweight patients in particular should be counselled to reduce the fat in their general diet while they are taking some medications.

**Table 11. Nutrition counselling support recommendations for short- and longer-term side effects of HIV and ART (Castleman 2003)**

| | |
|---|---|
| Anorexia | • Eat smaller, more frequent meals.<br>• Eat favourite and high-energy foods when hungry.<br>• Avoid strong-smelling foods. |
| Change in or loss of taste | • Use flavour enhancers such as salt, spices, or lemon.<br>• Chew food well and move it around in mouth to stimulate taste receptors. |
| Diarrhoea | • Drink plenty of fluids (e.g., boiled water, rice water, ORS) and limit coffee, soft drinks, alcohol, and large amounts of fruit juice.<br>• Prepare and drink rehydration solutions regularly (see recipes in Appendix 4).<br>• Continue eating during and after illness.<br>• Eat food high in soluble fibre (e.g., psyllium husk, oats, rice, banana and peeled apples).<br>• Avoid fatty or spicy food. |
| Fever | • Drink plenty of fluids.<br>• Eat energy- and nutrient-dense foods in small amounts and frequently. |
| Nausea or vomiting | • Take medication with food (except Indinavir and didanosine [DDI]).<br>• Eat small quantities of food at frequent intervals.<br>• Drink after meals and limit intake of fluid with meals.<br>• Avoid having an empty stomach.<br>• Avoid lying down immediately after eating.<br>• Eat slightly salty and dry foods to calm the stomach. Rest between meals. |
| Altered taste | • Use flavour enhancers. |

| | |
|---|---|
| Pain and difficulty when swallowing | • Use saline mouth washes; eat soft/pureed or liquid foods. |
| Bloating and digestion problems | • Modify the type of fibre eaten and limit foods that increase symptoms. |

**Table 9: Metabolic Complications**

| | |
|---|---|
| High blood fats (e.g., cholesterol and triglycerides) | • Change the type of fat eaten in the diet from saturated to unsaturated (e.g., eat more oily fish, seeds, and nuts).<br>• Eat unsaturated fat (e.g., soya, canola, or other oils) instead of palm oil or butter.<br>• Eat more fibre from legumes, oats, etc.<br>• Eat fruit and vegetables daily.<br>• Limit alcohol intake. |
| Weakening of bones (testing for osteoporosis is unlikely in resource-poor settings) | • Get regular exposure to sunlight (at least 10 minutes per day).<br>• Eat calcium-rich foods daily (e.g., milk, milk powder, soya products, yoghurts).<br>• Perform weight-bearing exercise daily (e.g., walking). |
| Insulin resistance or diabetes (management for PLHIV not on diabetes medication) | • Eat foods containing carbohydrates (e.g., maize, sweet potato, rice, and fruit) in similar amounts at each meal (e.g., 1/3 cup rice and 1 medium piece of fruit).<br>• Avoid soft drinks (e.g., cola).<br>• Limit sweets (a small amount of sugar added to foods/meals is acceptable).<br>• Protein foods (e.g., legumes, eggs, and meat), unsaturated fats, and green vegetables do not affect blood sugar and can be eaten as required. |

*Adapted from*: Food and Nutritional Technical Assistance, August 2003, Food and Nutrition Implications of Antiretroviral Therapy in Resource Limited Settings.

### *Are there specific needs for infants and children living with HIV?*

Wasting and stunting are common symptoms among children living with HIV. In a study from Botswana, 59 percent of the first 145 HIV-infected children to receive antiretroviral therapy were severely wasted, and 75 percent were severely stunted (Anabwani 2003). Such growth failure in children is associated with a high risk of death. Height has been suggested as an important predictor of survival in HIV-infected children (Benjamin 2003; Carey 1998; Chantry 2003). The exact mechanism of malnutrition in children with HIV is not known. Factors similar to those experienced by adults appear to contribute to child malnutrition, including inadequate energy intake, malabsorption and increased energy expenditure, and food insecurity. Children experiencing growth failure should be targeted for overall healthcare, and the cause of their growth failure determined and addressed (e.g., treatment of opportunistic infections; Doherty 2006). Antiretroviral therapy can assist children in gaining weight, especially when adequate food is available.

Low birth weight and stunting are common among children born to HIV-infected mothers. Even HIV-negative children with an HIV-infected parent have been shown to be at heightened risk of malnutrition, possibly due to heightened susceptibility to household food insecurity resulting from their parent being affected by HIV (Chaterjee, 2007).

WHO recommends that early nutrition intervention be an integral part of care of HIV-infected infants and children. Current recommendations state that nutrition support should be provided, including ensuring a daily intake of micronutrients equivalent to the recommended daily allowance. Where possible, this should be achieved through the provision/consumption of locally available and affordable foods. Yet the reality in many places is that households affected by HIV-related poverty may not be able to afford a diverse and nutritionally adequate diet using only locally produced foods. As a result, fortified foods and/or micronutrient supplements may be needed to fill the gap.

As in adults, it is recommended to increase the energy intake of HIV-infected infants and children by 10 percent of the RDA for their age and sex, and increase it to 20–30 percent if they are symptomatic or recovering from acute infections. This may need to be increased in cases of growth failure.

Children with acute malnutrition should be treated in the community or hospital setting (UNAIDS 2007; WHO 1999). Effective community treatment for severe acute malnutrition is ready-to-use therapeutic food (RUTF) until the children show clinically improved weight gain (UNAIDS 2007). A number of WHO resources provide guidance on malnutrition (Tebas 2000; WHO 1999; WHO 2005; UNAIDS 2007).

There is evidence to suggest that vitamin A supplementation in children, regardless of HIV status, reduces overall morbidity, diarrhoeal morbidity, and all-cause mortality. Vitamin A supplements should be given in accordance with the WHO-recommended high-dose prevention schedule for all children at high risk of vitamin A deficiency.

### *Infant Feeding in the Presence of HIV*

**UN Recommendations:** WHO's global public health recommendation for infants is to breastfeed exclusively for the first 6 months and then introduce nutritionally adequate and safe complementary foods while breast feeding continues for up to 2 years of age or beyond, except in the occurrence of exceptionally difficult circumstances, including HIV infection of the mother (WHO 2003). The most appropriate infant feeding option for an HIV-infected mother depends on her individual circumstances, including her health status and the local situation, and should take into account the health services available and the counselling and support she is likely to receive. Exclusive breastfeeding is recommended for HIV-infected women for the first 6 months of life unless replacement feeding is acceptable, feasible, affordable, sustainable, and safe before that time (WHO 2006).

At 6 months, if replacement feeding is still not acceptable, feasible, affordable, sustainable, or safe, continuation of breastfeeding with additional complementary foods is recommended, while the mother and baby continue to be regularly assessed. All breastfeeding should stop once a nutritionally adequate and safe diet without breast milk can be provided.

Starting from 6 months of age, the non-breastfed child should receive:

- extra water each day (2–3 cups in temperate climate and 4–6 cups in hot climate);
- essential fatty acids (animal-source foods, fish, avocado, vegetable oil, nut pastes);
- adequate iron (animal-source foods, fortified foods or supplements);
- milk (1–2 cups per day); and
- extra meals (1–2 meals per day).

*Recommendations for HIV-Positive Mothers with Infants:*

Use replacement feeding with baby formula (not dried skim milk) for at least 12 months only in ideal situations, where it is Acceptable, Feasible, Affordable, Sustainable, and Safe (AFASS). Introduce safe complementary foods at about 6 months (PAHO 2003; WHO 2005). If replacement feeding does not meet AFASS strongly recommends **exclusive breastfeeding** for the first 6 months (Coovadia 2007; WHO 2003; Kourtis 2006). At around 6 months, cessation of breastfeeding may be recommended (Coovadia 2007; WHO 2003; Kourtis 2006) and rapid (2 days to 3 weeks) weaning (Kourtis 2006; WHO 2003; WHO 2005). Commence family foods, especially *boiled* animal full-cream milk or yoghurt. Other animal products, fruits and vegetables, and a micronutrient supplement are recommended. If animal-source foods such as meat, poultry, fish, or eggs are eaten daily, then only 200–400 ml/day of full-cream milk is needed; if not, then 300–500 ml/day is required (WHO 2005). **If adequate food (600 kcal/day at 6–8 months; 700 kcal/day at 9-11 months; and 900 kcal/day at 12–23 months;** WHO 2005) **is not available at 6 months, then there is no other choice but mixed feeding.**

After 6 months of age, any liquids given should be fed by cup rather than bottle, especially because of risk of infection from the bottle (WHO 2003).

For further information, see WHO 2003 (especially pp. 67–69), for complementary feeding see WHO 2005; and for an overall practice guide, see WHO 2003.

## Summary of key points from Chapter 2

- People living with HIV are more vulnerable to malnutrition than the general population.
- Malnutrition in PLHIV often occurs against a background of poverty and poor access to food.
- Three key factors that contribute to malnutrition in PLHIV are inadequate food intake, malabsorption, and increased energy expenditure.
- Adequate nutrition cannot cure HIV but is essential for maintaining the immune system and supporting physical activity to achieve optimal quality of life.
- Current research is insufficient to determine whether nutritional supplementation, support, and/or food aid will slow the progression of HIV and delay the need for treatment. However, a cycle of malnutrition in the context of HIV can be demonstrated. Nutrition support may slow or stop this cycle.
- Nutritional support that helps ensure adequate intake of both macronutrients and micronutrients may help keep PLHIV well for longer.
- Improving the nutritional status of PLHIV has the potential to enhance the effectiveness of antiretroviral therapy, in particular by using nutritional therapy to manage the side effects of medications.
- Nutritional needs vary by age, sex, environmental factors, and stage of HIV disease progression. Such variations need to be considered when calculating the nutritional needs of specific groups when planning food and nutritional programmes.
- To maximize the impact of the food assistance, programme designers should identify and develop partnerships with comprehensive care services that are accessed by food-insecure PLHIV and HIV-affected households.

# Chapter 3: The design and implementation of food support in the context of care and treatment programmes

## Where are food support programmes implemented?

The conventional approach to targeting food assistance programmes in resource-poor settings is to use information on food access, availability, and utilization collected through vulnerability assessments in order to geographically identify populations in need of food. Such an approach helps to maximize the benefits of food support while minimizing potentially negative effects of food assistance, such as its adverse impact on markets. However, this approach most often identifies rural rather than urban and peri-urban areas, where many care and treatment programmes are currently focused. Conventional approaches to targeting may need modification in light of HIV prevalence in urban areas and the ability of care and treatment programmes to screen for those in need of food assistance.

## What problems does food support try to address? The importance of starting with an assessment

While nutritional counselling should be an integral part of all antiretroviral programmes, decisions about whether or not to equip a health centre with a programme of food support should *always* be made based on evidence that lack of food is a problem for those who are eligible for treatment.

Given that the needs and socio-economic situation of people seeking treatment may be markedly different than those of others in the same geographical area, a survey that focuses on potential beneficiaries (and not just on a given geographic area) can often provide valuable information about the need for food. This can often be combined with information from the centres on the nutritional and health status of people going onto treatment. If appropriate, the information gained through such an assessment can be used to make decisions about where to programme scarce food resources, which criteria to use to decide who should receive food, how to advocate for funding . Numerous examples now exist from such assessments (see Table 11). A detailed guide to Food Assistance Programming in the Context of HIV was recently published by WFP and FANTA (WFP/FANTA 2007).

**Table 11. Understanding the Needs of People Seeking Treatment Before Initiating Food Support: WFP's Experiences from Chechnya and Afghanistan**

In 2006, WFP Chechnya was presented with a request for food from a centre providing support to 27 PLHIV. With only a little knowledge of the contextual situation in Chechnya, the country office decided to interview people attending the centre, discussing with them topics such as household size, employment, income, monthly expenditure, potential food needs, social vulnerability, current sources of food and food assistance, and their reasons for going to the centre. Results from this survey showed high levels of vulnerability—many people reported that their current income wasn't enough to survive on, given large family sizes and high expenditures for medicine. Based on this information, the country office decided to fund the centre, adding this caseload to an existing programme focused on TB treatment.

Following a regional meeting held on the topic of food and nutrition in HIV/AIDS in 2006, the WFP country office, the Ministry of Public Health (MOPH), and the National AIDS Control Programme in Afghanistan realized that little was known about the food or other needs of PLHIV in Afghanistan. Despite numerous challenges to the collection of such information (high stigma, low HIV prevalence, and few available follow-up and care services), these partners decided to undertake a study to ascertain the socio-economic and nutritional situation of PLHIV and their families, with the purpose of understanding their need for food assistance. Ethical considerations were paramount to undertaking such a survey; to ensure that they would not place respondents at risk, the researchers took special care to be discreet in the collection of information, and cleared the protocol through the Institutional Review Board (IRB) of the MOPH.

In an examination of the situation of 34 HIV-positive people (accessed with the assistance of VCT counsellors), the survey found a mean household size of 7.1, and that 71 percent of respondents and their families fell below the poverty line. The survey also revealed difficulties in

## What are the objectives of food and nutritional support to HIV care and treatment programmes?

*"Improved attention to diet and nutrition may enhance ART acceptability, adherence and effectiveness"*

WHO, Nutrient Requirements for People Living with HIV/AIDS: Report of a Technical Consultation, 2003

### *Analysing where food fits in*

Adequate nutrition is an essential component to improving the quality of life of PLHIV through all the stages of disease, along with living a healthy lifestyle, preventing opportunistic infections, managing symptoms, and maximizing the full benefits of antiretroviral therapy.

The overall role of food and nutritional support (as part of comprehensive care and treatment programmes) is to help meet the food and nutritional needs of PLHIV (and often their families) during key phases in the continuum of care. This can help treatment programmes to more effectively reach their goals: i.e., saving lives, improving quality of life, and enabling people to reengage in their livelihoods.

Provided that an assessment reveals that there are problems that can be addressed by food support, the next step should be to consider how food might fit into the programme, and what the objectives are. This process should involve potential partners.

The objectives of providing food and nutritional support through care and treatment programmes may vary by context. However, in general there are three main objectives:

***Objective 1: To help facilitate nutritional recovery and therefore to optimize the benefits of antiretroviral therapy***

In an ideal situation, nutritional support would begin long before a person's immune status deteriorated to the point where he/she became eligible for antiretroviral treatment (i.e., before the CD4 count fell below 200). Unfortunately, the reality for many living in resource-poor settings is that the first treatment consultation is often the first time that HIV status is ascertained. People coming in for antiretroviral therapy often show up severely wasted, in such bad physical condition that they are unable to work. Many households dependent on a single wage earner for much of their income will have exhausted their savings and lost access to food. Some individuals may have lost their appetites or suffer from symptoms that prevent them from eating properly.

Food and nutritional support can play a critical role in stabilizing the nutritional status of PLHIV prior to treatment and ensuring that they benefit fully from treatment during their recovery. During a recent WHO Consultation on Nutrition and HIV in Africa, participants recognized that adequate nutrition is required to optimize the benefits of antiretroviral drugs. Assessment of nutritional problems and tracking key indicators of nutritional status, such as body weight and lean body mass, are an integral part of treating and managing the infection. Dietary counselling can also help patients to deal with symptoms of illness, such as mouth sores, and to avoid consuming foods or dietary supplements that have harmful interactions with medications (Raiten 2005). Food support can play an important role during this critical period by enabling food-insecure individuals and households to act on dietary recommendations made by care providers. While many first-line antiretroviral medications do not need to be consumed with food, **they are often better tolerated and are more effective when given to people who are adequately nourished.** However, caution should be exerted, and ART should not be delayed for patients who urgently need it.

***Objective 2: To increase the uptake of treatment by enabling food-insecure people to seek treatment***

There is increasing evidence from multiple countries that food insecurity is a major reason why individuals fail to come in for treatment. A study of barriers to accessing ART in Tanzania concluded, "*Although participants welcomed antiretroviral therapy, they feared that transportation and supplementary food costs…would limit accessibility*" (Mshana 2006). A quantitative survey of people in Rwanda eligible for, but not receiving, treatment, concluded that "*Three-quarters of participants said that they would develop too much of an appetite as a result of taking the drugs, but would not be able to afford enough to eat*" (Au 2006).

Expanding access to antiretroviral therapy in resource-poor settings is a global priority. It is essential that programmes with an objective of rolling out treatment acknowledge and systematically address the challenges people face in accessing life-saving drug treatment. For patients and households who have lost income due to illness or who have exhausted their savings by paying healthcare or funeral costs, the economic transfer associated with food support can make a difference in terms of enabling people to access services. This "enabling" effect would likely be stronger among poorer populations and in settings where drugs were not provided free of charge and represented a greater economic cost for households. Having the assurance that food will be provided for their families until they feel well enough to reengage in work activities may help people

feel more confident in seeking services. Food may also help patients overcome physical limitations to accessing services

***Objective 3: To encourage adherence to treatment, specifically before people are well enough to reengage in their livelihoods***

Successful treatment of HIV with antiretroviral therapy requires that patients maintain nearly perfect adherence to prescribed drug regimens (Stone 2001). Poor adherence is the main reason for failure to achieve maximal suppression of viral load and for the development of drug resistance. There are many barriers to adherence, even in developed countries, including side effects and psychosocial issues. Among resource-poor populations, however, the same barriers to accessing services described under Objective 2 can also be expected to impact adherence, particularly during the early stages of treatment, before people become well enough to resume work and earn money to pay for things such as transportation to clinics. Recent evidence from a study in Zambia suggests that adherence rates are greater during the first 12 months of treatment among food-insecure beneficiaries who receive food support than those who do not (Megazzini 2006). Dietary counselling and nutritional support also play an important role in helping people and their families manage the symptoms of opportunistic infections and drug side effects.

Certain metabolic complications and side effects such as lipodystrophy, the redistribution of fatty tissues in the body, are common reasons for patients to stop using ART. It is unclear whether such complications are more or less likely in chronically undernourished areas, or whether food supplementation can prevent or reduce such complications (WHO 2005).

## Analysing where food fits in: Deciding what the objectives of food support are

Provided that an assessment reveals that there are problems that can be addressed by providing food support, the next step should be to consider how food fits into the programme, and what the objectives are. This process should involve potential partners. A “programme theory” map, such as the one shown in Figure 6 (page 68), is often useful for outlining the relationship between inputs, activities, outputs, outcomes, and impacts, as well as the potential barriers that could hinder the programme from functioning properly. Such a map can also be invaluable in identifying critical steps where monitoring indicators can be put in place to ensure the programme runs smoothly.

## Who should implement food and nutritional components of HIV comprehensive care and treatment programmes?

Implementing partner agencies or CBOs should be able to reach out to communities for integrating food and nutrition support in comprehensive care and treatment programmes.

- *Is the partner identified as a legitimate provider of care and support? Do they have a history of effective programming? Are they known and accepted by the community and by the healthcare workers?*

The first step is to find out whether a proposed partner is legitimate and experienced in providing care and support. A history of effective programme implementation is an important characteristic. It is useful to ask whether they have been accredited by the government health system and whether they are implementing according to WHO’s treatment and care guidelines. It may also be useful to explore how they are perceived by communities, how well women are represented in the organization’s decision-making bodies, how they interact with other organizations, and who they are serving (e.g., do they serve only certain religious, ethnic, or political segments of the community?).

- *Does the partner support a population that is food-insecure?*

Most care and treatment programmes are currently in urban/peri-urban settings, settings that are not food-insecure by themselves but that may serve sub-populations that are food insecure. In most settings, it is important to work with partners to ascertain vulnerability prior to providing food support.

- *Is there capacity to handle/store/distribute food*?

The possession of or access to proper storage facilities with quality-assured services and experience in handling and distributing food are valuable qualities to seek in partners, but may be difficult to find in remote areas. Some capacity development is often needed to help such partners understand the issues involved in storing and handling food. However, in some settings, it may be most appropriate to organize food distributions at a different location than the treatment site, due to the demands it places on staff time, stigma issues, and/or inadequate food storage capacities.

- *Is the partner capable of effective screening of beneficiaries for food assistance?*

Assuming that not all beneficiaries require food assistance, partners need to use some objective indicators to decide who should receive food. Strong community ties are often essential in this regard to make sure that the screening or "food prescription" process is transparent and understood.

- *Does the partner have the capacity and willingness to collect and report on indicators of importance to your organization?*

If your organization takes a results-based management approach, you may require that your partners are able to collect and report on output and outcome indicators in a reliable and timely way. To assess this capacity, ask about the information management systems and reporting capacities already being used by the partner in relation to treatment. Also, given the relatively recent development of many indicators, and the different approaches taken by many partners, partners should be open to pursuing harmonized approaches for M&E of programmes and working with your organization to build an evidence base.

- *Does the partner provide a comprehensive package of care and support that complements the food being provided?*

Food support is most effective at achieving outcomes when it is part of a comprehensive package of nutritional support. It is useful to find out whether the partner has a demonstrated interest and capacity in providing nutrition care services (other than food). Do they have dieticians or nutritionists on staff? Are they trained in nutritional counselling and assessment? The capacity to provide longer-term livelihood or training support, although a rare quality for providers of care, is also valuable to ensure that patients can provide for themselves once they have graduated from food support. If the partner does not provide such services, determine how well they link their beneficiaries up with organizations/projects that do.

- *What is the implementation capacity of the partner (i.e., number of people they are supporting)?*

As a general principle, it is easier and more cost-effective to work with several large partners than many small ones, because of the comparative simplicity of food distribution. Having many small partners, each requiring a relatively small amount of food each month, requires more frequent deliveries. Increased strain on reporting capacities may also result from having a large number of small partners. However, it is important to recognize the strong community linkages that smaller partners bring.

**An example from Uganda**

> Normally WFP works with larger NGOs. To facilitate its ability to support a network of smaller partners with strong community ties in Uganda, WFP supports the Association of Volunteers in International Service (AVSI), an international NGO that receives the food, distributes it to smaller partners, and ensures proper reporting and accountability to WFP. In such relationships, it should be agreed from the outset that the smaller local organizations will be trained over time in order to build their capacity.

## Critical issues in the design of food support programmes

### *How should we target our support to treatment programmes?*

In general, most food programmes are targeted geographically toward rural populations often living in food-deficit areas with high vulnerability to food insecurity and malnutrition. There are certain dynamics to consider when thinking about targeting food to HIV treatment programmes:

1. At present, most treatment programmes are located in or around urban areas, which tend not to be traditional working areas for food support programmes.
2. In many countries, urban and peri-urban areas are often the hardest hit by HIV.[1]
3. The populations accessing treatment may be quite different from the overall urban population.

These dynamics make analysis and evaluation of where to support treatment programmes difficult. While food availability may not be a problem in the geographic areas where such programmes are being implemented, access to food may be a big problem for sub-populations living in those areas, particularly for households who have lost their main source of income and/or assets due to sickness or death.

Prior to integrating food support into a treatment and care programme, formative research into the socio-economic, food security, and nutritional situation of the populations being supported by a partner can be helpful determining if there is a need for food as a component of nutritional support. The main objective of such research should be to get an approximate figure of the proportion of beneficiaries in need of food support—note that there is a much stronger rationale for supporting a clinic if 80 percent of the population it serves is in need of food (versus 30 percent). This type of research can also be used to develop or improve the nutritional components of a treatment programme—for example, to develop screening tools or survey questions that can identify individuals/families in need of food assistance or help guide the content of nutritional counseling.

### *What screening criteria should be used to select who gets food and nutritional support?*

[1] For example, in both Zambia and Zimbabwe, WFP's analysis has indicated a relatively recent yet rapid increase in both acute malnutrition and food insecurity among peri-urban households.

One of the biggest challenges in the design and implementation of food support programmes related to HIV is deciding who is eligible for food assistance.

It is difficult to prescribe a single screening tool that would be useful for most individual countries, given the wide variety of programmes being supported and the different contexts of vulnerability. We recommend that eligibility criteria be developed at the country level with the local context in mind, and in consultation with partners, considering such issues as:

1. Programme objectives;
2. Availability of resources;
3. Relative vulnerability of the population (including nutritional status);
4. User-friendliness of the criteria and the time and resources it takes for partners to use the tools;
5. Perceived transparency of the eligibility criteria by the targeted community;
6. Alternative ways of using the information collected (e.g., data on dietary consumption might be useful not only for screening for beneficiaries, but also for nutritional counselling); and
7. Prevention of stigma and discrimination, and respect of ethics.

It is recommended to work with local partners to define the screening criteria used to decide who gets food. Partners who have strong community linkages can use those ties to help decide who is the most vulnerable. For example, in Mozambique, the Community of St. Egidio has a strong network of volunteers "activistas" who provide outreach into an urban community and help health providers determine who is the most vulnerable. In some cases of high vulnerability, it may be more cost-effective to provide food to all beneficiaries rather than to screen. This is particularly true in areas where there is a limited number of staff to make such decisions.

**WFP's policy is to target its food assistance based on food insecurity and malnutrition** and **not on an individual's HIV status** alone. Thus, once the decision has been made to provide food and/or nutritional support to a given site, it is important to develop screening/eligibility criteria that partners can use to decide who gets food and who does not. A set of explicit agreed-upon criteria may help partners make this difficult decision.

All stakeholders, clinicians, services providers, and community members determine eligibility criteria. Bringing together all stakeholders is likely to make the intervention more effectively integrated and possibly more equitable. In Uganda, WFP and partners developed an eligibility evaluation form with a scoring system based on a number of different food insecurity and biological indicators. This tool has been refined over time, using information from post-distribution monitoring and feedback from providers. A similar tool was developed in Zambia to help partners ascertain the food security status of beneficiary households.

In many countries, decisions about food assistance eligibility are based on body mass index (BMI). It should be remembered, however, that BMI by itself has many limitations. More research is needed to explore the usefulness of BMI, MUAC, and other anthropometric indicators to identify people in need of food and nutritional support.

### *What ration should be given in support of treatment programmes?*

This question does not have a "one size fits all" answer. Such decisions must be made at the country level and must consider a number of factors. An upcoming set of guidelines from WFP will outline the design of rations for different types of HIV activities, posing five main questions to guide the decision-making process:

1. Why do we provide food assistance?
2. What food ration would be most appropriate?
3. What is the operational feasibility of the suggested ration?
4. What activities do we need to put in place to enhance the proper use of the food ration?
5. How do we monitor the appropriateness and effectiveness of the ration and make adjustments if necessary?

While it is not possible to outline the entire process of ration design in this document, some of the major considerations are outlined here.

The process of deciding upon rations should begin with an examination of the objectives of food support. The objectives may differ, but most relate to helping patients realize the full benefits of treatment, and enabling food-insecure patients to seek care by providing for their (and often their family's) food needs and thus adhere during the early stages of treatment. It is important that the food basket be designed with the objectives in mind and based on an assessment of food needs. For example, if the objective is to support the nutritional needs of the patient on antiretroviral therapy, and only an individual ration is given when the entire household has no means to meet its food needs, sharing may occur, and thus dilute the benefits of that ration for the patient. Conversely, if a household-size ration is determined to be necessary, when only an individual ration might be sufficient to achieve the goals, fewer households can be reached with scarcer food resources.

### *Consider nutritional needs of the population being supported*

Chapter 2 gives an overview of the nutritional requirements of people with HIV and AIDS faced, which are also described in detail in many references (Grimwade 2006; WHO 2003; Paterson 2000; Byakika-Tusiime 2005). In addition to considering the nutritional requirements of the population being supported, it is also important to consider the other factors that may influence people's ability to eat, such as symptoms (mouth sores and digestive difficulties) and drug-diet interactions.

It is essential to consider what types (and quantities) of food households have access to through their own resources. Ideally, any food aid provided would be a complement to locally available foods, as intake of fruits and vegetables is particularly important.

**Table 12. Example of how to incorporate the increased energy needs of PLHIV into a ration**

PLHIV have increased energy requirements, that further increase depending on which stage they are in the progression from HIV to AIDS. This increase is reflected as a percentage of the basic requirement. In order to judge how much energy this percentage increase represents in context of a food aid ration, it is important to know the sex and age distribution of the target group and to use the information from Table 7 (page 35) as a starting point.

**Example:** a 15 percent energy increase required by a HIV-positive women in the age category 15–19 years is calculated as follows:

15% x 2120 kcal = 318 kcal

The additional amount for men in the same age group is: 15% x 2700 kcal = 405 kcal

### *Commodities that may make up a food basket*

In most instances it is difficult to use fresh foods in food assistance programmes unless there are strong community linkages. Most donor commodities need to be transported and stored over extended periods. PLHIV are particularly susceptible to infections caused by spoiled food. Therefore, it is important to consider the following when deciding on the types of commodities to provide in a food basket:

- Commodities' reasonable shelf life, so as to avoid spoilage;
- Storage capacity;
- General water and sanitation conditions (e.g., availability of safe water to soak pulses);
- Availability of fuel to allow food to be cooked to adequate texture and to destroy/reduce bacteria or other contaminants; and
- Appropriate milling (and fortification) of staple foods to alleviate beneficiaries of this physical.

When making up a food ration basket as food support, it is important to consider the advantages and disadvantages of each of the following foods:

*Cereals (e.g. Maize Meal)*

When suggesting the use of milled cereals, it is important to consider that locally milled cereals have a short shelf life (1–1.5 months). Although they are of high nutritional value (due to high extraction rate), it may be difficult to include them in the food basket due to operational constraints. Commercially produced flours, milled under superior hygienic conditions and resulting in a low extraction rate product, may be used for up to 3–4 months after milling. (Maize meal with U.S. donor specifications has a shelf life of about one year). Locally produced CSB-type products normally last up to 6–12 months, their shelf life being extended as a result of the heat treatment.

*Pulses*

Pulses (including green peas, yellow split peas, beans, and lentils) provide an important contribution to the protein intake of poor households Together with the proteins in cereals, they provide an adequate protein package. However, their "special cooking requirements" (i.e., need for safe water and cooking fuel) must be taken into account when considering the type and amount of pulses to be included in the food basket and when designing complementary education activities.

*Oil*

Oil is very important for providing energy without increasing a meal's volume—increasing instead its "energy density." Fats are also important in facilitating the absorption of certain vitamins, and they make the meal more palatable. These are important considerations when providing food rations to people who have difficulty eating, as they need to consume as many nutrients and as much energy as possible in few, small meals.

Table 13 describes the associated increases in protein and fat intake that occur with increased energy needs.

## Sugar

Sugar provides energy through carbohydrates, adds palatability to meals, and is helpful for those who need to gain weight. Use of sugar poses few problems; however, in its natural form it does not provide any other macronutrients or micronutrients. It does provide energy without increasing the volume of a meal (increasing the energy density), which is an important consideration when designing meals for people with poor appetites or difficulty eating. Oil and sugar are often increased in meals for malnourished people to add to their energy intake.

**Table 13. Associated increases in protein and fat intake**

For PLHIV, the proportional protein needs (10–12 percent) do not increase. However, with increased energy needs, the protein needs also go up. Similarly, the proportional contribution of fat to the total energy requirement doesn't increase for PLHIV. However, when the energy increases, so does the amount of fat required to maintain the 17 percent benchmark.

Example: a 20 percent energy increase required by HIV-positive men in the age group 20–59 years adds up to:

20% x 2460 = 492 kcal

Of this energy 10–12 percent should be provided by protein (i.e., 59 kcal, at 12 percent), and at least 17 percent should be provided by fat (i.e., 84 kcal). This translates to 15 g of additional protein and 9 g of additional fat to be consumed.

The total energy requirement is thus: 2460 + 492 = 2952 kcal
The total protein requirement is thus: 74 + 15 = 89 g
The total fat requirement is thus: 46 + 9 = 55 g

*Dried Skim Milk*

Dried skim milk (DSM), which is sometimes available for food aid activities, can be a valuable ingredient for drinks and porridges used in nutrition rehabilitation programmes (often mixed with sugar and oil, and/or combined with fortified blended flour).The reconstitution of the milk powder requires mixing it with safe water, preferably boiled. It should be mixed and consumed under supervision, and therefore should not be used as a stand-alone commodity unless required for specific nutritional purposes. It should not be used as baby formula. It can, however, be premixed with cereal flour or FBF, and as such enrich the food basket. Premixing should be done in hygienic conditions to avoid exposing the product to contaminants or speeding up the spoilage (rancidity) process.

*Ready to Use Therapeutic Food (RUTF)*

RUTF is a specialized food developed specifically for the nutritional rehabilitation of malnourished individuals. It is known mainly under the commercial name Plumpy'Nut'® (produced by Nutriset). However, various local production initiatives are developing appropriate recipes for local varieties based on the same principle. RUTF is typically made of peanut paste (variations using beans also exist), oil, sugar, and DSM and is fortified with a special micronutrient mix.

RUTF is sufficiently different in appearance, texture, taste, and smell from regular household food commodities to be successfully targeted to vulnerable individuals as a special nutritional supplement. Whereas it was originally developed to support community-based therapeutic care for severely malnourished children, it is currently being tried in Malawi and other countries for the nutritional rehabilitation of severely malnourished adult AIDS patients. As it is a very expensive product, even when locally produced, its role and cost-effectiveness must be carefully considered. See Table 17 (p. 53) for more on RUTF and HIV.

*Infant Formula and Breast milk substitutes*

The decision HIV-positive mothers must make about whether to breastfeed or formula-feed their infants is a difficult one that involves balancing two sets of risks: the risk of transmitting the virus to their children against the significant health risks associated with formula-feeding in unsafe contexts. WFP and other agencies recognize the right of HIV-positive mothers to make this decision. Current guidance from WHO/UNICEF states that replacement feeding may be recommended where it is "acceptable, feasible, affordable, sustainable and safe."

**Table 14. WFP policy on breast milk substitutes and new commodities**

While some PMTCT programmes may infant formula as part of their services, it is WFP's policy **not to** provide infant formula. This policy is based on:

- Concerns that the conditions outlined above for safe replacement feeding most often do not exist among the populations supported by WFP;
- The high cost of infant formula; and
- WFP's Memoranda of Understanding (MOU) with UNICEF and UNHCR for emergency settings places the responsibility of providing formula with those partner agencies.

*Other specialized products*

Many companies are now producing specialized commodities marketed for use by PLHIV. WFP and other implementers of food programmes are often approached by these companies who hope that their products will be adopted for use in food assistance programmes. Many of these commodities have not been tested for efficacy or effectiveness, despite their claims of benefit. To ensure that the commodities used by WFP are safe for beneficiaries, all new products proposed for use by WFP must first be approved by the Technical Assistance Group (TAG), an independent panel composed of experts on food technology, nutrition, and food safety. Further details can be obtained by writing to tag@wfp.org.

## *Other Considerations*

### *Determining ration type: Individual vs. household ration*

Two main factors should guide decision-making about the ration to be given. The first has to do with needs of the population to be supported. Assessment and profiling exercises of potential beneficiaries (and their families) can help determine how many people in the family need to be supported. "Needs" in this case refers to the nutritional needs of the individual and, where pertinent, those in the family. The second major factor has to do with the objectives of support. While the recovery of the patient going on to treatment is the prime objective, it is also necessary to consider household food security issues in ration planning, remembering that sharing of rations is often inevitable in conditions of extreme vulnerability. The examples here are intended to illustrate the process and considerations that go into planning rations.

**Example of an individual ration:** Many programmes particularly focused on the needs of PLHIV aim to improve the person's physical and nutritional well-being. In these cases, the role of the food ration is mainly to provide a nutritional supplement while possibly also serving to help enable improved attendance of health services. In the example ration given in Table 15, a relatively high amount of CSB is provided (resulting in a relatively high protein content). The decision to include 200 g of CSB in this case had to do with the likelihood of the patient's sharing CSB with children. Note that maize meal rather than whole maize is provided, so that the households are not burdened with milling costs.

**Table 15. Example of a daily individual ration (for adult males with asymptomatic HIV, per person, per day)**

| Cereal (maize meal) (g) | Pulses (g) | Oil (g) | CSB (g) | Sugar (g) | Salt (g) | Energy (kcal) | Grams protein (% kcal)/Grams fat (% kcal) |
|---|---|---|---|---|---|---|---|
| 250 | 90 | 25 | 200 | 25 | 5 | 2 283 | 76.5 (13.4)/ 46.65 (18.4) |

**Example of a household ration:** Household rations are normally provided in programmes where beneficiaries and their families are shown to be particularly vulnerable to food insecurity or have limited livelihood opportunities. This often stems from the sickness or death of adults. In the example ration given in Table 16, WFP provides on average approximately half the food needs of each individual within the household. Those households with one to four persons receive food for three persons; five-to-seven-person households receive food for six persons; and household sizes of nine and above receive food for nine. Many alternative approaches are being used by country offices, including the provision of an individual ration oriented at the person going on to treatment, and a "protection ration" for the household, to ensure that the individual is able to consume the food intended for him/her.

**Table 16. Example of a daily household ration (per person, per day)**

| Cereal (g) | Pulses (g) | Oil (g) | CSB (g) | Energy (kcal) | Grams protein (% kcal)/ Grams fat (% kcal) |
|---|---|---|---|---|---|
| 150 | 60 | 20 | 100 | 1 294 | 42 (13.2)/33 (22.9) |

WFP's new "Food Aid and HIV: Ration Design Considerations" (WFP, 2008) document expands on these approaches.

### *Rehabilitation of severe malnutrition and therapeutic feeding*

Protocols for nutrition rehabilitation vary by age, type of care (e.g., hospital, community, home-based), medical condition, and product availability. **Ready-to-use therapeutic food** (RUTF) is an energy-dense fortified food that was developed to treat severe acute malnutrition. It is particularly useful in community therapeutic care because of its low water activity (preventing bacterial growth) and long preservation. describes RUTF in more detail in the context of HIV care.

**Table 17. Ready to use foods and HIV**

The original formulation of RUTF, commercially called Plumpynut®, was developed by Nutriset for treatment of child severe acute malnutrition. It is made from peanuts, milk powder, sugar, oil, and a mix of vitamins and minerals. RUTFs are also now being locally produced at lower cost in many countries, both in the original formula and with other compositions (for example, a local RUTF is being produced in Malawi based on sesame and chickpeas).(80)

RUTFs have two main advantages over F100 (therapeutic milk), the conventional treatment for severe acute malnutrition. The first advantage is that it is oil-based and has low water activity, which prevents the growth of bacteria. This means that it can be preserved longer, and remains safe, to some extent, if accidentally contaminated by pathogenic bacteria, which is a key element in enabling the product to be used through community therapeutic care (CTC) rather than only clinic environments. The second advantage is that studies have shown weight gain in children to be greater with RUTFs than F100 (Diop et al. 2003). The main limitation of RUTFs is that they are often expensive compared with the commodities WFP is used to dealing with—e.g., locally produced RUTF in Malawi is estimated to cost about US$3000–4000/ton, possibly lower once it is mass produced.

The success RUTFs have had to date in the treatment of severe acute malnutrition among non-HIV-infected children in many contexts is well documented and accepted (Diop 2003). Among HIV-infected children, studies to date suggest that many children in food insecure areas can recover normal nutritional status with normal protocols for severe acute malnutrition without antiretroviral drugs, but that recovery takes longer for them than for uninfected children (Diop 2003)

Little research has been done to explore the efficacy of different food commodities or to develop protocols for the treatment of adult malnutrition (particularly that associated with HIV). Valid International recently undertook a study in Malawi where chronically ill home-based care patients not on antiretroviral therapy were provided with a locally produced RUTF made of chickpeas and sesame. Of the 60 patients included in the study, all were diagnosed with clinical Stage 3–4 HIV and most were bed-ridden or suffered severe activity limitations due to their sickness. Preliminary findings suggest high acceptability rates of RUTF, improved weight gain, and increased mobility. These findings need to be replicated on a larger scale. However, they do indicate that RUTF holds great promise as a therapeutic component of HIV treatment.

While corn-soya blend is probably the most frequently used commodity provided through antiretroviral therapy and home-based care programmes, little research is available to demonstrate how effective it is or to compare it with RUTFs (which are likely to have greater efficacy but also to come at a much higher cost). Ultimately, the decision about what food commodities to use during different phases of treatment needs to be based on a careful evaluation of efficacy and cost. In the case of antiretroviral therapy programmes, factors such as whether food is being shared within the family, recovery time, mortality rates, shelf life, ease of delivery, and the objectives of food support must all be considered. More evidence related to all of these factors is desperately needed, and should be collected in the context of existing programmes.

### *Strategies for reducing potential stigma and discrimination of PLHIV and households receiving food assistance*

Stigma and discrimination toward PLHIV can impact their ability to care for themselves, provide for their families, and participate in their communities. When planning strategies with partners, consideration must be given to avoid stigmatization of beneficiaries occur if receiving food rations results in perceived HIV status within a community. It is vital to be able to provide services to those at risk without compromising their privacy or safety, and to adapt nutritional programmes to suit different community needs without alienating PLHIV. For example, it is possible to develop strategies with partners to maintain beneficiary confidentiality and break down the lack of knowledge and attitudes that lead to discrimination. In Ethiopia, some of WFP's partner NGOs use coffee ceremonies as a way of building community awareness and prevention education.

### *What activities should be put in place to enhance the proper use of the food ration?*

#### *Nutrition counselling and education*

Food assistance activities in the context of HIV should be accompanied by education and counselling activities that highlight the importance of nutrition in overall well-being, with an emphasis on the appropriate use of the food assistance package.

Issues of concern are household-level utilization and distribution of the food basket, sharing of individual nutritional supplements, appropriate storage and preparation for maintenance of maximum nutritional value, and the appropriate use of limited household resources to support a balanced and diversified diet.

#### *Gardening*

As food rations are usually designed as a complement to locally available food, gardening is a good opportunity to increase access to fresh food and should therefore be encouraged.

### *How and when do we stop providing food support?*

Unlike antiretroviral treatment, which must be provided for life, food support should be provided for a fixed period of time in order to avoid indefinite reliance on it, and to make the best use of resources to support other people going on to treatment during their time of greatest nutritional vulnerability.

One strategy for "exiting" beneficiaries off food support is to provide food for a fixed period (often six months). Generally, beneficiaries often feel better after several months of treatment, and are once again physically capable of engaging in livelihood activities. Another strategy (one that is more human resources intensive) is to reevaluate the socio-economic and/or physical situation of beneficiaries at six months and then at regular intervals, to determine if continued support is necessary.

One of the most difficult challenges associated with "exiting" beneficiaries off food support is that some people may not be able to reengage in their former livelihoods for various reasons (they may have sold off their family assets or land to pay for medical treatment, missed opportunities to sow their fields, or lost community ties due to stigma).

Ideally, food support should be coupled with livelihood support to provide such inputs as, micro-credit, seeds, tools, and training in income-generating activities. However, partners implementing food support rarely have transition strategies or expertise to help beneficiaries reestablish sustainable livelihoods.

**Table 18. An example of a livelihood programme to help people with the transition from food support**

In Uganda, micro-financing projects have been particularly valuable partners, especially those providing funding and training for the rearing of small animals (goats, chickens, pigs, rabbits). Because such assets can "multiply naturally," they can replace assets sold during the progression of the disease, can easily be sold or consumed by the household, and do not require much land or physical strength. Other projects that have been supported include beekeeping, brick-making, and fish ponds. Some of these activities can be linked up with WFP's food-for-work or food-for-assets programmes—for example, food-for-work programmes can dig ponds for fish farming. There is no one-size-fits-all option—the success of any such programme depends on local conditions, coordination with other development partners, and beneficiary initiative.

## Summary of key points in Chapter 3

- Most of the core principles of nutrition for uninfected persons are the same for people living with HIV. A balanced healthy diet that provides for adequate intake of energy, protein, fat, and micronutrients is essential for the health and survival of all people, regardless of HIV status.
- A universally applicable "HIV ration" does not exist. The development of rations for HIV-related activities must occur at the country level, considering the nutritional needs of potential beneficiaries, their ability to access other food sources of adequate quantity and quality, and the objectives of food support.
- Food provided through HIV activities should address the nutritional requirements of beneficiaries, considering the access they have to other food sources.
- Conducting an assessment of the food security of potential beneficiaries prior to implementation is a critical part of good programme design. HIV by itself does not mean that people are food insecure.
- Factors to consider when designing a food support programme in partnership with HIV comprehensive care programmes include: the type of programme; the type of partnership; the geographical location; the selection criteria for potential beneficiaries; strategies to reduce potential stigma and discrimination of PLHIV or households receiving food aid; and ration composition.
- Several factors influence decisions about the type of ration to give: objectives of the programme, nutritional needs of beneficiaries, socio-economic status, and whether the ration is designed for a household or an individual.
- WHO recommends increasing energy requirements by 10 percent to maintain body weight and physical activity in asymptomatic HIV-infected adults and growth in asymptomatic children (WHO 2003). For symptomatic HIV, energy requirements increase by 20 to 30 percent for adults and by 50 to 100 percent for children experiencing weight loss.
- According to WHO, there is insufficient data to support an increase in protein, fat, or micronutrient requirements due to HIV infection. Thus, protein should provide 10 to 15 percent of daily energy intake[1], fat should provide at least 17 percent of energy intake, and micronutrients should be consumed at RDA levels.

# Chapter 4: Taking action: Integrating food and nutrition support as part of national care and treatment strategies

> "The decision of what type of food and nutritional support should be provided is best made at the country level, with information that comes from identified needs on the ground. Some factors influencing this decision include the priorities of governments, resource availability, capacity of implementing partners to facilitate the activities, and availability of complementary resources to ensure that results can be achieved."
>
> Answering the call to action: An update on WFP's response to HIV, June, 2005[81]

## How should food and nutritional support for care and treatment be funded?

Until quite recently, food and nutritional support was often a neglected aspect of most national strategic plans related to HIV. In the absence of evidence of the socio-economic and nutritional vulnerability faced by populations going on treatment, policymakers are sometimes hesitant to prioritize what are often seen as "complementary" or "wrap-around" services such as food or even nutritional counselling. While many partners view food and nutritional interventions as an important part of care and treatment, incorrect assumptions are often made that "somebody else" outside of the health sector will fund such interventions. Yet, in order to fund food and nutritional support, larger financing mechanisms such as the Global Fund, PEPFAR, and the World Bank require its inclusion in national strategic plans and alignment between the national strategic plan and funding proposals.

The case of Benin is a good example of how evidence was used for the inclusion of food and nutritional support in the national strategic plan, in Round 5 of the Global Fund– submitted (and –funded) proposal, and in the World Bank's Multi-Country HIV/AIDS Programme (MAP2) proposal.

**Table 19. Convincing funding agencies of the value of food and nutrition in treatment programmes: Benin, the Global Fund, and the World Bank**

In early 2005, a group of interested agencies and institutions, including WFP, WHO, DIAL-IRD, IMEA, Université de Gent, and INSERM U687, began a study in four West African countries aimed at comparing the impacts of nutrition interventions as part of a global care package provided to patients under antiretroviral therapy. This study, called *Impact du Soutien Nutritionnel Integré à la Prise en Charge Globale des Patients Sous ARV (INIPSA),* was initiated in Benin, Burundi, Mali, and Senegal.

As the study commenced, the investigators quickly realized that there was an urgent need to inventory all ongoing interventions related to treatment in the four countries, and to understand what the "baseline" situation was of people eligible for treatment and their families. Quantitative and qualitative survey methods were used in this "profiling" exercise, which explored many different aspects of people's lives, including their clinical status (medical indicators), nutritional status (weight and BMI), physical and psychological ability to work, availability to work, employment, income generation and assets, and quality of life.

The findings of this preliminary study were compared with those of a similar survey performed in 2002 by the World Bank for the general urban Beninese population. Two thirds of those surveyed had started treatment in 2005, the same year the survey was done. The research revealed that 62 percent of the population was women (compared with 52 percent in the overall population), with a much higher proportion of widows (21 percent), divorced (26 percent), and women-headed households (36 percent) than the general population. The population eligible for treatment had lower levels of education, particularly among women (85.7 percent had received no education or primary level only), and was markedly worse off in terms of indicators of socio-economic status (including water supply, living conditions, sanitary conditions, home ownership, and underemployment).

In terms of food insecurity, 40 percent of the sampled group reported not eating enough, and 7 percent of men and 29 percent of women reported having received any type of food assistance (including food provided by relatives). Interestingly, 90.3 percent reported changing their eating habits as a result of treatment. The main desire expressed by those surveyed was to return to economic autonomy.

Findings from the baseline exercise in Benin were made available as policymakers were preparing the country's strategic plan for 2006–2010, and the decision was made to include food and nutritional support in the plan. Specific strategies include provision of nutrition education to professionals providing support, to patients, and to their families; to train communities and families in nutrition and HIV while ensuring food stocks are available for those in need; to help exit strategies by putting in place and managing income-generating activities; and to reinforce operational research to see an impact of this support. In turn, a proposal to Round 5 of the Global Fund was submitted to fund many of these activities, and was subsequently approved.

## Key questions for incorporating food assistance into HIV care and treatment programmes

When deciding whether and where to target food assistance through HIV care and treatment programmes, the following key questions should be considered in consultation with potential partners and other stakeholders. (This list is not exhaustive and can be added to or modified to suit the needs of the local context.)

### *Identifying existing services, needs, and possible gaps*

- Where and how is comprehensive care being implemented?
- Where are the most food insecure PLHIV likely to access comprehensive care services?
- What are some of the key comprehensive care services where food assistance might be most appropriately provided (e.g., voluntary counselling and testing, antiretroviral clinics, TB programmes)?
- What is the potential role for food assistance?
- Is there any risk of duplication? Are other organizations providing a similar programme?
- Is there support from partners and other stakeholders to introduce food assistance? Would that assistance complement existing programmes?

### *How to identify implementing partners for HIV care and treatment programmes*

- What are the goal and components of the service being provided?
- What is the capacity (trained staff), storage and transport, and linkages with authorities and communities?
- How is their service integrated with the delivery of comprehensive care?
- What referral linkages do they have with other services (e.g., home-based care, community-based care, or hospital-based care)?
- What is the current reach of their service and what is the general demographic profile of their clients?
- Would food assistance be complementary to their current service?
- Are they able to assess individual and household-level food security?
- Does the staff of the partner organization have knowledge and training in nutrition and HIV?
- Have they done nutritional surveys or assessments? If yes, where, when, and what were the findings?
- Do they have a willingness and capacity to develop an appropriately targeted programme in partnership with other agencies?
- What is the capacity of the staff to undertake new responsibilities to assess and distribute food assistance to PLHIV?
- Do they have the capacity and logistics to handle, store, and distribute food? If not, what support may be needed from the initiating partner?
- What M&E systems are currently in place?
- Are they willing to collect and report data about the impact of the food assistance?

### *How to decide on the type of food assistance*

- What is the objective of the food assistance?
- What is the most appropriate form of food assistance?
- How can the food assistance be targeted to reach those most vulnerable (e.g., women, orphans, and child-headed households)?
- What will be the eligibility criteria for deciding who receives the food assistance?
- Are there other interventions that can enhance the impact (e.g., HIV prevention education)?
- What might be the duration of the programme?

### *Consider the potential impact of food assistance*

- How would food assistance targeted to households affected by HIV impact current levels of stigma and discrimination in the community?
- Is there a risk the food assistance might increase stigma and discrimination?
- Could food distribution bring additional support and follow-up for people on antiretroviral therapy?
- Can we ensure that the food assistance is reaching only those individuals or households unable to meet their own food needs?
- Is the food distribution gender sensitive, with the assurance that women and children in need will receive the ratios in a balanced manner?
- Can we ensure that the PLHIV is receiving the food supplement according to need?
- Could the food assistance encourage dependency?
- When should it be stopped?
- What type of assistance should be provided when food assistance stops (e.g., agricultural training, provision of seeds and tools, education)
- Are the food rations appropriate for the dietary needs of PLHIV at various stages of their illness?
- Are the food rations appropriate for the cultural conditions?
- Are the food rations presentation and storage conditions appropriate to the conditions in which the beneficiaries live?
- Could the food assistance be considered as coercive (e.g., provided only to people who take a test for HIV (which is not recommended)?

## What is the role of organizations such as WFP in HIV care and treatment programmes?

Organizations with a mandate to alleviate hunger and malnutrition have an important role to play in ensuring that people enrolled in HIV comprehensive care programmes do not go hungry, particularly during the vulnerable initial period of antiretroviral treatment.

Organizations and programme designers can play a number of roles to help ensure the success of comprehensive care programmes for HIV:

### *Providing food, logistical, and technical support*

Given the nature of care and treatment programmes, food and logistical expertise can be quite helpful to partners, who often lack extensive knowledge about how to distribute and manage food commodities. Likewise, expertise in nutrition and vulnerability assessment can be vital for helping to target food support to the most vulnerable populations or to develop screening tools that can be used by practitioners to determine who would benefit the most from food assistance.

The development of logistical frameworks and selection of indicators for measuring the outputs and outcomes related to food assistance can be mutually beneficial for the food aid organization and the partners, as it clarifies the objectives and targets of food support.

### *Ensuring that complementary interventions are in place*

"Nutritional support" includes interventions that go beyond the provision of food, such as: assessment of the dietary intake, nutritional status, and food security of the individual or household; nutrition education interventions, and micronutrient supplementation, and the provision of clean water.

Where food support is provided by a food assistance organization with nutritional objectives, the organization should push for partners to provide complementary interventions to make food support more effective. Likewise, there is a need to advocate for partners to provide longer-term

livelihood support strategies for people when they are once again capable of earning their living due to treatment.

### *Advocating at a policy level for food and nutritional support*

Advocacy for food and nutritional support as part of comprehensive care programmes by a food aid organization is essential. The rapid scale-up of many antiretroviral therapy programmes has often led to nutritional care and support being overlooked as a key element of treatment.

In countries such as Mali, WFP has played an important role in helping governments create policy around food support and HIV—through such actions as contributing to the development of national guidelines on HIV and nutrition or supporting governments in the development of Global Fund proposals.

### *Identifying and spreading good tools and "best practices"*

Just five years ago, only a handful of projects provided antiretroviral therapy in resource-poor settings, and food aid in the context of antiretroviral therapy programmes was virtually nonexistent. An indication of progress in this area is the current implementation of food support by WFP for treatment programmes in at least 13 countries. The rapid scale-up of ART programmes necessitates rapid learning and identification of how best to provide food and nutritional support alongside treatment programmes. Likewise, it is essential that the pilot activities initiated today incorporate rigorous collection of outcome indicators, to ensure the building of an evidence base.

# Chapter 5: Monitoring and evaluation

Experience in integrating monitoring and evaluating (M&E) of food and nutrition support components into HIV treatment and care programmes is still limited. It is therefore of critical importance to agree on basic principles and indicators, and harmonize as much as possible data collection and reporting.

This section proposes some general principles to consider and a menu of potential indicators. The recommended reading list in Appendix 7 presents a number of other references that may be helpful in developing and refining M&E systems.

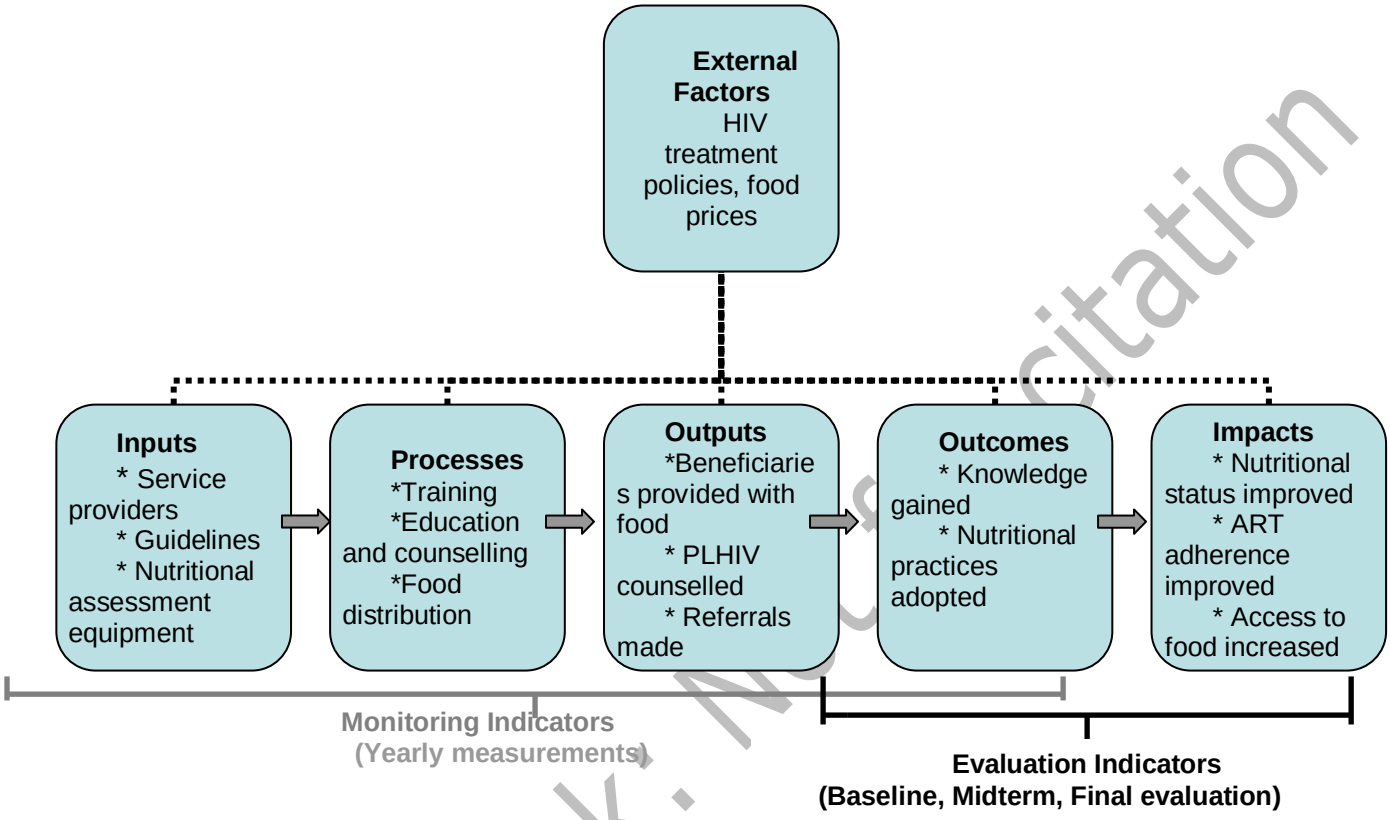
## What general M&E principles apply to care and treatment programmes?

Deciding which M&E indicators to collect in the context of a project should be part of a larger programme design, which includes the formulation of project objectives.

The M&E process should involve broad participation by decision makers, national programme managers, project staff, and partners to ensure that there is a common understanding of objectives and sufficient commitment to collecting the information accurately and consistently to measure progress toward those objectives. Collected data should inform the decision making and help identify and correct possible gaps or problems as they occur. Collecting information should not overburden health care workers, and once analysed, the results should be discussed with programme implementers.

Figure 5 represents the stages of a programme cycle in the context of HIV care and treatment programmes. Outcomes among beneficiaries of food security programmes in the HIV context may vary depending on stage of disease and treatment status. Improvements in nutritional status and food security, for example, may be smaller than for non-affected individuals or households. This variation should be considered in the M&E design process.

**Figure 5. A conceptual M&E framework for nutrition and food assistance programmes in HIV care and treatment programmes**




*Source:* Adapted from Bergeron et al., ***Monitoring and Evaluation Framework for Title 11 Development-oriented Projects***, Technical Note 10, Washington, D.C.: FANTA Project, Academy for Education Development, 2006.

## How to work with partners to develop a harmonized approach to M&E

A good starting point is to organize a workshop with partners to discuss the information already being collected and used by each partner for M&E or other purposes, and to sort out an appropriate strategy.

Large organizations supporting multiple partners often find that partners have different capacities to collect, manage, and report on information. One of the big challenges is to agree upon common indicators of relevance that can be used by all to make management decisions and to measure project outputs and outcomes on a large scale. It is also important to consider who will collect, analyse, and report on different indicators. The training guidelines and monitoring of staff in charge of data collection should be consistent and part of the M&E process.

Where qualified local academic institutions exist, it may be possible to form partnerships to enlist their expertise in the design of operational research studies, such as that undertaken in Zambia (see Table 20). Local capacity to collect and report on information is a critical determinant of how rigorous an M&E system can be. In many countries where WFP works, partners struggle to find the resources to buy weighing scales, let alone computers to track and analyse data. There is always the need to determine what is realistic in a given setting and to adjust M&E systems accordingly.

**Table 20. Assessing the impact of food supplementation for food insecure patients on ART in Zambia: A WFP/CIDRZ collaboration**

In 2004, WFP Zambia and the Centre for Infectious Disease Research in Zambia (with affiliations with University of Alabama Birmingham) decided to launch an operational research project aimed at evaluating whether food supplementation improved early outcomes (e.g. CD4+ cell response, weight gain, adherence was assessed as timeliness of pharmacy visits) among food insecure, HIV-infected groups receiving antiretroviral therapy. Food insecurity was assessed using a tool which took into consideration income, household size, and food consumption patterns, and about a third of all patients coming in for treatment fell into the 'food insecure' group.

The study used an interesting design that took advantage of a planned expansion in food support to track a group of patients not receiving food support (the control group). Patients enrolled in two clinics were assigned to receive food and the control group came from food insecure patients in two clinics not yet receiving food. All patients qualifying for food support received an individual ration of 200g CSB/day and 20 ml/day cooking oil. Those households in which the patient was the main income earner (about 73% of patients), also received a household ration of 200 g CSB/day, 10 ml oil, 200g maize, and 20g beans per person per day for a family of 6 additional household members. The purpose of this ration was to serve as a supplement to the food already being purchased by the household, not to provide for the entire nutritional needs of patients and their families.

Baseline characteristics were gathered from both groups at the time they started treatment, and follow up data was gathered at 6 and 12 months after starting antiretroviral therapy. Final results of the study found significantly better adherence among those receiving food supplements, although the final analysis of the study did not find an impact of food on weight gain or CD4+ counts.

The authors concluded that the results were encouraging but further study on the topic was warranted with an appropriately designed study with larger sample size in order to be able to appropriately account for clustering effects.

This example illustrates several important lessons for WFP that can be applied to other countries. The first is that it is often advantageous to collaborate with academic and research institutions (both international and local) to harness their expertise and to help ensure that studies are ethically and appropriately designed rather than trying to undertake research studies alone. The second is that in order to measure outcome and impact level indicators adequately, it is essential that a large enough sample size is collected. (Megazzini 2006)

Before implementing data collection instruments such as forms, surveys, and questionnaires, they should be tested to ensure they collect the appropriate data and are easy to complete. Additionally, programme staff may require orientation as to which forms to use at what point. Often a short protocol or flow diagram can simplify data collection requirements for programme staff.

**Table 21. Working with partners to align the objectives and implementation of food support in Mozambique**

The WFP country office in Mozambique was one of the first to provide food to partner organizations involved in treatment and prevention of mother-to-child transmission. Many lessons have been learned from Mozambique's activities over the past several years of implementation. In particular, WFP has developed innovative implementation strategies to work with a large number of partners to address such challenges as the limited capacity of health structures to store food and the relatively small beneficiary caseloads served by some partners.

Since early 2004, WFP Mozambique has supported a number of international NGOs in the implementation of ART services in health centres in the southern and central regions of the country. These NGOs include MSF, Sant'Egidio, Health Action International, and International Relief Development. More recently, WFP has engaged in direct partnership with a government-run hospital and several local NGOs—all of whom requested that food be part of their programmes. While there were some commonalities in the way the various partners implemented their programmes (such as the provision of a family ration rather than an individual ration), the WFP country office realized that each of the partners had different implementation approaches on issues such as selection and discharge criteria, duration of food support, and M&E.

To help develop a more unified approach to programme implementation, WFP hosted a three-day "Programme Harmonization Retreat" in June 2006, with an objective of identifying basic common programme principles for the improved design and implementation of food assistance in support of antiretroviral therapy, PMTCT, and home-based care programmes. The agenda of the retreat included an exploration of various elements in the development of a common programme model, including:

- Discussion of problem analysis: objectives, targets, results hierarchy, and logical framework;
- Basic principles of programme implementation: selection and discharge criteria, process, duration of food support, ration size and composition, distribution modalities, and food handling and storage;
- Monitoring and evaluation: indicators, methodologies, tools, data systems, information utilization; and
- Research agenda and evidence building: research questions, methods, partnerships, timeframes, utilization of research findings.

The retreat represented a starting point for partners to discuss common issues regarding food and nutritional support. While many partners had met at other HIV-related meetings, issues related to food and nutritional support had been left off the agenda of those meetings. One of the biggest realizations of the workshop was that more clarity was needed in identifying the objectives of food support and how they fit into the larger objectives of treatment programme. One lesson learned was that WFP could play an important facilitating role in developing common approaches to programme implementation, sharing, and building of the evidence base. The consensus-building exercise among implementing organizations was of great importance in outlining the role each is playing within the national care and treatment context. Understanding common programming principles helps to define roles and responsibilities in support of the government and assist in the development of a national strategy for food support in HIV care and treatment.

## What key indicators should be considered in the design of an M&E system for food programmes?

While some indicators, particularly process and output indicators, are often easy to identify, outcome indicators may be more challenging. For example, information collected as part of routine clinical care (such as patient weight or CD4 count) is recorded in patient records or computer databases. If available, a dietician, nurse, or a healthcare worker trained in nutritional assessment should collate this data. Some transformation of data is often needed in order for that data to be suitable for reporting: for example, tallying weight changes in individuals for the first six months of their treatment or calculating changes in BMI. Providing partners with a data collection form (such as that found in Appendix 6) can help ensure standardization in the way information is consolidated and used.

It is important to differentiate the different types of indicators, such as food support programme indicators and nutritional status indicators. WHO provides generic HIV care/ART patient monitoring tools including a patient card, longitudinal registers, and two reports (see Patient Monitoring Guidelines for HIV Care and Antiretroviral Therapy, 2006). These tools were developed with many international partners and include the minimum data set for HIV care and ART patient monitoring, inclusive of information necessary for clinical management and for reporting of facility, district, national, and global-level indicators.

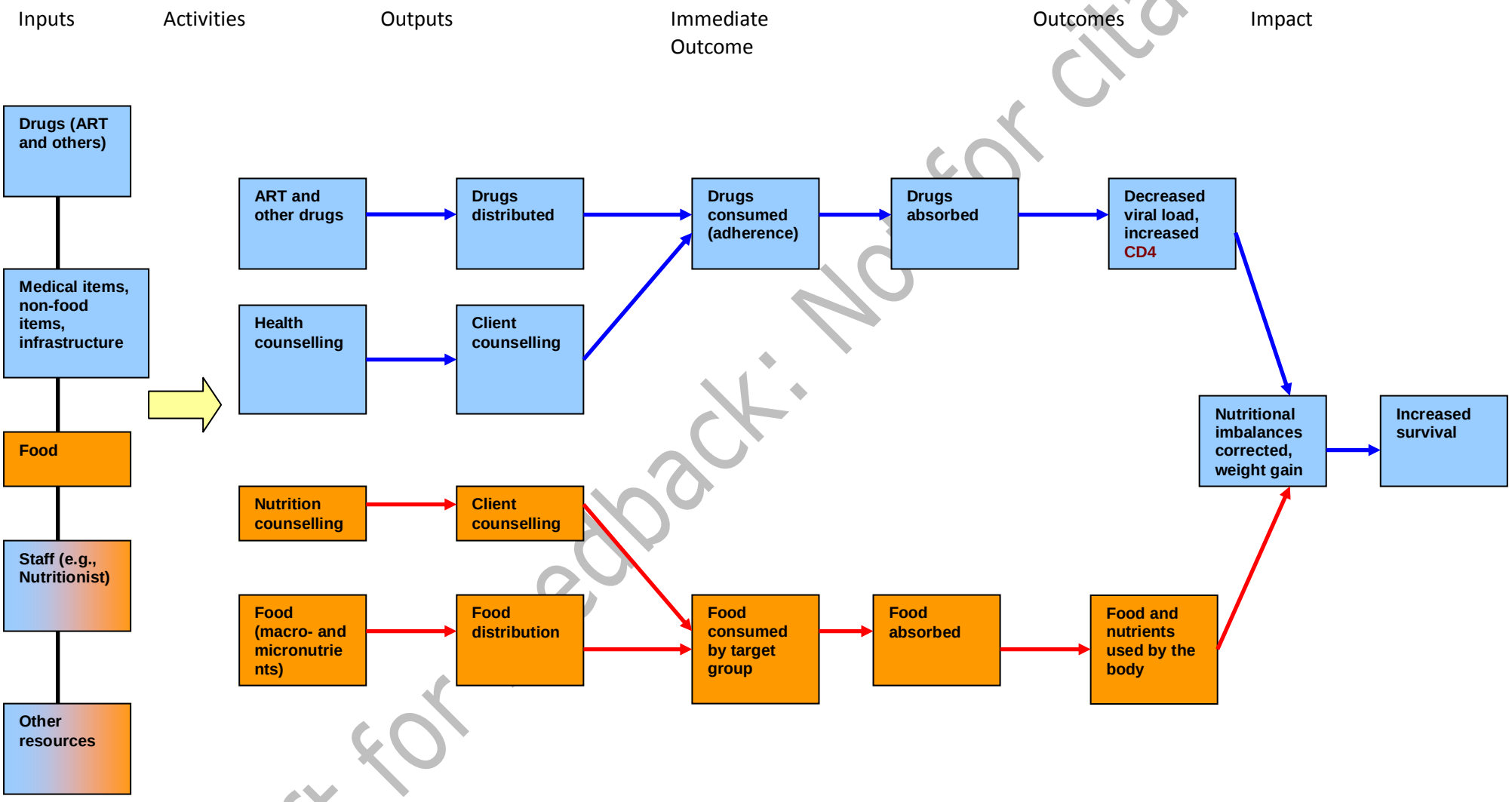
M&E guidelines emphasize the need to develop programme indicators specific to each operation and in line with the articulation of the operation's design elements (e.g., inputs, activities, outputs, outcomes, impact). Indicators to be used in programme M&E are closely linked to the project design process. A helpful starting point is to sketch out a "programme theory" diagram (similar to that shown in Figure 6 that articulates the expected inputs, outputs, outcomes, assumptions, and potential risks. Such a diagram can be helpful in identifying where indicators may be useful to monitor critical processes along the way.

### Country-level indicators

A starting point for all HIV-related interventions is the "Three Ones"—a set of agreed-upon principles at the country level designed to improve coordination of M&E of all related programmes (WHO Monitoring and Evaluation 2004). One of these principles is that there be **one** agreed-upon country-level M&E system. While certain indicators—particularly those related to inputs and outputs—can be collected using information from individual organizations' internal information systems, it is important that the indicators being collected are harmonized with this national-level system.

The relatively recent expansion of ART into resource-limited settings means that all partners are still developing and testing M&E strategies and indicators for care and treatment programmes. However, in some countries, agreed-upon national M&E indicators for HIV programmes are already established. Proposals to add additional indicators to help measure outputs or outcomes related to food and nutritional support should be considered in parallel with the integration of food and nutrition in comprehensive HIV services.

**Figure 6. Example of a programme theory diagram**



## Indicators for measuring programme performance

Performance indicators are often divided into four levels: inputs, outputs, outcomes, and impact. These indicators correspond to the various steps of monitoring and evaluation of programmes.

### *Input level indicators*

Table 22 provides an example of indicators that reflect programmatic inputs. As the inputs (and ability to collect indicators) will vary from setting to setting, this is not intended to be a comprehensive nor a prescriptive list, but rather a starting point for considering the types of indicators that may be useful in measuring the fincancial, human, and material resources required to implement programmes.

**Table 22. Menu of input level indicators related to food support and nutritional counseling in the context of HIV care and treatment programmes**

| Type of indicator | Indicator | Source of information and details about how to collect |
|---|---|---|
| Input | Number or percentage of programme sites with at least one service provider trained in nutritional care and support of PLHIV | Programme site visit/audit |
| Input | Number of educational and counselling materials available at each site | Programme site visit/audit |
| Input | Number or percentage of programme sites with functional weighing scales | Programme site visit/audit |

### *Process and Output Indicators*

Most of the recommended output indicators in are similar to those used in WFP's programmes to monitor critical processes and outputs, and for reporting purposes. These indicators tend to be specific to the food delivery programmes. While certain indicators—such as number of food beneficiaries—are standard from WFP's perspective, the collection of such indicators does require experience and a capacity to aggregate and disaggregate data. Health-related partners may not be accustomed to collecting or reporting on such indicators, and may need to modify their patient forms in order to harmonize this collection.

| | | |
|---|---|---|
| Output | Number of food beneficiaries, by sex and age | A mandatory output WFP indicator for all operations. Collected by partners through distribution reports. (Remember that WFP's definition of *beneficiary* includes not only the primary beneficiary, i.e., the person on antiretroviral therapy, but also family members if the ration is intended as household support.) |
| Output | Metric tons of food distributed, by commodity | A mandatory output WFP indicator for all operations. At the project level, the actual distribution figure should be compared to planned figures in the |

| | | |
|---|---|---|
| | | project document (or revised project document). |
| Process/output | Percentage of food delivered by WFP to partner on time | Delivery records (waybill). "On time" refers to the date agreed upon with the cooperating partner in the delivery plan. |
| Process/output | Percentage of food rations distributed on time | An indicator of regularity of food distribution |
| Process/output | Percentage intended food beneficiaries receiving the *full* food ration<br>Identification of direct and indirect beneficiaries | An indicator of the completeness and reliability of the food pipeline. This could be collected through partner reports or through random spot checks at distribution centres. The denominator for this indicator should be calculated using the total number of ART programme participants on the food distribution list (not the total number of people receiving ART). |
| Process/output | Percentage of beneficiaries aware of ration entitlement<br>Identification of direct and indirect beneficiaries | An indicator that measures whether beneficiaries know exactly what and how much they are supposed to receive. Collected through partner reports or through random spot checks at distribution centres. Indirect and/or direct beneficiaries may be included if defined from the outset. |
| Process/output | Percentage of planned complementary inputs and services to food assistance provided by cooperating partners on time | An indicator that measures whether the expected inputs complementary to food are being provided on time. Collected through partner reports. |

| | | |
|---|---|---|
| Process/output | Percentage food beneficiaries satisfied with food quality | This indicator could be collected through beneficiary surveys following distribution, and would ideally be coupled with qualitative questions about reasons for dissatisfaction or other open-ended feedback. |
| Immediate outcome | Percentage food beneficiaries improving their food consumption<br>(*Note:* periodic repeated surveys required.) | Collected through beneficiary surveys—may be useful to qualitatively explore sharing and the addition of other (local) foods to the diet, particularly in cases where nutritional counselling is done. Other options exist for collecting information on dietary intake. |
| Output | Percentage patients receiving nutritional assessment | Ideally all patients should receive nutritional assessment. Data collected by ART programmes. |
| Output | Percentage patients receiving nutritional counselling | Data collected by ART programmes. Nutritional counselling can benefit even those who are not in need of food assistance.* |

*Disaggregate data according to programme site (home-based, community-based, or facility-based) and the way the data are collected (site facility registries, distribution centres records).

### *Outcome- and impact-level indicators*

Of particular interest is information that can be simultaneously used for clinical management and patient follow-up management (e.g., body weight, CD4 count, adherence) and also be useful for tracking outcomes when consolidated at a population level. Sampling of clinical records may be appropriate for some programmes.

One of the principles of M&E is to select indicators that meet "SMART" criteria—i.e., those that are specific, measurable, accurate, realistic, and timely. One of the challenges to the use of outcome indicators such as weight gain or CD4 count is their reflection of factors that may or may not relate to a beneficiary's receiving food assistance. For example, much of the weight gain observed after commencing treatment has to do with the effectiveness of the medicine in reducing the viral load—even without food supplementation, weight gain is commonly observed. Likewise, the failure of some individuals to gain weight over time might be due to a lack of food, or to the presence of an underlying infection, or to nausea from a new medication. (*Note:* weight gain as an indicator may be useful only if the patient gains weight. Weight gain in children might also be a sign of oedema.)

When providing food to patients who are malnourished due partly to lack of food (i.e., those suffering from primary malnutrition), weight gain is greater or more rapid than in the absence of food. In most cases, it is difficult or even impossible to "attribute" changes observed at the outcome level to a specific component of an intervention, such as food supplementation. While study designs to look at issues related to attribution are possible, they are often entangled with ethical issues, and therefore require careful consultation with experts who can help provide advice on study design, and identify potential collaborating research institutions. In some cases, where the desire exists to attribute changes in certain indicators to food or nutritional support, it may also be possible to set up M&E systems in a way that can facilitate such studies.

All of the outcome-level indicators listed in Table 13 can be collected through regular clinical registries and from contact with beneficiaries. Population-based surveys, although often valuable for understanding the local context and planning interventions, are less valuable for tracking the outcomes of care and treatment programmes oriented toward a small proportion of the overall population living in a given area. In some situations where reporting of data for M&E purposes requires special data entry or tabulation, and where the number of beneficiaries is high, it may be necessary to develop a sampling strategy to reduce costs and/or facilitate timely reporting.

**Table 23. Menu of outcome and impact level indicators for ART (not directly attributable to food and nutrition programmes)**

| Type of indicator | Indicator | Source of information and details about how to collect |
|---|---|---|
| Outcome | Percentage of patients taking >95% of their medications over the past 6 months* | Adherence is measured in different ways (pill counts, recall, etc), but in most cases will be collected as standard procedure. The time frame for reporting this information may be modified as suitable to the context and capacity. |
| Outcome | Percentage of adults/children still alive who are remaining on treatment at 6, 12, and 24 months* | Consider the duration of food support when deciding which of these time frames to use to measure outcomes. It may also be useful to look at changes in this percentage over time as the implementation changes—decisions about eligibility criteria for treatment, cost of treatment, and inputs such as food may strongly influence mortality rates. |
| Outcome | Percentage of adult patients exceeding the threshold of BMI > 18.5 at 6 or 12 months of treatment | This indicator may be most useful in situations where eligibility for food assistance is based on a low BMI. BMI may also be used in some places as discharge criteria. The threshold of BMI can be adapted to local conditions. |

| | | |
|---|---|---|
| Outcome | Median CD4 count ≥ 200 at 6 months and 12 months of ART<br><br>CD4 percentage should be used for paediatric patients up to age 5 | As with most outcome-level indicators, the relationship between CD4 count and provision of food still needs more research. In many places, CD4 count may not be regularly monitored, and collection in some contexts not possible. |
| Impact | Percentage of adults/children still alive who are remaining on treatment at 6,12, and 24 months* | Consider the duration of food support when deciding upon which time frames to use to measure outcomes. It may also be useful to look at changes in the percentage over time as the implementation changes—decisions about eligibility criteria for treatment, and about inputs such as food, may influence mortality rate. |

*Treatment indicators recommended in WHO's "The Monitoring and \evaluation (M&E) of the 3 by 5 Initiative," Working document on monitoring and evaluating of National ART programmes in the rapid scale-up to 3 by 5 (http://www.who.int/entity/3by5/publications/briefs/en/m&e.pdf)

www.who.int/hiv/pub/me/pubnapcs/en/index.html

## Summary of key points

- M&E requires the collection of data based on agreed indicators at specified points:

- Baseline needs assessment and mapping of existing resources prior to or at the start of the intervention, such as at the first clinical and/or counselling visit;
- At regular intervals throughout the intervention (the period between assessments may vary for individual cases, but tri-monthly intervals may be reasonable); and
- At the end of the intervention.

- If available, a dietician, nurse, or a healthcare worker trained in nutrition assessment should conduct or collate the clinical data for M&E.

- Ideally all data collection forms should be available to programme workers prior to any activities being initiated.

- How indicators are reported from partners to country authorities and WFP should be integrated in the design of the intervention. It is helpful to consult with and streamline data reporting forms across partners.

- Decisions about which indicators to include should be based on many factors, including programme objectives, ability to collect and consolidate information, and how specific the indicators are to the inputs being provided.

# Glossary

AIDS WASTING SYNDROME: The involuntary weight loss of 10 percent of baseline body weight plus either chronic diarrhoea (two loose stools per day for more than 30 days) or chronic weakness and documented fever (for 30 days or more, intermittent or constant) in the absence of a concurrent illness or condition other than HIV infection that would explain the findings.

AIDS: acquired immunodeficiency syndrome, acquired immune deficiency syndrome

AIDS DEMENTIA COMPLEX (ADC): A diagnosis of exclusion. There is no single diagnostic test for ADC (210 management manual).

ANAEMIA: A lower than normal amount of haemoglobin in the blood. Symptoms may include tiredness and shortness of breath.

ANOREXIA: The lack or loss of appetite that leads to significant decline in weight.

BLOOD LIPIDS: A compound containing much carbon and hydrogen, little oxygen, and sometimes other atoms. Lipids dissolve in ether and benzene, and include fats, oils, and cholesterol.

BODY MASS INDEX (BMI): Weight (in kilograms) divided by height (in meters) squared ($kg/m^2$). Normal range: 20–25. A value of 30 or greater shows obesity-related health risks.

CARBOHYDRATE: An important nutrient found in many foods and an important source of energy for the body. Many carbohydrate-containing foods are high in dietary fibre and low in fat and are therefore healthy food choices. The consumption of carbohydrate-containing foods in every meal provides the body with energy throughout the day. Foods containing carbohydrates include bread, breakfast cereals, rice, pasta, fruit, potatoes, corn, dried beans and lentils, milk, and yoghurt.

CANDIDIASIS (CANDIDA): An infection with a yeast-like fungus of the Candida family, generally *Candida albicans*. Candidiasis of the esophageus, trachea, bronchi, or lungs is an indicator disease for AIDS. Oral or recurrent vaginal candidiasis is an early sign of immune system deterioration.

CD4 COUNT: The measurement in cells per $mm^3$ of plasma of CD4 lymphocytes, the main target of HIV infection. These cells are a vital part of the immune system

CHOLESTEROL: A steroid alcohol present in animal cells and body fluids. Cholesterol has many important functions in the body; however, having high levels of cholesterol in the blood increases the risk of developing heart disease. The total level of cholesterol in the blood is a combination of HDL (good) cholesterol and LDL (bad) cholesterol. You are more likely to have high cholesterol if you eat a lot of foods high in saturated fat, are overweight, or have a family history of high cholesterol.

COMPREHENSIVE CARE: The provision of a range of a continuum of care, support and treatment where PLHIV can access appropriate services in a timely manner to meet their physical, psychological, and social needs

CONSTIPATION: Infrequent (and frequently incomplete) bowel movements. The opposite of diarrhoea, constipation is commonly caused by irritable bowel syndrome, diverticulosis, and medications (constipation can paradoxically be caused by overuse of laxatives).

CORN-SOYA BLEND (CSB): A naturally wholesome blended food containing 69.5 percent cornmeal, 21.8 percent soya flour, a premix of 3.0 percent minerals and vitamin antioxidant, and 5.5 percent soya oil. It is highly nutritious, and precooked for ease in use and handling.

CRYPTOSPORIDIOSIS: A diarrhoeal disease caused by the protozoa Cryptosporidium, which grows in the intestines. Symptoms include abdominal cramps and severe chronic diarrhoea. It is considered an AIDS-defining opportunistic infection in persons with HIV infection. Cryptosporidiosis usually occurs late in the course of HIV disease as a result of severe immunosuppression.

CYTOMEGALOVIRUS (CMV): A virus of the herpes virus family, which is present as a silent infection in most people. CMV may become reactivated in people with advanced immunosuppression (with CD4 counts of less than 50) and can cause disease in many parts of the body, especially the eyes (retina), throat, and colon. Several treatments are available.

DIARRHOEA: Uncontrolled, loose, and frequent bowel movements caused by diet, infection, medication, and irritation or inflammation of the intestine.

ENERGY EXPENDITURE: The amount of energy, measured in kilocalories (kcal) or kilojoules (kj) that a person uses. Kilocalories are used by people to breathe, circulate blood, digest food, and be physically active.

EPIDEMIC: A disease that has spread rapidly through a segment of the human population in a given geographic area.

FAT: An essential part of the human diet; fat is higher in energy (kilojoules) than any other nutrient. Some fat in our diet is essential to provide us with fat-soluble vitamins and essential fatty acids. Fat can be found in margarine, oil, meat, dairy foods, cakes, and biscuits, etc. Fat is made up of polyunsaturated fat, monounsaturated fat, and saturated fat (see individual definitions).

FEVER: Technically, any body temperature above the normal of 98.6 degrees Fahrenheit. (37 degrees Celsius.); in practice, a person is usually not considered to have a significant fever until the temperature is above 100.4 degrees F (38 degrees C). Also called pyrexia.

FOOD AID: A transaction by which food commodities destined for human consumption are provided to a recipient country, a group of people, or a beneficiary entity either on a fully grant form or on a concessional loan basis.

FOOD-DRUG INTERACTION: When food affects the ingredients in a medication, preventing the medicine from working the way it should. Some nutrients can affect the way certain drugs metabolize by binding with drug ingredients, thus reducing their absorption or speeding their elimination. Taking medications at the same time as eating may interfere with the stomach and intestines' absorption of medications.

FOOD SECURITY: When all people at all times have both physical and economic access to sufficient food to meet their dietary needs for a productive and healthy life. Food security includes at a minimum: the ready availability of nutritionally adequate and safe foods and an assured ability to acquire acceptable foods in a socially acceptable ways (e.g., without resorting to emergency food supplies, scavenging, stealing, or other copying strategies). (Core Indicators of Nutrition State for Difficult-to-Reach Populations, 1990).

FOOD INSECURITY: Limited or uncertain availability of nutritionally adequate and safe foods or limited or uncertain ability to acquire acceptable foods in socially acceptable ways.

FORTIFIED FOODS: \foods with nutrients added for the purpose of ensuring the nutritional equivalence of substitute foods.

FORTIFICATION: The addition of one or more nutrients to a food to prevent or correct a demonstrated deficiency of one or more nutrients in the population or specific population groups by the relevant authority.

GIARDIASIS: A common protozoal infection of the small intestine, spread via contaminated food and water and direct person-to-person contact.

HAEMOGLOBIN: The iron-containing protein in the red blood cell that carries oxygen to the cells and carbon dioxide away from the cells. It is also responsible for the red colour of blood.

HIV: Human immunodeficiency virus.

HOSPICE: A place or site for very unwell or terminally ill people to rest.

HYPERLIPIDEMIA: High lipid (fat) levels in the blood.

INSULIN RESISTANCE: The diminished ability of cells to respond to the action of insulin in transporting glucose (sugar) from the bloodstream into muscle and other tissues.

LIPIDS: Any of a group of fats and fatlike compounds, including sterols, fatty acids, and many other substances.

LYMPH NODES Small rounded or bean-shaped masses of lymphatic tissue surrounded by a capsule of connective tissue. Also sometimes referred to as lymph glands. Lymph nodes are located in many places in the lymphatic system throughout the body. They filter the lymphatic fluid and store special cells that can trap cancer cells or bacteria travelling through the body in the lymph fluid. The lymph nodes are critical for the body's immune response and are principal sites where many immune reactions are initiated. During a physical examination, doctors often look for swollen lymph nodes in areas where lymph nodes are abundant, including the neck, around the collarbone, the armpit (axilla), and the groin.

LYMPHOCYTE: A small white blood cell (leukocyte) that plays a large role in defending the body against disease. Lymphocytes are responsible for immune responses. There are two main types of lymphocytes: B cells and T cells. B cells make antibodies that attack bacteria and toxins, while T cells attack body cells themselves when they have been taken over by viruses or become cancerous. Lymphocytes secrete products (lymphokines) that modulate the functional activities of many other types of cells and are often present at sites of chronic inflammation.

MACRONUTRIENTS: Foods that provide fuel for the body.

MALABSORPTION: Difficulty in the digestion or absorption of nutrients from food substances. Malabsorption can affect growth and development, or it can lead to specific illnesses. Prolonged malabsorption can result in malnutrition and vitamin deficiencies.

MALNUTRITION: Failing health that results from a long-standing dietary intake that fails to match nutritional needs.

MENINGITIS: Inflammation of the meninges usually caused by microorganisms including bacteria viruses, fungi, and protozoa. The onset may be rapid (acute) or evolve over weeks, depending on the cause. If untreated, the disease can be fatal within a short period of time. The early symptoms are non-specific and flu-like. They are followed by more serious symptoms, which may include stiff neck, confusion, vomiting, loss of appetite, fever, headache, and coma.

Diagnosis is by observation of the clinical signs and symptoms and is confirmed by lumbar puncture to examine the cerebrospinal fluid or blood tests. Treatment depends on the cause of the inflammation. Meningitis can cause permanent damage to the brain and nervous system.

METABOLISM: The chemical changes in living cells by which energy is provided for vital processes and activities and new material is assimilated.

MICRONUTRIENTS: Vitamins and minerals that help the body function normally.

MONOUNSURATED FATS: The "healthy" fats that reduce the risk of heart disease by removing cholesterol build-up from the blood vessel walls when they replace saturated fats in the diet. Foods containing polyunsaturated fats include canola oil and canola margarine, olive oil and margarine based on olive oil, peanut oil, avocado, almonds, and hazelnuts.

NAUSEA: A stomach distress with distaste for food and an urge to vomit.

NUTRITIONAL STATUS: The nutritional health of an individual as determined by anthropometric measures (height, weight, circumferences, and so on), biochemical measures of nutrients or their by-products in blood and urine, a clinical (physical) examination, and a dietary analysis (Wardlaw 1993).

OPPORTUNISTIC INFECTION (OI): An infection that occurs because of a weakened immune system. Opportunistic infections are a particular danger for people with AIDS. HIV itself does not cause death, but the opportunistic infections that occur because of its effect on the immune system can.

OSTEOPENIA: Mild thinning of the bone mass, but not as severe as osteoporosis. Osteopenia results when the formation of bone (osteoid synthesis) is not enough to offset normal bone loss (bone lysis). Osteopenia is generally considered the first step on the road to osteoporosis, a serious condition in which bone density is extremely low and bones are porous and prone to shatter. Diminished bone calcification, as seen on plain X-ray film, is referred to as osteopenia, whether or not osteoporosis is present. The diagnosis of osteopenia may also be made by a special X-ray machine for bone density testing.

OSTEOPOROSIS: The loss of bony tissue, resulting in bones that become brittle and liable to fracture. Infection, injury, synovitis (inflammation of the membrane surrounding a joint), and prolonged exposure to microgravity can cause osteoporosis.

OXIDATIVE STRESS: The harmful condition that occurs when there is an excess of free radicals, a decrease in antioxidant levels, or both.

**PANDEMIC: An outbreak of an infectious disease, such as HIV, that affects people or animals over an extensive geographical area. Also known as a global epidemic.**

PROTEIN: An important nutrient that helps build and repair body cells. Protein can also be used for energy if enough carbohydrate-containing foods are not eaten. Protein needs are increased during times of cell growth and repair, such as childhood and adolescence, pregnancy/lactation, and during and following illness or surgery (e.g., HIV). Protein can come from animal foods such as meat, chicken, fish, eggs, dairy products (i.e., milk, cheese, yoghurt) and from plant foods such as dried beans and lentils, nuts and seeds, and soy products.

PCP: Pneumonia caused by *Pneumocystis jiroveci* (previously classified as *Pneumocystis carinii*), a fungus that causes disease in immunosuppressed individuals and in premature, malnourished infants. Symptoms include dyspnea (shortness of breath), nonproductive cough, and fever. Chest X-ray typically show infiltrates in both lungs, Untreated PCP, with increasing pulmonary involvement, leads to death.

POLYUNSATURATED FATS: The "healthy" fats that reduce the risk of heart disease by removing cholesterol build-up from the blood vessel walls when they replace saturated fats in the diet. Foods containing polyunsaturated fats include safflower oil, sunflower oil, corn oil, soybean oil, fish oils, grapeseed oil, walnuts, linseed, and some margarines.

POST-EXPOSURE PROPHYLAXIS (PEP): Treatment of a person who has potentially been exposed to HIV with a short course of ARV.

PROPHYLAXIS: A measure taken for the prevention of a disease or condition.

REFLUX: The regurgitation of acid stomach contents back into the oesophagus. This occurs because the valve separating the stomach from the esophageus does not function properly.

RESTING METABOLIC RATE (RMR) OR BASAL ENERGY EXPENDITURE (BEE): The amount of energy, measured in kilocalories (kcal) or kilojoules (kj), that a person uses at rest.

SATURATED FATS: Known as the "unhealthy" fats because eating too many of them can increase the risk of heart disease because they cause cholesterol to build up in the blood vessel walls. They can be found in animal products such as chicken skin, fat on meat, butter and cream, and in vegetable products such as coconut oil, palm oil, and cooking margarine. Saturated fats are commonly found in processed foods.

STIGMA: Negative thoughts and attitudes about a person or group based on prejudices or beliefs.

SYMPTOMATIC: Experiencing symptoms from a disease or condition.

THROMBOCYTOPENIA: Low blood platelet count.

TOXOPLASMOSIS: An infection caused by the single-celled parasite *Toxoplasma gondii* that may invade tissues, most commonly the brain, in late-stage HIV infection.

TUBERCULOSIS (TB): A bacterial infection caused by *Mycobacterium tuberculosis*. Most commonly presenting as lung infection.

VOMITING: Forceful ejection of contents from the stomach into and usually beyond the mouth (or nose).

# Appendix 1: WHO Clinical Staging of HIV for Adults and Adolescents (WHO 2005)

## Primary Infection

Primary HIV infection following exposure to HIV may present with a variety of flu-like symptoms, such as fever, swollen glands, rash, sore throat, fatigue, and headache. These symptoms can be mild to severe and may last from a few days to a few weeks. This illness is known as "seroconversion illness." As these non specific symptoms are common to other infections, many people do not recognize they have been exposed to HIV. The period during which HIV antibodies become detectable in the blood is called seroconversion and may take up to three months. Within days of infection with HIV, the virus multiplies rapidly, spreading through the body and targeting and damaging immune cells, chiefly CD4 lymphocytes.

HIV can be categorized into four main clinical stages, summarized here:

### *Clinical Stage 1: Asymptomatic*

No symptoms, or *persistent enlarged lymph nodes (also called Persistent Generalised Lymphadenopathy, or PGL)*, may occur.

### *Clinical Stage 2: Symptomatic (mild)*

In this stage, a person with HIV infection may not have any significant symptoms of illness. The immune system will continue to fight the virus, although billions of HIV particules are produced and millions of immune cells are destroyed each day. Clinical findings include:

- Moderate unexplained weight loss (<10 percent of presumed or measured body weight);
- Recurrent respiratory tract infections; and
- Skin, oral, and fungal nail infections.

### *Clinical Stage 3: Symptomatic*

This stage heralds signs of HIV causing significant damage to the immune system, and PLHIV may start to feel fatigue. A person with HIV can experience one or more of the following symptoms:

- Severe unexplained weight loss that is more than 10 perceent of usual body weight in less than six months;
- Unexplained diarrhoea for more than one month;
- Unexplained prolonged fever for more than one month;
- Oral conditions, including candidiasis, oral hairy leukoplakia, and gingivitis;
- Pulmonary tuberculosis (TB); and
- Severe bacterial infections.

### *Clinical Stage 4: Acquired Immune Deficiency Syndrome (AIDS)*

At this stage the immune system is severely damaged and the person is vulnerable to one or more opportunistic infections (OIs), which result only when there is significant immune suppression. People with AIDS may be bedridden for more than 50 percent of the day and experience a wide variety of life-threatening conditions, such as:

- HIV wasting syndrome: defined by weight loss greater than 10 percent of body weight plus either unexplained diarrhoea (for more than one month) or chronic weakness and unexplained prolonged fever (for more than one month);
- Oesophageal candidiasis;
- Fungal, viral, and bacterial infections affecting the lungs, brain, intestines, skin, and other major organs; and
- HIV-related cancers (e.g., lymphoma, Kaposi's Sarcoma).

For a complete reference of WHO staging of HIV and a specific list of clinical events and opportunistic infections, go to http://www.who.int/docstore/hiv/scaling/anex1.html.

Some examples of opportunistic infections that can affect **nutritional status** include:

- Tuberculosis (TB): weight loss and fatigue
- Oesophageal Candidiasis: difficulty swallowing
- Pneumocystis Carinii Pneumonia (PCP): anorexia and weight loss
- Cytomegalovirus (CMV): damages the eye but can affect other organs, including the intestines, causing diarrhoea
- Cryptosporidiosis: severe watery diarrhoea

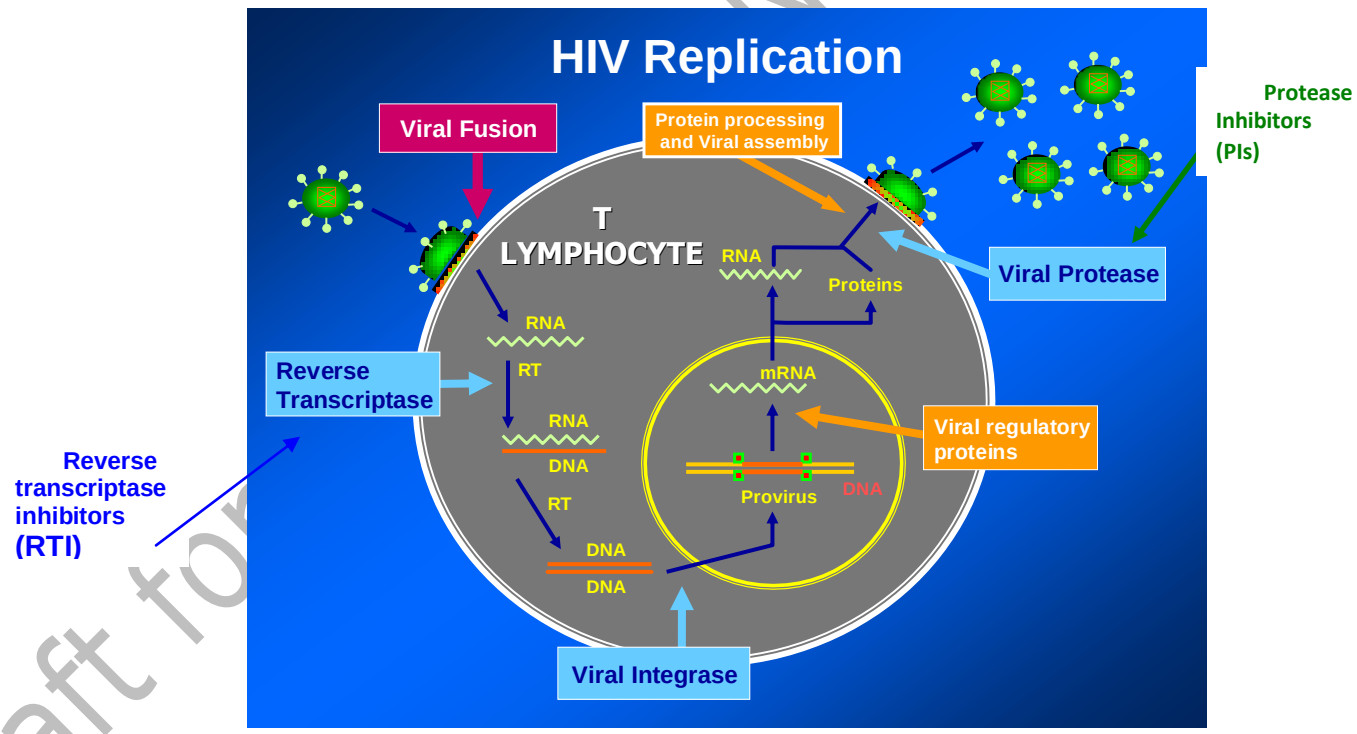
# Appendix 2: Antiretroviral therapy

## What are the different classes and types of ARVs?

Different classes of HIV antiretroviral medication target HIV at different stages in its replication cycle. Figure A illustrates the following major steps involved in viral replication:

1. HIV attaches to the surface of the CD4 lymphocyte via specific receptors ("Viral Fusion").
2. After entering the CD4 lymphocyte cell, the virus degrades to the viral RNA and enzymes necessary for replication within the CD4 cell.
3. Through reverse transcriptase enzyme, the 2 strands of RNA are converted into viral DNA.
4. This viral DNA enters the lymphocyte nucleus using viral integrase enzyme and the viral DNA becomes incorporated into the cellular DNA.
5. The CD4 lymphocyte DNA then begins production of viral RNA, which together with viral proteins assembles at the lymphocyte wall. Through viral protease enzyme, the mature viral particles form and bud from the surface of the lymphocyte.

***Figure A: Viral replication and types of ARV***




ARV therapy acts at keys sites in HIV replication chiefly by:

1. Inhibiting enzyme activity
    a. Reverse transcriptase inhibitors (RTI) include:
        - Nucleoside analogues (Zidovudine, Stavudine, Lamivudine, Didanosine, Abacavir, Emtricitabiune)
        - Non-nucleoside analogues (Nevirapine, Efavirenz, Delavirdine)
        - Nucleotide analogue (Tenofovir)
    b. Protease Inhibitors (PI) include:

- Indinavir, Saquinavir, Nelfinavir, Lopinavir, Ritonavir, Atazanavir, Fosamprenavir, Tipranavir, Darunavir

c. Integrase Inhibitors: currently in clinical trials

2. Blocking fusion and viral entry
   a. Fusion Inhibitors
      - Enfuvirtide (T20)

To prevent early drug resistance and treatment failure (likely when using only one or two ARVs), current ARV guidelines suggest using three or more drugs simultaneously.

Stavudine (d4T), + Lamivudine (3TC) + Nevirapine (NVP) is the most widely used ARV combination in developing countries. A full list of ARVs, available at the time of printing appear in Appendix 2a. It is unlikely that all manufactured antiretroviral agents will be available in many countries and settings largely due to cost. The recommended ARV regimens for resource-limited settings are described in Table A.

## What are the recommended ARV regimens for adults?

One type of antiretroviral drug alone cannot sufficiently stop replication of HIV, as drug resistance and treatment failure quickly develops with the use of one drug alone (monotherapy) or even two drugs in combination. To optimize efficacy, treatment involves taking at least three different drugs simultaneously. The medication must be taken as prescribed, without any missed doses, and preferably without any treatment breaks. Some drugs are now available combined in one pill. These pills are called "fixed-dose combinations" (FDCs). Table A outlines the combinations of ARV regimens recommended by WHO as first-line treatment for adults and adolescents. First-line drugs are standard therapy and vary from country to country, depending on such factors as price and availability. All first-line drugs recommended by WHO are reverse transcriptase inhibitors (RTI). See Appendix 3A for a full list of ARVs.

**Table A: First-line Regimens Recommended by WHO for Resource-Limited Settings**

| |
|---|
| (Zidovudine or Stavudine) + (Lamivudine or Emtricitabine) + (Efavirenz or Nevirapine) |
| Tenofovir + (Lamivudine or Emtricitabine) + (Efavirenz or Nevirapine) |
| Abacavir + (Lamivudine or Emtricitabine) + (Efavirenz or Nevirapine) |
| (Zidovudine or Stavudine) + (Lamivudine or Emtricitabine) + (Abacavir or Tenofovir) |

*Source:* WHO 2005.

### *Why regimens change*

When a patient receives a first-line regimen and develops toxic side effects, there is a need to change to another first-line regimen with fewer side effects. Some conditions such as pregnancy or the onset of TB will also guide the choice of first-line therapy. Some medications may cause foetal abnormalities and are to be avoided (Efavirenz, for example).

If the first-line ARV combinations do not reduce opportunistic infections, improve symptoms, or increase the CD4 count, it may mean that the virus has developed resistance to the drugs. This is when a second combination should be used. The goal of second-line therapy is to provide an alternative when first-line therapy is not tolerated or has failed. Refer to Appendix 3B for second-line combinations.

## What are the recommended ARV regimens for children?

Studies show that ART reduces illness and mortality among children living with HIV in much the same way that it does among adults. However, many of the drugs used to treat adults living with HIV are not available in an appropriate form or licensed/approved for use in children.

Where the correct drugs are available, a number of different combinations can work effectively in children. As with adults, ART with at least three drugs is recommended when treating children, to prevent HIV from becoming resistant to any single drug. It is usually recommended that this therapy consist of two nucleoside reverse transcriptase inhibitors (NRTIs) combined with either one non-nucleoside reverse transcriptase inhibitor (NNRTI) or a protease inhibitor (PI).

Infants who are too young to swallow tablets need to be provided with ARVs in the form of syrups or powders, but these formulations are expensive and often impractical. Some syrups need to be refrigerated after opening, which requires a reliable electricity supply; and powders need to be mixed with water, which may be unfeasible in areas where clean drinking water is not regularly available. In addition, the unpleasant taste of syrups and powders can make it difficult for children to take their ARVs every day.

If a child is suffering from malnutrition, it is recommended that they receive treatment to stabilize their condition before ART is started. In poorer areas this is not always possible, and it may be decided that ART be started despite the child's condition. When a child experiences rapid weight gain as a result of ARVs, the recommended dosage of ARVs needs to be reviewed (refer and take the major elements of WHO recommendations of HIV clinical management of children).

## Appendix 3a: List of HIV Antiretroviral Agents

| Nucleoside reverse transcriptase inhibitors | Nucleotide reverse transcriptase inhibitors | Protease inhibitors | Non-nucleoside reverse transcriptase inhibitors | Fusion inhibitors |
|---|---|---|---|---|
| Zidovudine (AZT/Retrovir) | Tenofovir (Viread) | Indinavir (Crixivan) | Efavirenz (Stocrin) | Enfuvirtide (T 20/Fuzeon) |
| Lamivudine (3TC) | | Nelfinavir (Viracept) | Nevirapine (Viramune) | |
| Stavudine (D4T/Zerit) | | Saquinavir (Invirase/Fortovase) | Delavirdine (Rescriptor) | |
| Didanosine (DDI/Videx EC) | | Ritonavir (Norvir) | | |
| Zalcitabine (DDC/Hivid) | | Lopinavir/ritonavir (Kaletra) | | |
| Abacavir (Ziagen) | | Fosamprenavir (Telzir) | | |
| Emtricitabine (FTC/ Emtriva) | | Atazanavir (Reyataz) | | |
| | | Tipranavir | | |
| | | Duranivir | | |

*Source:* Severe 2005.

## Appendix 3b: Detailed recommendations for switching to second-line ARV regimens in adults and adolescents

| First-line regimen | | Second-line regimen | |
|---|---|---|---|
| | | Rti component | Pi component |
| Standard strategy | AZT or d4T + 3TC b + NVP or EFV | ddI + ABC or TDF + ABC or TDF + 3TC (± AZT) c | PI/r d |
| | TDF + 3TC b + NVP or EFV | ddI + ABC or ddI + 3TC (± AZT) c | |
| | ABC + 3TC b + NVP or EFV | ddI + 3TC (± AZT) c or TDF + 3TC (± AZT) c | |
| Alternative strategy | AZT or d4T + 3TC b + TDF or ABC | EFV or NVP ± ddI | |

A. NFV does not need refrigeration and can be used as a PI alternative in places without a cold chain.
B. 3TC and FTC are considered interchangeable because they are structurally related and share pharmacological properties and resistance profiles.

C. 3TC can be considered to be maintained in second-line regimens potentially to reduce viral fitness, confer residual antiviral activity, and maintain pressure on the M184V mutation to improve viral sensitivity to AZT or TDF. AZT may prevent or delay the emergence of the K65R mutation.
D. There are insufficient data to detect differences among currently available RTV-boosted PIs (ATV/r, FPV/r, IDV/r, LPV/r and SQV/r) and the choice should be based on individual programme priorities (see text). In the absence of a cold chain, NFV can be employed as the PI component but it is considered less potent than an RTV-boosted PI.

*Source:* WHO, HIV/AIDS Programme Antiretroviral Therapy for HIV Infection in Adults and Adolescents: Recommendations for a Public Health Approach, 2006 rev.

## Appendix 3c: WHO Recommendations for Commencing ART

WHO has provided recommendations on when to initiate ARV treatment. The recommendations are devised according to the availability of CD4 cell count blood test. These are presented in Table B.

1. Clinical staging based on the evaluation of the health status of the patient: This status is first evaluated based on the clinical status of the patient (bring here the table of clinical staging)

2. It is recommended when available to measure the CD4 count of the patient

**Table B: Indicators for commencement of ART with availability of CD4 testing**

| CD4 count (cell/mm$^3$)* | Action |
|---|---|
| <200 | Treat irrespective of clinical stage. |
| 200–350 | Consider treatment; initiate before level drops below 200 cells/mm$^3$. |
| >350 | Defer treatment in asymptomatic persons. |

*Ideally, two consecutive CD4 counts should establish baseline levels.

If a CD4 cell count blood test is not available, ARVs are recommended during Stage 3 or 4 of HIV clinical staging, when constitutional symptoms or AIDS-related opportunistic infections indicate severe immune system damage is occurring.

3. When clinically eligible for ART, the patient should receive counselling and be evaluated for his/her capacity to adhere to treatment. Treatment adherence is critical to ensure its efficiency and prevent the occurrence of drug resistance. The counselling session should include an assessment of the patient's knowledge of the medication, its possible side effects, and the lifelong commitment necessary. Patient adherence and the availability of social support to help adherence, such as a “treatment buddy,” should be discussed. to remind the patient about medications, assist in the first stage of the treatment when side effects are more important, and bring the nutritional support the patient does need as most ARVs will be better supported when taken with food ; access to services and where the ART is prescribed, agenda for the follow-up visits; peer support groups and home-based care.

## Appendix 4: Homemade Oral Rehydration Solutions

**A. Sugar and salt solution**: Add ½ teaspoon of table salt and 8 teaspoons of sugar into 1 litre of boiled water.

**B. Cereal solution**: Add ½ teaspoon of table salt and 8 teaspoons of rice flour or maize flour. Boil for 5–7 minutes, until the solution looks like thin porridge. Cool the solution quickly.

## Appendix 5: Food and Nutritional Implications of ARV

| Medication | Food recommendations | Avoid |
|---|---|---|
| **Non-nucleoside reverse transcriptase inhibitors** | | |
| Efavirenz | Can be taken with or without food, except do not take with a high-fat meal (as this reduces drug absorption). | Alcohol |
| Nevirapine | Can be taken with or without food. | St. John's Wort |
| Delaviradine | Can be taken with or without food. | |
| **Nucleoside reverse transcriptase inhibitors** | | |
| Abacavir | Can be taken with or without food. | |
| Abacavir/ Lamivudine (Combivir) | Can be taken with or without food. | |
| Abacavir/ Lamivudine/zidovudine (Trizivir) | Can be taken with or without food. | |
| Didanosine | Take one hour before or two hours after food. Take with water only. (Taking with food reduces drug absorption.) | Alcohol<br>Do not take with juice.<br>Do not take with antacids containing aluminium or magnesium. |
| Lamivudine | Can be taken with or without food. | Alcohol |
| Stavudine | Can be taken with or without food. Can be taken with food to reduce stomach upset. | Alcohol |
| Zidovudine | Take without food, however, if nausea or stomach upset develop, take with a low-fat meal. Do not take with a high-fat meal | Alcohol |
| Emtricitabine | Take with or without food. | |
| **Nucleotide reverse transcriptase inhibitors** | | |
| Tenofovir | Preferably taken with a meal. | |
| Tenofovir/emtricitabine | Preferably taken with a meal. | |

| **Protease inhibitors** | | |
|---|---|---|
| Indinavir | Take on an empty stomach, one hour before and two hours after a meal. Or take with a light nonfat meal. Take with water. Drink at least 1500 ml of fluids daily (more in hot weather) to prevent kidney stones. | Grapefruit<br>St. John's Wort |
| Lopinavir/ritonavir | Take with food to aid absorption and reduce stomach upset. | St. John's Wort |
| Nelfinavir | Take with a meal or light snack. Taking with acidic food or drink will cause a bitter taste. | St. John's Wort |
| Ritonavir | Take with food to aid absorption and reduce stomach upset. | |
| Saquinavir | Take with a meal or light snack. Take within two hours of a high-fat and high-calcium meal | Garlic supplements<br>St. John's wort |
| Tipranavir | Can be taken with or without food. Taking with food may reduce stomach upset | Alcohol |
| Atazanavir | Take with food to increase drug absorption and reduce upset stomach. | Alcohol |
| Fosamprenavir | Tablets: Can be taken with or without food.<br>Suspension: Taken without food, on an empty stomach. | Alcohol |
| Amprenavir | Can be taken with or without a meal. Avoid taking with high-fat meals. | Alcohol |
| Atazanavir | Take with food. | |
| Tipranavir | Can be taken with or without a meal, but better tolerated with food. | |
| Duranivir | Take with food. | |

*Source:* Adapted from Food and Nutrition Technical Assistance, August 2003, Food and Nutrition Implications of Antiretroviral therapy in Resource-Limited Settings. See Severe 2005; Castleman 2003.

## Appendix 6: Example of Data Collection Form for Programme Monitoring

| Baseline demographics | | |
|---|---|---|
| Client name: | | Date: / / |
| Client ID number: | | |
| Client sex: | Male | Female |
| Client address:<br>HIV story? | | |
| Name of respondent, if other than the client: | | |
| Relation to the client: | | |
| Marital status: | Religion: | Profession: |
| Current income: | Working? Yes/No | Not working? Yes/No |

| Household occupants | |
|---|---|
| How many adults stay in the household? | |
| How many elders stay in the household? | |
| How many children stay in the household? | |
| How many people in the household earn an income? | Number of people:<br>Males: Females: |

| Medical history | | |
|---|---|---|
| Medical doctor: | | |
| Medical centre: | | |
| Current medications: | | |
| Symptoms: Does the client have problems with any of the following (circle those that apply)? | | |
| Nausea<br>Sore mouth<br>Diarrhoea<br>Fever | Vomiting<br>Difficulty swallowing<br>Constipation<br>Fatigue | Poor appetite<br>Difficulty chewing<br>Dry mouth<br>Other |
| Does the client require a change in their diet related to their medication? | Yes/No<br>If yes, specify changes: | |
| Weight (kg) | Height (m) | BMI: Wt (kg)/Ht($m^2$): |
| Mid upper arm circumference (MUAC) (cm): | | |
| CD4 (if known): | Other labs (if known): | |
| Current illness: | | |

Energy level (Client to circle on scale below)

1 2 3 4 5 6 7 8 9 10
No energy High energy

| Diet history | | |
|---|---|---|
| What did the client eat in the last 24 hours? | | |
| Morning: | Midday: | Night: |
| | | |
| Snacks: | | |
| No. of portions of :<br>Energy foods: Protective foods: Body building foods: (define) | | |
| How long has the client been experiencing this pattern of food intake? | _____ days<br>_____ weeks<br>_____ months | |
| Has food intake in the last month (please circle): | Increased Decreased Not changed | |
| Who prepares the food? | Self | Other household member |
| Are there any preferred consistencies in the food the client eats? | Yes/No<br>If yes, please circle or state below:<br><br>Soft Fluids only<br>Warm Cold | |
| How many meals does the household consume in a day (circle one)? | 1 2 3 4 | Where did the food come from? |
| In the last month, did anyone in the household skip or reduce meals? | Yes/No | If, yes, how often did this happen? |

| Food aid | |
|---|---|
| Is the household receiving any donated food? | Yes/No<br>If yes, from whom is the food received? |
| How much food/what type of food is the household currently receiving each month? | How many persons in the household are benefiting from this food aid? |

Source: Adapted from Pamela Fergusson, January 2005, Targeting Household Security in the Context of HIV: A Report by WFP Zambia, unpublished.

## Appendix 7: Recommended Reading Related to Monitoring and Evaluation of Care and Treatment Programmes

WFP M&E Guidelines
http://home.wfp.org/meknowledgebase/index.asp?Page=Modules&MType=Design

WFP RBM Orientation Guide
http://docustore.wfp.org/stellent/groups/public/documents/other/wfp022113.pdf

Measuring the Impact of Targeted Food Assistance on HIV/AIDS-Related Beneficiary Groups, November 2005, C-SAFE, http://www.ifpri.org/pubs/books/oc50/oc50ch16.pdf

A Guide to Monitoring and Evaluation of Nutrition Assessment, Education and Counseling of People Living with HIV. 2008, FANTA.

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## APPENDIX 8: REFERENCES

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