

# HATiP

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# Nutrition in ART programmes

By Lucy Reynolds

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This clinical review looks at the relationships between HIV infection and malnutrition, and how to provide nutritional support as a part of programmes providing antiretroviral treatment and comprehensive care to people with HIV. It does not cover the issue of infant feeding, which was previously addressed in two HATIP editions [published in September 2006](#).

Ensuring that peoples' nutritional needs are met is a fundamental part of a palliative care approach to HIV, and recognises the links between malnutrition and wasting and poor response to antiretroviral treatment.

## Key points

- **Malnutrition is more likely to be present in people with HIV, and weight loss of greater than 10% is diagnostic of WHO stage 3 HIV disease. A body mass index below 16 is associated with an increased risk of death in adults starting antiretroviral treatment.**
- **The consequences of malnutrition for the efficacy of ART are poorly understood, and evidence regarding the impact of food supplementation on ART outcomes is still limited.**
- **The World Health Organization and World Food Programme have issued guidance on food support in ART programmes.**
- **Every newly enrolled patient should have a nutritional assessment that includes measurement of weight and body mass index, along with nutritional counselling and monitoring.**
- **Nutritional interventions are most likely to be needed in patients with severe malnutrition, in those with TB/HIV coinfection, in pregnant women and in children.**
- **Food insecurity without severe malnutrition is also a criterion for food support in some programmes.**
- **The World Food Programme recommends either ready to use therapeutic foods, such as *Plumpy Nut*, or corn-soya blended flour, or household food rations. Ready to use therapeutic foods such as *Plumpy Nut* are likely to be particularly suitable for malnourished children.**
- **Promotion of activity that increases ability to maintain and expand food supplies, either through growing crops or trading (‘livelihoods’) may be a more appropriate response to malnutrition in people with less advanced HIV disease. Households affected by HIV often experience multiple threats to their livelihoods. Cash transfers are also being used as a means of addressing food insecurity.**

- **All nutritional support programmes need realistic strategies to avoid dependency and promote long-term food security through enhancing livelihoods or cash transfers.**

## Types of nutritional interventions

THERAPEUTIC FEEDING	
Micronutrient supplements	Single- or multi-compound micronutrient supplements may be provided to either correct or prevent a specific micronutrient deficiency.
Therapeutic foods	Specialized foods are provided to rehabilitate those with severe malnutrition. These foods are often energy- and nutrient-dense and need minimal preparation.
SUPPLEMENTARY FEEDING	
Food rations	Food rations are provided to specific groups that may be particularly vulnerable to malnutrition (such as pregnant women or OVC). Sometimes rations are also used as an incentive to encourage patients to return for follow-up care (e.g., PMTCT).
Program-based feeding	A regular meal is provided for recipients attending a health or support service. Recipients may also receive nutrition education and skills building training in such areas as food preparation and hygiene.
Home-based care (HBC)	Food support is usually provided in the form of individual foods (such as rice, oil, or salt) to people requiring home-based care. Interventions may also include nutrition screening, basic medical care, counselling, and welfare support.
FOOD AS INCENTIVE	
Food for treatment programs (HIV/TB)	Food rations are used as an incentive to promote adherence to medical treatment, such as treatment for TB and during the early phase of ART.
Food for work (FFW)	Food rations are provided in exchange for manual labour on activities such as land clearing, planting, community infrastructure development, and appropriate agricultural practices (aquaculture, forestry).
Food for assets	Food is provided in exchange for labour, but emphasizing the creation of assets that are owned, managed, and used by targeted households or communities.
Food for training/food for education	Food rations are linked to home-based care workers, income generating activities (IGA), and micro-credit programs.
Food safety nets	Often government-supported initiatives, these may be either cash or food-based transfers or a subsidy available to those most vulnerable to food insecurity.

Examples include provision of food stamps to food insecure families.

Source: FHI. *HIV, Nutrition, and Food: A Practical Guide for Technical Staff and Clinicians*. December 2007

## Nutritional impacts on HIV disease progression and on ART adherence

Many PLHIV in resource-limited settings already suffer “primary” malnutrition. In the hyper-epidemics of sub-Saharan Africa (Gillespie 2007), some of the populations at greatest risk of contracting HIV are the same populations at high risk of food insecurity (Rollins 2007), with weak economies damaged by the “structural adjustment” programmes of the 1980s and 1990s (Guhan 1994) and food supplies vulnerable to disruption by changes in global markets or local environmental shocks. To take a single example, the 2004 Demographic and Health Survey showed 48% of Malawian children to be stunted. Malawi has a hungry season from December to April, which causes a peak of malnutrition in February, and suffered droughts in 2002-3 and 2005-6; in the latter period, almost 6,000 children were admitted to the 48 Action Against Hunger (AAH) nutrition rehabilitation units (NRUs). A sample of 12 of Malawi's 92 NRUs showed 18% HIV prevalence in the hungry season, and 31% post-harvest, indicating that people with HIV are substantially more likely to be malnourished even at times of relative plenty (AAH 2007).

Malnutrition is more likely to be present in people with HIV for a range of reasons:

- Elevated resting metabolic rate in HIV infection leading to 20-30% increase in energy expenditure
- Further elevation in energy expenditure due to opportunistic infections
- Reduced absorption of nutrients due to diarrhoea and direct damage to intestinal tract by HIV
- Loss of appetite due to opportunistic infections, especially those that cause problems in eating and swallowing
- Reduced food intake due to inability to cultivate crops or earn money to buy food (loss of livelihood)

### Elevated energy needs and restrictions on intake

HIV and opportunistic infections raise the resting metabolic rate and cause wasting: unexplained weight loss of up to 10% is diagnostic of WHO Stage 2 infection, and above 10% of Stage 3. From the time of HIV infection, the body needs about 10% more energy. During opportunistic infections (OIs), energy expenditure increases by 20-30% (Macallan 1995). In a severely malnourished patient, especially a small child, up to 100% extra energy intake is needed (WHO 2003a). Insufficient nutrient intake impairs immunity and hastens development of opportunistic infections (Loevinsohn 2003, Fawzi, 2004, Perrone 1999).

Malnutrition impairs immune function (Scrimshaw 1997) in ways which overlap with immune damage from HIV (Beisel 1996), and predisposes to infections which boost the metabolic rate and increase nutrient utilisation while reducing absorption. A vicious spiral of “secondary” malnutrition, physical weakness and waning earning power ensues.

Appetite loss is one of the main biological reasons for weight loss in PLHIV (Macallan 1995), resulting from medication side-effects, depression or illness. Oral sores, nausea, and vomiting further impede adequate intake. Intestinal malabsorption leading to energy

and nutrient losses is common (Griffin 1990) due to diarrhoea resulting from opportunistic infections or HIV itself (Ullrich 1989), or to malignancies and other gastrointestinal disease (Amadi 2001; Macallan 1993). Lower body weight correlates with more severe malabsorption among PLHIV (Keating 1995).

Weight loss (Tang 2002, Mangili 2006), and low body weight/muscle mass (Severe 2005, Kotler 1989, Suttman 1995) correlate with shorter PLHIV survival. At diagnosis of HIV, body mass index (BMI, used for adults) or weight for age (for children) is as accurate as CD4 count in predicting death (van der Sande 2004, 3Cs4kids 2008).

## Maintaining macronutrient balance

WHO recommends that PLHIV maintain a normal balanced food intake of 70% carbohydrate, 10–13% protein, and 16–18% fat. Except for those with severe malnutrition, WHO/WFP state that PLHIV can reach recommended intakes through daily consumption of starchy staples with cooked pulses, nuts and nut butters, fat and oil, fruits, and vegetables. Animal protein should be added when affordable (WHO/WFP 2008).

Carbohydrates should derive mainly from starchy staples, but sugar can improve palatability and raise energy content of meals without increasing bulk.

Whole body protein turnover increases markedly in PLHIV and can lead to muscle wasting if opportunistic infections develop, due to even greater protein turnover during acute phase infection. (Macallan 1999). Increased protein intake can reconstitute muscle stores (Schwenk 1999) and total body weight in PLHIV (Charlin 2002; Tabi 2005). Protein content of diet will increase proportionally with overall intakes if WHO recommendations are followed.

Getting the right balance of carbohydrates, protein and fats can prove challenging. For instance, fats should comprise approximately 17% of a PLHIV's diet, however fat-rich foods are the most energy-dense, and consuming them may allow adequate calorie intake in patients with limited ability to eat. Fats also facilitate absorption of certain vitamins. However, diets high in saturated fats have been associated with cardiovascular disease and other health problems, and it is particularly important that patients at risk of ART-related problems, including high cholesterol/triglycerides and diabetes should avoid saturated fats.

## Micronutrients

### Deficiencies, balance and interactions

Micronutrient deficiencies are common in PLHIV, perhaps due to the reduced absorption caused by HIV infection (Ullrich 1994). An insufficient intake may accelerate HIV disease progression (Piwoz 2000, Fawzi 2004). Deficiencies in vitamins A, C, and E, zinc, and selenium are associated with an impaired immune response (Chandra 1991).

Some research on micronutrient supplementation indicates that it can slow disease progression (Fawzi 2004, Abrams 1993, Tang 1993, Tang 1996, Kanter 1999, Tang 1997), reduce mortality (Jiamton 2003, Range 2006), lower viral loads, and decrease gastrointestinal effects (Fawzi 2004). Other studies do not show the expected effects (Friis 2007). Friis notes that the same micronutrient may be beneficial in some situations while having adverse effects in others; more evidence is required to establish optimal micronutrient intakes to reduce progression of HIV to AIDS and mortality (Friis 2005).

Micronutrients interact: for example, vitamin A deficiency can be partly due to lack of zinc, required to generate retinol from dietary carotenoids and to synthesize retinol binding protein. Few interactions are well understood, thus supplementation with a full range of micronutrients may be preferable to use of single supplements. WHO does not currently recommend micronutrients above the level of recommended daily allowances for healthy non-HIV-infected persons of the same age, sex, and physical activity level (Mannheimer 2002).

HIV replication speeds up under conditions of oxidative stress (Schreck 1991), which is combated by antioxidant systems supported by vitamins A, C and E, selenium and zinc. However, even PLHIV with adequate micronutrient intake show high oxidative stress (Schreck 1991, Allard 1998, Batterham 2001). The higher the burden of infectious diseases, the greater the need for effective antioxidant systems, thus micronutrient needs for PLHIV in tropical countries may exceed those in temperate zones.

Friis notes that current data suggest that provision of vitamins B, C, and E is beneficial, but vitamin A and possibly other micronutrients could be harmful in excess. He identifies the need for studies of the mechanisms involved. WHO recommends that Vitamin A supplements be given according to the high-dose prevention schedule for all children at risk of deficiency. This schedule has been shown to reduce diarrhoeal morbidity in HIV-positive children under 5 years old (Coutsoudis 1995) and all-cause mortality by 30% (Fawzi 1999, Villamor 2002, Friis 2005). Zinc is essential to DNA synthesis and cell differentiation, with deficiency leading to recurrent infections, decreased phagocytosis, decreased lymphocyte production and depressed macrophage activity (Fischer 2004). Zinc supplementation in HIV infected children also diminishes diarrhoeal morbidity (Bobat 2005), but excess zinc impairs immunity (Chandra 1984).

Anaemia reduces PLHIV survival (Mocoff 1999, 3Cs4kids 2008), and supplementation is appropriate if tests show iron deficiency. However, high iron levels correlate with faster disease progression (Friis 2005); Friis calls for research on safety and efficacy of current recommendations on iron supplementation (Friis 2007). The Academy for Educational Development's Food and Nutrition Technical Assistance project (FANTA) suggests that if the prevalence of anaemia in children 6-24 months in the community is below 40%, a dose of 2 mg iron/kg body weight +50 µg folic acid each day from six through 11 months of age is appropriate. If anaemia prevalence is 40% or above, the 2 mg iron/kg body weight +50 µg folic acid should be continued until two years old (FANTA 2004).

## ART and nutrition

### Impact of ART on nutritional status

When a patient commences ART, weight gain is common; it is associated with reduced HIV-related morbidity and mortality (Raiten 2005). An extensive review (Drain 2007) looking at the effect of ART on micronutrient deficiencies noted major weaknesses in most studies. It is unclear whether ART reduces deficiencies, or whether ART patients benefit from supplementation.

ART may cause nausea and vomiting; these reduce adherence, particularly early in treatment (Chen 2003).

### Impact of malnutrition on ART outcomes

Many researchers have documented links between poor nutritional status (body mass index (BMI), anaemia) and mortality risk on entering treatment (Paton 2006, Mshana 2006). More advanced stage of disease, higher number of previous OIs, lower

CD4 count and higher viral load were all significantly associated with BMI. HAART patients with BMI below 17 had six-fold the risk of death (hazard ratio 6.14,  $p = 0.01$ ) of patients with normal BMI (Paton 2006) (BMI calculations are explained in the anthropometric section below). Research in Malawi found that 50% of patients with BMI below 16 died within six months of starting ART (AAH 2007).

The AMPATH project in Kenya found that the majority of HIV-positive patients were malnourished, attributed to lack of access to food, poor appetite and poor preparation of food (Siika 2005). The consequences and efficacy of ART among malnourished individuals are unclear, as the effects of underlying malnutrition on ARV absorption and metabolism remain poorly understood (Castleman 2003).

### Impact of food supplementation on ART outcomes

Conclusive evidence linking food supplementation with reduced mortality or weight gain of adults on HAART in resource-poor settings remains unavailable.

### Food-ARV interactions

While timing of meals is immaterial with most ARVs, others such as indinavir and didanosine should be taken with liquid but no food, while tenofovir and most protease inhibitors should be taken with food. Certain foods can interfere with ART absorption and utilisation (Castleman 2003), for instance grapefruit, alcohol and garlic. Taking efavirenz with food may increase its absorption and the risk of side effects. High-dose Vitamin C may reduce blood levels of indinavir (Slain 2003). The WHO/WFP report contains an appendix of ARV-food interactions (WHO/WFP 2008).

### Impact of lack of food on adherence to ART

Some antiretrovirals need to be consumed with food; all ARVs are better tolerated in adequately nourished patients. While ART should not be delayed for patients in deteriorating health, the regime is harder for the food-insecure.

Quantitative and qualitative peer-reviewed studies substantiate anecdotal evidence that lack of food is an important barrier to people seeking ART in resource-poor settings (Au 2006, Mshana 2006, Marston 2004). Au surveyed Rwandans who were not on HAART despite eligibility; three-quarters "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). Clients of The AIDS Support Organisation of Uganda (TASO) speak of increased food intake in the first three months after starting ART, and those not yet on treatment express concern about how they will meet their increased appetite (Nabiryo, 2008).

A Zambian controlled trial of food-insecure adults commencing antiretroviral therapy concludes that supply of a half-ration of food to patients and their dependents significantly increases adherence (defined as physical possession of the drugs) during the first six months of treatment, but notes no conclusive evidence of its effect on weight gain or CD4 count (Megazzini 2006). TASO new client registration trends show sudden increases around 2002, when the WFP/TASO short-term food support program commenced, and in 2004 when they commenced ART (Nabiryo, 2008).

## Nutrition programming for ART

### New WHO/WFP recommendations on incorporating food into ART programmes

WHO and WFP have prepared new operational guidelines on food support in antiretroviral treatment (ART) programmes (WHO/WFP



2008), with the aim of encouraging integration of nutritional support into national responses, enabling providers to include food and nutrition in HIV care programming, and developing an agreed upon framework for monitoring and evaluation. They present data showing that food and nutrition interventions (such as therapeutic feeding) may improve ART effectiveness and adherence, reduce symptoms, and support long-term quality of life, and offer guidance on designing and running food support programmes.

Some programme components should cover all enrolled patients, while others will address particular subgroups.

## Interventions covering all patients

### Evaluation

Every PLHIV should have a full nutrition assessment on intake to medical services. The ABCDE approach covers anthropometric, biochemical, clinical, dietary and environmental issues significant to nutritional welfare for new patients, and provides baseline data for future monitoring. A model for evaluation was presented at AIDS 2008 in Mexico City by the Kenya AIDS Consortium (Chesire 2008) (see opposite page).

### Anthropometric measures

Untreated HIV infection is characterised by loss of lean body mass (Suttmann 1995). Ockenga et al note that “*loss of muscle and visceral mass may be masked by an increase in extracellular fluid and/or fat mass*” (Ockenga 2006). Alterations in body shape and muscular function differ between predominant muscle mass depletion (wasting) seen in untreated HIV infection and peripheral fat loss (lipoatrophy) seen in people on antiretroviral treatment regimens (chiefly those containing d4T and to a lesser extent AZT).

Despite these complications, monitoring of anthropometric measures is essential in intake evaluation and follow-up. Height and weight should be recorded.

Clinical evaluation	Dietary assessment	Food security
Evaluate	Evaluate	Explore with the patient
<ul style="list-style-type: none"> <li>Oral or oesophageal thrush or other reasons for difficulty chewing or swallowing such as inadequate saliva secretion</li> <li>Diarrhoea</li> <li>Nausea and/or vomiting</li> <li>Constipation</li> <li>Appetite loss</li> <li>Low energy levels</li> <li>Evidence of nutritional deficiency symptoms, such as weak hair, bleeding gums, breaks at the corner of the mouth (angular cheilitis)</li> <li>Other symptoms that could have an impact on nutrition, e.g. confusion</li> </ul>	<ul style="list-style-type: none"> <li>Baseline dietary intake (collected using diet history interview and/or food frequency checklists)</li> <li>Household meal patterns</li> <li>Foods available within the home</li> <li>Assessment of individual and household intake of energy and key nutrients</li> <li>Intake of dietary supplements including herbal therapies: [note, some drug/supplement interactions may affect the efficacy or safety of ART (Castleman 2003, Raiten 2005)].</li> </ul>	<ul style="list-style-type: none"> <li>What foods are available near the patient's home?</li> <li>What foods are grown, bartered, bought?</li> <li>Is there access to land for growing food? [and access to land may differ for men and women]</li> <li>Are there constraints on food preparation or storage?</li> <li>What emergency coping strategies are in use?</li> <li>Does the patient have a caregiver, and if not, do they need one?</li> </ul>

<ul style="list-style-type: none"> <li>Medications which might cause or interact with symptoms.</li> </ul>		
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For wasted children, tables give the corresponding percentage of normal weight for the child's height or the Z-score (standard deviations below normal). Less than 80% or -2Z indicates moderate acute malnutrition, and under 70% or -3Z severe acute malnutrition. For chronically malnourished children, stunting is monitored through calculating % height for age.

For adults, BMI is calculated, as weight (kg) divided by (height (m<sup>2</sup>) x 100)). Among the general adult population, BMI of 17-18.5 indicates mild acute malnutrition, 16-17 moderate acute malnutrition, and below 16 severe acute malnutrition requiring therapeutic feeding. Validation of these limits in PLHIV is the subject of current technical discussions. Nutritional intervention is indicated for PLHIV with significant sudden weight loss, and should be considered for patients with BMI < 18.5 kg/m (Ockenga 2006). Calculation of BMI is not useful in oedematous or pregnant patients, as their weight changes will not reflect nutritional status.

For pregnant women, MUAC may be useful: a mid-upper arm circumference (MUAC) below 18.5cm indicates moderate undernutrition; a measurement less than 16cm suggests severe undernutrition (Cogill 2003). MUAC requires validation with adult populations and with PLHIV (WHO/WFP 2008).

Equipment required for anthropometric evaluation (AAH 2007):

- Scales for infants, children and adults
- Height board or QUAC sticks (Rainer 1969)
- Weight/height and height/age tables for child malnutrition.

C-SAFE suggest that ART programmes should monitor BMI and % weight change (Egge 2005).

### Ongoing nutrition counselling and monitoring

Counselling on managing nutrition-related side-effects and symptoms should be part of routine follow-up for all adults and children being considered for or taking ART (Raiten 2005). According to USAID, “Nutrition counselling refers to an interactive process between provider and client to assess nutritional status and needs; understand client preferences, constraints and options; and plan a feasible course of action that supports healthy nutritional practices” (Castleman 2008). WHO suggests that health care providers, nutritionists and peer educators should be trained in and encouraged to provide nutrition counselling. Dietary counselling assists PLHIV in making nutritious, affordable and culturally appropriate food choices, and improves the body weight of PLHIV, especially when provided early (Chlebowski 1995, van Niekerk 2000). It can help maximise ART tolerability and adherence, and reduces adverse nutrient-medicine interactions (Raiten 2005). It should cover use of any food assistance package given, and advice should take into consideration available foods and household conditions. WHO quotes detailed advice on managing side effects of HIV and ART (Castleman 2003) and on metabolic complications of HIV disease and ART (WHO/WFP 2008).

All patients should be weighed at follow-up appointments, with children's heights measured, and changes in nutritional status monitored. Counsellors and patients should agree on objectives and actions to be pursued at follow-up.

In designing nutrition advice for patients, as well as in choosing micronutrient supplements, it may be worthwhile consulting national FAO and UNICEF programmes for details of local deficiency patterns; these can arise from low soil concentrations of key trace elements, or from local dietary choices or food preparation methods. For instance, known malnutrition problems in Kenya include, in addition to protein energy malnutrition, iron deficiency anaemia, Vitamin A deficiency, iodine deficiency disease and zinc deficiency (Wagah 2005).

Nutrition counselling of PLHIV may extend the asymptomatic period (Piwoz 2000). For instance, seven months of nutritional counselling about protein intake led to significant weight gain among PLHIV not on treatment (Tabi 2006).

### Nutrition, hygiene and food handling education

Some patients require nutrition education to help them select a nutritionally balanced diet from foodstuffs available, rather than consuming soft drinks, unnecessary supplements and nutrient-depleted convenience food. Training in food storage and preparation and hygiene education are important in protecting against food-borne disease. These interventions can be delivered through PLHIV groups in lower prevalence settings, and at clinics or within communities in high-prevalence regions, taught by programme staff, or visiting medical staff. Demonstration kitchen gardens, such as those run by TASO (Nabiryo 2008), can be combined with cooking clubs and nutrition education.

## Interventions for particular groups

### Severely malnourished patients entering ART

In poor countries with fee-for-service medical services and high stigma, it is common for HIV status to be unknown until PLHIVs are admitted to hospital with serious illness, often of long duration. Fear of stigma leads many, particularly men, to avoid HIV and TB testing and treatment until their situation is already extreme. Such late presentation patients may arrive with BMIs down to 13, at risk of organ failure. For such severely wasted patients entering highly active antiretroviral therapy, access to competent nutrition rehabilitation *"is an immediate matter of life and death"* (Paton 2006). Management of malnutrition-associated dehydration is urgent, with enteral feeding by naso-gastric tube or parenteral feeding (by IV drip) indicated until the patient can eat (Ockenga 2006). Selenium should be included in parenteral mixes, as deficiency causes serious metabolic problems (Gramm 1995). Intensive care will often be required for survival of HIV-positive children presenting to NRUs with severe acute malnutrition whether or not they commence ART, including therapeutic feeding.

### TB/HIV coinfecting patients

Malnutrition is well known to predispose people to develop active TB. Malnutrition and wasting are particular issues for patients coinfecting with HIV and TB. Malnourishment further weakens the cell-mediated immune response in people with HIV, increasing the risk that latent TB infection will become active disease. HIV, TB and malnutrition are mutually reinforcing in their effects on energy expenditure, malabsorption, micronutrient deficiency, and oxidative stress (van Lettow 2003, Niyongabo 1999). Niyongabo et al examined nutritional status of HIV-positive and HIV-negative hospitalized TB patients in Burundi, finding lower body weight, fat mass, and fat-free mass in the co-infected cases.

Patients with active TB are typically wasted (van Lettow 2004, Harries 1988, Paton 2004), with weight loss seen in almost every

patient at TB diagnosis in resource-poor settings (Schwenk 2000). TB affects protein metabolism and nutritional status through multiple mechanisms, including raising resting metabolic rate and reducing appetite (Dye 2006). TB treatment usually improves nutritional status, but fat mass may be preferentially restored with little rebuilding of muscle tissue (Schwenk 2004). Malnutrition may trigger relapse of treated TB (Khan 2006).

Patients with active TB suffer depressed blood concentrations of antioxidant vitamins A (Mugusi 2003, Ramachandran 2004, van Lettow 2005), C (Hemila 1999, Bakaev 2004) and E (Bakaev 2004, van Lettow 2005), zinc (Kassu 2006, van Lettow 2005), iron (Kassu 2006), and selenium (Kassu 2006, van Lettow 2005) compared with healthy controls, partly due to the immune system response to infection, which raises oxidative stress, lowering antioxidant capacity (Madebo 2003, Vijayamalini 2004). Anaemia, due to coughing blood, decreased red blood cell production and inadequate intake is common in pulmonary TB patients and even more so among the TB/HIV co-infected (van Lettow 2005, Das 2003), and needs to be considered when choosing a first-line ART regimen (AZT may exacerbate pre-existing anaemia).

USAID recommends micronutrient supplementation for TB patients, since some evidence that daily micronutrient supplementation may benefit those with deficiencies, especially during the early months of anti-TB therapy (Papathakis 2008) (though little systematic data is available to guide interventions). High-energy protein supplements (600-900kcal/day, 25-37.5gm protein/day) initiated at commencement of anti-TB drugs may significantly improve lean body weight and physical function (Chandra 2004, Paton 2004), though no specific recommendations have yet been internationally agreed (Papathakis 2008).

While evidence of the impact of food support on TB patients' nutritional status, quality of life, treatment adherence, and outcome is mainly anecdotal, it appears to be valuable in rehabilitation. Food support is often used to encourage TB patients to complete the full duration of their treatment as well as improving nutrition status, maximising cure rates and minimising antibiotic resistance. Food assistance may also influence early case detection, but according to USAID "the cost to programs of providing food support may be considerable" (Papathakis 2008).

TB medications affect nutritional status: isoniazid increases excretion of vitamin B6, causing peripheral neuropathy (Visser 2004), while rifampicin alters vitamin D metabolism and so may weaken bones (Roth 2004). WHO/WFP recommends that vitamin B6 and vitamin D supplementation should be considered for PLHIV during TB treatment. Given the elevated risk of peripheral neuropathy in people with HIV, especially those also receiving d4T-based ART, vitamin B6 supplementation is arguably essential in any HIV-positive person receiving isoniazid.

Paton et al found that patients entering TB treatment randomised to a high energy-protein supplement (600- 900kcal/d, 25-37.5gm protein/d) for six weeks showed significant increases in body weight, lean mass, fat mass and grip strength compared to controls (Paton 2004). Since in the first month of TB treatment, moderate to severe under-nutrition is associated with increased risk of death (Zachariah 2002), Paton et al suggest that swift nutritional rehabilitation for wasted TB patients, as for HIV patients, may have significant impact on mortality.

There is evidence of increased risk of malnutrition and resulting mortality among TB/HIV co-infected children (Palme 2002, Hesselting 2005, Soeters 2005).

### Pregnant and lactating women

Pregnant women require around 285 additional calories each day, and breastfeeding women at least 500 extra calories (WHO 2000). More research is needed concerning the interaction of ART with nutritional status during pregnancy and lactation (Friis 2005), but one study found that vertical transmission approximately doubled in HIV+ women who lost weight during their pregnancy (Villamor 2005a). Pregnant women may also be at increased risk of developing active TB. For instance, (Venkatesh 2005).

Improved maternal micronutrient status may reduce vertical transmission of HIV by enhancing maternal immune function and reducing viral load (Nduati 1995, Fawzi 2001). High-dose vitamin supplements have been shown to increase CD4 (Fawzi 1998, French 1998, Swiss HIV Pregnancy Cohort 1997). Multivitamins may decrease the risk of secondary maternal infections during pregnancy and result in improved weight gain; lower levels of anaemia may diminish maternal birth complications. In addition, provision of folic acid and vitamin B12 which may assist T-cell production as well as benefit the foetus, as these nutrients function in development and proliferation of cells (Fawzi 1998, Villamor 2002).

But not all vitamin supplementation studies have found such beneficial effects. In a study of 357 HIV-positive Kenyan women, high dose multiple vitamins with selenium versus placebo were used to investigate the effect of micronutrient supplementation on cervical and vaginal shedding of HIV-infected cells. CD4+ and CD8 lymphocyte counts increased, while viral load was unchanged, but vaginal HIV shedding was significantly higher in those supplemented than in those receiving placebo (McClelland 2004). Meanwhile, although vitamin A supplementation in HIV-infected women can reduce maternal mortality (West 1999), raise birth weights and improve infant growth (Villamor 2002, Villamor 2005b), it may increase mother-to-child transmission. In a Tanzanian randomised controlled trial, daily vitamin A increased mother-to-child transmission (Fawzi 2002). According to WHO, single high-dose vitamin A supplements to HIV-infected mothers and/or their infants postpartum have not affected vertical transmission or overall mortality up to 24 months (Humphrey 2006). Research is needed on protocols to allow vitamin A-deficient PMTCT clients to benefit from provision of this important antioxidant without increasing vertical transmission.

Anaemia can increase vertical transmission (Iliff 2005). A survey by UNICEF and the Government of Kenya found that 49% of new Kenyan mothers had iron deficiency anaemia, with 73% prevalence rates among children under five. Anaemia was associated with vitamin A and zinc deficiencies, and with malaria and hookworm (UNICEF (2002).

Similarly, 83% of 1064 HIV-positive pregnant women enrolled in a Tanzanian supplementation study were anaemic, with mean CD4+ cell count, haemoglobin and serum retinol levels independently associated. Women with BMI less than 19 were at least three times more likely to have severe anaemia than were those with BMI exceeding 24. Folate deficiency, assessed by the presence of macrocytic cells, was found in only 5% of the women (Antelman 2000). Standard iron-folic acid supplementation among pregnant women is helpful for PMTCT patients, but supplementation of other micronutrients may also improve outcomes (Friis 2005).

In the most malnourished HIV-infected women with the weakest immunity, daily supplementation with high-dose vitamins B, C and E during pregnancy and lactation reduced mother-to-child HIV transmission in Tanzania (Chatterjee 2007). There was no significant effect on vertical transmission from other women, but with supplementation over several years, their own disease

progression slowed, with effects on viral load and CD4 counts observed. These results need to be confirmed in other contexts.

### Infants

Both HIV-positive and HIV-negative children with an HIV-infected parent have been shown to be at elevated risk of malnutrition, possibly due to heightened susceptibility to household food insecurity (Chatterjee 2007). Children born to HIV-infected mothers are at high risk of low birth-weight and stunting (Bailey 1999). Malnutrition has the greatest impact during gestation and the first two years of life, with some damage irreversible (Martorell 1994).

WHO recommends early nutrition support as an integral part of care of HIV-infected infants and children, including ensuring a daily intake of micronutrients equivalent to the recommended daily allowance, ideally from locally available and affordable foods (WHO/WFP 2008).

Exclusive breastfeeding is recommended for HIV-infected women up to 6 months (Coovadia 2007, WHO 2003, Kourtis 2006) unless earlier replacement feeding is acceptable, feasible, affordable, sustainable, and safe. At 6 months, rapid weaning over 2-21 days is recommended (Kourtis 2006, WHO 2003, WHO 2005a) to avoid the enhanced risks associated with mixed feeding (Newell 2007) (however, [subsequent studies](#) have reported that weaning too abruptly may not improve HIV-free survival). Breastfeeding should only stop once a nutritionally adequate and safe diet without breast milk can be provided. As complementary foods, WHO recommends boiled full-cream milk or yoghurt, other animal products, fruits and vegetables, and fortified foods or a micronutrient supplement. WHO states that if adequate food (600 kcal/day) is not available at 6 months, mixed feeding is needed to avoid malnutrition (Newell 2007). After six months, any liquids given should be fed by cup rather than bottle (WHO 2003), because bottles are hard to clean.

HIV-positive mothers must decide whether to breastfeed or formula-feed, balancing the risk of transmitting the virus to their children against possible health risks associated with replacement feeding. A further consideration is that the social and economic consequences of disclosing HIV-positive status by not breastfeeding where that is customary could pose risks to the infant outweighing the risk of vertical transmission. These calculations may change when DNA PCR testing for HIV in the infants of infected mothers becomes routine in resource-poor settings soon after birth.

### Children

In many HIV-affected communities, the diet of a typical child may be wholly inadequate, containing of little more than starchy staples such as cassava or polished rice. An MSF doctor said of her nutrition project in Niger "eating millet porridge every day is the equivalent of living off bread and water. With luck, toddlers here might have milk once or twice a week" (MSF 2008).

Dietary intake of HIV-infected infants and children should be 10% higher than that of uninfected peers, and intake should increase by 20-30% while suffering or recovering from acute infection. Children's bodies respond to under-nutrition initially by retarding growth (Arpadi 2005), thus WHO/WFP recommend that any child who is losing weight, regardless of HIV status, should increase intake by 50-100% to permit catch-up growth (WHO 2003).

Both wasting and stunting are common among children living with HIV (Doherty 2006). Fifty-nine per cent of the first 145 HIV-infected children to receive antiretroviral therapy in a Botswana-based study were severely wasted, with 75% severely stunted (Anabwani 2003). Height for age is an important predictor of survival in HIV-infected children (Benjamin 2003, Carey 1998,



Chantry 2003). Opportunistic infections may further check growth (Doherty 2006), particularly TB (and children with HIV are at five times the risk of active TB (Datta 2001).

A 10-country meta-analysis showed that severe wasting in HIV-infected children significantly increased the risk of mortality (3Cs4kids 2008). A Malawian study found that normal weight children were half as likely to die in the first three months of ART as those with mild malnutrition, and one-sixth as likely to die compared with those with severe malnutrition (WHO/WFP 2008). WHO recommends that severely malnourished children who are eligible for ART be medically stabilised before commencing treatment. Antiretroviral therapy can assist children in gaining weight; feeding programmes without ART can help them to regain weight, though more slowly than seronegative children (Diop 2003).

Active case-finding for children with HIV in feeding centre intakes could be productive in high-prevalence countries affected by famine. In a Malawian cohort study aimed at validating current WHO malnutrition guidelines for use with HIV-positive children, 17% of 454 children whose status was known were seropositive. 35% of them died, with half of deaths before day 10 of treatment, and 16% of deaths after return home. Across the sample, CD4 percentages were available for 374 children: 40% of children with a CD4 percentage below 20 died, compared with 15% of those with a CD4 percentage above 20. Fifty-seven per cent of children who showed severe acute malnutrition also had a CD4 percentage below 15. Sixty-nine per cent of the HIV-positive children met criteria for ART, but none were receiving it; 38% of them died in the nutrition rehabilitation unit (AAH 2007).

## The food-insecure: food support

WHO/WFP promote the provision of food support to increase the effectiveness of ART programmes where malnutrition and food insecurity are common. It aims:

- To help facilitate nutritional recovery and therefore to optimize the benefits of antiretroviral therapy
- To increase ART uptake by enabling food-insecure people to seek treatment
- To encourage adherence.

## Targeting

Food support should be designed and targeted according to vulnerability assessments which examine food access, availability, storage and utilisation, access to safe water, and existing or planned ration distribution. This targeting process minimises negative effects of food assistance, such as loss of trade for local farmers and traders. Involving village AIDS committees, where these exist, or local mechanisms for poverty relief such as religious authorities, may be useful in some areas.

Food support is aimed at patients whose health requires better quality or quantity of food, and who lack economic means for basic needs. In resource-limited settings, local food is mainly plant-derived, with animal products often unaffordable for PLHIV; diets often lack iron, calcium and zinc, and may contain nutrients in forms which are hard to absorb (MSF 2008).

Decisions on eligibility should involve the care team, with help prioritised to malnourished widows, divorced and abandoned women and their dependent children, orphans, child-headed households, and invalids. Developing fair, consistent and context-appropriate targeting criteria is essential, for cost-effectiveness and to minimize conflicts and negative outcomes

for individuals and communities, such as attracting migration into an area with limited safe water.

AMPATH uses the following targeting criteria for adult patients (Byron et al 2006):

- Insufficient access to food to support patient recovery;
- BMI below 19;
- Household income less than 3,000 Ksh per month, and
- CD4 count below 200.

MSF recommend use of the WHO 2006 growth standards (MSF 2008).

Food rations provided to PLHIV on the basis of their serostatus rather than nutritional and economic need may arouse envy among impoverished neighbours. Poor handling of these issues can result in ill-feelings being vented on PLHIV food recipients, or to HIV-positive status becoming desirable. In food-insecure, high HIV-prevalence zones, it may be more cost-effective to provide food to all beneficiaries rather than to screen each for malnutrition as recommended by WHO/WFP (WHO/WFP 2008), but such a strategy may generate social discord.

## Programme design

During the design phase, it is important to consider the type of programme needed, its duration, staffing, partnerships, intervention sites, culturally appropriate ration content, records, duration and exit strategy, and ways to reduce resentment of food assistance. It is important to capture cost-effectiveness data alongside monitoring and evaluation indicators, accounting and management information, for project control, improvement and development. Robust stock control systems and internal control systems reduce losses.

The WHO/WFP document lists standard interventions to assist particular groups (WHO/WFP 2008):

### Standard food support interventions for specific groups

#### Food for Treatment Programmes

Food may be provided during the early phases of ART, to improve adherence, minimise side effects, aid weight gain, and provide a safety net to households.

#### PMTCT

Rations may be supplied to pregnant women enrolled in PMTCT, to improve their nutritional status and birth outcomes, and to motivate attendance for antenatal appointments and other follow-up.

#### Home-Based Care

Food support, usually individual foods (such as rice, oil, salt), is provided to home-based care patients. Interventions may also include nutrition screening, counselling, and welfare support.

#### Supplementary Feeding

Food rations are provided to the moderately malnourished or groups who are vulnerable to malnutrition, such as pregnant women or orphans and vulnerable children.

#### Therapeutic feeding

Energy- and nutrient- dense foods are provided under medical supervision to resolve severe acute malnutrition.

#### Micronutrient supplementation

Fortified foods or micronutrient supplements may be distributed to PLHIV or households determined as being in need.

Between a fifth and half of those attending AMPATH clinics are food insecure (Byron 2006). AMPATH food prescriptions are renewed at the monthly clinical appointment, following nutrition

follow-up and weighing. Food prescriptions can be exchanged at the nearest distribution site fortnightly or monthly. 58% of food clients reported that food support eases adherence, with increased appetite and less dizziness and vomiting, and 11% reported no change in their ability to adhere to treatment. 61% reported that the food supplementation strengthened them enough to resume household, farm or other work (Byron 2006). Patients were one-fifth more likely to be able to work (Thirumurthy 2005). Clients interviewed commented on the diversification of their diet from mainly maize to include eggs and milk, previously unaffordable, and fruit and vegetables, previously undervalued. 82% of food clients considered that food support reduced their stress about feeding themselves and their households. Non-food clients commented on beneficial changes in their diet from implementing nutrition advice.

It seems that some eligible patients may fail to collect food because of stigma, with men the worst affected; clients suggested that evening opening of collection sites might increase take-up by men (Byron 2006).

Food aid programming logistics are demanding, as large volumes of food need to be transported, protected from deterioration and theft by outsiders and staff, and discarded rather than distributed if their storage life expires. TASO lists constraints imposed by infrastructure, supply chains, management and staffing (Nabiryo 2008). It is important to avoid nepotism in staff hiring. Diversion of food aid is hard to eliminate, but where staff collusion occurs, abuse may become massive: some food aid programmes have seen diversion of commodities of half to three-quarters of amounts received (OXFAM 1982). Strong systems, using food prescriptions and/or ration cards and careful training and supervision can minimise diversion of food (Mookherji 2005, Egge 2005).

AMPATH record the difficulties of distributing fresh food across a sparsely populated area in a tropical climate (Siika 2008). Working through community-based organisations can improve programme quality, particularly targeting and the distribution of fresh food. WFP provides constructive advice on selecting local partners for food distribution, together with detailed guidance on monitoring and evaluation (WHO/WFP 2008), and a detailed guide to Food Assistance Programming in the Context of HIV has been published by WFP and FANTA (Frankenberger 2007). WFP is able to play the following roles in HIV care and treatment programmes:

- Providing food, logistical, and technical support
- Ensuring that complementary interventions are in place
- Advocating at a policy level for food and nutritional support
- Identifying and spreading good tools and “best practices”

Once PLHIV are stabilised on treatment and brought back to normal weight, many will be able to earn a living. Thus ration support is usually planned to terminate after a fixed period or when nutritional recovery allows. It is important to establish clear criteria for weaning, “with anthropometric and clinical indicators linked with assessments of a patient’s ability to meet their nutritional needs post-intervention” (OGAC 2006).

Even where there is a realistic support strategy through referrals to sister livelihoods interventions, as in the AMPATH food support programme in Kenya (Byron 2006), wasting may re-emerge in patients who have completed food assistance. Thirty per cent of former AMPATH food clients were able to meet their food needs after rations ceased, but 48% saw their diet deteriorate and many showed resurgent malnutrition six months or a year after finishing ration entitlement (Siika 2008). Some restarted rations because of

ARV adherence problems or a change to second-line drugs, fall in socioeconomic status, inadequate preparation and poor timing of weaning, inability to resume productive activities, or increase in other expenses (such as school fees) which compete for resources with food purchases.

Preparation for termination of rations is important; however, 40% of AMPATH clients were not aware of when support would cease, and only 20% had concrete plans to access adequate food after “weaning”. It may be that six months is too short a period psychologically, even where adequate physically: a quote from a focus group summarises the views of many informants: “the six-month period of food collection only improves their health status but does not give them a chance to think on what to do next or what plans to cater for their weaning” (Byron 2006).

The issue of relapse into malnutrition and permanent dependency on food rations is likely to increase in importance as ART programmes become more common and older, and as food shortages grow.

### What food is appropriate?

Food support should be a complement to locally available foods, as fruit and vegetable intake is particularly important for PLHIV. Necessary cooking fuel should be provided, and grains milled into flour before distribution: collecting fuel and grinding grain are exhausting and time-consuming. Beneficiaries of the FACT programme in Malawi reported that the cost of milling the maize (either purchased or provided in the ration) represented up to 18% of household expenditure (Devereux 2006a).

There is inadequate evidence of the superiority of specialist products for PLHIV, and WHO/WFP recommend the cheaper option of using local produce or food aid commodities. Patient feedback at AMPATH stressed that labelling of commodities as relating to ART, and packaging them distinctively, rendered them a risk to confidentiality (Byron 2006). WFP has issued a ration planning guide for HIV-related activities (WFP 2008). WFP commodities recommended for supporting ART include:

#### Dried skim milk (DSM)

, alone or premixed with cereal flour or fortified blended foods. It is vulnerable to spoilage. Nutrient-dense ready-to-use therapeutic foods (RUTF) have helped achieve fast weight gain among severely malnourished adult and child PLHIV in WHO Stages 3 and 4; systematic studies to confirm those results are underway (WHO/WFP 2008). The dominant brand, Plumpy’Nut®, made from ground peanuts, oil, sugar, DSM and a micronutrient mix can be eaten straight from the 500-calorie foil sachet or used to sweeten porridge etc (MSF 2008). It is popular with children, but may be too sugary for adults, especially if they must consume several packs each day to achieve adequate nutrient intake. RUTF is packaged as a medical product rather than a food. It has a long storage life and resists bacterial growth once opened because it contains no water. Commercial versions are costly, and various local variants are under development (WHO/WFP 2008), including production facilities of the non-profit company Valid International in Bangladesh, Ethiopia, Malawi and Zambia (MSF 2008) and a locally produced version based on sesame and chickpeas in Malawi (WHO/WFP 2008).

#### Corn-soya blended flour (CSB)

is the most frequently used commodity provided through ART and home-based care, although little research demonstrates its effectiveness. Provision of CSB rations resulted in higher

acceptability of ARV treatment and better adherence to drug regimens according to a 2005 study in Zambia and Zimbabwe (Greenblott 2007). However, some constituents of CSB can interfere with the absorption of its nutrients (MSF 2008).

#### Food rations:

WHO/WFP provide examples of rations for individual patients and for households:

	For an adult male with asymptomatic HIV, per person, per day	For a household, per person, per day
Cereal (maize meal) (g)	250	150
Pulses (g)	90	60
Oil (g)	25	20
CSB (g)	200	100
Sugar (g)	25	-
Salt (g)	5	-
Energy (kcal)	2283	1294
Grams protein (% kcal)/Grams fat (% kcal)	76.5 (13%)/46.65 (18%)	42 (13%)/33 (23%)

Source: (WHO/WFP 2008)

AMPATH provides household food rations, with an WFP ration of maize, beans, corn-soybean blended flour (CSB), and vegetable oil, supplemented by eggs, milk, fresh fruits, vegetables and herbs from the HAART and Harvest Initiative (HHI) farms and purchased from local markets and from patients who are not on food supplementation. (Siika 2005). However, crop seasonality may dictate severing ration entitlements at particular times of year when patients and the community have more food available (Byron 2006). AMPATH recommend stressing to patients that the imported rations are a form of medical treatment to improve their health in order to boost acceptability and use.

However, this strategy has its risks. A survey of a mother and child health food aid programme in the Dominican Republic found that the enrolled malnourished children failed to gain significant weight except during the mango and avocado seasons and whenever food aid was interrupted (Hilsum 1982). Investigation determined that mothers thought that the children who received the foreign “wonder food” did not need much other food. Since food aid commodities, with the exception of RUTF, are not special nutritional products, it may be better to limit, rather than promote, expectations of miracle cures from their consumption.

It may be wise to have contingency plans in the event of failure of scheduled imported supplies to arrive. Due to the logistic challenges of transporting often perishable commodities in bulk via container shipping, customs, then road haulage across difficult terrain over long distances, stock-outs at the point of distribution are unfortunately fairly common.

Unfamiliar food aid commodities typically require persuasion of beneficiaries to accept them (Byron 2006) and undermine livelihoods of local producers and subsistence farming beneficiaries (OXFAM 1982), and it is arguable that procurement of food on local markets or from in-house production may be preferable in the long-term.

However, MSF is strongly in favour of using RUTF for swift nutritional rehabilitation of malnourished children, as it is nutrient-dense, well accepted and problem-free; their field projects report high cure rates, low mortality and low default rates (MSF 2008). According to WHO/WFP, “*nutrient-dense RUTF may lead to impressive and rapid weight gain among severely malnourished people (adults and children) with symptomatic AIDS, even those at WHO Stages 3 and 4*” (WHO/WFP 2008).

### The food-insecure: livelihoods and cash transfers

Livelihood support is a more sustainable response to under-nutrition for PLHIV with WHO stages 1 and 2 HIV disease, and for those stabilised on ART. People who recover their health through ART often face economic hardship; many will have sold income-earning assets to pay medical or funeral bills. By the time they access ART, many PLHIV are near destitution. Most of AMPATH’s food-support patients reported that ill-health and weakness impeded their former livelihood and domestic duties (Byron 2006). TASO has concluded that to be relevant to their clientele they must provide links to food security interventions (Nabiryo 2008).

A national survey in Mozambique found that households experiencing deaths had lower levels of cash, cattle, assets and income (Mather 2004). Debts may be incurred, productive and household assets sold, and land sold, leased, or sharecropped (UNDP 2004). Unfavourable inheritance customs or land-grabbing by relatives may leave widows homeless. The households of chronically-ill adults suffer multiple threats to their livelihoods (Donovan 2003, Yamano and Jayne 2004, Shah 2001, Barnett 1995), including the demands of nursing relatives (Gillespie 2005, Gillespie 2006). Following HIV-related illness and death, families suffer low levels of assets, lack of agricultural inputs, and unemployment (Peters 2008). Young people left to farm may lack production knowledge as adults die or are too ill to pass on their inherited skills (Alumira 2005). Destitute patients may not be able to resume meeting their own needs if they lack land for farming and/or are not capable of productive activities (Byron 2006). In addition, women’s time may be too scarce for extra activities. Cultural norms in some countries prevent men with free time due to unemployment, from undertaking food preparation, childcare or invalid care (Swan 2006). When illness or death affects a family the mother, grandmother or older daughters may acquire an impossible workload.

The goals of livelihoods work are to preserve and build food production skills, to produce food and to generate cash. Provision of micro-credit, seeds and tools, livestock, and training in income-generating activities and running small businesses can help PLHIV and their families to earn enough to eat. Food production schemes are preferable where possible, as plants and livestock are self-replacing and participants can eat some of their produce to improve their diet and sell any surplus. Home garden projects in Ethiopia, Uganda, and Zimbabwe, for instance, plant many varieties of vegetables with high protein and micronutrient value and medicinal herbs, to increase vegetable intakes and diversity (Adato 2007). Participants in TASO livelihoods projects gain skills in food production, enterprise management and in training others. These projects enhance client attendance and retention, but still only 6,000 of TASO’s 80,000 clients currently participate due to scarcity of partner organisations (Nabiryo 2008).

Loan default rates in micro-credit schemes may be higher than usually accepted in microcredit schemes due to participant



ill-health. TASO addresses this by training family members so that a relative can substitute if the patient is ill (Nabiryo 2006), and YONECO in Malawi use a similar model (Ngwira 2001). AMPATH patients choose an activity that they start after four to six months' supplementation in preparation for cessation of food support, and AMPATH extension officers visit patients at home to improve farming techniques (Byron 2006).

Income-generation projects studied in Malawi tended to fail because they were too ambitious, demanding a level of skill and time that participants could not muster (Peters 2008). AMPATH refers patients completing food support to its HAART and Harvest Initiative through the Family Preservation Initiative (FPI) which aims to restore PLHIV livelihoods, through providing agricultural microfinance, business training and technical support for poultry and horticulture. FPI found "that many referred patients were not sufficiently entrepreneurial to benefit from micro-credit. Loans were often being used for consumption rather than productive investments, leading to the failure to meet repayment schedules" (Byron 2006).

In setting up these schemes, it is important to be aware of local traditions about which family members own land, who carries out particular tasks on it, who carries traditional cultivation knowledge, who makes decisions on crop choices and inputs, and who controls storage and marketing of produce. Given the current losses of indigenous knowledge because of illness and death in many families, it would be useful for a scheme to organise knowledge transfer within the community from elders to the young, alongside more conventional agricultural extension work.

### The food-insecure: cash transfers

Providing food is necessary in some contexts, but where it is available locally, it may be much easier, and may meet beneficiary preferences better, to make cash payments to improve nutrition. The livelihoods activities and micro-credit interventions intended to create sustainability demand ability and consistent effort from both beneficiaries and program implementers, involve risks to beneficiaries, are more complicated and take longer to scale up, and require business expertise (Adato 2007). They may also preferentially benefit the more educated and affluent, whose skills allow them to make best use of the opportunity (Adato 2007). Microcredit programmes are ill-suited to channel benefits to the poorest (Hulme 1997, Hashemi 1997, Halder 1999, Rahman 1995), though examples of good targeting to the poorest exist (Sharma 2000).

Cash transfers are designed to provide cash for food and other basic needs, and avert the sale of assets (Adato 2007). Food insecure households can be helped directly with a regular cash allowance, allowing them to purchase good ingredients locally and prepare food according to their culture, tastes and nutritional advice.

Large-scale cash transfer programmes are now running successfully in many countries, with rapid scale-up to reach hundreds of thousands of PLHIV within a few years. This strategy maximises patient autonomy and requires less beneficiary capacity than livelihoods interventions, while demanding less administration than providing food support or running livelihoods projects (Adato 2007). According to the Joint Learning Initiative on Children and AIDS of the International Food Policy Research Institute, "*Cash transfers appear to offer the best strategy for reaching families who are the very poorest, most constrained and at-risk with respect to human capital, in large numbers, relatively quickly*" (Adato 2007).

Conditions may be attached to transfers. These may be related to nutrition, such as attending nutrition counselling or training, or micronutrient supplementation (Skoufias 2005, Maluccio 2005), or health, for instance antenatal care, infant growth promotion, sanitation, or water management (Kayira 2004). AMPATH patients reported that lack of transport money to collect their refills was a main reason for past adherence problems (Byron 2006): cash transfers for poorer patients to cover transport costs for ART appointments and visits to food distribution sites would be appropriate in most contexts.

From a nutrition standpoint, cash transfers may be counterproductive if beneficiaries are poorly informed about nutrition. The PRAF project in Honduras found, for example, that the cash transfer was applied to increase intakes of meat, fish, eggs, dairy, products and fruit where the household head had at least a primary school education. Where the household head had no education, oil, fat, and junk food consumption increased instead (Weissmann 2007).

PLHIV have competing needs for cash, such as funeral costs, repaying loans, rent and school fees, and the cash transfers paid by nutrition projects may not be spent on food; relief of stress concerning other unpaid bills may have a health impact too. If small amounts are not paid often, there may be little impact on food intakes: consumption expenditure may use only a small part of a lump sum payment (Adato 2007), especially for those with nowhere to safeguard cash.

There is considerable evidence that unconditional cash transfer programmes can increase food expenditure and food consumption. In most programs the highest spending is on food, followed by clothing, blankets, transport, household utilities, hygiene, and livestock.

### Conclusion

A range of nutrition interventions can support ART, allowing patients to obtain the full benefits of ART. In the case of late presentation patients suffering from severe wasting, particularly those with TB, prompt therapeutic feeding can reduce appreciable mortality. While worthwhile, valued by patients and feasible, these programmes are demanding in design capacity, administration and logistics, management and monitoring, needed to avoid undesirable economic or social impacts. Feeding programmes are potentially counterproductive. Examples are the conditional cash transfer provided in Brazil which resulted in continuing undernourishment of the child, and the Dominican MCH project which overclaimed for the properties of the food distributed; both produce less growth than controls receiving only the local diet. The same tragic manoeuvre is routinely seen in feeding programmes which provide valued household food rations. Careful project design and thoughtful monitoring of uptake and use of project food, supplements and services and impact in anthropometric indicators, physical functioning and self-reported well-being are essential.

Where sudden shocks or chronic poverty obstruct PLHIV on ART in accessing adequate food, the best strategy may be to link with general nutrition and livelihoods interventions. In high HIV prevalence regions hit by food shortages, active case finding among malnourished children entering feeding programmes may save many lives. Where such programmes are needed but absent, advocacy to national AIDS programmes, donors and WFP is appropriate.



All patients should receive evaluation, counselling, follow-up and education on nutrition, hygiene, food selection and use. Some of those who are malnourished or at risk of malnutrition will be able to benefit from interventions supporting gardening, subsistence farming or other income generation. Others whose health does not permit, or who are not able to manage a loan and a business venture, can benefit from ration distribution, micronutrient supplementation, and provision of fresh foods to improve their intakes directly. The lower cost option of cash transfers is suited to contexts when appropriate food can be purchased locally and patients know how to select and prepare a balanced diet; however, cash may not be spent on improving household or patient diets.

Provision of rations or cash at ART appointments should increase attendance and support adherence. Over-generous provision may encourage abuse and discrimination. Ideally benefits should be restricted to those who need a better diet on medical grounds and who cannot source it unaided at acceptable cost to their health.

The question of dependency is not well addressed in the literature, with the exception of the AMPATH work (Byron 2006, Siika 2008). If programmes mean to avoid undertaking unsustainable projects, both programme exit criteria for beneficiaries, and a realistic exit strategy for the time when funding is not renewed should be incorporated into programmes which provide money or food.

## References

Due to the number of references, the reference section of this article has been made available online as a separate document. Full references are available at <http://www.aidsmap.com/files/file1003575.pdf>

# A palliative care perspective on nutritional support

By Theo Smart

## What key palliative care resources have to say about nutritional support

"In many areas of Africa, caring for people living with HIV/AIDS requires dealing with the underlying problems of poverty, food security and lack of adequate, appropriate diet," wrote Dr Liz Gwyther and colleagues in *A Clinical Guide to Supportive and Palliative Care for HIV/AIDS in Sub-Saharan Africa*. "Providing quality care and support requires addressing the nutritional needs of people with HIV at all stages of the disease. Because good nutrition can contribute to a person's well-being at all stages of the illness and may prolong life, it is an important part of holistic palliative care."

As our main article explains, people with HIV have increased nutritional requirements, many of the conditions affecting people with HIV can lead to malnutrition, and conversely, malnutrition can cause or aggravate many of the clinical conditions diagnosed in people with HIV. Providing nutritional support for the people with AIDS is a logical extension of the basic package of care to improve their physical wellbeing.

But it can also be much more than that, because nutrition and food security are also social concerns that impact upon the family, and a patient's role in the family. Adults who are ill with advanced HIV disease or tuberculosis may not be able to provide food for their families, or may feel like they are a drain on their family's resources:

*"Imagine a young woman with three children... she lives in a shanty town. Her husband died six months ago and the neighbours say he must have had HIV. Now she is becoming sick, has lost weight and she is scared that she may also die. Recently she developed a painful ulcerating swelling on her leg which stops her sleeping. Some days she can barely get out of bed to care for her children, but her parents are far away in the village. The landlord is asking for rent but she has no income since her husband died. The neighbours are gossiping, saying that the family is cursed, and she wonders if they are right, since she has prayed for help but none has come.*

*If you were that woman, what would be on your mind? We can imagine that her illness is only one of her many problems. Her greatest worry might be how to put food on the table for her family, or what will happen to her children if she dies. She has no financial support, she is isolated and feels rejected by God.*

*Palliative care is about people rather than diseases and seeks to address the problems which are of most concern to the patient."*

*from the (Palliative Care Toolkit: Improving care from the roots up in resource-limited settings)*

Not having enough food to put on the family's table can contribute greatly to someone's psychological suffering. And in many parts of Africa, the job of putting food on the table largely falls to women — who are also disproportionately affected by HIV/AIDS.

"Women typically bear the brunt of multiple roles.... They have the burden of caring (physical and emotional) within the home, ensuring food security (including production of food for household consumption), and maintaining the entire household work" wrote Gwyther et al. "Gender and socio-cultural norms often dictate 'men and boys preference'; in times of scarcity, families allocate resources for men and boys first and women and girls later or not at all. For example, in Uganda, men and boys are fed first. Women themselves continue this pattern because of being socialized to sacrifice their own interests. They often put the health of their children and families first and tend to remain silent about their own health problems."

It is also important to remember that it may have been food insecurity that launched the chain of events that led to HIV infection in the first place: by forcing individuals to migrate to find work, breaking up families and increasing the risk of having multiple partners. For most women who engage in sex work in resource-limited settings, it is survival sex — in order to provide food for themselves and families. Importantly, ongoing nutritional support for families and children affected by HIV/AIDS is important to prevent this cycle from repeating.

## Engaging palliative care support teams for nutritional support

Specialists working in palliative care are trained to recognise these needs, and work to prevent and relieve suffering "by means of early identification and impeccable assessment and treatment of pain and other problems, physical, psychosocial and spiritual."

Assessment of the patient's holistic needs is an essential part of palliative care, and during the initial work-up, palliative care resources recommend performing a thorough nutritional assessment immediately following the pain assessment.

While healthcare providers are encouraged to integrate nutritional support into the care of people with HIV, in settings

where there may not be a trained nutritionist on staff, and/or the capacity to address an individual or their family's need for nutritional support is limited, local palliative support organisations should be able to help provide some of these services, augment or expand upon the services that are being offered, and provide linkages to other community or faith based organizations that provide support to families. (Please consult the resource list).

If there are no local palliative care organisations nearby, healthcare providers can still adopt palliative care approaches to try to provide more comprehensive holistic care to the patient and family. Both the Clinical Guide and the Palliative Care Toolkit, contain a wealth of practical common sense clinical information about how to manage weakness, nausea, poor appetite, loss of taste and other nutritional consequences of the different opportunistic infections and common HIV-related conditions.

However, it is important to realise that no doctor, nurse or clinic can attend to a patient's every need by themselves – it takes a team approach.

"Programmes should establish a resource list that includes large NGOs, FBOs, and private businesses that are sources of bulk food or are able to warehouse and distribute it to organisations that visit families in their area of operation," according to the *Clinical Guide to Supportive and Palliative Care for HIV/AIDS in Sub-Saharan Africa*.

In addition to directly providing food, the *Clinical Guide* suggests organisations can help families by establishing community gardens and income generation projects – which may be particularly important for orphans and vulnerable children, and in the long run, should be more sustainable:

"Children can be taught how to grow their own vegetables in communal vegetable gardens. In addition to being a source of nutrition, this provides them with an opportunity to develop a sense of achievement and self-worth. Income generation projects represent one strategy to promote food security and are well within the scope of smaller NGOs."

The *Palliative Care Toolkit* describes one such project in Cape Town

"

Kidzpositive is a clinic providing AIDS care for children. Clinic staff saw that the children were receiving good medical care and symptom control, but the social isolation and financial problems affecting their mothers were not being addressed. Now they stay at the clinic for the whole morning, chatting together over tea and bread. The mothers do bead work at the clinic, or take it home, making items to sell. This project supports 130 families with enough money to put food on their tables." Dr Paul Roux, Cape Town.

Income generating projects like this don't merely address the family's need for sustenance – they also reduce the need for a 'hand out' and help people become more self-sufficient. At the same time, they strengthen the community by weaving it more closely together, providing participants with a means to support each other and work towards a common goal.

This is the palliative care approach – not looking at people's nutritional needs in isolation, but considering its impact holistically and upon the community. Finding long-term, sustainable solutions to these problems is ultimately the best form of palliative care.

## Resources and references

### Resources

The AIDSMAP Palliative Care Portal

<http://www.aidsmap.com/cms1038390.asp>

The African Palliative Care Association: <http://www.apca.co.ug/>

The Hospice Palliative Care Association South Africa:

<http://www.hospicepalliativecaresa.co.za/>

The International Association for Hospice and Palliative Care:

<http://www.hospicecare.com>

The International Children's Palliative Care Network:

<http://www.icpcn.org.uk/> (in particular, see their international directory)

Foundation for Hospices in Sub-Saharan Africa (FHSSA): [www.fhssa.org](http://www.fhssa.org)

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A Clinical Guide to Supportive and Palliative Care for HIV/AIDS in Sub-Saharan Africa

to read online: <http://www.fhssa.org/i4a/pages/Index.cfm?pageID=3361>

WHO. WHO Definition of Palliative Care.

<http://www.who.int/cancer/palliative/definition/en/> accessed 2009.

Lavy V, Bond C, Wooldridge R. Palliative Care Toolkit Improving care from the roots up in resource-limited settings. Download pdf online (5 MB) at

<http://www.helpthehospices.org.uk/EasySiteWeb/GatewayLink.aspx?allid=6147>

## Food and nutrition at the 2009 HIV Implementers' Meeting

By Theo Smart

### Additional reporting by Lance Sherriff

PEPFAR supports food and nutrition services for malnourished people in HIV care and treatment, PMTCT clients as well as orphans and vulnerable children. However, integrating nutritional support into HIV programmes poses great operational and logistical challenges – consequently, the provision of food supplements should be seen as a "short term fix" according to several experts speaking in a session on food and nutrition at the 2009 HIV Implementer's Meeting in Windhoek. Finding more sustainable solutions that address the long-term food security needs of people with HIV, their families and communities will be critical.

"PEPFAR offers us an opportunity to better link activities through a development lens looking at economic growth, broader income generation, education and so forth," said Dr Robert Clay, Director of the Office of Population, Health and Nutrition at USAID, who co-chaired the session. "It's not just about food. There needs to be a whole package that goes into this."

Notably, there has been a shift in policy within the Obama administration to focus on local agricultural development to provide increased food security – as evidenced by the recent announcement at the G8 meeting, of a \$20 billion US-sponsored food security initiative over the next three years to boost agricultural investment in poorer countries and fight hunger by helping poor nations feed themselves – rather than relying on emergency food aid shipped from the US ([see press release](#))

"There is no reason why Africa cannot be self-sufficient when it comes to food," said President Obama. "It has sufficient arable land. What's lacking is the right seeds, the right irrigation, but also the kinds of institutional mechanisms that ensure that a farmer is going to be able to grow crops, get them to market, get a fair price."

How or whether these efforts will be linked into PEPFAR-supported projects is yet to be seen – however, a presentation by Wendy Hammond, a senior nutrition and HIV programme officer in FANTA2 suggests that these programmes will need to be well-coordinated.

## Food by Prescription and Community-based Management of Acute Malnutrition

Already, according to Hammond, the implementation of two programme approaches to treating acute malnutrition in countries with high HIV prevalence: 'Food by Prescription' (FBP) and Community-based Management of Acute Malnutrition (CMAM), "being initiated simultaneously in many countries, is causing a lot of confusion - and in many cases at ministry level - about the differences between these two programmes because they are so similar. They have similar aims and they use similar methods."

FBP includes nutrition assessment and counselling, provision of micronutrient supplements, point-of-use water purification means and specialised foods prescribed as part of clinic-based HIV services according to clinic entry and discharge or 'graduation' criteria. It is different from food assistance programmes such as that offered by the World Food Programme, because it integrates food and nutrition interventions into clinical HIV health services to improve ART adherence and outcomes.

The specialised foods for FBP include Ready to Use Therapeutic Foods (RUTF) and fortified blended foods, or FBFs, which are both meant to be eaten in addition to the normal diet for children and adults at risk of malnutrition.

The most common RUTF used is *PlumpyNut* a fortified peanut butter paste which is being produced locally in countries such as Zambia, Malawi and Kenya. (Another presentation at the conference on the use of *PlumpyNut* in malnourished Ugandan children with HIV reported greatly improved nutritional status, with 78/85 (92%) of the malnourished children reaching the 90% UNICEF weights/heights appropriate for their gender (Aweko). Research is being done on other RUTFs such as soy-based RUTFs for regions that are not used to eating peanut-based foods such as South-East Asia.

The FBFs are cereals fortified with micronutrients and sometimes other ingredients such as soya, beans, pulses, oil seeds and dried skimmed milk. These include corn soy blends and wheat soy blends that are mixed with water and cooked as a porridge. On average, FBFs are about five times cheaper than RUTFs, and for that reason the programme has tried to maximise their use and reserve the RUTFs for the more severe malnourished clients.

At the same time that PEPFAR-supported countries are poised to implement FBP, many are also rolling out CMAM, based upon the WHO treatment protocol to manage severe acute malnutrition (SAM) in children 6-59 months old in outpatient or inpatient care depending on the presence of medical complications.

The two approaches have different objectives:

Food by Prescription

- Manage severe acute malnutrition and moderate acute malnutrition in PLHIV, OVC, and paediatric AIDS clients
- Provides supplemental feeding based on nutritional vulnerability, particularly for early weaned infants up to two years old and HIV-positive women during pregnancy and lactation.
- Strengthen clinical HIV care and treatment, or rather, ART adherence and effectiveness and the survival of people living with HIV

Community-based Management of Acute Malnutrition

- Manage severe and acute malnutrition in children regardless of HIV status

- CMAM provides specialised foods, RUTF, only for children who are already identified as severely malnourished, or malnourished.
- Identify severe acute malnutrition in the community for early initiation of treatment

However, the programmes are complementary and share a number of things in common including treating severe or moderate acute malnutrition; both treat most cases on an out-patient basis and give them the food to take home; both use RUTF (which should be locally produced); both emphasise capacity and nutritional assessment, counseling, treatment, prevention and classification; both integrate nutrition assessment and counseling into existing health services; and Hammond stressed:

"Both ideally - although this is usually the last component to be developed - refer rehabilitation clients to livelihood assistance programs, or income generation programs, to prevent them relapsing into malnutrition," she said.

To better coordinate the two approaches, there is a call to harmonise guidelines for managing SAM at the global and country levels (admission and discharge criteria, registers/monitoring and reporting tools, and service aspects such as counselling/education messages and job aids and tools and community outreach to refer malnourished children to therapeutic feeding and also to HIV counselling and testing). "Targeting can be coordinated to maximise coverage in countries for example where CMAM addresses children and FBP can then take care of the adults," said Hammond.

Commodity procurement/management and distribution should also be harmonized, according to Hammond, which could simplify procedures for food procurement, storage, management, and distribution.

Coordination at this level is often quite difficult though. Food by Prescription and Community-based Management of Acute Malnutrition are usually under different ministry directorates or divisions and may run parallel to routine nutrition services), and supported by different donors/funding mechanisms (usually CMAM by UNICEF and FBP by PEPFAR) with different data collection systems for monitoring and reporting demands).

But, Hammond reiterated — the food should only be part of the programme. Unfortunately, "the food tends to overshadow the other elements, especially the nutritional assessment and counselling. In every country, when we start discussing initiating such a programme, the first thing that ministries are interested in - and sometimes missions - is 'What foods are we going to use?' 'How are we going to procure them?' 'Who's going to distribute them?' when the nutritional assessment, counselling and training hasn't even been contemplated. This is a real challenge," she said.

## Leveraging supply chain best practices for Food by Prescription programmes

But the addition of food support to the PEPFAR programme in 2008 has created complex logistical challenges, according to Ssanyu Nyinondi of Supply Chain Management Systems (SCMS).

First SCMS had to do considerable market research to see what is available in the market and identify the suppliers, then they had to evaluate the quality of the product to see whether it fitted the standards of each country that is being worked in. Then, they had to meet with all the various stakeholders to try to determine how much product would be needed.

"In addition to all of that we also have to go through an analysis of port freight and logistics costs — and it was very important to



have this information beforehand so we could provide to the countries to incorporate into their budgets,” said Nyinondi. “All of this work is done in coordination with different partners in each of the countries that we are working in.”

Then there are activities related to procurement, storage and distribution.

“In this particular project one of the major challenges we have to face is the diversity in policy and regulations among countries - not only in the three different countries but within country itself - Registration of products [for importation] can be lengthy and requirements are different in each country. We had a situation in a country where the regulatory authority did not have an idea how to handle this product - it's a FBP and should it be handled like a mineral supplement or is it food?” she said.

While SCMS might be dealing with one manufacturer, each country has specific requirements for packaging and labelling. This means the manufacturer has to go through a process of changing the labels to suit a particular country, which means more cost involved and it takes longer to have the food imported into the particular country.

“We also need to understand distinct storage requirements for these specialised products, especially like in the case of fortified blended flour. Which is to say, site assessments are very important. And fortified blended flour is food and attracts rodents and other pests whilst in storage,” she said. This caused problems for storage in some settings where they had initially been putting the food supplements with the medical supplies. “But you would not really like to store the food products with pharmaceuticals because they do not want rodents attacking the pharmaceutical products,” she said

In other situations, she said that SCMS had imported products into countries before it was clear which partner would distribute them. As a result, products just sat in storage until their shelf-life expired.

According to Nyinondi, several practices are needed to carry forward Food by Prescription programmes in-country and globally:

- Establish technical working groups to make decisions and coordinate with all of the stakeholders that are working in FBP programs to design and carry forward activities, including MoH, IPs, USG.
- Coordination among the different stakeholders Learn from what has already been happening in these countries where the products will be launched;
- Designing logistics systems for efficient distribution of these nutrition commodities is very important. As time goes on, more accurate estimations of the quantities needed will allow better procurement and planning of supply. Logistics systems can show consumption and allow for more informed decisions.

Finally, “we cannot stress enough to do proper site assessments just to make sure that the sites will be able to accommodate the food,” she said.

### Operational challenges of integrating food assistance in health care programmes

In another presentation, Gertrude Kara from the WFP described the findings of a review of their activities implemented in 14 countries in the East and Southern Africa regions — which largely expanded upon the challenges that Nyinondi described.

One issue is that storage poses challenges for the patient as well — and affects how food can be distributed to them. Another issue is how it is perceived.

“The way the food is packaged and also the objective of the programme determines what type of food or how the patient perceives the food. For example with *PlumpyNut*, it is perceived as medicine so it is provided in a very big ration to the patient only. Whereas the food support to the household is associated with social welfare because it's basically just to improve the food security of the household,” she said.

The products like ‘plumpy nut’ are easier to store and distribute because it can be stored in the pharmacy area. But the FBFs like corn soy blend present a challenge.

“Most people don't have enough storage space for it and the packaging is also a challenge because for instance a 25 kg bag of corn-soy-blend — the patient only requires 10 kg per month it means scooping (measuring) and spilling and thus presents a challenge,” she said. As a result these supplies are often housed separately from the clinic, which poses a burden upon the patient especially when timing of food distributions do not match clinic visits.

Likewise, clinic staff do not perceive food supplement provision as a clinical activity.

“I was attending the TB session this afternoon and nobody mentioned nutrition in terms of care and support. Which means that doctors and nurses, nobody, considers nutrition as part of their responsibilities when they are treating these patients. Since it is being considered as an added responsibility it is really a challenge to get people to implement the nutrition programmes,” she said.

Increased training is needed to address this issue, but the nutritional protocols should also be incorporated into the HIV care programmes.

“We are also trying to say this nutrition care should be integrated into the treatment protocol. When they are trying to do blood pressure, they should also consider weight, height as part of that protocol so that it becomes part and parcel of the treatment, care and support,” she said.

Finally, there are supply chain logistics — it can be especially difficult to keep small remote clinics consistently stocked when they only serve a small number of clients.

### Sustainability and cost effectiveness

Kara believes that these logistics suggest there must be a better way of providing for the support of the household:

“We need to distinguish this from the specialised supplements because this is just for welfare, just to increase the security for the household. So these should be handled outside the health sector and it can be handled by volunteers, civil society and people outside the health infrastructure. Although the patient may be the entry point for identifying the vulnerability of the household. We also should consider the use of other social transfer modalities like cash or vouchers and create bridges to existing social welfare schemes that could be inclusive or exclusive services but at least they have to be part in that,” she said.

While food supplementation programmes are very well-meaning, another representative of the WFP, Gideon Cohen of the World Food Program (WFP) in Ethiopia said that it is also important to assess the relative cost-effectiveness of these programmes.

“It's very important that we have effective cost-benefit analysis tools for the whole issue of providing food and nutrition support to people living with HIV/AIDS. This is a major gap and it's particularly important in our efforts to integrate the very high impact - but very high cost - Food By Prescription approach with the kind of supplementary food that the World Food Programme is also providing to people living with HIV/AIDS. We should recognise that



these two types of food, which we're giving to people living with HIV/AIDS, are inherently complementary and that it's very important to see how we integrate them. It is not only important for us to see what the clinical outcomes are, but we have to look beyond that and we also have to see where we should be putting the money. I'm not saying that either type of food should be given preference but it's very important for us to see where we should put the money and where we have the high impact. I don't think we have an adequate evidence-base to answer those questions yet."

Finally, he said that partners need to be very careful in how we target food toward people living with HIV/AIDS.

"We should make sure that if we give food to people living with HIV/AIDS, this should be a short-term investment for other long-term gains like ART enrollment and ART adherence. And we should definitely be making sure that we use food assistance, whatever type of food it is, as a bridge and make sure that we are giving people enough information so that after that they can look after their own nutritional needs. The long term solution for people living with HIV/AIDS must be that we improve the quality of their diet and

that people take responsibility for having a healthy diet themselves," he concluded.

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## about HATiP

A regular electronic newsletter for health care workers and community-based organisations on HIV treatment in resource-limited settings.

The newsletter is edited by Theo Smart (Cape Town) and Keith Alcorn, NAM's Senior Editor (London).

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