

THE UNITED REPUBLIC OF TANZANIA



**MINISTRY OF HEALTH COMMUNITY
DEVELOPMENT, GENDER, ELDERLY, AND
CHILDREN**

THE NATIONAL TB AND LEPROSY PROGRAMME

**Nutrition Implementation Guideline for MDR-TB Patients in
Tanzania**

June, 2016

Table of Contents

Abbreviations	3
Acknowledgements	4
Foreword	5
Executive Summary	6
Chapter 1	8
Background	8
1.1 The interlink between nutrition disorders and MDR-TB	8
1.2 Goal, Objectives and Guiding Principles	10
1.3 Patients rights and ethics towards MDR-TB patients	11
Chapter 2	16
2.1 Coordination of Nutrition and TB care and treatment	16
2.2 Incorporating the nutrition agenda into MDR-TB care	17
2.3 Integration of nutrition interventions into MDR-TB care and treatment.....	18
2.4 Roles of health care workers in nutrition care for MDR-TB patients.....	19
2.5 Parameters of Practice for nutrition care in facilities for MDR-TB patients	22
2.5.1 The site characteristics	22
2.5.2 Equipment and Materials:	22
2.6 Quality of Care.....	22
Chapter 3	24
3.1 Comprehensive nutritional care and support for MDR-TB patients.....	24
3.1.1 Assessment of nutrition status.....	24
3.1.2 Comprehensive Nutrition Counseling.....	25
3.1.4 Management of severely malnourished children	38
3.1.5 Management of micronutrient undernutrition.....	39
3.1.6 Preparing patients for discharge from the nutrition care and treatment.....	40
3.1.6 Management of moderate acute malnutrition	42
3.1.7 Follow up of the discharged patient	43
3.1.8 Healthy lifestyle for MDR-TB patients	43
Chapter 4	46
4.1 Nutritional management in MDR-TB patients with coexisting conditions	46
4.1.1 Management of MDR-TB with Diabetes and nutrition complication	46
4.1.2 Management of undernutrition in the MDR-TB and HIV co-infection.....	50
4.1.3 Management of undernutrition in the MDR-TB and pregnancy.....	52
Chapter 5	54
5.1 Care and Support for populations affected by MDR-TB	54
5.1.1 Food support to MDR-TB patients.	54
5.1.2 Supply chain management of commodities	55
Chapter 6	59
6.1 Monitoring and evaluation	59
6.1.1 Site level indicators: Input indicators.....	59
6.1.2 Process indicators.....	59
6.1.3 Impact/ outcome indicators	59
Reference	61
Annexes.....	63

Abbreviations

AIDS	Acquired Immuno-Deficiency Syndrome
ART	Anti-Retroviral Treatment
BMI	Body Mass Index
DOT	Direct Observed Treatment
DR TB	Drug Resistant Tuberculosis
FDC	Fixed Dose Combination
FEFO	Fesolate and Folic Acid
FQN	Floroquinolones
HCW	Health care workers
HIV	Human Immunodeficiency Virus
MDAs	Ministries, Department and Agencies
MDR-TB	Multi-drug resistance Tuberculosis
MoHCDGEC	Ministry of Health, Community Development, Gender, Elderly and Children
MUHAS	Muhimbili University of Health and Allied Sciences
NGO	Non Governmental Organization
NNPM	National Nutritional Policy for MDR-TB
NTP	National Tuberculosis and Leprosy Programme
OI	Opportunistic Infection
OPD	Out Patient Department
PLHIV	People living with HIV
RUTF	Ready to Use Therapeutic foods
SAM	Severe Acute Malnutrition
TB	Tuberculosis
TFNC	Tanzania Food and Nutrition Center
WHO	World Health Organization
WHZ	Weight for Height Z-score
XDR-TB	Extensively drug resistance Tuberculosis.

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The national nutrition implementation guide for MDR-TB is made out of the collective efforts of several stakeholders and partner institutions working on care and treatment for MDR-TB patients. These efforts were coordinated by the Directorate of Preventive Services through the National TB and Leprosy Program (NTLP) on behalf of the government of Tanzania, while incorporating the standard guideline and evidence based guidelines from the World Health Organization and other national, regional and international organizations. Locally, the technical working group included technical officers from the Ministry of Health, Community Development, Gender, Elderly, and Children (MoHCDGEC); Tanzania Food and Nutrition Center (TFNC); Clinicians and other technical persons from Kibong'oto Infectious Diseases Hospital (KIDH); academic institutions including Muhimbili University of Health and Allied Sciences and Sokoine University of Agriculture; and International Non-Governmental Organizations.

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Last, but not least, the Ministry would like to extend similar gratitude to all who in one way or another gave their inputs for the production of this document. The ministry believes that this document will be put in good use and result in improved care and treatment for MDR-TB patients in Tanzania



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Foreword

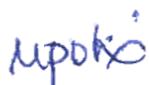
Tuberculosis is strongly associated with undernutrition. The presence of undernutrition especially in its severe form among patients with such chronic infection poses a significant threat to their treatment outcome. To this end, patients with the more chronic form of Tuberculosis, such as those with MDR-TB require longer treatment duration and are hence more affected by undernutrition. Undernutrition has great impact on the course of care and treatment of MDR TB patients with fatal outcome. Clinical observations during care and treatment of MDR-TB patients in Tanzania reveal a high magnitude of undernutrition, which also worsens treatment outcomes.

Undernutrition is a cause and consequence of MDR-TB. Evidence points for bi-directional causes of undernutrition among patients with MDR-TB. It can result from poor feeding practices caused by the effect of the chronic disease but it can also be a consequence of the disease itself. In the wider context, TB and MDR TB are primary diseases of poverty. Patients with MDR-TB also succumb to elevated magnitudes of food insecurity, poor access to health services, and poverty among other factors that escalate their poor nutrition status. These factors call for both nutrition specific and sensitive interventions.

In the face of rising magnitudes of MDR-TB and the complexity in their care and treatment especially when coupled with severe undernutrition, the Ministry of Health, Community Development, Gender, Elderly, and Children (MOHCDGEC) initiated development of this nutrition implementation guideline for MDR TB patients. This document therefore aims to integrate nutrition care and treatment as part of MDR-TB care and treatment, on routine basis, while at the same time addressing sustainability issues related with the limited resources available in the health sector. Integrating nutrition care and treatment into existing MDR-TB care will also ensure that frontline workers are knowledgeable and skilled enough to assess, treat, and care nutrition conditions for MDR-TB patients. On the other hand, health workers will be able to use this opportunity to also manage undernutrition as part of their standard care in routine duties. Such integration will improve health facilities and equip them with necessary tools, supplies, and capacity to handle care and treatment of undernutrition and other nutrition and related disorders for MDR-TB patients.

Overall, the guidelines aim to address undernutrition, so as to improve quality of lives, and longevity among patients with MDR-TB. In this manner, the Ministry is expressing its commitment in the fight of undernutrition in the vulnerable groups, stopping TB and its other deadly forms, and improves lives of all citizens.

In the process of making this implementation guide, the Ministry engaged stakeholders from academic, implementation, policy, and non-governmental organizations. This guide therefore reflects substantial input from a wide range of key players, guided by the World Health Organization (WHO), and tailored into a Tanzanian context through informed expert opinions. The Ministry is satisfied with the quality and contents of this document and that it reflects national and international standards for implementation of nutritional programmes. This implementation guideline will be a useful tool to improve lives of MDR-TB patients through integrating nutrition care in their routine TB care and treatment and targets health care managers and health coordinators at national, regional and district levels. The document also provides guidance to staff at health facility level providing care and treatment for MDR TB patients



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Executive Summary

Multidrug-resistant *Mycobacterium tuberculosis* (MDR-TB) affects about 450,000 people worldwide each year. Of them about 170,000 MDR-TB patients die with undernutrition being an underlying cause. The magnitude of MDR-TB is also high in Tanzania—MDR-TB is prevalent in about 1.1% and 3.1% of new and retreated TB cases respectively. Such an alarming rate calls for a strong policy guideline to address undernutrition, a common factor, and consequence of the disease itself.

Efforts to address undernutrition—both macronutrients and micronutrients undernutrition—has yielded positive results. However, vulnerable groups such as people with TB, MDR-TB, and others like those living with HIV, people with drug addiction, and others who succumb to socio demographic disadvantages have remained behind. MDR-TB is a chronic condition that subject infected patients to long-term treatment. Undernutrition is an underlying condition to it, but it can also be a consequence of the disease. Because of its complex association, efforts to address undernutrition need to also cover a wide range of interventions. Yet, such efforts are not yet coordinated and adopted as standard care in the management of MDR-TB patients. Lack of implementation guide is the primary reason.

Tanzania recognizes the importance of a tailor-made approach to improve undernutrition in vulnerable population—MDR-TB being one of them. It has therefore put in place this nutrition implementation guide to spearhead the efforts to improve nutrition care for MDR-TB patients through integration of nutrition care in TB treatment. This guide emphasizes individualized and routine nutrition care and treatment for all MDR-TB patients in their encounter with health workers. It provides the framework for incorporating nutrition care and treatment at all levels of care, ensuring supplies for nutrition assessment and counseling for such patients, ensure resource allocation including trained health workers capable of providing such interventions.

Because of multi-dimensional causes, this policy calls for multi-sectoral approach towards implementation of nutrition interventions. This nutrition implementation guideline will guide the implementation of evidenced-based, high-impact nutrition interventions, and promote the adoption of optimal practices, healthy lifestyles, and appropriate dietary habits to safeguard quality of lives and longevity for MDR-TB patients. It will also reposition nutrition as a crosscutting issue and facilitate the integration and mainstreaming of nutrition into national development efforts using a multi-sectorial approach. It further aims to strengthen sectoral capacity for the effective delivery of nutrition-specific and nutrition-sensitive actions pertinent to MDR-TB, and mobilize resources, support, and partnerships among nutrition stakeholders and mainstreaming them into vulnerable

patients such as those with MDR-TB. In this way, the efforts to improve care and treatment of MDR-TB patients can therefore be achieved with sustainability in Tanzania.

Chapter 1

Background

1.1 The interlink between nutrition disorders and MDR-TB

Nutrition disorders are the major underlying causes of the burden of diseases and loss of lives. Of more importance is undernutrition, which has heightened the burden of immunity debilitating conditions and deaths particularly in low and middle-income countries. Tanzania is no exception. Effective interventions are available to address unprecedented magnitudes and therefore consequences of undernutrition; however, people living in vulnerable conditions are more at risk of mortality. In particular, people living with Tuberculosis (TB) and indeed those with the chronic form of the disease, Multi Drug Resistance Tuberculosis (MDR-TB), have continued to suffer and even die from undernutrition.

MDR-TB is defined as TB disease with resistance to isoniazid and rifampicin (the two most powerful anti-TB drugs). Estimatedly, 450,000 people succumb to MDR-TB each year globally. Of them, about 25,000 cases are expected to have Extensive Drug Resistance TB (XDR TB). XDR TB is a more extensive type of drug resistant TB that is resistant to isoniazid and rifampin, plus any fluoroquinolone and at least one of three injectable second-line drugs used to treat MDR-TB patients. Despite such magnitudes, less than 5% of all MDR-TB cases are currently detected and only 3% receive standard treatment. In Tanzania, the magnitude of MDR-TB is prevalent in about 1.1% and 3.1% of new and retreated TB cases respectively (1).

A bidirectional association exists between TB/MDR-TB and undernutrition. A study among MDR-TB patients in Kibong'oto Referral Hospital (KDH) in Tanzania revealed unprecedented magnitudes of undernutrition among patients seen in the facility (2). The prevalence was 53% among untreated patients. Of them, 30% had mild form of undernutrition, 30% had moderate form of undernutrition, and 40% presented with severe form of undernutrition (2). Undernutrition is an underlying factor for and a common consequence of the disease. Undernourished patients with MDR-TB are prone to inadequate adherence to their medication and poor treatment outcomes. Both conditions affect immunity; predispose them to further risk of other infections, therefore increasing the burden of comorbidities and therefore mortality (3, 4). MDR-TB is a chronic disease that impairs metabolism. The increase in cytokines and tumor necrotic factors among these patients increases energy consumption and therefore predispose them to higher nutrition demand. They are also prone to other constitutional symptoms such as vomiting and diarrhea, which further contribute to nutrition loss and availability to the body. In addition, loss of appetite due to the disease further complicates nutrition

intake.

MDR-TB patients also succumb to micronutrient deficiencies. Like for the other chronic disease conditions, MDR-TB patients present with low circulating concentrations of serum micronutrients during the start of their treatment; these are Vitamins A, E and D and minerals such as iron, zinc, and selenium (5-8). Appropriate treatment with anti-TB usually improves their serum levels.

Patients suffering from MDR-TB may also present with other complex conditions such as during pregnancy, with co-morbidities such as diabetes, and other vulnerable conditions pose unique challenges in their care and treatment. For example, pregnant women with MDR-TB have high risk of undernutrition and are susceptible to deliver low birth weight children, who are in turn susceptible to early childhood undernutrition (9-13). Adolescents and adults with MDR-TB are also prone to wasting, micronutrient deficiencies including vitamin and mineral deficits (5-8). These cause poor adherence to medication, poor immunity, and poor treatment outcomes with heightened mortality risk. Dietary control for diabetic MDR-TB patients needs careful planning, care and treatment to ensure adequate nutrition supply and management of both conditions.

Treatment with effective anti-TB for MDRTB can potentially improve their undernutrition. In a study conducted in KDH, 39% of patients with undernutrition improved (2). However, treatment alone is not enough as 9% deteriorated in the same study (2). Nutrition care and treatment are therefore essential in mitigating the adverse effects caused by undernutrition. Effective interventions are known to address undernutrition for children, adults, and people with special needs including HIV/AIDS, TB, and food insecurity, both in hospital and community settings. However, for MDR-TB, such interventions have been implemented in silo. In this way, patients with MDR-TB have been missing an important opportunity for care and treatment of nutrition conditions that directly affect TB treatment.

Nutrition training of health workers improves both their skills to care and treat undernutrition and improving feeding practices of the patients with undernutrition (14, 15). Integration of nutrition care and treatment into the MDR-TB care and treatment will ensure adherence to medication and improve quality of care and treatment for MDR-TB patients. Introducing nutrition care and treatment into existing MDR-TB care will also ensure that frontline workers are knowledgeable and skilled enough to assess, treat, and care nutrition conditions for MDR-TB patients. Health workers will then be able to use the opportunity they get during care and treatment of MDR-TB patients to also manage undernutrition as part of their standard care. Such integration will improve health facilities and equip them with necessary tools, supplies, and capacity to handle care and treatment of undernutrition and other nutrition and related disorders for MDR-TB patients.

Despite the needs for integration of nutrition care and treatment in MDR-TB patients, Tanzania lacked a National nutrition implementation guideline to direct provision of nutrition care and support to MDR-TB patients. Interventions that health facilities were conducting on MDRTB patients were not guided. The Government through Ministry of Health, Community Development, Gender, Elderly and Children and other stakeholders has therefore developed this guideline in order to roll out nutrition care services into the routine MDR-TB care and treatment with support from partners. The aims are to utilize evidence based interventions and streamline them within the same care and treatment services for MDR-TB. Such integration is important due to human resource for health (HRH) challenges in the country, to prevent duplication of efforts, to improve efficiency of care and treatment in Directly Observed Therapy (DOTs) in MDR-TB, and reduce morbidity and mortality related to MDR-TB. Integration of nutrition care into MDR-TB routine care and treatment, therefore, calls for strengthening nutrition care infrastructure that include human resource development, equipments and supplies for nutrition assessment and care, coordinating public health services using evidence-informed approaches and nutrition counseling and treatment of various nutrition conditions patients may present with.

1.2 Goal, Objectives and Guiding Principles

1.2.1 Goal

The overall goal of the National Nutritional Implementation Guideline for MDR-TB is to ensure improved wellbeing for MDR-TB patients in Tanzania, through evidence based nutritional care and support using multi-sectoral approach for sustainable development and ensuring patients rights.

1.2.2 Objectives

This nutrition implementation guideline has five objectives that set standards for the implementation of nutrition interventions for MDR-TB patients in Tanzania:

1. To guide the implementation of nutritional assessment, prevention, care, and treatment of undernutrition among MDR-TB patients in Tanzania
2. To ensure that MDR-TB patients receive quality and timely nutrition interventions to ameliorate their nutrition and associated health problems in Tanzania
3. To ensure equitable and sustainable implementation of nutrition sensitive approaches on food accessibility, quality, and safety at the individual, household, community, and national levels pertinent to MDR-TB patients in Tanzania

4. To guide the integration of nutrition interventions on care and treatment of MDR-TB patients for sustainability
5. To create an enabling environment for the effective co-ordination, integration, and implementation of nutrition programmes for MDR-TB patients in Tanzania

1.3 Patients rights and ethics towards MDR-TB patients

1.3.1 Ethical obligations in providing access to MDR TB treatment

To safeguard the rights and lives of individuals, the Government of Tanzania ratified the WHO's standards for care and treatment of TB patients (16, 17). The constitution of this organization calls for all governments to provide universal access to TB and MDR TB care, it is grounded in their duty to fulfill the human right to health. On similar grounds, the International Covenant on Economic, Social and Cultural Rights recognizes "*the right of everyone to the enjoyment of the highest attainable standard of physical and mental health*" and specifically calls on states to take steps necessary for "*the prevention, treatment and control of epidemic, endemic, occupational and other diseases*".

The Government of Tanzania is obliged therefore to providing universal access to TB and MDR TB care as part of their commitment to fulfilling the human right to health. The rationale to this obligation includes:

- Benefits of treatment to the individual patient are substantial because proper treatment prevents significant morbidity and mortality and leads to a complete cure of TB and MDR TB patients
- Slowing the spread of a highly infectious disease can benefit the patient and the broader community
- The lack of proper TB care and adherence thereof can potentially lead to the development of dangerous drug-resistant strains, especially MDR-TB and XDR-TB
- Treatment is inexpensive and cost effective when used under supervision and routinely
- TB affects large numbers of people, a disproportionate number of whom are vulnerable and marginalized, and TB can further increase people's vulnerability to poverty

Providing universal access to TB care is important to MDR and XDR-TB, which have had a particularly unprecedented impact on vulnerable populations. The obligation to provide universal access to MDR-TB care implies a duty to ensure the quality of that care. Thus, the government of

Tanzania has an ethical obligation to ensure and regulate the care (both treatment and diagnostics) provided to these in conforming to internationally accepted quality standards.

1.3.2 Ethical values pertinent to nutrition care for MDR-TB patients:

A comprehensive MDR TB strategy should include nutrition care and treatment as part of care and treatment package for MDRTB patients. As the risk of undernutrition is high for this sub-population, the comprehensive strategy should also seek to protect individuals and communities through the proper treatment of infected individuals and the prevention of new infections (through the existence of an effective care and control programme as well as through measures such as infection control, vaccination, population screening, and improvement in the socioeconomic factors known to increase the risk of TB).

The following are the key ethical values during care and management of TB, that are also applicable in nutrition care and management for MDR-TB patients:

- i. ***Social justice/equity*** – Undernutrition has various causes that vary between MDR-TB patients. A focus on social justice calls attention to the underlying root causes and existence of inequalities in society and requires that we explicitly address them. In some cases, this may mean a redistribution of resources to compensate for existing inequalities and further actions to prevent their perpetuation. Given the role of socioeconomic factors, especially extreme poverty, in increasing the risk of undernutrition among people with TB infection and the progress of disease, the pursuit of social justice must now become a key component of TB and MDR-TB control.
- ii. ***Solidarity*** – Infectious diseases such as TB and MDR TB increase the risks of harm for whole populations. Such risks can be reduced where strong community ties result in cooperative action to enforce the conditions for flourishing, disease-free lives.
- iii. ***Common good*** – An infectious disease not only threatens the health of an infected individual, but of the whole population. Undernutrition may increase the burden or predispose the populations to infectious disease like TB and MDR-TB. The removal or reduction of a threat of infection from a society is therefore something that we can all benefit from. Therefore, we *all* gain from a society with strong public health facilities capable of nutrition care and treatment to address TB control and treatment.
- iv. ***Autonomy*** – Respect for patient autonomy has often dominated discussions of ethical issues in many areas of health care. While it is not the only value that is important, nor the one that

always ought to take priority, it requires consideration in debates about ethical TB policy. For example, respecting autonomy means that patients generally should have the right to choose among treatment options.

- v. **Reciprocity** – Within societies it is common for some members to put themselves at greater risk of harm for the sake of others. Reciprocity seeks to express the idea that these individuals deserve benefits in exchange for running such risks. It might include an obligation to minimize the risks to individual caregivers (by providing protective equipment) as well as positive interventions to treat and compensate individuals when harm occurs as a result of providing care.
- vi. **Effectiveness** – The idea of effectiveness includes the duty to avoid doing things that are clearly not working, as well as the positive obligation to implement proven measures that are likely to succeed. Effectiveness is linked to the concept of *efficiency*, which requires that limited resources be used in the most productive manner possible. Evidence of effectiveness (or lack of it) in TB programmes should also require monitoring and evaluation of nutrition sensitive and specific interventions and research thereof.
- vii. **Subsidiarity** – This value promotes the idea that decisions should be made as close to the individual and communities at local level as possible. The idea is that this ought to result in decisions reflecting local interests, concerns and beliefs, and ensure the highest possible involvement by the public.
- viii. **Participation** – This principle requires that the public and the patients suffering from MDR-TB be encouraged to participate in the decision-making process, and that reasons be provided for decisions.
- ix. **Transparency and accountability** – This principle requires that decisions be made in an open manner, and that the decision-making process be fair, responsive and evidence-based.

The WHO has articulated the concept of “person-centered care”, as a part of the End TB strategy. It involves viewing health care from the patient’s perspective and tailored them to meet the needs and expectations of patients. It is designed to account for the rights of the TB patients. Such rights include that for TB patients to have the right to receive advice and treatment that meets international quality standards including nutrition care and treatment; be free of stigmatization and discrimination; establish and join peer support networks; and benefit from accountable representation (16). Such care recognizes that patients are not the only individuals whose rights and interests must be protected (17). It is equally important to consider those who are sick and not receiving care (i.e., those who are not

patients but should be); family members and contacts of patients, who are at heightened risk of being infected; the community at large, which faces risks from the failure to diagnose and appropriately treat individuals with TB; and the consequences of undernutrition to individuals, families, and community at large.

1.3.3 Cost of health care and nutrition services for MDR-TB patients

The government of Tanzania recognized the need for improving access to care for MDR-TB patients. It therefore adhered to the WHO's End TB Strategy stating that, "*anti-TB drugs should be available free of charge to all TB patients, both because many patients are poor and may find them difficult to afford, and because treatment has benefits that extend to society as a whole (cure prevents transmission to others)*" (18). Nutrition care and treatment is part of TB care and treatment. It should be integrated into the mainstream care and treatment and therefore provided alongside the End TB Strategy. The cost of nutrition care and treatment should be bore by the facilities providing treatment for MDR-TB patients in Tanzania.

1.3.4 Ethical considerations for the government and health workers in promoting better access to TB care and treatment

- i. ***A patient-centered treatment approach*** – Conducted through focusing on the patient means that treatment should be accessible, acceptable, affordable, and appropriate (19, 20). Wherever available, and feasible, patients should be given choices about the location of treatment and, treatment modality including that of ambulatory care, home based nutrition care and treatment.
- ii. ***Promoting community-based care:-*** Such care needs to be of acceptable quality, which is accessible, well accepted by patients, and that promotes adherence (21). Tanzania government has integrated community health workers. Such trained health workers if trained can provide DOTs and nutrition care and treatment at home. The community-based care reduces burdens on already overburdened health-care facilities and is more cost effective than facility-based treatment (9, 22).
- iii. ***Focusing on patients as part of their larger communities:-*** Undernutrition and MDRTB are complex conditions that are associated with various and intertwined risk factors and consequences. Addressing these conditions needs community wide approaches that the patients are center to it. Patients should be encouraged to form support groups and to work with their communities to address the social determinants of MDR-TB (23) and undernutrition.
- iv. ***Promoting social justice and equity:-*** Programs addressing undernutrition in the context of TB and MDR-TB should take into account the needs of all patients, and in particular, the special needs.

These are particularly important for vulnerable groups for whom such interventions should be tailored made to suit their context. Interventions should be sensitive to different types of vulnerabilities. These include young children and the elderly, those living in extreme poverty, refugees, incarcerated and imprisoned individuals, asylum seekers, mine workers, people living with HIV, substance users and diabetic patients.

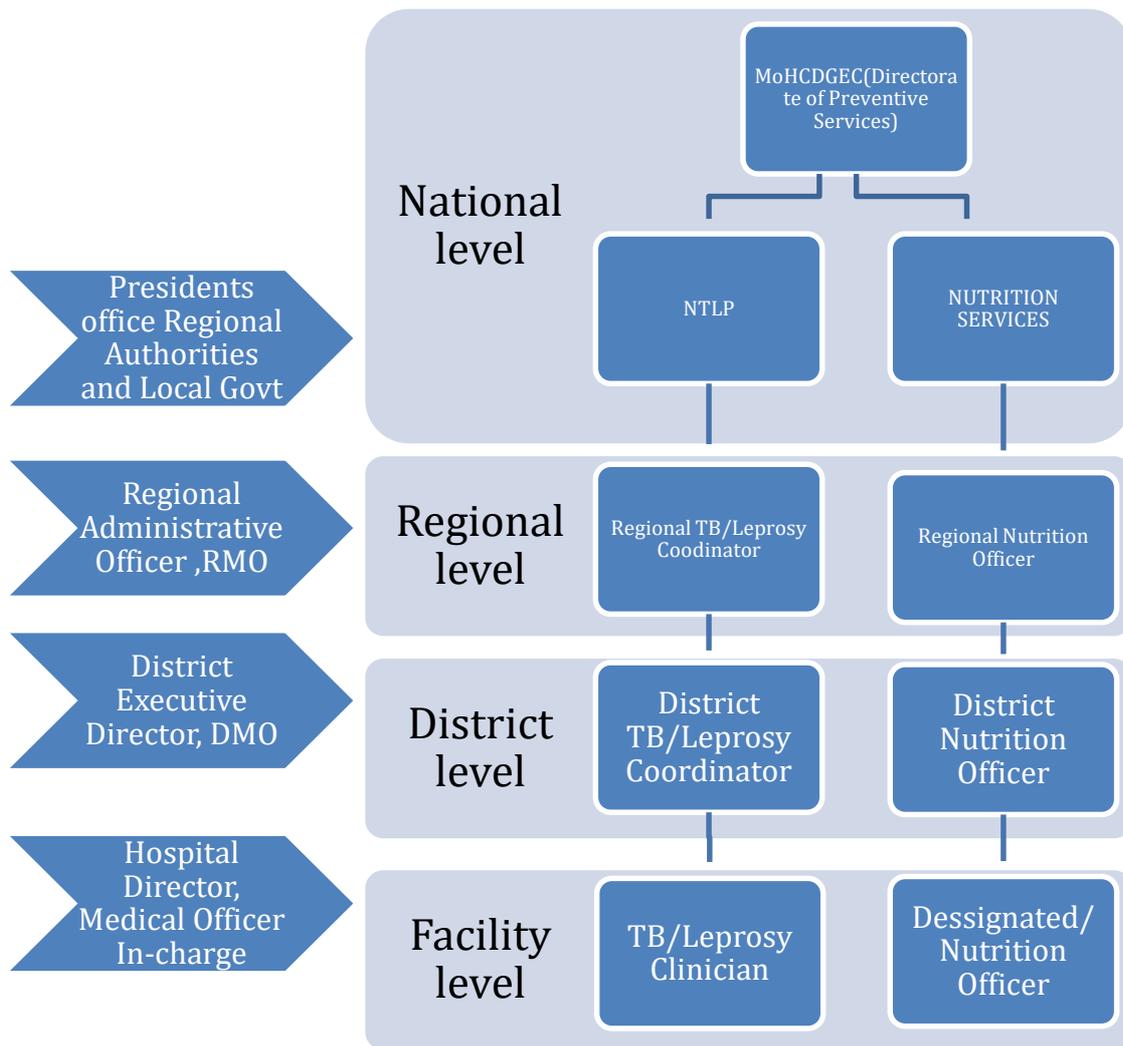
Chapter 2

2.1 Coordination of Nutrition and TB care and treatment

TB and nutrition efforts are coordinated by the National TB and Leprosy program (NTLP) in collaboration with Nutrition Services Section through the Directorate of Preventive service in the Ministry of Health, Community Development, Gender, Elderly and Children (MoHCDGEC). Similarly, all nutrition activities in the country are coordinated through the same directorate. This makes it possible for integration of TB and nutrition services from the national level to the implementation sites.

The flow chart below shows the coordination flow of the two activities: NTLP and Nutrition Services. At regional level, TB activities are coordinated by Regional TB & Leprosy Coordinator (RTLTC) while for the nutrition the coordinator is the Regional Nutrition officers. Recently, the MoHCDGEC has deployed district nutrition officers to coordinate nutrition activities in most of the districts. At the same level, District TB & Leprosy Coordinator (DTLTC) oversees the coordination of TB care and treatment services. At facility level, a designated clinician with knowledge in care and treatment manages TB and MDR-TB patients. Similarly, clinicians or frontline workers are obliged to provide care and treatment for nutrition conditions should the patients present with them. Frontline workers are charged with tasks to initiate care and treatment of TB patients countrywide. These could be trained to also provide basic nutrition assessment and initiate care. To improve their skills, routine nutrition trainings should also be provided to such cadres.

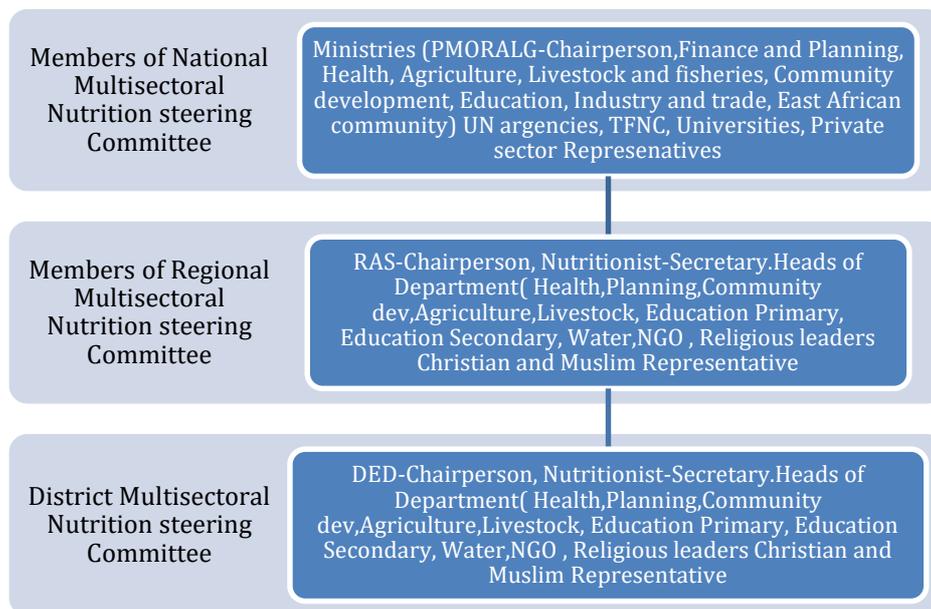
Figure 1: TB and Nutrition Coordination in Tanzania



2.2 Incorporating the nutrition agenda into MDR-TB care

The guideline recommends the incorporation of nutritional agenda for MDR-TB into the existing multi-sectoral nutrition steering committee at various levels. Various stakeholders such as UN agencies, Developmental Partners, NGOs, Religious organizations should play a role in addressing issues that are cross cutting.

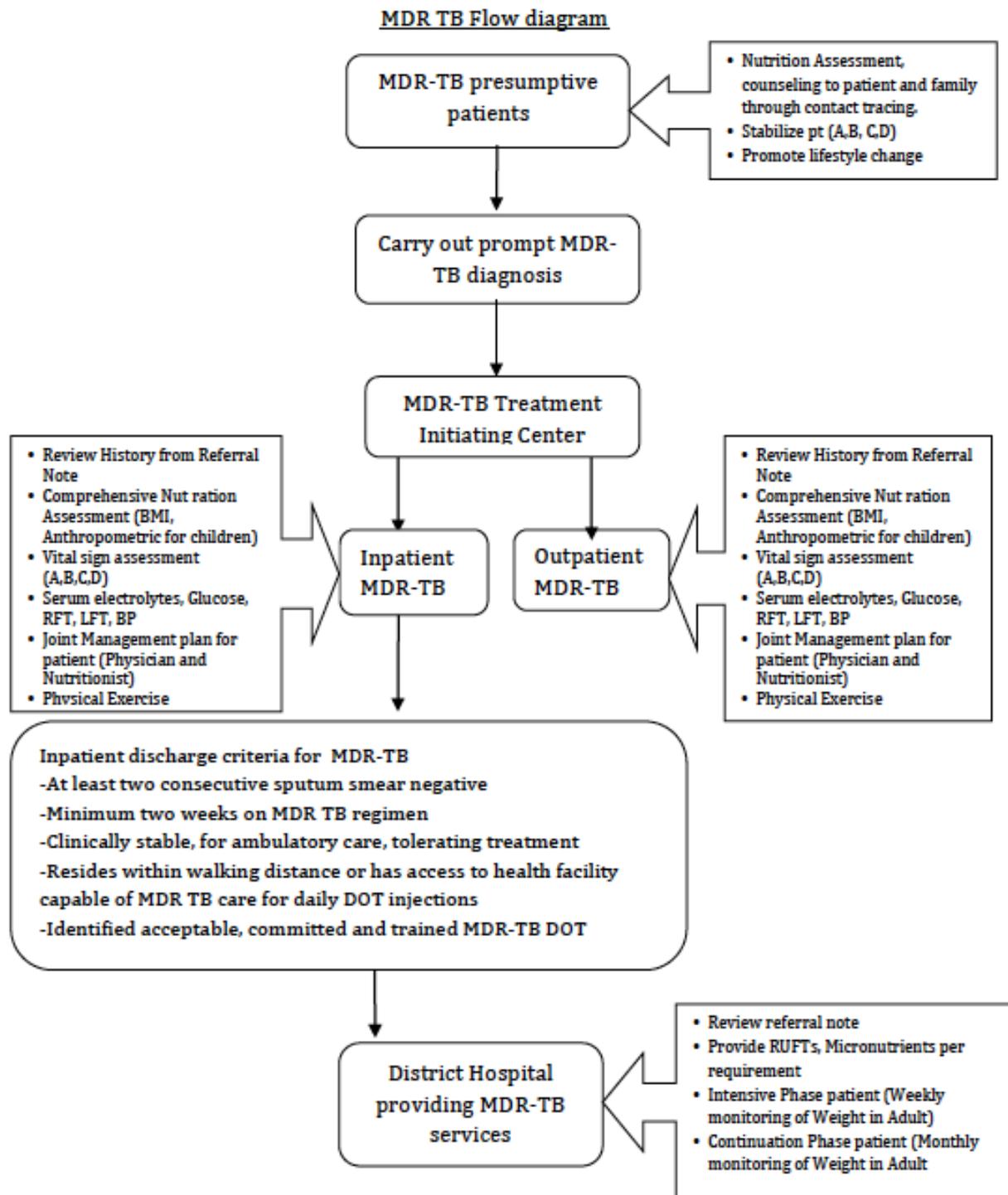
Figure 2: Integrating nutrition agenda to MDR-TB care



2.3 Integration of nutrition interventions into MDR-TB care and treatment

This guideline emphasizes the integration of nutrition interventions into MDR-TB care and treatment. Integration will reduce duplication and ensure sustainability of comprehensive and routine care for such vulnerable population. Under this guideline, MDR-TB patients are supposed to receive nutrition care and treatment as part of MDR-TB treatment. The following flow of care is thus recommended.

Figure 3: MDR-TB flow diagram



2.4 Roles of health care workers in nutrition care for MDR-TB patients

Health workers responsible for care and treatment of nutrition related problems for MDR-TB should include all cadres involved in care and treatment of MDR-TB. This will enhance care delivery at any opportunity that the patient has with a health workers. To achieve this, it is

important to provide nutrition training of all frontline workers in TB care. To equip them with necessary skills and knowledge sets, inservice training for all health workers in TB-care and treatment should be routine. Such trainings can also be integrated in the routine TB care and treatment that these health workers receive. Evidence is available on effectiveness of nutrition training of health workers (of any cadre) on their nutrition knowledge, skills, and practices in management of undernutrition (14), and actual improvement in feeding practices among patients they care (15).

Health workers responsible for nutrition care and treatment should therefore include all health personnel that participate in MDR-TB care and treatment. These are frontline health workers; nurse counselors; nutrition officers; midlevel professionals including assistant medical officers, clinical officers; and physicians that they encounter. Further, inclusion of community health workers can be effective as they can provide home based care and link it with health facility interventions. They, too, have a role in improving and sustaining better nutrition for MDR-TB patients.

The roles of health workers responsible for nutrition care and treatment is to assess, investigate causes, advice and coordinate with health care workers managing MDR-TB patients. This is essential to ensure the nutrition continuum of care.

The main roles of nutrition officers designated for MDR-TB patients:

1. Assess nutritional status for MDR-TB patients including anthropometric measurement and dietary history and other nutrition risk factors
2. Identify the nutrition problems for MDR-TB patients including nutritional deficiencies, both micro and macronutrient deficiency
3. Hold Nutrition and healthy living talks while demonstrate to patients and relatives on healthy food preparations and sanitation
4. Carry out counseling on healthy living, including dietary counseling and physical exercise following the recommended GATHER steps
5. Ensure that patients with undernutrition receive appropriate nutrition care including therapeutic foods and micronutrient supplements as appropriate
6. Prepare and distribute nutrition related IEC materials and handouts to clients
7. Collaborate closely with pharmacist in the management of patients using therapeutic foods

and micronutrient supplements

8. Conduct food security assessment to MDR-TB patients
9. Assist patient linkage to nutritional support groups in collaboration with social and community health workers
10. Ensure quality collection, analysis, and use of nutrition data at facility level
11. Ensure timely reporting on the nutritional indicators to appropriate levels
12. Conduct nutrition assessment to vulnerable populations including relatives and care givers of MDR-TB patients, vulnerable populations including incarcerated, children, and elderly

At the care and treatment center, the roles of a frontline worker on nutrition care and treatment include:

1. Take anthropometric measurements (Weight and Height) convert them to nutrition indices (z-scores for BMI for adults, WFA and WFA for children), and classify them into nutrition status (Underweight, wasted, or stunted)
2. Take dietary history (including 24 hours dietary recall) and socio- economic assessment
3. Recommend or/do clinical assessment of nutrition deficiencies and related factors if appropriate
4. Carry out dietary counseling following the findings above (Follow the GATHER steps)
5. Conduct feeding practices demonstrations (e.g. food preparation and sanitation)
6. Provide/ dispense food and micronutrient supplements following the national guidelines
7. Conduct food security assessment and assessing other factors associated with undernutrition and provide nutrition education to MDR-TB patients and their caregivers
8. Follow-up progress of the nutrition interventions compared to previous sessions
9. Collection and management of nutrition data
10. Reporting on the nutritional indicators

2.5 Parameters of Practice for nutrition care in facilities for MDR-TB patients

2.5.1 The site characteristics

This is the health facility where MDR-TB patients are taken care of. It can be an inpatient facility where patients undertake intensive phase care or outpatients where MDR-TB patients are seen and receive a follow-up care. These facilities should have the following qualities:

1. Ability to provide nutrition counseling services
2. Have at least one trained service provider (nutritionist, nurse, or counselor) in a competence based nutrition course/ short course approved by the MoHCDGEC
3. On the days they are operational, they must have at least one health staff (with the qualities mentioned above) on duty providing nutritional care and support
4. Have a separate area/room allocated for individual nutrition counseling of patients for privacy

2.5.2 Equipment and Materials:

TB/ MDR-TB care and treatment facilities shall have:

- A copy of the most recent national implementation guidelines on nutrition for MDR-TB
- At least one functional adult weighing scale—a tarrying scale that can measure a mother and a child is an advantage
- At least one functional infant/neonatal scale for children who can not yet stand
- At least one functional height measurement scale for children and adults
- Nutrition counseling materials and nutrition job aids
- Demonstration equipment available and safe practices (including demonstration for ORS preparation, hand washing, water purification, safe food storage)

2.6 Quality of Care

- The NTLP should advocate for health facilities that provide MDR-TB services to have the required number of health care workers with the right mix in skills

- An appointed focal person to oversee nutritional services should be in place.
- Health staff providing nutrition counseling should have received nutrition training short course, receive annual refresher course, and score higher than 75% on a Nutrition Counseling Quality Checklist
- Relevant supplies for Nutritional care and management of MDR-TB should be made available in the selected health facilities, an efficient supply chain system should be established and strengthened by NTLP in each health facility to ensure an uninterrupted supply of drugs and therapeutic food to avoid stock outs.
- Service provision should be in line with ethical standards of medical practices in the country
- Patient right must be safeguarded by the health care workers and related staff to ensure privacy, confidentiality, and lack of stigmatization.

Chapter 3

3.1 Comprehensive nutritional care and support for MDR-TB patients

According to the policy guideline for nutrition care and treatment for MDR-TB patients:

All individuals with MDR-TB in all encounters with a health worker should receive: An assessment of their nutritional status; Assessment of immediate causes of undernutrition (Feeding practices and diseases); Appropriate nutrition counseling based on their nutritional status at diagnosis and throughout treatment

3.1.1 Assessment of nutrition status

All patients visiting the care and treatment site **for the first time** should have their weight and height taken, and BMI computed and recorded in the patient file

1. MDR-TB patients should have their weights measured according to their treatment phases:
 - MDR-TB patients with severe acute malnutrition should have their weight measured every day during their stabilization phase (Phase I) to monitor their BMI and response to the nutrition care and treatment
 - MDR-TB patients with severe acute malnutrition should have their weight measured every day during the Second phase (recovering from SAM) should have their weight taken at least twice a week to monitor their BMI and weight gain
 - MDR-TB recovered from malnutrition or those who had no malnutrition should have their weight and height measurements taken once every week to ensure that they do not fall back on their nutrition statuses. In case MDR-TB patient's weight is falling, they should be subjected to further nutritional assessment. This includes dietary history, biochemical analysis, adherence to medication, and assessment for feeding practices, household food insecurity, and other socio-demographic characteristics

Key: Weigh and record the weight of PLHIV at each visit. Body weight assessment is required to:

- Identify those whose growth patterns are outside the normal parameters, indicating either over-nutrition or under-nutrition
- Identify individuals at risk of malnutrition with repeated measurement (screening) over time
- Monitor effects of nutrition interventions on various anthropometric measurements

Practice point: Clients who have lost weight and their nutrition status is BMI of less than 18.5 kg/m² and children with weight-for-height (wt/ht) of less than -2 Z scores should be supported with food supplements for the purpose of improving their nutritional status to BMI above 18.5 kg/m² or wt/ht of > -2 Z score.

3.1.2 Comprehensive Nutrition Counseling

Recommended Components of a Nutrition Counseling Session

In a nutrition counseling intervention, the service provider and client (MDR-TB patient) work together to assess nutritional status and dietary intake, create nutrition care plans, and develop strategies that address symptoms and overcome constraints to consuming a healthy diet. The three main activities of a nutrition counseling session are: assessment, goal setting, and planning.

- a. **Assessment:** The purpose of assessment in a nutrition counseling session is to gain an understanding of the nutritional, medical, and physical status of the TB patients. As part of the assessment, physical status is assessed through anthropometric measurements, functional capabilities (e.g. activity level) and, if possible, the results of biochemical tests. On every contact the service provider should take the **weight** and height of the patient or the **MUAC** to assess nutrition status.
 - If the weight is below the recommended weight for height (-3 z score), or if the patient has unintentionally lost weight (more than 5% within the last 3 months) the patient should be provided more care. This involves a dietary assessment in which the service provider asks about dietary intake, dietary problems (e.g. poor appetite, difficulty chewing and swallowing), and hygiene and food preparation practices.
- b. The service provider also asks about the client's medical history, which includes current medications and symptoms. The main factor to any declined nutritional status is determined (if possible).
 - The assessment is also a time for the service provider to learn about the client's nutritional and health concerns.
- c. **Goal setting:** The service provider and client then agree on goals, or expected outcomes, based on the assessment. The number of goals should be limited to a maximum of three so that the client is not overwhelmed with too many changes at one time; goals should be added incrementally as they are achieved. Goals should also be SMART **specific, measurable,**

achievable and time bound.

- d. Planning:** After establishing goals, the service provider and client plan together how to achieve those goals. Selecting actions to improve nutrition status happens in two steps. First, the service provider educates the client on those topics relevant to their goals. Service providers should be prepared to provide information on eating well, preventing infections, and maintaining physical activity. Second, the service provider and client decide together which recommendations are **acceptable and feasible**. If there are challenges to making the recommended dietary changes, these also need to be addressed.

Clients should receive routine counseling sessions (usually scheduled at most **a month apart**), so that the client's progress toward his or her nutritional goals can be tracked and plans revised as needed.

The following points are also important during counseling or nutrition assessment sessions:

1. MDR-TB patients visiting the care and treatment site should be educated on dietary approaches to managing symptoms commonly seen in TB. Adequate diet with variety of foods and frequency are necessary for all patients to prevent undernutrition.
2. All MDR-TB on drugs/ or ART should be counseled on how to manage food-drug complications
3. MDR-TB patients should be counseled on a) how to treat drinking water appropriately, b) the critical times to wash hands, c) how to achieve food hygiene, and d) when and where to seek deworming services
4. **All** MDR-TB patients should be educated on the need to consume a **variety of foods** every day, including fruits, vegetables, animal products, nuts/legumes, and fats.
5. MDR-TB patients especially those on ambulatory care or those in acute care but can ambulate should be educated/counseled on the need to perform physical activity every day
6. In case the patient has reduced food intake the table below should be useful
7. The focus of counseling should be first on the foods that are locally available
8. Standard nutrition counseling guidelines should be used (NACS guideline). The Ministry of Health Community Development, Gender, Elderly and Children recommend the use of the **GATHER** process in nutrition counseling.

Table 1: Guidelines to Address Reduced Food Intake

If the cause of reduced	Then take this action:
Diseases and/or inability to eat.	<ul style="list-style-type: none"> • If OIs, refer the patient for appropriate treatment of the infections • Counsel patients on home dietary management of diet related symptoms • For psychological disorders including depression, refer to counseling; provide reassurance and hope • For medical toxicity in patients on Anti TB, HAART, counsel the patient and refer for clinical care • Counsel if taking non-prescribed substances or too much alcohol • Refer persistent cases for medical care
Poor attitude on food intake or taboos that affect food intake in sickness	Provide nutrition counseling to both the patient and care-givers to change attitude and any detrimental eating taboos and attitude
Complex medical regimens (for treatment of OI or Anti-TB, or ARVs, renal disease, pancreatitis)	<ul style="list-style-type: none"> • Assist clients in making a plan for daily intake of foods that are locally available and meet nutritional needs • Advise caregivers of MDR-TB patients, or PLHIV to regularly supervise their meals to ensure adequate food consumption
Unavailability of food in the household, or not able to prepare food due to illness	Refer “food insecure” client for supplementary food support or programs
Oral intake is not possible due to disease	Enteral or parenteral feeding routes can be used by qualified health staff to stabilize and improve nutrition status of the subject

Counseling the Client to Improve Weight

1. Weigh the client

- Compare current weight to previous weight
- For clients who are underweight, experiencing unintended weight loss, or who want to increase their weight, refer to **N0. 2 - 8 below**
- For clients who are overweight and clients who are experiencing unintended and undesired weight gain, refer to the issues below:

2. If the client is severely undernourished (e.g. BMI<16), urgently refer to an institution where they can get appropriate nutritional rehabilitation. The ***national guidelines on Management of Severe Malnutrition***, should be followed to manage the malnutrition.
3. Inform the client of the critical nutrition practices for TB/MDR-TB. Inform them that each of the actions is critical for maintenance of healthy nutrition among MDR-TB patients
4. Assess the possibility of opportunistic infections or other illness that may be affecting nutrient absorption or utilization. If other opportunistic infections or other illnesses are:
 - Present, then counsel on dietary management of related symptoms and refer to a medical doctor
 - Are NOT present, go to (5) below

Assess whether energy intake is adequate. Try to get a sense of the adequacy of the client's intake. Consider whether the client is eating a sufficient quantity of energy giving foods. General indicators that a client may be getting sufficient amounts of food include:

- Eating at least 3 meal a day (breakfast, lunch, and dinner) and the quantity of meals are “reasonably adequate” for their age, sex, activity and physiological state
 - Eating meals that contain a variety of foods (dietary diversity). These include energy giving foods, body building foods, protective foods (fruits and vegetables) and lots of safe/clean water and juices
 - Eating (one or 2) snacks in between meals, especially those that are high in energy like porridge or mashed bananas, baked bananas or sweet potatoes
 - Increasing intake of a balanced set of energy giving foods. Enriching local staples/foods with fats/oils, sugar, honey
5. If intake of energy giving foods is estimated to be inadequate, assess the reason(s):
 - If due to drug-related side-effects (such as nausea and loss of appetite) discuss with the client whether dietary management can help. If needed, modify the food-drug timetable to enable increased intake
 - If dietary management of side effects has been used but is not effective and side effects continue, refer client to a medical doctor. The doctor may prescribe appetite stimulants

for appetite loss; ant-emetics (to prevent vomiting) for nausea or vomiting; or anti-diarrhea medications

- If drug-related side effects are not the issue and food is available in the household, but dietary intake is inadequate, then counsel the client on increased food intake, through:
 - Increase the amount of food consumed
 - Increase the frequency of meals and snacks
 - Increase intake of energy giving foods
 - This may require helping the client identify appealing, available and affordable foods
 - If needed, modify the food-drug timetable to enable increase intake
 - If the client lacks access to sufficient food, help him/her identify options to increase access to food, including budgeting of food expenditures or accessing services that improve livelihoods or provide assistance. It may be necessary to link the client to programs providing supplements, food or other goods and services if available
6. If dietary intake is estimated to be adequate and other opportunistic infections and side effects that affect nutrient absorption are not present, it is possible the weight loss is the result of metabolic changes or other problems. In this case, refer the client to a clinician. Remember to provide the client with information about maintaining adequate food intake
 7. Counsel clients to do moderate physical exercise (three to four times a week) when possible. This is useful for building muscles and improve metabolism. If the client experiences difficulties exercising, refer him/her to a physiotherapist if available.
 8. If improved diet as a result of counseling fails to increase weight, refer the client to a clinician for further assessments
 9. For overweight clients and those experiencing unintended weight gain:
 - Ask the client about his/her daily food intake. If intake of fat/energy is higher than recommended, help the client to identify ways to reduce consumption of high-fat and high energy foods, especially those not rich in other nutrients

- Encourage the client to eat a variety of foods
- Encourage the client to continue with physical activity such as house work or other work, and to exercise regularly through recreational activities or walking
- If weight increase is likely due to metabolic changes fully or partly, (e.g. if weight has increased rapidly despite little change in dietary intake), refer the client to a medical doctor for further assessment and treatment

Conducting a Counseling Session Using the GATHER Approach

Greet the client (and develop rapport). Provide them a seat. Introduce each other; know their wellbeing since the last visit.

Ask their feeling about their nutritional status and food intake. Is it good or bad?

- Ask about any symptoms, nutritional problems, and concerns
- Carry out the nutritional assessment, if you have not done so already. If nutritional status has been done, record and share the results, e.g. dietary, current weight (and BMI) and weight change, biochemical, dietary, and clinical. For example, are they eating enough to provide the additional energy needs, a balanced diet? Taking enough clean, safe water? Managing symptoms using dietary approaches? Adhering to drug-food plans?
- Together with the client identify their nutritional needs and specific nutritional problems, if any, e.g. not increasing weight adequately; not adhering to drug/food plan; need to use dietary approaches to manage symptoms
- Find out what the client has done in the past to address these problems? What was successful?

Tell client about alternative choices they have to address their nutritional problem(s). The counseling cards can be used for this. The choices should address the problems identified above. Make sure the key message(s) on the issue is/are communicated.

- Help the client set nutritional goal(s) to address the nutritional gap/problem
- The Nutritional Goal/Objective should be specific, measurable, achievable, and realistic and time bound (SMART). An example of a SMART goal is, *“I will make an effort to increase my weight by 4 kilograms by the end of March”*

Help the client to make informed choices. With the client (and family members/ care givers), develop approaches/actions to attain the nutrition goal/objective the client has set. As much as possible let the client come up with the choices that are practical and relevant to their context. Some may include:

- Monitor my weight every month to assess whether I am meeting my goal
- Use the handout to manage any symptoms that may affect my nutrition/dietary intake
- Increase my energy intake by a) having one extra snack every day b) adding groundnut paste or a spoon of ghee into my evening meals, c) changing my breakfast from a cup of tea and scones to a mug of porridge made from fermented millet/sorghum or UNIMIX
- Ensure that all my drinking water (including the water I use to mix juice) is boiled (for at least 8-10 minutes), and that I wash my hands before preparing my food and before I eat any food. I will also ensure all my fruits are well washed with clean water before I eat them.

Explain fully the choice(s) the client has made

- Discuss any barriers the client may have in implementing the choices they have made
- Ensure the client can explain the actions they will take. Make demonstrations if necessary
- Summarize what has been agreed to be done and how it will be done (the client can do this)

Reassure and give Return date on the next visit

3.1.3 Management of MDR-TB patients with Severe Acute Malnutrition

This implementation guideline called for nutrition status screening using anthropometric measurements in order to determine those at high risk of developing SAM and other forms of undernutrition. It is of paramount importance to screen and classify types and severity of each type of malnutrition and plan their care according to the standard guidelines.

Management of severely malnourished adults

i. Identifying Severely Malnourished Adults

- Adults exhibiting signs of malnutrition such as wasting (thinness) or oedema should be assessed for severe acute malnutrition
- If their BMI is less than 16.0 or if they have bilateral oedema (which has been determined is not due to heart failure, pre-eclampsia, kidney failure, or beriberi) than they need to be treated
- Severely malnourished patients should be nutritionally and clinically managed in two phases with a “transition stage” in between. **In Phase 1**, the patient is stabilized as life-threatening illnesses are treated; while in **Phase 2** the patient regains lost weight.
- Patients without life-threatening illnesses may not require **Phase 1 treatment**; however, all patients will need **Phase 2 rehabilitation** of lost weight. During both phases, patients are fed special diets and are weighed daily.

ii. Management of Severely Malnourished Adults

Phase 1: Management to Stabilize the Patient

Severe acute malnourished (SAM) patients with complications for example: those who have no appetite (cannot eat) and who are suffering serious illnesses (such as low body temperature, low blood sugar, or dehydration) require inpatient stabilization at a nutrition rehabilitation unit or a therapeutic feeding center (located in health centers and hospitals). Ensure that the patient is stable before is referred to MDR-TB treatment centers.

SAM patients without complications; have none of the following signs and symptoms: Nutritional oedema (bilateral and pitting), electrolyte imbalance, and signs of shock,

hypothermia, hypoglycemia, anemia, and dehydration. Such SAM patients who are stable can be referred to MDR-TB treatment centers.

Clinical Management:

Upon admission, severely malnourished patients should be clinically assessed and treated in the following systematic manner.

1. Patients should first be tested for hypoglycaemia (blood glucose less than 3 mmol/litre). Hypoglycaemia must be treated immediately with glucose solution (follow your protocols)
2. Temperatures should also be taken to assess for hypothermia (low temperature) or fever. Patients with low temperature (less than 35.5 degrees Celcius rectally or 35.0 axillary) should be covered with blankets, especially around the head, neck, groin, and armpits. Any wet clothing should be removed. Low body temperature is dangerous and can be deadly
3. Patients in shock will show signs of lethargy, unconsciousness, cold hands, weak and rapid pulses, and low blood pressure, among others. These patients may need oxygen and IV fluids. Since severely malnourished patients are at risk of fluid overload (and heart failure), IV fluids should only be administered under the supervision of a physician and follow national (or WHO) guidelines on treatment of severe malnutrition. Solutions with lower sodium content are often administered. Patients must be closely monitored every ten minutes to ensure pulse and respirations do not increase with the fluid administration
4. If the patient is dehydrated, but not in shock, he/she usually has vomiting or diarrhea and may be lethargic, thirsty, have a dry mouth or tongue, or show poor skin turgor (skin is slow to pull back when pinched). Dehydrated patients will need a modified oral rehydration solution called **ReSoMal**, which has lower sodium content. Again, dehydrated patients need to be monitored for fluid overload (increasing respirations or pulse).
5. Severe anaemia should also be assessed (haemoglobin < 40 g/l), as this serious condition can cause heart failure. If the patient is severely anaemic, he/she needs to be treated by a blood transfusion, under the supervision of the physician. Iron supplements should **NEVER** be given during **Phase 1** treatment of severe malnutrition, as iron can make

infections worse

6. Severely malnourished patients often suffer from infections, but because the body lacks energy they do not always present with fever or signs of inflammation. One should therefore presumptively treat infections using broad-spectrum antibiotics according to your protocols (e.g. amoxicillin [500 mg three times daily] or cotrimoxazole [960 mg twice daily] for 7 days). Malaria and helminth (worm) infection should also be assessed and treated using respective national guidelines.
7. Initiate the patient on anti-TB as per national guideline if the patient wasn't on medication

Nutritional Management:

During Phase 1-stabilisation, the patient needs a diet that will prevent further weight loss, while infections are treated in preparation for the weight recovery of Phase 2. **F75 therapeutic milk is the only food used during Phase 1.** This milk has less energy (kilocalories) and protein than the milk used during Phase 2. F75 comes as a powder, to which 2 litres of cooled boiled water may be added.

Local production of F75 milk

- F75 may be produced using local ingredients, but must be prepared according to WHO (or MOHCDGEC) recipes
- Quantities of ingredients should be carefully measured to ensure the proper quantity of energy and protein is obtained
- When preparing F75 milk, it is very important that hands be washed prior, and that all cooking utensils and equipment be clean. Only clean safe water (boiled or treated water) should be used
- Patients are very susceptible to infection, so good hygiene is important
- Once prepared, the F75 must be discarded after 6 hours, as it will go bad.

1. The amount of milk patients are fed is based strictly on their weight. Weight must be measured daily and feeding quantities adjusted accordingly to ensure they get the recommended intake (no more and no less), following WHO or MOHCDGEC guidelines. F75 should be given at the recommended amounts at each feeding, avoiding giving the patient a large quantity to consume throughout the day
2. Feeding frequency: Feeding is started in small, frequent amounts, so as not to overwhelm the body. Initially, patients are fed every 2 hours, including throughout the night. After the first day, patients are gradually fed greater quantities less frequently: every 3 hours, followed by every 4 hours

3. Patients must be closely monitored to ensure they are drinking the milk. Patients who are not able to drink 80% of the milk over 2 consecutive feedings (including losses from vomiting), may need to have a nasogastric tube inserted until they are able to drink it all by themselves.

Transition Phase

The criteria for transitioning from Phase 1 to Phase 2 are return of appetite, control of serious illnesses, resolving oedema, and ability to easily finish all feeds. During the three days of transition, F75 milk is replaced with F100 milk. During the first 2 days of transition, the patient is given the same amount (in ml, not in kcals) of F100 as the last amount of F75 given. This is given every 4 hours. On the third day, the F100 is gradually increased at each feed as long as the patient is tolerating it (i.e. finishing the food and showing no signs of fluid overload). This gradual increase continues until some food is left after each meal. At this point, transition is finished and the patient is ready for Phase 2 rehabilitation. An appropriate ready to use therapeutic food (RUTF) may also be introduced in small quantities at this stage in addition to F100 to allow patients to be familiar with it when they reach Phase 2.

Phase 2: Nutritional Management for Weight Catch-up

Recovery of lost weight occurs during Phase 2 treatment of severe malnutrition. Patients who have completed Phase 1 treatment and transition are admitted to Phase 2. Additionally, severely malnourished adults who do not require Phase 1 treatment (i.e. those adults who lack serious illness and who have appetite) may be directly admitted to Phase 2 treatment. Phase 2 treatment may be conducted in an inpatient setting (often at the same Phase 1 facility) or it may be conducted in an outpatient or community setting. The nutritional management is generally the same in either setting, though the specific foods may vary.

Nutritional Management

The aim of Phase 2 is to achieve rapid weight gain and rebuild lost tissues. This requires more energy and protein than needed during Phase 1. Kind of Food: For inpatient management, F100 therapeutic milk is given at this time. Like F75, it may be prepared using local ingredients (strictly following the recipe) or by adding cooled, boiled water to F100 powder. It must also be prepared hygienically and discarded after 6 hours. A ready to use therapeutic food (RUTF) such as **Plumpy'nut®** may also be used in place of F100 for inpatients. For outpatients, an RUTF must be used, as F100 cannot be distributed to outpatients. RUTF is nutritionally equivalent to F100. They have the same energy, protein, fat, and vitamin and mineral levels. Closely monitor acceptance and any allergies/intolerances/side-effects.

Amounts:

The amount of F100 patients are fed is based on their weight. Weight is measured daily weekly, with feeding quantities adjusted accordingly to ensure they get about 70-80 mls/kg body weight/day.

Where available, RUTF can be introduced as the patient tolerates it. Start the small quantities of the RUTF and increase it to a maximum of:

- 6 sachets of RUTF (92g, 3000 kcal) per day (or 2 pots of locally prepared RUTF (260g, 2700 kcal) per day).
- Closely monitor acceptance and any allergies/intolerances/side effects.
- Towards discharge, the patient should be encouraged to begin eating normal foods from the home diet. Over the last few days of treatment, the F100 or RUTF should be gradually replaced with family foods.

Outpatient MDR-TB patients are given a week's worth of RUTF (or two week's worth for biweekly programs) to take home. Initially the RUTF should provide approximately the daily energy needs of the person (6 sachets Plumpynut or 2 pots of locally prepared RUTF per day). Noting the HIV status, WHO recommends that HIV+ adults who are symptomatic (WHO Stage 2 or greater), need to increase their daily energy intake by an additional 20 to 30 percent. This should be considered when calculating the necessary amount of food to give them. As the client gets better and increases weight, the amount of RUTF can be reduced to provide about 40-50% of energy needs (3 sachets **Plumpynut** or 1 pots of locally prepared RUTF per day).

Clinical Management

- All HIV+ patients who are admitted for severe malnutrition (BMI<16) should be referred for eligibility for ART. Many emaciated HIV+ patients are very likely to have advanced HIV immune suppression (WHO stage III and IV)
- Anti-TB should be provided according to the National guidelines

Failure to respond

Many times patients are slow to respond to nutritional treatment due to an untreated underlying illness, a nutrient deficiency, or refusal or inability to follow the treatment regimen. Before

making other recommendations make sure:

- The weighing equipment is accurate and being used correctly,
- The food is prepared hygienically and correctly (F75 and F100) and has been given according to recommendations (daily frequency, and amounts).
- Related illnesses have been addressed. Other issues that may affect weight gain and to consider for referral/specialized care are:
 - The patient is micronutrient deficient
 - There is mal-absorption (or intolerance to certain foods)
 - Other serious conditions and underlying diseases that may delay weight gain, especially, diarrhoea, dysentery, pneumonia, tuberculosis, urinary tract infection, otitis media, malaria, and hepatitis/cirrhosis, particularly where these have not been recognized, or successfully treated.

Cancer patients, burns victims, HIV and TB infected patients in general have higher energy requirements and therefore recovery may be slower.

3.1.4 Management of severely malnourished children

Therapeutic feeding for children with severe malnutrition

Therapeutic feeding meets the complete nutritional needs of a severely malnourished child through a specifically prepared and formulated diet. Severely malnourished children with medical complications should be admitted to hospital for medical care including therapeutic feeding.

During the stabilization phase these children should be fed with a **low protein therapeutic milk called F 75 and receive 100 kcal/kg/day**. The feeds should be given in small amount and frequently (every 3 to 4 hours). The child should also receive medical care to manage complications (e.g. severe dehydration, shock, severe anaemia, corneal ulceration). After the stabilization phase, these children should receive **F 100 therapeutic diet or RUTF**

Severely malnourished children without medical complications may be managed at home. These children should receive **150-220 kcal/kg/day (6 months-5 years) or 60-75 kcal/kg/day (6-14 years) of RUTF** as well as vitamin A supplements, antibiotics and deworming treatment. It should be provided to the caregiver in form of RUTF in adequate quantities until the child has recovered nutritionally (**usually ~6-10 weeks**).

F 75 is a therapeutic diet. This is prepared from dried skimmed milk, sugar or preferably cereal flour, vegetable oil, mineral and vitamin mixes and water. It can be either ready-to-prepare or prepared with local products. It is used in the stabilization phase for severely malnourished children with no appetite. F 75 should be used only for inpatient care

Note F 100 milk and F 75 diet **are not used** for community-based management. Therapeutic

F 100 is a therapeutic diet prepared from dried skimmed milk, sugar, vegetable oil, mineral and vitamin mix and water. It is used only for the in-patient feeding of severely malnourished children once they are stable and appetite has recovered.

feeding may be offered through a number of approaches.

Ready to Use Therapeutic Food (RUTF) is a therapeutic food prepared from peanut butter, dried skimmed milk, sugar, oil and a micronutrient mixture so as to have the same energy, protein and micronutrient composition as non diluted F 100, except for iron. It is prepared as a paste that can be stored safely in small plastic containers at room temperature for up to several weeks and given to child on a spoon. RUTFs are appropriate for children with severe malnutrition either when admitted to hospital or when managed at home.

During rehabilitation, other specialized foods such as amylase-enriched, high-energy porridges

fortified with micronutrients may be used if they provide the same nutritional composition as F 100. These porridges may be combined with milk to increase their nutrient content.

Table 2: How to make F75 and F100 using local ingredients

Alternative sources of local milk	Ingredients	Amount for F75	Amount for F100
If Fresh Cow's Milk (or whole cream animal milk) or UHT milk	Fresh animal (cow's) milk	300ml	880ml
	Sugar	100g	75g
	Vegetable oil	20g	20g
	Mineral Mix (CMV)	20ml	20ml
	Clean safe water	Make to 1000ml	Make to 1000ml
Have whole dried milk	Dried whole milk	35g	110g
	Sugar	100g	75g
	Vegetable oil	20g	20g
	Mineral Mix (CMV)	20ml	20ml
	Clean safe water	Make to 1000ml	Make to 1000ml
Have skimmed dry milk	Skimmed dry milk	25g	80g
	Sugar	100g	75g
	Vegetable oil	20g	20g
	Mineral Mix (CMV)	20ml	20ml
	Clean safe water	Make to 1000ml	Make to 1000ml

Sources: "The Management of Nutrition in Major Emergencies", WHO, 2000, Geneva

3.1.5 Management of micronutrient deficiency to MDR-TB patients

A daily multiple micronutrient supplements should be provided in situations where fortified or supplementary foods should have been provided in accordance with standard management of moderate undernutrition. All pregnant women with active TB should receive multiple micronutrient supplements that contain iron and folic acid and other vitamins and minerals, according to the United Nations Multiple Micronutrient Preparation, to complement their maternal micronutrient needs. For pregnant women with active TB in settings where calcium intake is low, calcium supplementation as part of antenatal care is recommended for the prevention of pre-eclampsia, particularly among those pregnant women at higher risk of developing hypertension, in accordance with WHO recommendations. All lactating women with active TB should be provided with iron and folic acid and other vitamins and minerals, according to the United Nations Multiple Micronutrient Preparation, to complement their maternal micronutrient needs.

Food provides the best source of micronutrients. Micronutrient supplementation should only be given

if it is not possible to consume sufficient quantities and quality of food, or in case of micronutrient deficiency (Evidence is not available on effectiveness of micronutrient supplementation). In such a case, a daily multiple-micronutrient supplement is recommended. It is advisable to adhere to one Recommended Daily Allowance. Clients should be informed that excessive doses of some micronutrients (like vitamin A and D) can be toxic. Some people who take high doses of vitamin C have reported intestinal upset or kidney complications.

It is important to remember the following:

- Supplements are not an alternative to a balanced meal. If taken, they should “supplement” the food eaten
- RUTF contains most essential micronutrients that may be sufficient to cater for the daily requirements when taken in the prescribed dosage
- Supplements do not treat MDR-TB. In some cases they improve the immunity of the body to fight against infections
- Where clinically indicated, one tablet of iron/folic acid (e.g. FEFO (200mg) or ferrous sulphate (200mg) per day) can be given during phase two of management of acute severe undernutrition
- Get advice from a health professional whether supplements are necessary and if so, the required dosage
- It is rare for toxicity or overdose of a nutrient to result from food intake alone, but taking supplements may lead to overdose
- Other means of supplementation may be recommended by a doctor if the MDR-TB patient is severely deficient and has had infections (e.g. mal-absorption, diarrhea, specific intolerances, severely malnourished)

Advise the patients against purchasing unregulated and unapproved supplements. Also discourage the use of unknown herbal medications or nutritional supplements.

3.1.6 Preparing patients for discharge from the nutrition care and treatment

Once the BMI reaches 17 or greater for adults or WFH above -2SD z-scores of the standard population, the patient is ready for discharge. Patients should also:

- Have appetite and be able to eat normal family foods.
- Have some level of mobility (Severely malnourished adults may have some muscle atrophy because they have been unable to walk whilst severely ill. Physical therapy may therefore be beneficial to facilitate full mobility).
- Be stronger than they were when they came to hospital.
- Have received nutrition and dietary education.
- In preparation for discharge, the patient and his/her family members or caregivers should be provided with nutrition education and counseling. The key component of the education and counseling should include:
 - The importance of eating a diet of diverse foods during at least three meals per day with two snacks in between.
 - Home and cooking hygiene practices.
 - Common illnesses associated with low immunity and dietary and approaches to addressing them: diarrhoea, vomiting, and thrush.
 - Importance of regular medical check-ups.
 - Linkages should be made with:
- Supplementary feeding programs that provide food assistance (such as High Energy Corn Soy Blend) for continued weight gain to a BMI greater than 18.5.

Institutions and organizations providing other services (like social welfare, prevention of parent to child transmission, home based care, opportunistic infection and antiretroviral treatment)

3.1.6 Management of moderate acute malnutrition

Adult patients suffering from MDR-TB with concurrent moderate undernutrition can be managed at home if they are stable. The following nutrition care should be followed

First visit

- Nutrition assessment including detailed history of is indicated
- The patient should receive TB treatment as directed by the national guideline
- If the patient is losing weight, further investigations including HIV-counseling are warranted. If found to be positive, the patient should be referred to CTC to start ART
- Assess for anemia. If anemic, provide iron supplementation according to the national guidelines of anemia
- Assess for food intake, counsel for energy and protein dense foods, assess for insecurity, and judge if the client would benefit from food support
- Counsel the client to consume 20-30% more of energy from normal home based foods based on the current weight as below
- Counsel the client to consume fortified food.

Table 3: Energy requirements for MDR TB patients

Age	Energy (kcal) needed per day + 20-30% in active TB infection	Food equivalent	Tentative cost/meal (average)
15-17	2800+700	2 mugs (250mls) porridge 5 medium sweet potatoes 2 large coffee cups of fresh milk 5 small serving spoons of boiled pumpkin or 4 medium potatoes 3 small serving spoons of meat sauce+ 1 small ladle of vegetables	
18+	2170-2430 + 525-600	2 mugs (250mls) porridge 4 medium sweet potatoes 5-6 large coffee cups of fresh milk 5 small serving spoons of boiled pumpkin or 4 medium potatoes 2 small serving spoons of meat sauce+ 1 small ladle of vegetables 4 eggs	
Pregnant and post partum	2450-2670 + 525-600	2 mugs (250mls) porridge 4 medium sweet potatoes 5-6 large coffee cups of fresh milk	

		5 small serving spoons of boiled pumpkin or 4 medium potatoes 2 small serving spoons of meat sauce+ 1 small ladle of vegetables 4 eggs	
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3.1.7 Follow up of the discharged patient

Follow up sessions

The follow up sessions helps both patient and counselor or health worker to track the progress and improve care and treatment. These sessions enable the counselor to evaluate the client's progress, adjust actions as needed, encourage adherence to beneficial practices, and measure the effect of interventions. During follow-up sessions, health worker will:

- i. Check the general progress of the clients
- ii. Identify what problems have arisen in following the plan prepared last session
- iii. Assess whether new complications have come up and address them
- iv. Assess whether actions agreed to earlier have been taken and if not, what were the barriers
- v. Further educate the client about issues and problems to be addressed. If necessary, discuss the problems in greater depth
- vi. Help the client plan specific diets
- vii. Support the client to adhere to their plans
- viii. Give the client additional handouts and materials if needed and available
- ix. Update the case notes and data on the client

3.1.8 Healthy lifestyle for MDR-TB patients

MDR-TB patients are not immune to other chronic non-communicable diseases. Moreover, TB is a chronic illness that can also predispose the patients to non-communicable diseases including diabetes, chronic obstructive lung diseases, among others. Healthy living among MDR-TB patients can also improve their wellbeing, adherence to care and treatment, and effectiveness in the medications. The following are important aspects to consider in order to achieving healthy lifestyles for MDR-TB patients.

i) Physical exercise

Regular exercise is important for healthy body and mind.

Physical exercises for bed ridden patients

- Breathing exercise at least three times per day to improve lung expansion
- Turning of position to prevent bed or pressure sores and to prevent pneumostatic pneumonia
- Sitting up position and light exercises like stretching hands and lifting legs
- Physiotherapeutic evaluation to identify patients capacity, muscle performance joint mobility

Ambulatory patients

- Breathing exercise at least three times per day to improve lung expansion
- Walking around the hospital compound for least 15 minutes

Discharged patients

- Breathing exercise at least three times per day to improve lung expansion
- Continue with light exercises and gradually increase as you can tolerate
- Brisk walking and jogging or cycling for at least 30 minutes five days per week (individualized)

Note: Ensure to have enough time to rest during the day (at least two hours) and enough sleep during the night (at least six hours)

ii) Hygienic practices

- Drink clean and safe water
- Clean environment including surrounding, sleeping room, toilet and bathroom, kitchen
- Washing hands using clean water and soap after using the toilet

- Washing hands before handling food
- Eat warm and fresh food

iii) Eating habits

- Eat adequate diversity of foods that covers at least each food group in each meal (refer to NACs job aid)
- Eat at least five meals per day, three main meals and two in between main meals
- Drink enough water -- at least two liters per day

iv) Other lifestyle aspects to consider

- Taking medicine as recommended. Some patients may have to take more medicines depending on their burden of disease.
- Stop smoking all forms of tobacco including cigarrate
- Avoid drinking alcohol and other illicit drugs

Other harm reduction interventions for the key populations should be continued. They include methadone-assisted therapy for PWUDs, safer needle exchanges for IDUs, safer sex practices for people at risk, among others.

Chapter 4

4.1 Nutritional management in MDR-TB patients with coexisting conditions

4.1.1 Management of MDR-TB with Diabetes and nutrition complication

Type 2 diabetes may result from drugs complication on insulin. For example, MDR-TB patients may also be on ART that contain PIs and therefore resulting into insulin resistance. Under such circumstance, the following assessments are recommended:

- Fasting glucose
- Fasting lipid panel (total cholesterol, HDL, and LDL cholesterol [calculated or direct], and triglyceride levels
- A blood glucose level after oral administration of 75 g of glucose may be used to identify impaired glucose tolerance in patients with risk factors for type 2 diabetes mellitus or those with severe body fat changes.

If the patient is glucose intolerance and/or diabetes mellitus

- Avoid use of a drugs that may trigger further insulin intolerance such as PI as initial therapy in patients with pre-existing glucose intolerance or diabetes mellitus
- If the patient is under diabetic control, follow established guidelines for treating diabetes in the general population

Oral glucose tolerance tests may lead to one of the following diagnoses. (Blood glucose is measured in either mmol/l or mg/dl. To change Mmol/l to gm/dl. Multiply the number of mmol/l by 18 or divide the number of mmol/l by 0.0555.) Average healthy persons have a glucose level of 4.5 to 7.0 mmol/dL (80-125 mg/ dL)

- Normal response: A person is said to have a normal response when the 2-hour glucose level is less than 140 mg/dl (7.8 mmol/dL), and all values between 0 and 2 hours are less than 200 mg/dl (11 mmol/dL)
- Impaired glucose tolerance: A person is said to have impaired glucose tolerance when the fasting plasma glucose is less than 126 mg/dl and the 2- hour glucose level is between 140 and 199 mg/dl (7.8-11.0mmol/dL)
- Diabetes: A person has diabetes when two diagnostic tests done on different days show that the blood glucose level is high (>200 mg/dL (11mmol/dL)
- Gestational diabetes: A woman has gestational diabetes when she has any two of the following: a 100g OGTT, a fasting plasma glucose of more than 95 mg/dl, a 1-hour glucose level of more than 180 mg/dl, a 2-hour glucose level of more than 155 mg/dl, or a 3-hour glucose level of more than 140 mg/dl

- Educate/Counsel the patient on need to control diabetes

- Diabetes may be treated with insulin, oral medications, exercise, and a diabetic diet.

If the patient is glucose intolerance and/or diabetes mellitus

- Avoid use medication that trigger further intolerance in patients with pre-existing glucose intolerance or diabetes mellitus
- If the patient is under diabetic control, follow established guidelines for treating diabetes in the general population
- Educate/Counsel the patient on need to control diabetes
- Diabetes may be treated with insulin, oral medications, exercise, and a diabetic diet

Type 2 diabetes is first treated with weight reduction (if over weight), a diabetic diet, and exercise. If these measures fail to control the elevated blood sugars, oral medications are used. If oral medications are still insufficient, insulin medications are considered.

Recommended medicines for diabetes in HIV-infected individuals are metformin and rosiglitazone, which both increase insulin). Energy and nutrient needs should be derived from a balanced, nutritious diet that is low in fat, cholesterol, and simple sugars. Adherence to a balanced diet is an important aspect of controlling elevated blood sugar in patients with diabetes.

- Together with the patient, estimate the energy, protein, and fat requirements, taking into consideration the age, sex, physical activity, physiological status and the target weight for the client
- Considering any symptoms the patient may be having, food preferences and availability, help them design a variety of diets that they can prepare in their homes, grouping meals into breakfast, lunch, dinner, and snacks
- Ensure moderation of (saturated) fats/oils, and simple sugars.

If the patient is overweight (BMI>25), recommend weight loss

- Ask the client about his/her daily food intake. If intake of fat/energy is higher than recommended, help the client to identify ways to reduce consumption of high-fat and high energy foods, especially those not rich in other nutrients
- Encourage the client to eat a variety of foods
- Encourage the client to continue with physical activity such as house work or other work, and

to exercise regularly through recreational activities or walking

- If weight increase is likely due to metabolic changes fully or partly, (e.g. if weight has increased rapidly despite little change in dietary intake), refer the client to a medical doctor for further assessment and treatment.

If the patient is underweight or losing weight

- Ensure the client is controlling blood sugar well. Weight loss is sometimes due to the diabetes (i.e. the loss of sugar in the urine: if the diabetes (blood sugar) is brought under control, the client should stop losing weight and should improve strength
- Ensure the client is consuming between 20-30% additional energy over and above the requirements of an HIV-negative person of the same age, sex and physical activity. This implies taking 2-3 nutrient dense snacks during the course of the day, in addition to well-balanced meals
- May want to increase the frequency of consumption of their food (without changing the time for taking medication during the course of the day)
- Discuss potential ways to increase consumption of whole meal/grains in place of processed products and refined sugars
- In order to increase energy and still control blood sugar level, medication may be needed

Parameters for Good Control of Blood Sugar

Clients who can afford to monitor their blood sugars frequently should be taught how to do it. Use the following blood sugars for indications of good control or poor control.

- Fasting Blood sugar:
 - 3.5 – 5 mmol/l 63 – 90 mg/dl 1 hour after meal
 - 6 – 9 mmol/l 108 – 162 mg/dl 2 hours after meal
 - 7 – 10 mmol/l 126 – 180 mg/dl If the units are higher than the upper limit by:
 - 2 units, that is considered “high”
 - 4 units, that is considered “very high”

- 6 units, that is considered “dangerously high”
- Any blood sugar that is 8 units or more above the upper limit needs immediate medical attention.

Points for the Patient to Remember

- What, when, and how much one eats affect the blood glucose level
- Blood glucose can be kept at a healthy level if the client:
 - Eats about the same amount of food (especially the carbohydrates) each day
 - Eats at about the same times each day
 - Takes their medicines at the same times each day
 - Exercises at about the same times each day
- Clients should eat balanced diets (i.e. choice of foods from: starches, vegetables, fruit, legumes/meat and meat substitutes/milk products. How much of each depends on the client’s daily energy and nutrient needs
- Limit the amounts of fats and sweets you eat each day.

Messages for a sick client

It’s important to educate clients about diabetes and MDR-TB to take care of their diabetes even when ill. Here are some tips on what to do:

- Continue with diabetes medications even if they can’t eat or you can’t keep food down
- Drink at least one cup (8 ounces) of water or other calorie-free, caffeine-free liquid every hour while awake
- If the client can't eat the usual food, they should try juice, soup, crackers, popsicles, or other foods that are soothing and easy to eat
- If they can't eat at all, they should drink plenty of liquids with calories. Lack of enough calories, may increase the risk of hypoglycaemia (low blood sugar)
- Make sure to check blood glucose. Blood glucose level may be high even if one’s not eating
- If vomiting or diarrhea are severe, seek clinical care immediately

4.1.2 Management of undernutrition in the MDR-TB and HIV co-infection

Undernutrition is not uncommon among HIV-TB co-infected patients. Such patients also present with higher risk of treatment complications and mortality (24). There is a vicious cycle of undernutrition and the disease itself. TB contributes to undernutrition, which weakens immunity and thereby increases the likelihood that latent TB will develop into active disease (25). Poor nutrition status may also loop back to poor adherence to the standard treatment adherence, and therefore result into MDR-TB. For recovering TB and MDR-TB patients, HIV and undernutrition lower immunity, increasing the risk of reactivation of TB. As a result of pathophysiology of the disease, most individuals with active TB experience weight loss and micronutrient deficiencies. Like in HIV, weight loss among those with TB also can be caused by multiple factors. They include household food insecurity and poverty due to chronicity of the disease, inability to engage in economic activities, and cost of the disease itself. Such socio-demographic disadvantages may be heightened in TB-HIV co-infection. Other causes include: reduced food intake due to loss of appetite, nausea, and abdominal pain. Nutrient losses from vomiting and diarrhea are also common among patients suffering from the duo conditions (26). Moreover, there are documented metabolic alterations caused by the disease itself (27).

In addition to the standard recommended ART and TB treatment, WHO recommends nutrition workout, counseling, and care for all patients with co-infections. This will help to adhere to adequate intake of essential nutrients required to address weight loss and micronutrient deficiencies. Considering an immune compromised individual (or PLHIV) will be more susceptible to opportunistic infections, adherence to ART is critical. TB is one of a few opportunistic infections that arise, but other infectious diseases such as pneumonia, candidiasis, helminthes, or water/food borne illness (giardia) are common. In this way, MDR-TB may be partly prevented; in case of the condition, proper management will be effective. With co-infections, nutritional needs are higher due to combating multiple foreign organisms in the body.

The World Health Organization recommends the following for care and treatment for undernutrition for children with HIV-TB co-infection

Children under six months of age should be managed according to the WHO standards for management of undernutrition (12):

- i. Children with severe acute malnutrition who are HIV infected should be started on antiretroviral drug treatment as soon as possible after stabilization of metabolic complications and sepsis. This would be indicated by return of appetite and resolution of

severe oedema.

- ii. HIV-infected children with severe acute malnutrition should be given the same antiretroviral drug treatment regimens, in the same doses, as children with HIV who do not have severe acute malnutrition. HIV-infected children with severe acute malnutrition who are started on antiretroviral drug treatment should be monitored closely (inpatient and outpatient) in the first 6–8 weeks following initiation of antiretroviral therapy, to identify early metabolic complications and opportunistic infections.
- iii. Children with severe acute malnutrition who are HIV infected should be managed with the same therapeutic feeding approaches as children with severe acute malnutrition who are not HIV infected. This also applies for those with MDR-TB-HIV co-infection
- iv. HIV-infected children with severe acute malnutrition should receive a high dose of vitamin A on admission (50 000 IU to 200 000 IU depending on age) and zinc for management of diarrhoea as indicated for other children with severe acute malnutrition, unless they are already receiving F-75, F-100 or ready-to-use therapeutic food, which contain adequate vitamin A and zinc if they are fortified following the WHO specifications.
- v. MDR-TB HIV-co-infected children with severe acute malnutrition in whom persistent diarrhoea does not resolve with standard management should be investigated to exclude carbohydrate intolerance and infective causes, which may require different management, such as modification of fluid and feed intake, or antibiotics.

Children aged 6 months to 14 years with MDR-TB and HIV-co infection, suffering from undernutrition also have increased nutrition needs. Even without undernutrition, such patients have 20-30% additional energy requirements compared to the normal or otherwise healthy children. To prevent undernutrition, such children should be replenished with additional energy and proteins foods to cater for such demand.

In the situation where they have severe acute undernutrition, they should be managed according to nutrition care plan C. They should be managed using care plan B if they have moderate undernutrition, and care plan A when they are normal. The following should be done in addition:

- i. These children also need ART and should be referred to a treatment site for assessment and treatment of TB
- ii. The additional 20-30% energy is best given through additional household foods, provided

as part of a balanced, varied diet. If this is not possible, then specific nutritional supplements should be offered until the underlying causes of poor weight gain, or cured from MDR-TB

- iii. Children who have chronic increased nutritional requirements, but who are not severely malnourished, may require long-term nutrition support. Nutrition support may be provided in the form of food or other special products such as locally produced fortified porridges i.e. nutritional supplements
- iv. Severely malnourished children with medical complications should be admitted to hospital for medical care including therapeutic feeding. During the stabilization phase these children should be fed with a low protein therapeutic milk called F 75 and receive 100 kcal/kg/day. The feeds should be given in small amount and frequently (every 3 to 4 hours)
- v. The child should also receive medical care to manage complications (e.g. severe dehydration, shock, severe anaemia, corneal ulceration).
- vi. After the stabilization phase, these children should receive F 100 therapeutic diet or RUTF
- vii. Severely malnourished children without medical complications may be managed at home. These children should receive 150-220 kcal/kg/day (6 months-5 years) or 60-75 kcal/kg/day (6-14 years) as well as vitamin A supplements, antibiotics and deworming treatment. It should be provided to the caregiver in form of RUTF in adequate quantities until the child has recovered nutritionally (usually ~6-10 weeks).

Adults with MDR-TB, HIV-co-infection with severe acute or moderate undernutrition should be managed according to the standard care and treatment of undernutrition stipulated in this guideline.

4.1.3 Management of undernutrition in the MDR-TB and pregnancy

Low birth weight, a predictor of infant morbidity and mortality, is more common in infants borne by women with TB (9-13). Infants of mothers with MDR-TB are more likely to have increased risks of premature birth and perinatal death, while the mothers are more likely to have complications during pregnancy, with disorders of hypertension during pregnancy being the more common (10, 12, 13, 28).

It is recommended to initiate appropriate MDR-TB treatment earlier in the pregnancy (13, 28). In populations where calcium intake is low, calcium supplementation is recommended as part of

antenatal care for the prevention of pre-eclampsia among pregnant women, particularly among those at higher risk of hypertension. Regardless of the presence of TB, MDR-TB, or XDR TB, the maternal requirement for micronutrients during pregnancy tends to be 25–50% higher, depending on the nutrient, than the pre-pregnancy requirements (29, 30).

A healthy well-nourished woman should gain between 10 kg and 14 kg during pregnancy to increase the likelihood of delivering a full-term infant weighing at least 3.3 kg (31). To support an average weekly weight gain of approximately 420 g and an average monthly gain of 1.7 kg in the second and third trimesters, a woman usually consumes 360 kcal/day (1.5 MJ/day) in the second trimester and 475 kcal/day (2.0 MJ/day) in the third trimester, in addition to usual food (31). To support the additional protein requirements during pregnancy, women are advised to consume an additional 9 g/day of protein during the second trimester and 31 g/day in the third trimester. A pregnant adolescent needs 1.5 g protein/kg pregnant body weight to support her own needs as well as those of the fetus (51). Underweight pregnant women (BMI less than 19 kg/m²) can eat additional food, in order to achieve a total weight gain between 12.5 kg and 18 kg, with an average weekly weight gain of 510 g and an average monthly gain of 2 kg in the second and third trimesters (32). Such requirements may have to be increased depending on the presenting case for MDR-TB. This is because of the increased requirements to counteract the losses brought about by increased metabolic rates from fevers, loss of nutrients from vomiting and diarrhea, and low intake from loss of appetite. Nutrition assessment in every encounter and counseling based on individual is essential to provide tailor made care and treatment.

Chapter 5

5.1 Care and Support for populations affected by MDR-TB

5.1.1 Food support to MDR-TB patients.

MDR-TB patients have varied nutritional needs depending on their disease presentation and state of their nutrition status. Compared to the normal people, MDR-TB patients need more energy, proteins, and other micronutrients. To achieve this, meals planned for these patients should contain high energy and protein dense foods substances. The assumptions for should be considered for the meal plan for MDR-TB patients:

The following preference is advised:

Assumptions:

- The recommended energy requirement per day is likely to be 2500kcal considering that they are usually wasted so have relatively low BMI (this amount includes the 20% increase of energy in MDR-TB)
- One nutritious meal should be able to provide approximately 850kcal to meet the daily requirement of 2500kcal. The meals should be spread through the day.
- Recommended amount of Vitamin A for an adult is 900 μ g for an adult man, and 700 μ g for a woman, we have based our micronutrient requirement based on the daily-recommended vitamin A. Then one nutritious meal should provide approximately 300 μ g
- We assume that if one of the proposed meals offered to the patient in the estimated amount then 1/3 of the recommended energy and nutrient is met.
- MDR-TB patients should have a total of three main meals and two in between meals (or snacks) to meet such dietary requirement.

Proposed Recipes available locally

1. Menu 1 (Ugali beef and vegetables)
 - a. Ugali (300g)
 - b. Beef (80g) – Beef, onions, carrots, tomatoes, oil
 - c. Chinese cabbage (100g) – oil, onions preferably boiled

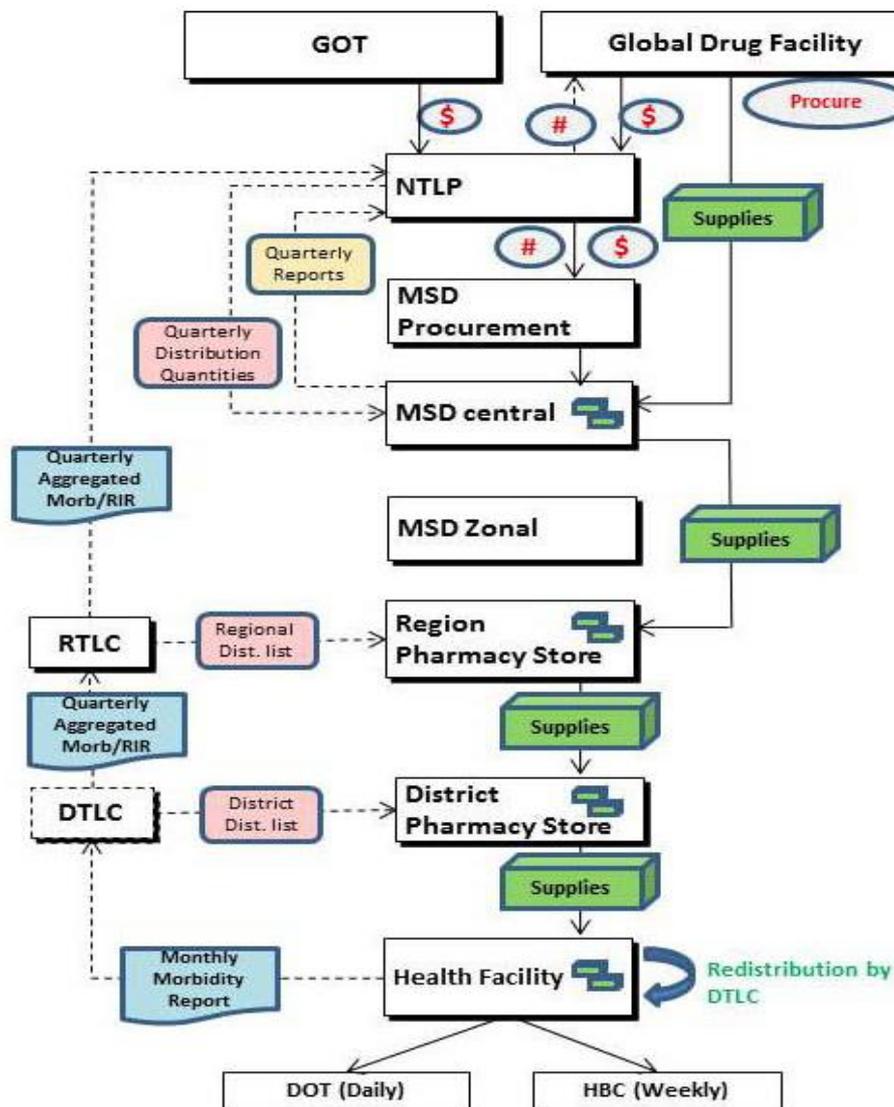
- d. A portion of seasonal fruit
2. Menu 2 (Rice and beans, vegetables)
- a. Rice (200g) – rice, salt, oil –boiled
 - b. Beans (280g) – beans, carrots, green peppers, onions, salt
 - c. Amaranth (200g) – amaranth, onions, oils
 - d. A portion of seasonal fruit
3. Menu 3 (Potatoes with beans, vegetables)
- a. Potatoes (450g) – potatoes, carrots, African egg plant, onions, tomatoes
 - b. Beans (280g) - beans, carrots, green peppers, onions, salt
 - c. Chinese cabbage (100g) - oil, onions preferably boiled
 - d. A portion of seasonal fruit

MDR-TB is a chronic and debilitation disease. Such patients further subject households to poverty and food insecurity. Moreover, the purchasing power in such households is lower, subjecting them further to poor feeding practices and undernutrition. Nutrition sensitive interventions should be designed to alleviate the nutrition impact of the disease to such households and communities at large. It is therefore important to introduce support structures to the community. Such support structures include food-based strategies, improving skills for food production and storage, microfinance, nutrition education that include TB and Nutrition IECs, mass media, HBCs and expert patients. It should also include collaboration from partners and non-governmental organizations to support communities affected. Other interventions recommended include: prescribed food packages; Subsidized Health insurance schemes to household members; Income generating activities; Promotion of home gardens; Education and school support to children.

5.1.2 Supply chain management of commodities

To ensure the smooth nutrition care and treatment of MDR-TB patients both in health facilities and community, it is essential to establish and align supply chain management of nutrition commodities in the existing supply chain management of TB care and treatment. Flow of nutrition care and treatment commodities from manufacturer to users should therefore be integrated in the existing system of MDR-TB drugs. The following flow diagram if followed can ensure availability of such commodities and management of nutrition related condition like it is for MDR-TB treatment.

Figure 4: Procurement and information flow of TB products (adapted from TB and leprosy logistic assessment report 2011)



Products needed for nutrition care and treatment

The nutrition products necessary for delivering care and treatment of MDR-TB patients include nutrition assessment tools, nutrients and supplements, food items, nutrition guidelines, counseling guidelines, IEC materials, growth monitoring charts, and R&R tools. Assessment tools include weighing scales for adults and children, measuring boards, MUAC tapes, all calibrated according to the national and international standards. Nutrients and supplements includes F75, F100, RUTF (such as *Plumpynut*), multivitamins and micronutrients for supplementation, Fortified foods (Micronutrient Powders, premixes, Fortified Blended Four), and other essential medicines and supplies for treatment of associated conditions such as ORS, Intravenous fluids, antibiotics, among others. The essential nutrition management commodities such as F75, F100, and RUTF should be included in the essential drugs list to ensure their constant supply. Other food items needed for care and treatment include the

high protein and energy diets for admitted patients, and for prescription to people living in vulnerability such as those in hunger or severe food insecurity.

NOTE: Nutrition supplements should not replace normal foods

Currently, international organizations have been supporting nutrition care and treatment for other disease conditions and specific populations. UNICEF and USAID have been key partners. They should also be involved in forecasting and implementation of such merchandise. At national level, TFNC has been the key partner in policy implementation in general population. It is a useful entity for IEC materials production and dissemination, training of health workers, and other interventions. TFDA should also be involved in standardization of the nutrition and food products. For care and treatment facilities in the district level, involvement of districts and regional authorities is essential.

Procurement

Medicine and essential nutrients and food supplements should be procured from the medical store department. The procurement system of medical items should follow the similar pattern as it is for Anti-TB medications to ensure the smooth flow and accountability. It can also help to cut down the cost of transportation and duplication of activities.

Commodity flow

TB commodities (drugs and other supplies) are WHO-prequalified. For nutrition commodities, F75, F100, and RUTF are also recommended by the WHO. The NTLP is the sole administrating organ for providing instructions on such essential commodities. Nutrition commodities will be procured direct from manufacturer after clearing from the port will be sent to MSD for storage and distribution up to the facility. On the other hand MSD Central is responsible for delivering commodities to the MSD zonal warehouses where TB and leprosy commodities are transported to but not stored. The commodities are then distributed to the RTLC who stores the commodities in the regional pharmacy store and distributes commodities to each DTLC based on each district's needs. The DTLC is then responsible for distributing commodities to the health facilities responsible for care and treatment of TB and MDR-TB. At the facility level, patients receive their treatment through clinics or as in patient's care depending on the state of treatment.

Information flow

Information flow of nutrition supplies should also follow the existing system for TB and Leprosy information flow. It is designed to ensure that health facilities collect and report data on the total

number of TB patients by regimen and stock on hand. In addition, using the current implementation guideline, they should also collect information on essential nutrition products needed for care and treatment. DTLCs will collect this information from the health facilities on a monthly basis. The DTLCs will compile such information and share with RTLC during the quarterly meeting. RTLC will compile all of the reports from the districts and creates regional report and submit to the NTLP on a quarterly basis. The NTLP the will review the data and prepares a commodities distribution list (that include TB and nutrition supplies) which is sent to the Medical Stores Department (MSD). This information is used for national level programming support, quantification and forecasting efforts, and supply planning.

Chapter 6

6.1 Monitoring and evaluation

To ensure implementation of nutrition intervention among MDR-TB, it is essential to merge monitoring and evaluation of such interventions with the existing strategies for TB care and treatment (Annex 6-7). For nutrition related interventions, the following are the important programmatic indicators:

6.1.1 Site level indicators: Input indicators

1. Sites reporting Nutrition commodity stock outs
2. Proportion of sites with anthropometric tools including functional weighing scales for adults and children, MUAC tapes, and height boards for children and adults
3. Proportion of nutrition and feeding IECs materials on the counseling and treatment rooms counseling materials
4. Proportion of sites with updated job aids, and nutrition guidelines for MDR-TB patients
5. Proportion of sites with trained health provider on nutrition counseling according to Ministry of Health Community Development, Gender, Elderly and Children guidelines
6. Proportion of sites capable of providing food for prescription for identified MDR-TB patients classified as having severe food insecurity and hunger

6.1.2 Process indicators

1. Proportion of children and adults MDR-TB patients receiving nutrition assessment during their visitation (Anthropometric measurements and dietary assessment)
2. Proportion of MDR-TB patients with undernutrition receiving nutrition counseling
3. Proportion of health workers adhering to GATHER steps in counseling
4. Proportion of severe undernourished MDR-TB patients receiving appropriate nutrition treatment following first and second phases of treatment

6.1.3 Impact/ outcome indicators

1. Proportion of newly diagnosed MDR-TB with normal, moderate and severe acute

malnutrition at baseline, 6, 12 and 24 months

2. Proportion of MDR-TB patients consuming food at least five times on the day before their visits at baseline, 6, 12 and 24 month (abstracted from the 24hrs dietary recall form)
3. Proportion of MDR-TB patients (diagnosed as severe, mild, or moderate malnourished) recovered and discharged from care and treatment
4. Proportion of MDR-TB patients with treatment completion rate

Monitoring and evaluation is part of everyday care and treatment. Information gathered by health workers, and indeed frontline health workers will be essential for impact evaluation of the program. Indicators should therefore be filled with clarity and completeness.

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Annexes

Annex 1. Algorithm for management of severe acute malnutrition for adults (WHO)

ALGORITHM FOR MANAGING MALNUTRITION IN ADULTS

ASSESS		CRITERIA	CLASSIFICATION	TREATMENT/CARE	
HISTORY	LOOK AND FEEL				
<p>Ask the client or refer to records:</p> <ol style="list-style-type: none"> Has the client lost weight in the past month/since the last visit? Has the client had: <ul style="list-style-type: none"> Active TB (on treatment)? Another chronic opportunistic infection (OI) or malignancy (e.g., oesophageal infections)? Mouth sores/oral thrush? Has the client's body composition/fat distribution changed noticeably? <ul style="list-style-type: none"> Thinning of limbs and face? Fat distribution on limbs, breasts, stomach, back? Has the client had: <ul style="list-style-type: none"> Nausea and vomiting? Persistent fatigue? Poor appetite? 	<ol style="list-style-type: none"> If the client has oedema on both legs or base of the spine: <ul style="list-style-type: none"> Rule out pre-eclampsia, kidney problems, elephantiasis, heart failure, and wet beriberi (vitamin B1 deficiency with oedema). Measure the client's weight (kg) and height (cm). Compute body mass index (BMI). Measure mid-upper arm circumference (MUAC) for all pregnant women, all women up to 6 months post-partum, and adults who cannot stand straight. Examine the client for conditions that cause secondary malnutrition (e.g., injuries, burns, surgical procedures, pregnancy, diarrhoea, or disease of the gastrointestinal tract, thyroid, kidney, liver, or pancreas). Look for medical complications and danger signs (e.g., anaemia, severe dehydration, active TB, severe bilateral oedema). If the client has no medical complications, give an appetite test using ready-to-use therapeutic food (RUTF). 	<p>Adults (non-pregnant and non-post-partum) BMI < 16 kg/m² (If can't measure BMI, MUAC < 19 cm) OR Bilateral pitting oedema (both feet or legs are swollen, and the skin remains indented when pressed with a finger)</p> <p>Pregnant women and women up to 6 months post-partum MUAC < 19 cm</p>	<p>Severe acute malnutrition (SAM) with complication (fever, hypothermia, severe anaemia or dehydration, vomiting, bilateral oedema ++++) or no appetite</p>	<p>Inpatient treatment Follow Nutrition Care Plan C1 (red).</p>	
		<p>Adults (non-pregnant and non-post-partum) BMI ≥ 16.0–< 18.5 kg/m² (If can't measure BMI, MUAC ≥ 19–< 22 cm)</p> <p>Pregnant women and women up to 6 months post-partum Weight loss or no weight gain MUAC ≥ 19–< 22 cm</p>	<p>Moderate/mild malnutrition</p>	<p>Significant weight loss</p>	<p>Follow Nutrition Care Plan B (yellow).</p>
		<p>Severe lung disease Active TB (first 3 months of treatment) Chronic diarrhoea Difficulty swallowing</p>	<p>Signs of symptomatic disease</p>		
		<p>Adults (non-pregnant and non-post-partum) BMI ≥ 18.5 kg/m² (If can't measure BMI, MUAC ≥ 22 cm)</p> <p>Pregnant and post-partum women MUAC ≥ 23 cm</p>	<p>Normal</p>	<p>Follow Nutrition Care Plan A (green).</p>	

Annex 2. Nutrition care plan (C1) for adults with SAM

Nutrition Care Plan C1: Inpatient Care of Adults with SAM and Complications or No Appetite

1. Admit

- Treat all medical complications following national guidelines.
- Give 200,000 IU of vitamin A if NO oedema (otherwise wait until the oedema subsides).
- If client is not on ART, provide **Cotrimoxazole prophylaxis** following MOHSS protocol for HIV-positive clients with CD4 < 350 or at WHO stage 3 or 4 regardless of CD4 level.

2. Stabilisation (1–2 days)

- Give client 70–80 ml/kg/day of F-75 or F-100, especially if client has **bilateral pitting oedema +++**.
- If client has confirmed lactose intolerance, give high-energy porridge or alternative F-75 recipes made of fermented milk. *Expect slower recovery but no increase in mortality.*
- Demonstrate sip feeding for patients who are too ill to eat by themselves.
- If client has appetite, give hospital diet plus three high-energy nutritious snacks a day.

3. Transition and rehabilitation

- Gradually introduce RUTF in small amounts until client can eat 3 sachets per day, plus enough fortified blended flour (FBF) to provide 2,850 kcal/day as tolerated, plus hospital diet.
- On discharge, provide 3 sachets of RUTF and 300 g of FBF per day to last for 2 weeks (total of 42 sachets of RUTF and 4,500 g of FBF).
- Make an appointment for review after 2 weeks.

4. Transition to Nutrition Care Plan C2 when client

- Has had no oedema +++ for 2 consecutive days
- Has appetite for RUTF
- Can return for review and supplementary food after 14 days

Annex 3. Nutrition care plan (C2) for adults with SAM

Nutrition Care Plan C2: Outpatient Care of Adults with SAM, Appetite, and No Complications

1. First visit

- Treat all medical complications following national and WHO guidelines.
- **If client is on ART and losing weight**, refer as needed for counselling on ART adherence, management of ART-related side-effects, opportunistic infections, immune reconstitution syndrome, treatment failure if on ART for more than 6 months (check CD4).
- Do an appetite test by offering one sachet of RUTF. The client should eat at least half of the sachet.
- **If client has appetite and health and social conditions allow home management**, give 3 sachets of RUTF and 300 g of FBF per day to last for 2 weeks (total of 42 sachets of RUTF and 4,500 g of FBF).
- Explain how to prepare and use the specialised foods. Encourage client to eat home foods after finishing the daily ration of RUTF. If client has appetite for RUTF but not for other foods, counsel on how to modify home foods to improve appetite. If client has no appetite, try giving smaller amounts of family food more frequently or sip feeding. If this is not successful, admit the client for INPATIENT management of SAM.
- Counsel on 1) weight monitoring at least once a month, 2) increasing energy density of home foods, 3) managing HIV-related symptoms through diet, 4) managing medicine-food interactions, 5) sanitation and hygiene, especially safe drinking water, and 6) exercise.
- Make an appointment for review after 2 weeks.

2. FOLLOW-UP management

- If client is not on ART, refer for **Cotrimoxazole prophylaxis** following MOHSS protocol and ART assessment.
- Give 3 sachets of RUTF and 300 g of FBF per day to last for 2 weeks (total of 42 sachets of RUTF and 4,500 g of FBF).
- Give ferrous sulphate tablets if client has clinical signs of anaemia (generalised pallor, fatigue, lower blood haemoglobin, decreased iron).
- Weigh after 2 weeks to monitor weight gain.
- If client is not gaining weight or has lost weight for 3 months or has worsening oedema, refer to a medical or clinical officer immediately.

3. Transition to Nutrition Care Plan B when client

- Has been treated for SAM for at least 2 months **AND** has BMI $\geq 16 \text{ kg/m}^2$ OR MUAC > 19 for pregnant women **AND** appetite **AND** some mobility **AND** can eat home foods

Annex 4. Nutrition care plan B for moderate malnutrition for adults

Nutrition Care Plan B for Adults with MAM

1. First visit

- Check for medical conditions and refer client for treatment when indicated.
- **If client is not on ART**, refer for Cotrimoxazole prophylaxis following MOHSS protocol and for ART assessment.
- **If client is on ART and losing weight**, refer as needed for counselling on ART adherence, ART-related side effects, opportunistic infections, immune reconstitution syndrome, treatment failure if on ART for more than > 6 months (check CD4), and lipodystrophy.
- Assess client for **anaemia**. If client is anaemic, provide iron supplementation according to national guidelines on anaemia.
- Assess food intake, energy density of the food, and food access and provide appropriate support if client has problems.
- Counsel client to consume 20%–30% more energy from home foods, based on current weight (see table below).

Age (years)	Energy (kcal) needed per day + 20–30% because of HIV	Food equivalent (give as snacks in addition to meals and other snacks)
15–17	2,800 + 700 because of HIV	2 mugs (250 ml) porridge 5 medium sweet potatoes 2 large coffee cups of boiled milk 5 small serving spoons of boiled pumpkin or 4 medium potatoes 3 small serving spoons of meat sauce + 1 small ladle of vegetables
18+	2,170–2,430 + 525–600 because of HIV	2 mugs (250 ml) of porridge 4 medium sweet potatoes 5–6 large coffee cups of boiled milk 4 small serving spoons of boiled pumpkin or 4 medium potatoes 2 small serving spoons of meat sauce + 1 small ladle of vegetables 4 eggs
Pregnant and post-partum women	2,455–2,670 + 525–600 because of HIV	2 mugs (250 ml) of porridge 4 medium sweet potatoes 5–6 large coffee cups of boiled milk 4 small serving spoon of boiled pumpkin or 4 medium potatoes 2 small serving spoons of meat sauce + 1 small serving spoon of vegetables 4 eggs

- Give client 300 g of FBF per day to last until the next visit to collect medication (e.g., 9,000 g to last for 1 month). If client is pregnant, give 300 of FBF per day to last until the next antenatal visit.
- Make an appointment for review after 1 month (or at next visit to collect medication).

2. FOLLOW-UP management

- Monitor weight and changes in eating patterns on each visit.
 - Counsel client to **increase energy intake** (eat more food more often, including snacks between meals; add groundnut paste, eggs, or milk to enrich food and spices or lemon juice to improve flavour) to meet extra food requirements.
 - Give client a **daily micronutrient supplement** that provides 1 RDA of a wide range of vitamins and minerals, unless FBF provides sufficient micronutrients.
 - Counsel client on** 1) the need for monthly weighing, 2) increasing energy density of the diet at home, 3) managing HIV-related symptoms through diet, 4) medicine-food interactions, 5) maintaining good sanitation and hygiene, especially safe drinking water, and 6) exercising to strengthen muscles and improve appetite.
 - If client has not gained weight for 4 months**, refer for medical examination or nutrition assessment.
3. **Transition to Nutrition Care Plan A when client** has BMI $\geq 18.5 \text{ kg/m}^2$ or MUAC $\geq 21 \text{ cm}$ for two consecutive weighings, no weight loss, and no clinical signs of symptomatic disease. For pregnant or post-partum women, transition to Nutrition Care Plan A when client is 6 months post-partum.

Annex 5. Nutrition care plan A for adults with normal nutrition status

Nutrition Care Plan A for Adults with Normal Nutritional Status

- If client is on ART, find out whether (s)he is adhering to treatment and managing diet-related symptoms. If not, counsel client as needed.
- If client is HIV positive but not on ART, give **Cotrimoxazole prophylaxis** following MOHSS protocol for HIV-positive clients with CD4 < 350 or at WHO stage 3 or 4 regardless of CD4 level.
- Counsel client to eat enough food to meet the 10% increase in energy and nutrient needs caused by HIV (see table below).

Age (years)	Energy (kcal) needed per day + 10% because of HIV	Food equivalent for extra energy (give as snacks in addition to meals and other snacks)
15–17	2,800 + 280 because of HIV	1 mug (250 ml) porridge 2 medium sweet potatoes 4 large coffee cups of boiled milk 3 coffee cups of spinach cooked in oil 1½ small serving spoon of boiled pumpkin or potatoes 1½ small serving spoon of meat sauce + ½ small serving spoon of vegetables 1½ eggs 4 ripe mangos 1 baobab fruit ½ an adult handful of <i>oofukwa</i>
18+	2,170–2,430 + 225 because of HIV	1 mug (250 ml) of porridge 1½ medium sweet potatoes 3½ large coffee cups of milk 1 small serving spoon of boiled pumpkin or potatoes 1 small serving spoon of meat sauce + ½ small ladle of vegetables 200 g of fish 3 ripe mangos ¾ of a baobab fruit 1 adult handful of mopani worms

Annex 6. Quarterly report and requisition for nutrition and therapeutic products



MINISTRY OF HEALTH, COMMUNITY DEVELOPMENT, SOCIAL, ELDERLY AND CHILDREN
NATIONAL TB AND LEPROSY PROGRAMME
QUARTELY REPORT AND REQUISITION FORM FOR THERAPEUTIC NUTRITIONAL PRODUCTS

District _____ Date Reported _____
 Facility Name _____ To _____ Year _____
 Reporting Period from _____ To _____

SN	Item Description	Unit	Beginning Balance (A)	Quantity Received (B)	Total Used (C)	Losses/ Adjustments (D=E+C-A-B)	Ending Balance (E)	Maximum Stock Quantity (F=2XC)	Quantity to Order (G=F-E)	Requested Quantity	Remarks
1	F75	SACHETS									
2	F100	SACHETS									
3	PLUMPY NUTS	SACHETS									
4											
5											
6											

Prepared by: Name _____ Title _____ Date & Signature _____
 Checked by: Name _____ Title _____ Date & Signature _____

Annex 7. Monthly report form for therapeutic nutritional products



**MINISTRY OF HEALTH, COMMUNITY DEVELOPMENT, SOCIAL, ELDERLY AND CHILDREN
NATIONAL TB AND LEPROSY PROGRAMME
THERAPEUTIC NUTRITIONAL PRODUCTS MONTHLY REPORT FORM**

District _____
 Facility Name _____
 Month _____

Date Reported _____
 Year _____

		NUMBER OF PATIENT	
SAM			
MAM			

SN	Description (specify preparation of drug)	Unit	QUANTITY REC'D LAST MONTH	QUANTITY USED	STOCK ON HAND	QUANTITY EXPIRED AND DATE
1	F75	SACHETS				
2	F100	SACHETS				
3	PLUMPY NUTS	SACHETS				
4						
5						
6						

Prepared by: Name _____ Title _____ Date & Signature _____
 Checked by: Name _____ Title _____ Date & Signature _____

Annex 8. How to make F75 and F100 using local ingredients

Alternative sources of local milk	Ingredients	Amount for F75	Amount for F100
<i>If Fresh Cow's Milk (or whole cream animal milk) or UHT milk</i>	<i>Fresh animal (cow's) milk</i>	<i>300ml</i>	<i>880ml</i>
	<i>Sugar</i>	<i>100g</i>	<i>75g</i>
	<i>Vegetable oil</i>	<i>20g</i>	<i>20g</i>
	<i>Mineral Mix (CMV)</i>	<i>20ml</i>	<i>20ml</i>
	<i>Clean safe water</i>	<i>Make to 1000ml</i>	<i>Make to 1000ml</i>
<i>Have whole dried milk</i>	<i>Dried whole milk</i>	<i>35g</i>	<i>110g</i>
	<i>Sugar</i>	<i>100g</i>	<i>75g</i>
	<i>Vegetable oil</i>	<i>20g</i>	<i>20g</i>
	<i>Mineral Mix (CMV)</i>	<i>20ml</i>	<i>20ml</i>
	<i>Clean safe water</i>	<i>Make to 1000ml</i>	<i>Make to 1000ml</i>
<i>Have skimmed dry milk</i>	<i>Skimmed dry milk</i>	<i>25g</i>	<i>80g</i>
	<i>Sugar</i>	<i>100g</i>	<i>75g</i>
	<i>Vegetable oil</i>	<i>20g</i>	<i>20g</i>
	<i>Mineral Mix (CMV)</i>	<i>20ml</i>	<i>20ml</i>
	<i>Clean safe water</i>	<i>Make to 1000ml</i>	<i>Make to 1000ml</i>

Sources: "The Management of Nutrition in Major Emergencies", WHO, 2000, Geneva