



# Malawi's guide to the prevention and management of common diet and lifestyle related non-communicable diseases



## Foreword

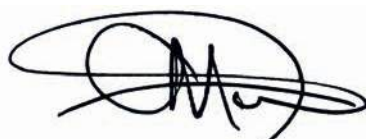
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Non-communicable diseases (NCDs) are the leading cause of morbidity and mortality globally, and the biggest rise in number of cases is seen in low- and middle-income countries like Malawi. Cardiovascular diseases, cancers, diabetes and chronic lung diseases account for the largest portion of NCDs morbidity and mortality, although other NCDs such as mental health conditions are also highly prevalent and important priority areas. In Malawi 24% of women are overweight and 6% are obese while 17% of men are overweight and 3% are obese. The prevalence of cardiovascular diseases are also becoming significant causes of morbidity and mortality. Eighty percent (80%) of premature heart disease, stroke and diabetes can be prevented by addressing the modifiable risk factors and the underlying major NCDs. These are tobacco use, harmful use of alcohol, unhealthy diets, insufficient physical activity, overweight/obesity, high blood pressure, sugar and cholesterol. Hence, government led comprehensive and integrated action is needed urgently to curb the risk factors and reduce disease progression.

The Government of Malawi has prioritized action on the rising prevalence of non-communicable diseases (NCDs) at policy level through inclusion of NCDs prevention and control in the Health Sector Strategic Plan (HSSP) II (2017-2022), National Multi-Sector Nutrition Policy and National Multi-Sector Nutrition strategic plan (2018-2022) and the development of the NCD strategic plan 2017-2022. Furthermore, the government has established the NCDs and Mental Health Unit in the Ministry of Health to provide leadership and coordinate NCDs and mental Health related activities.

This guide has been developed based on existing evidence in prevention and management of common diet and lifestyle related NCDs. The aim of this guide is to promote healthy eating, physical activity and other healthy lifestyle habits as preventative measures that can help reduce the burden of malnutrition by specifically targeting the risk factors for NCDs. The guide also offers guidance on the management of cardiovascular diseases and diabetes. It complements the long-established and ongoing work carried out by the Ministry of Health and other stakeholders on other areas of nutrition, such as control of micronutrient deficiencies and promotion of optimum maternal infant and young child nutrition. It also strengthens the linkages between health, nutrition and agriculture.

I therefore call upon everyone to use this guide in order to promote optimal nutrition and health lifestyle.



**Dr. Charles Mwansambo**  
**SECRETARY FOR HEALTH**

## Acknowledgements

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## How to use the guide

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**This guide is arranged into three main sections.**

**Section 1-** Defines what NCDs are and describes the most common NCDs in Malawi. The section also covers the modifiable risk factors for NCDs, with a focus on diet and lifestyle risk factors.

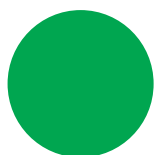
**Section 2 –** Defines a healthy diet and lifestyle patterns and contrasts with unhealthy diet and lifestyle patterns. The section introduces, *ten steps to a healthier you* as behaviours that anyone can adopt to reduce their risk of NCDs. These are based on high quality global evidence.

**Section 3 –** Covers recommendations for the management of the most common diet related NCDs, heart disease (including high blood pressure) and diabetes mellitus. This section specifically applies to people who have been diagnosed and live with these conditions. The section does not replace advice given by a health professional. Instead it gives a general overview of factors to consider in the management of common NCDs. Personalized health professional advice is strongly recommended for all people that are diagnosed with NCDs.

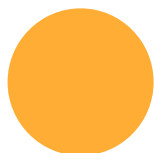
### Key features of the guide

#### 1. Colour code system for classifying health properties of food

The guide uses a system to classify foods based on health properties like total fat content, saturated and trans-fat (bad fat) content, sodium, sugar content and total energy content.



**Green foods (best choices)** are the healthiest choices and are good sources of important nutrients, low in bad fats, added sugar and salt, low energy and high fibre.



**Amber (choose carefully)** choices should be selected carefully and should only be eaten in moderation. Some foods in the amber category may provide some good nutrients. However, they can also contain too much sugar, salt, bad fats or very high in energy.



**Red (limit)** foods are not essential and if eating too often or in large amounts can lead to weight gain and the development of NCDs. These foods are generally high in energy, bad fat, salt and/or sugar. There are also low in healthy nutrients like vitamins, minerals and fibre.

## **2. Emphasis boxes**

The guide uses emphasis boxes to highlight information that is important to know about NCDs, their prevention and management. All Emphasis blocks are in blue. New topics and ideas are also emphasised with blue text.

## **3. Case study**

A case study is provided describing how lifestyles of individuals may be modified to reduce the risk of developing NCDs. It also provides dietary and lifestyles changes which individuals can practice to reduce the risk.

# Section 1

## **Diet and lifestyle related non-communicable diseases (NCDs)**

This section identifies and describes the most common diet and lifestyle related non-communicable diseases (NCDs) in Malawi. The diet and lifestyle risk factors for NCDs are also identified and explained.



## What are Non-Communicable Diseases?

Non-communicable diseases (NCDs) which are sometimes called lifestyle diseases are not passed from person to person, rather risk factors such as diet, lifestyle and genetics may increase a person's risk of acquiring them. The risk factors that cause the diseases tend to be present over a long period of time. The four most common nutrition related NCDs in Malawi are cardiovascular diseases (high blood pressure, heart attack and stroke) cancers and diabetes. **These three NCDs contribute the most to illness and death globally, accounting for more than 7 in 10 (79%) deaths in the world.** Four out of every five people with an NCDs live in low- and medium-income countries like Malawi. **As shown in figure 1, nearly 1 in every 3 deaths in Malawi is caused by an NCD (29%).**

**Most NCDs are preventable**, however, treating the conditions once they have developed can be difficult and costly. Additionally NCDs have an economic impact on the country's development due to loss in productivity as a result of illness, premature death and increased health costs to treat the conditions. Interventions to prevent, control and manage NCDs are simple, cheap and cost effective.

### Common nutrition related NCDs in Malawi

- Cardiovascular diseases
  - High blood pressure
  - Heart attack and stroke
- Cancers
- Diabetes



**Figure 1:** Nearly 1 one in every 3 Malawians dies from NCDs

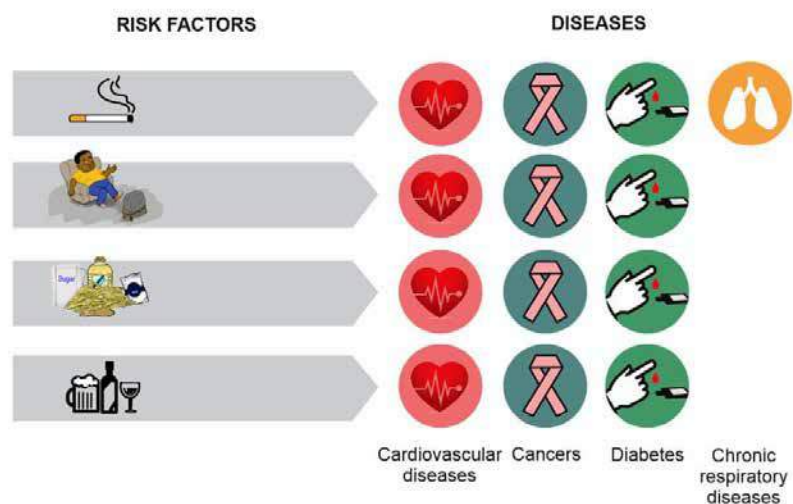
## Risk factors for NCDs

Nearly all the common nutrition related NCDs are driven by four main factors related to social behaviours which individuals do. These factors include:

- Unhealthy diet which is high in; energy, sugar, fats and salt, and low in; fruits, vegetables and whole grains
- Lack of physical activity
- Smoking
- Alcohol abuse



These factors lead to conditions that change the way the body functions and further increases the risk of developing NCDs and can worsen complications. The conditions are: (i) overweight and obesity, (ii) high blood pressure, (iii) high blood sugar (pre-diabetes and diabetes) (iv) high blood cholesterol levels



**Unhealthy behaviours, including an unhealthy diet and not being physically active increase the risk of overweight/obesity, blood pressure, blood sugar and cholesterol**

## Overweight and obesity

An overweight individual is a person whose weight is higher than what is considered a healthy weight for a given height, while obesity is an extreme form of overweight. Overweight and obesity can be measured and distinguished through body mass index (BMI) measurement. A BMI above 25 is overweight and BMI above 30 is obese.

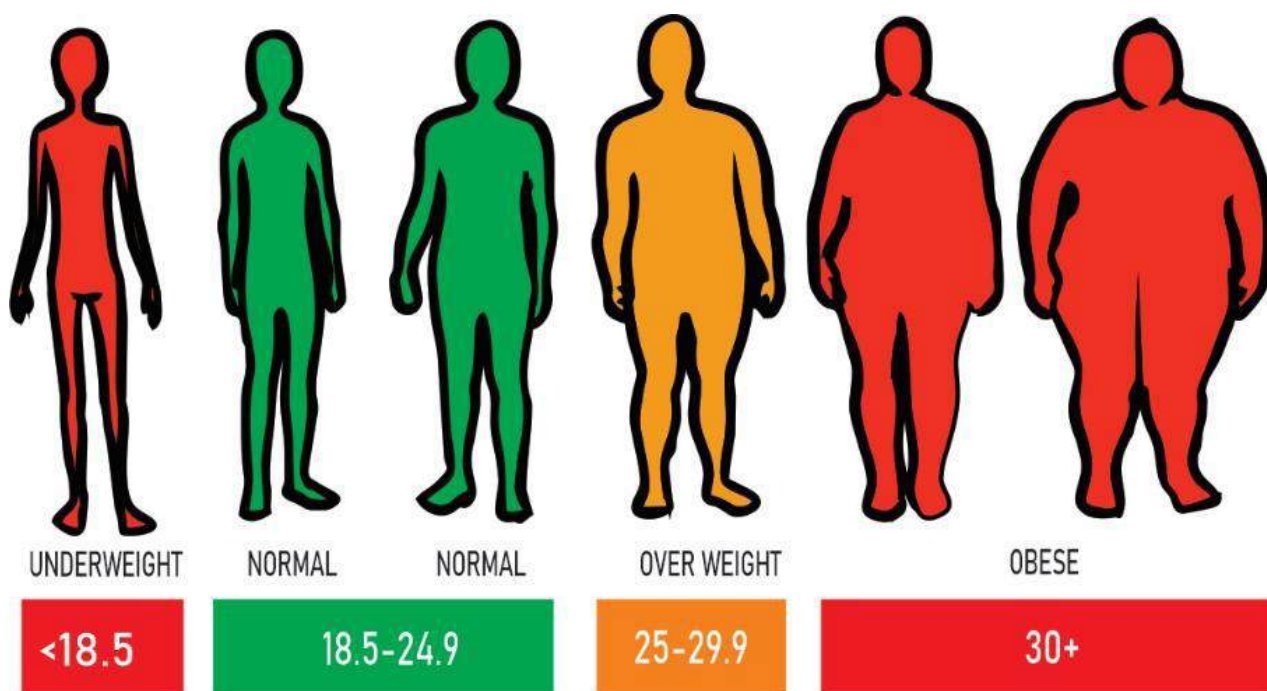
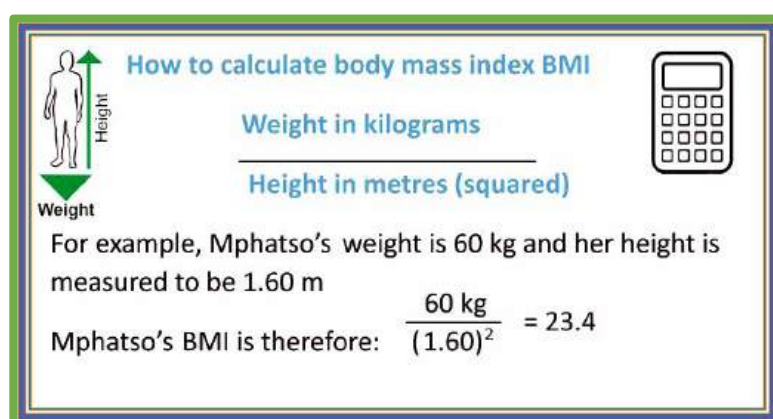


Figure 2: Body mass index (BMI) cut off ranges for adults

### Calculation of body mass index (BMI)

#### Calculate your BMI

You can calculate your BMI, provided you have accurate measures of your weight and height (see Figure 3 for calculation of BMI).



**Figure 3:** Calculation of Body Mass Index

- To convert centimetres into metres, divide by 100 (100 cm is equal to 1 metre)

## Interpretation of BMI

BMI can be interpreted as underweight, normal weight and overweight, and further classifies the degree of underweight and overweight.

**For adults** a BMI between 18.5 and 24.9 is the normal range for most people irrespective of gender and age. A BMI within the range of 25-29.9 is classified as overweight. Refer to table 1.

**Table 1: WHO classification of overweight and obesity in adults by BMI**

Classification	BMI (kg/m <sup>2</sup> )	Risk of comorbidities
Severe underweight	<16.0	Low (but risk of other clinical problems is very high)
Moderate underweight	16.0-18.4	Low (but risk of other clinical problems is high)
Underweight	< 18.50	Low (but risk of other clinical problems is increased)
Normal range	18.50-24.99	Average
Overweight	25.00-29.99	Increased
Obese class I	30.00-34.99	Moderate
Obese class II	35.00-39.99	Severe
Obese class III	≥40.00	Very severe

**For children**, age needs to be considered when interpreting BMI

- Children under 5 years of age
  - ✓ Overweight is weight-for-height greater than 2 standard deviations above WHO Child Growth Standards median
  - ✓ Obesity is weight-for-height greater than 3 standard deviations above the WHO Child Growth Standards median.
- Children and young adults between 5 and 19 years old
  - ✓ Overweight is BMI-for-age greater than 1 standard deviation above the WHO Growth Reference median
  - ✓ Obesity is greater than 2 standard deviations above the WHO Growth Reference median.

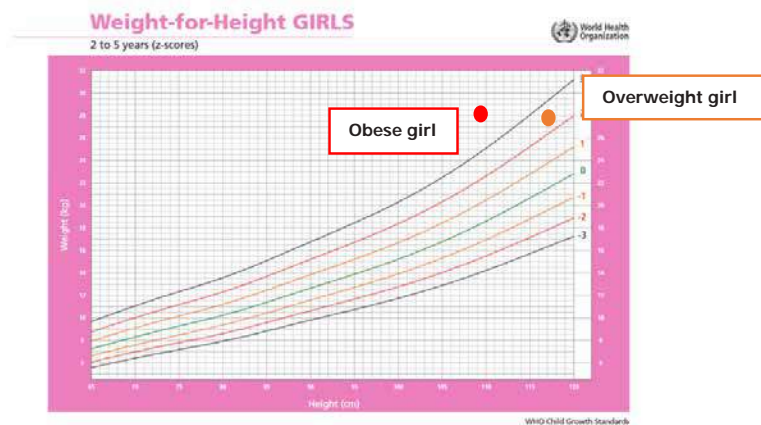


Figure 4: Weight-for-Height chart for girls aged 2 to 5 years

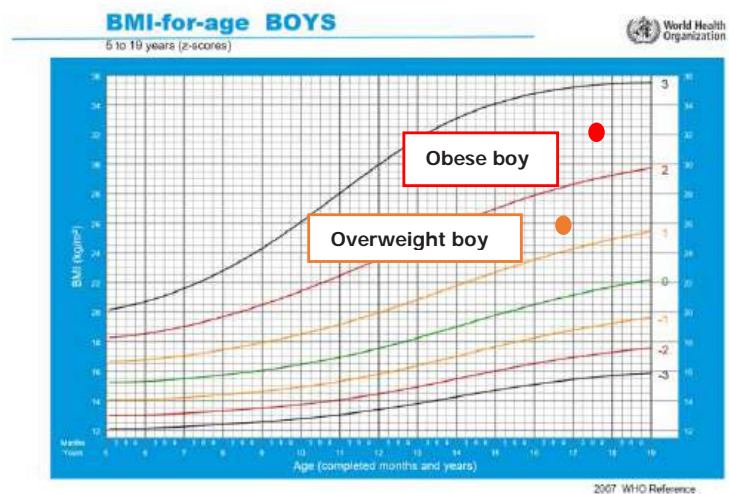


Figure 5: BMI-for-age chart for boys aged 5 to 19 years

**Parents are encouraged to track their child's growth in the health passport book. For older children who no longer use the health passport books, seek advice from your health provider on how to calculate your child's weight for height or BMI for age during routine visits to health care centres.**

You can also use BMI reference tables using weight in kg and the height in cm for adults and BMI for age for children 5 to 19 years old. Refer to annexe 1 and 2.



Another way to screen for overweight or obesity is to measure waist circumference. **Both a high BMI and waist circumference are strongly linked with a high risk of NCDs.** The waist circumference measures the accumulation of fat in the belly (abdominal obesity), which increases your risk for NCDs more than accumulating fat anywhere else. **A waist circumference above 101 cm for men and 88 cm for women are high risk for NCDs.**

### Where you carry your fat matters

Apple shapes carry more fat above the waist than below and is associated with a high risk of NCDs than pear shapes – people who carry more fat around the hips and buttocks. Figure 6 shows apple body shape versus pear shape body. Trained health professional will be able to measure your waist circumference or waist hip ratio and accurately interpret your risk of NCDs.

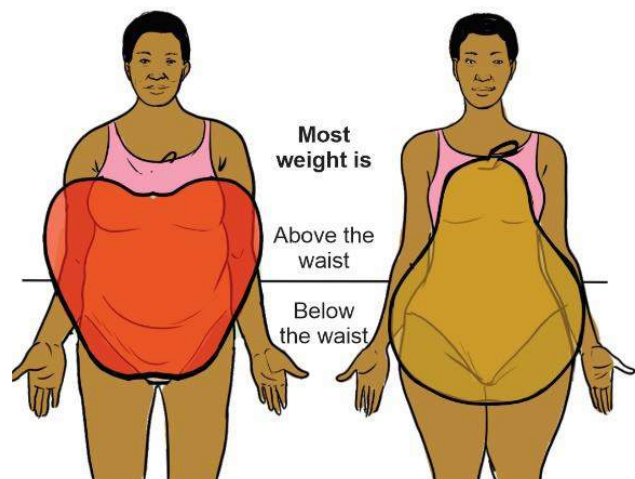


Figure 6: Apple body shape vs pear shape body



More fat above the waist  
is a risk factor for NCDs

Figure 7: More fat above the waist is a risk factor for NCDs

## How to Measure waist circumference

- Stand and place a tape measure around the middle, just above the hipbones
- Keep the tape snug around the waist, but not compressing the skin
- Measure the waist just after breathing out

**NOTE:** For accurate measurements involve a second person to do the measurements.

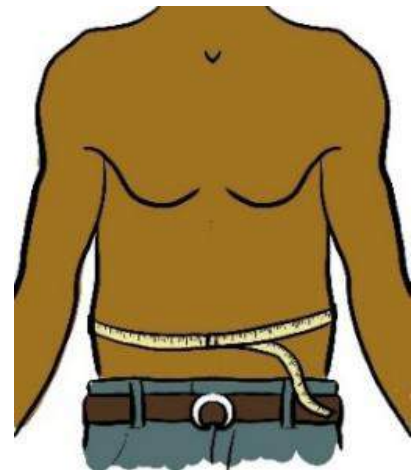


Figure 8: Measuring waist circumference

## Health risks of overweight or obesity



Overweight and obesity is a growing health challenge in Malawi

- 1 in 6 adult men are overweight or obese
- 2 in 5 adult women are overweight or obese
- Nearly 1 in 5 school going children and adolescents are overweight or obese

Overweight and obesity has negative effect on health and increases the risk of NCDs

**The following conditions can be triggered by overweight and obesity:**

## **1. Cardiovascular diseases (heart diseases and stroke)**

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Heart and blood vessel diseases (veins and arteries), known medically as cardiovascular diseases are the leading NCDs worldwide. Heart diseases include; heart attacks, high blood pressure, heart failure and stroke. **High blood pressure is the most common heart disease affecting one in three (32.9%) Malawians aged 25-64 and is also a major risk for heart attacks and strokes.** Another form of heart disease is caused by high or abnormal blood fat and cholesterol

levels that are deposited on the walls of blood vessels and lead to hardening (stiffening) and narrowing of blood vessels. The medical term for this condition is atherosclerosis. In the long run, hardening and stiffening of arteries leads to blockages that can cause heart attacks and strokes. **High blood cholesterol is estimated to affect 3 in 50 (6%) of Malawians.**

## **2. Diabetes Mellitus**

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Diabetes mellitus (sugar disease) is a disease in which blood sugar levels are above normal. When people have diabetes their bodies either do not make enough insulin or cannot use insulin made effectively. Insulin is a hormone produced by the pancreas which helps the food you eat get into body cells, where it is used for energy. **Type 2 diabetes is the most common type and its development is directly linked to overweight/obesity, unhealthy diets and lifestyles.**

Other types of diabetes are Type 1 diabetes and gestational diabetes (the one that is diagnosed in women during pregnancy). Type 1 diabetes is usually diagnosed in children and young adults, although it can appear at any age, and requires that one takes insulin every day for life. Although the cause of Type 1 diabetes is not directly linked to unhealthy diets, overweight/obesity and other lifestyle factors (e.g. lack of physical activity), all these factors are extremely important in managing the condition. Health professionals can guide individuals on the management of Type 1 diabetes.

Gestational diabetes increases the risk of miscarriage, pregnancy complications, early birth (preterm birth), still births, breathing difficulties and lack of sleep for the baby.



**Early signs and symptoms that may show that one has high blood sugar are:**

- Feeling very thirsty
- Urinating often
- Blurred vision
- Feeling hungry all the time (even if you have eaten)
- Fatigue (feeling tired all the time)

It also increases the risk of future diabetes for the mother and baby. It is important for pregnant women to be aware of the symptoms and go for regular check-ups at their local clinics if they suspect diabetes.

### 3. Cancers

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Cancer is the name given to a collection of related diseases where cells in the body begin to divide uncontrollably and spread to other parts of the body, causing damage. There are over 100 different types of cancers, including the more common cancers globally like breast cancer and prostate cancer. Thirteen of these cancers have been directly linked to nutrition, overweight and obesity. The cancers that are linked to nutrition, overweight and obesity include breast cancer, endometrial cancer, gallbladder cancer, stomach cancer, oesophageal cancer, prostate cancer, liver cancer, kidney cancer, rectum cancer, pancreas cancer, larynx cancer and colorectal cancers. In Malawi the most cancers directly linked to nutrition, overweight and obesity are oesophageal cancer and breast cancer. Nutrition is very important for people with all types of cancers as they often lose significant weight owing to lack of appetite, poor food intake and increased needs for food by the cancer cells. If you or someone you know has cancer it is advisable to seek health professional advice about how to eat healthy and slow down weight loss.

## Section 2

### Prevention of NCDs through healthy diet and lifestyle

This section defines a healthy diet and lifestyle and contrasts with unhealthy diet and lifestyle patterns. Here, *ten steps to a healthier you* are introduced as behaviours that anyone can adopt to reduce their risk of NCDs. The 10 steps are also applicable to people who have been diagnosed with diet/lifestyle related NCDs too. However, further guidance on specific principles of managing NCDs through diet and lifestyle is given in Section 3.

## What is a healthy diet and lifestyle?

People's diets vary considerably and are influenced by many factors such as culture, religion and availability of food. There are healthy eating patterns that protect people against NCDs and improve their health status. **A healthy diet consists of plenty of vegetables, fruits, whole grains, legumes, nuts, healthy fats and oils, moderate amounts of fish and chicken, low amounts of red meat, very low amounts of processed meats, added sugar, salt, refined staples and other highly processed foods.** High quality evidence from all around the world shows that people that eat this way have lower rates of NCDs and generally live longer and healthier lives.

**A healthy lifestyle involves healthy eating habits and incorporating physical activity, stress management, getting enough sleep, maintaining a healthy body weight and avoiding alcohol, cigarettes and recreational drugs.** A healthy lifestyle improves overall health and lowers the risk of being ill and prevents early deaths due to NCDs.



Figure 9: Unhealthy vs Healthy eating habits

Health lifestyle goes beyond just preventing illnesses but also improves your overall wellbeing and your family's physical, mental and social well-being.

## What is an unhealthy diet and lifestyle?

Unhealthy diet is one that is high in added sugars, salt, unhealthy fats (trans-fats, saturated fats and animal source fats. Refer to table 5 on choices of healthy and unhealthy fat sources), highly processed and refined foods and generally very high in energy and low in nutrients. Unhealthy diets are also low in fruits, vegetables and wholegrain staples.

**Unhealthy diets are associated with 1 in 5 deaths worldwide**

## Are unhealthy diets and lifestyles a problem in Malawi?

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Around the world and especially in countries like Malawi, the way that people eat is shifting towards unhealthy diet patterns. These changes are thought to be driven by more access to unhealthy food choices like highly processed foods, refined staples, foods with added sugar and salt through more fast food eating and marketing of unhealthy foods, especially in young children. These foods are usually undiversified coupled with reduced physical activity. Many people use cars or public transport to get to places and are doing less activities like farming and walking.

### **Unhealthy lifestyles that we should all be worried about in Malawi**

- **1 in 5 drink alcohol frequently**
  - 1 in 3 men drink alcohol frequently
- **More than 98% of the population do not eat adequate amount of fruits per day**
  - On average fruits are eaten only twice per week
  - On average less than 2 servings of vegetables are eaten per day
- **4 in 5 school going children in urban areas drink a sugar sweetened drink everyday**
- **The average Malawian eats 30% more sugar than is recommended**
- **More than 90% eat more salt than is recommended**

## Ten tips to a healthier you

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Any person, irrespective of age can adopt the practices/behaviours below to improve their health and wellbeing. These tips are applicable for people of all ages irrespective of whether they have NCDs. For people with diagnosed NCDs, these tips apply as part of health diet and lifestyle. Health professionals can provide additional guidance if needed.

- 1. Eat a variety of locally available foods from the six food groups every day**
- 2. Half of your plate should be fruits and vegetables**
- 3. Choose whole grain starch options over refined starches where possible**
- 4. Be mindful of portion sizes**
- 5. Make use of cooking methods that limit the amount of fats and oils, choose healthy fat options where possible**
- 6. Choose safe drinking water, limit fruit juice and avoid processed sweetened and fizzy drinks**
- 7. Use salt sparingly during cooking and avoid adding salt to cooked food**
- 8. Be physically active**
- 9. Avoid smoking and limit the amount of alcohol intake**
- 10. Aim for a normal weight by adopting and following healthy eating habits, physical activity and a healthy lifestyle**

# 1. Eat a variety of locally available foods from the six food groups every day

## Why eat a variety of foods?

Eating variety foods means having a wide selection of foods within and among all six Malawi food groups through the day. All six food groups do not have to be eaten in a meal but at least 4 groups per meal. However, by the end of the day you must have eaten all six. No single food contains all the food nutrients; hence the different foods must be eaten in order to meet the body's need for nutrients. Eating a variety of foods reduces the risk undernutrition, especially in children. Eating a variety of foods also reduces the risk of obesity/ overweight and nutrition related NCDs.



Figure 10: Revised Malawi six food groups guide

### The Malawi six food groups provide variety

The Malawi government recommends the six food groups for the general population to get all the nutrients needed to keep healthy. Eating foods from each food group every day, including water provides the right amount of nutrients for the average person of all ages. The size of the segment on the pie for each food group represents how much of the food group a person should aim to eat every day. For NCDs the size of each food group on the pie looks different from the traditional chart. In this modified version, people are encouraged to eat much more fruits, vegetables, less staple foods and less animal protein compared to legumes and nuts (Figure 10). Not all food groups may be eaten at one meal, but at the end of each day, all food groups should have been eaten for a balanced diet.

**Table 2: Malawi six food groups and examples of foods in each group**

Six food groups	Examples from each group
Staple foods	Sorghum, millet, rice, maize, potatoes, sweet potatoes, plantains, cassava and yams
Fats	Avocado, coconut, cooking oil, margarine, butter, (fat from meat)
Animal foods	Eggs, milk, yoghurt (chambiko), fish, chicken, termites
Legumes (beans and nuts)	Cowpeas, field peas, ground beans, soybeans, pigeon peas, ground nuts, sugar beans
Vegetables	Mushrooms, amaranthus (bonongwe), blackjack (chisoso), rape, cabbage, onions, garlic, carrots, tomatoes, pumpkins
Fruits	Bananas, mangoes, papaya, watermelons, apples, oranges, masuku, masau, strawberries

### How to eat a variety of foods?

- Choose affordable foods in season from all the six food groups.
- At every meal try and have a minimum of 4 food groups.
- Aim to have at least the traditional three meals per day (breakfast, lunch and supper).
- Eat nutritious snacks in between the 3 main meals such fruits and vegetables.
- Avoid other kinds of snack foods like chocolates, chips and fizzy drinks.
- Grow your own vegetables, fruits, legumes and other foods, and rare poultry and other small stocks to ensure variety of foods at household level.

### For children

- Give children less than 6 months breast milk only. Do not give these children any water nor other fluids and foods unless medically indicated.  
Children who are more than 6 months of age should be given a variety of foods from the six food groups in addition to breast milk until they are 2 years or more. Give children foods from mixed dishes.



- Young children benefit from being offered healthy snacks in between main meals. Choose fruit pieces and vegetables compared to chips, chocolates, sweets and sugary drinks.
- Give them different coloured fruits and vegetables according to their age as advised by service provider.

## 2. Half your plate should be fruits and vegetables.

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### Why eat fruits and vegetables?

Fruits and vegetables are a great source of vitamins, minerals, dietary fibre and phytochemicals and are relatively low in energy. These have been also shown to reduce the risk of overweight/obesity and NCDs. In 2017 the WHO estimated that 3.9 million deaths worldwide were attributable to low consumption of fruits and vegetables. The majority of these deaths occur in low income countries like Malawi.



Figure 11: Variety of foods and vegetables

### How to increase fruits and vegetables intake?

- **Eat a minimum of 2 portions of a variety of fresh fruit and 3 portions of fresh vegetables per day**
- Aim towards filling up at least half of your plate with fruits and vegetables at each meal.
- Buy fresh vegetables and fruits in season which are likely to be cheaper.
- Have a home garden of fruits and vegetables to ensure supply throughout the year.

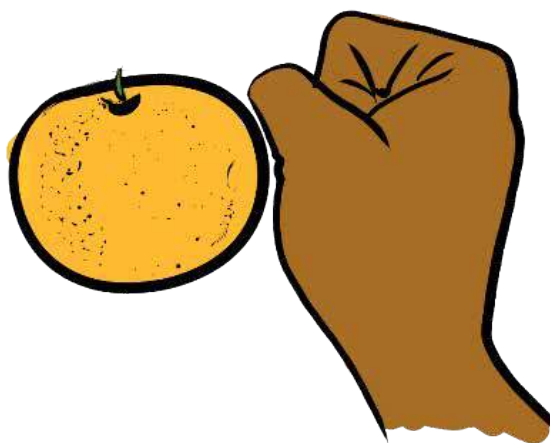


Figure 12: Portion sizes for fruits



- Use vegetables and fruits with different colours because they contain different nutrients.
- Try and cook two or more vegetables at each meal for example, carrots and chinese cabbage or pumpkin and a green leafy vegetable (e.g. rape and bonongwe)
- Have fruits after meals for example an orange, papaya, pineapple, watermelon, banana, guava or mango.
- Eat whole fruits and vegetables as opposed to making juice or smoothies because juice and smoothies have more sugar and reduce the fibre content of fruits and vegetables.



Figure 13: Portion sizes for vegetables

Table 3 shows fruits and vegetables that have to be chosen and those that should be consumed in moderation.

**Table 3: Fruits and vegetables to choose and to limit**

Fruits and vegetables to choose	Fruits and vegetables to limit
<ul style="list-style-type: none"> <li>✓ All fresh vegetables and fruits</li> <li>✓ Frozen vegetables and fruits</li> <li>✓ Dried vegetables and fruits</li> </ul>	<ul style="list-style-type: none"> <li>• Fried vegetables</li> <li>• Vegetables covered in cream sauce, cheese or other salty, fatty substance</li> <li>• Canned fruit packed in syrup</li> </ul>

### Tips for children

- The earlier you introduce fruits and vegetables into your child's food habits, the more likely they are to enjoy them.
- For children above six months, start with puree or mash fruits and vegetables as snacks or after meals. You can mash fruits such as bananas, mangoes, papaya and avocado pears. Aim for 2 portions of fruit and 3 portions of vegetables for children of all ages.

- Add a fruit or vegetable as part of every meal or snack. For example, you could put fruit in porridge or cereal, add a piece of fruit or vegetable to your child's lunchbox, offer raw vegetables like carrots and cucumbers as snacks.
- Be a role model—eat more fruits and vegetables yourself. Children often mimic what they see others doing.

### 3. Choose whole grain starches over refined starches when possible

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#### Why should you choose whole grains?

Whole grains are staples made from the entire grain seed, retaining all the nutrients stored in the different parts of the seed. Examples are mgaiwa from maize, sorghum, millet, whole wheat flour/bread and brown rice. Whole grains are broken down slowly after eating which helps maintain a stable level of energy for several hours. This is important for managing weight for everyone and blood sugar, especially for those with diabetes. In addition, the fibre in whole grains has many health benefits, including reducing the risk of high blood pressure, heart attacks and strokes, promoting healthy toilet habits (bowel habits) and reducing the risk of many cancers. Fruits and vegetables are excellent sources of fibre. Legumes and nuts are also good sources of fibre. Table 4 shows the staples you have to choose and those to choose carefully.

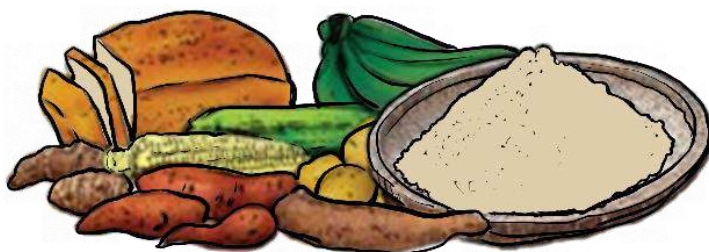


Figure 14: Staples

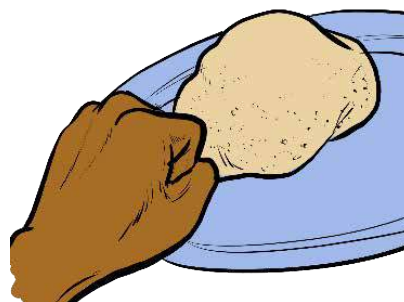


Figure 15: Portion sizes of staples

**Table 4: Staples to choose and to choose carefully**

High fibre staples (Choose)	Low fibre staples (Choose carefully)
Whole maize flour Whole sorghum flour Finger millet	<ul style="list-style-type: none"> <li>Degermed and dehulled white flour</li> <li>Fermented maize flour</li> </ul>
Brown and Wild rice	White rice
Brown bread	White bread
Whole grain breakfast cereals e.g whole grain cornflakes, weet-bix, oats	Breakfast cereals such as cornflakes, rice krispies
Tubers e.g sweet potatoes, wild water tuber (nyika) Plantains and green bananas	Potatoes
Whole grain pasta e.g macaroni/spaghetti	Processed pasta e.g macaroni/spaghetti, noodles

### How to increase your whole grain and fibre intake?

- All grains should be processed minimally to retain fibre and nutrient content.
- Choose high fibre flour to make porridge or nsima and decrease low fibre flour (degermed and dehulled options). You can start by replacing processed flour with a high fibre alternative for one meal in a day with the goal of totally replacing low fibre with high fibre flour.
- If you eat bread, rice, macaroni/spaghetti and breakfast cereals, choose high fibre (brown) options whenever possible.
- Eat a minimum of 2 portions of fruits and 3 portions of vegetables (See tip #2)
- Eat legumes frequently.

### For children

- Introduce high fibre staple options to children from six months old by making porridge with high fibre staples.
- Set a good example for children by eating whole grains with meals or as snacks for older children.

## 4. Be mindful of portion sizes

### Why does portion size matter?

Eating the recommended daily portion sizes for each type of food helps the body to get the different nutrients that it needs to function well. However, people that consistently eat larger than recommended portions are at risk of weight gain that leads to overweight/obesity and increases the risk of NCDs. Therefore, eat appropriate portions and use tools that are available to help with correct portion sizes.

### How to estimate portion sizes

Two easy methods of practicing portion control are to use your hands (the hand jive) or use the health plate method as guide of quantity of each food group in a meal. These methods are easily accessible and can easily be used regardless of setting. Other methods like using cups and spoons to measure portions can also be used if they are available. Use whichever methods are easiest and most convenient for you.

### Tips for portion control using the healthy plate method

- Use a standard dinner (30 cm) plate and divide into quarters
- Fill half of your plate with vegetables and fruits
- Fill a quarter of your plate whole grains
- Fill a quarter of your plate with legumes, fish or lean meat
- You may have milk and milk products once or twice a day

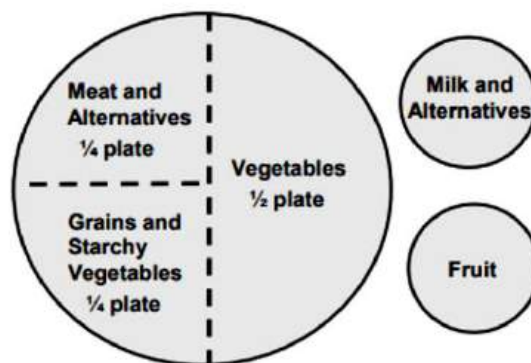


Figure 16: Portion control using the healthy plate method

## Tips for portion control using the hand jive method

- Use your own hand to estimate the portion sizes of each food group.
- Vegetables should make the biggest part of any meal. Use both hands cupped to estimate a big enough portion per meal. Refer to Figure 17.
- Fruits like oranges and apples can be size of your closed fist (Figure 18).
- Use the palm of your hand to estimate the amount of meat, nuts and legumes to be taken at each meal. Refer to figure 19.
- As shown in figure 20, staple foods should be the size of your closed fist.
- Use healthy fats and oils the size of your thumb (Figure 21).



Figure 17: Vegetable portion size per meal

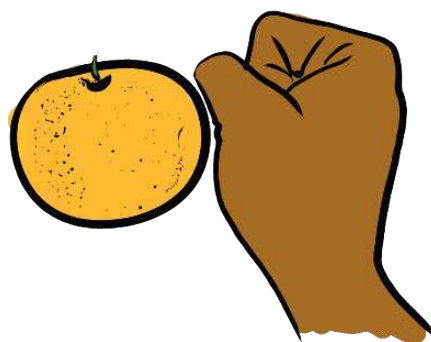


Figure 18: Fruit portion size per meal



Figure 19: Portion sizes for animal source food, nuts and legumes per meal

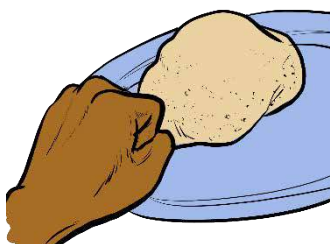


Figure 20: Staple food portion size per meal



Figure 21: Fats and oils portion sizes

### Tips for eating smaller portions

- You can use a smaller plate e.g. a side plate or bowl that will help you eat less. Small plates and bowls can also make the portion sizes appear larger and leave you feeling more satisfied.
- Try to eat slowly so that you can feel when you are satisfied or full sooner. It takes a few minutes for the stomach to send messages to the brain to stop eating when you are full. If you eat too fast you may overeat.
- Try portioning out foods with measuring cups and spoons to give yourself an idea of what the portion should look like.

### How much is enough food for a typical adult

The amount of food that a person should eat varies considerably, depending on age, gender, how active you are and many other factors. However most healthy adults should eat an average of about 2000 – 2300 kilocalories to maintain their current body weight. Women tend to need less food than men. People who want to lose weight should aim to eat less than this target. Annexe 3 shows how much of each food group an average adult should eat to maintain their body weight, live a healthy and active lifestyle.



## 5. Make use of cooking methods that limit fats/oils, and choose healthy fat options

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### How to choose healthy fat options and avoid fatty foods

- Where possible cut off any visible fat from your meat cuts.
- Choose cooking methods that do not add fat e.g. boiling, broiling, baking, grilling/roasting compared to methods that require cooking oil/fat such as frying and deep frying.
- Remove all sources of commercially baked foods, processed and packaged foods, hard margarines, fried and deep fat fried foods.
- Limit intake of fat from red meat. Eat fish, chicken, legumes and nuts more in place of red meat.
- Where possible switch from using full cream/whole milk and milk products to reduced fat versions (low fat or skim milk).
- When you eat red meat, try and choose leaner cuts of meat like sirloin, top side, and fillets compared to very fatty options like offals (tripe, livers and kidneys).



**Figure 22:** Chiwaya chips and chicken food vendor along the roadside.

Chiwaya street food is becoming very popular in Malawi because it is seen as cheap and convenient. However, this practice is likely contributing to increasing number of overweight/obese people and NCDs.

## Why choose healthy compared to unhealthy fats

Eating too much of **unhealthy/bad fats** increases your risk of NCDs, particularly heart diseases and strokes. Experts encourage people to replace unhealthy fats with **healthy fats/good fats** and avoid eating foods that are very fatty (for example deep fried foods). Sources of unhealthy fats are generally highly processed foods. Animal source foods like meat and milk products are also sources of unhealthy fats. However, if eaten in small amounts they are part of a balanced diet. The general rule to follow is that any natural occurring food is better than processed food.

**Table 5: Choices of healthy and unhealthy fat sources**

Unsaturated fats Choose	Choose carefully	Trans fats Limit
<ul style="list-style-type: none"> <li>• Avocados</li> <li>• Nuts</li> <li>• Peanut butter</li> <li>• Olives</li> <li>• Olive oil</li> <li>• Canola oils</li> <li>• Soybean oil</li> <li>• Fish</li> </ul>	<ul style="list-style-type: none"> <li>• Chicken</li> <li>• Red meat (beef, lamb, pork) *note that certain cuts of meat can contain less fat (leaner) than others</li> <li>• Full cream milk and milk products e.g. ice cream, cheese, chambiko and yoghurt</li> <li>• Butter and lard</li> <li>• Coconut oil</li> <li>• palm kernel oil</li> </ul>	<ul style="list-style-type: none"> <li>• Commercially baked food</li> <li>• Biscuits, cookies, doughnuts, muffins, cake, pizza, pies, samosa, mandazi, chocolates</li> <li>• Packaged snack foods</li> <li>• Potato chips and crackers</li> <li>• Hard margarine (remains solid at room temperature)</li> <li>• Hydrogenated cooking oils</li> <li>• Most fried chips (chiwaya) and chicken are made from these oils</li> <li>• Processed meat such as bacon, sausage, polony and ham, corned beef</li> </ul>



## 6. Choose safe drinking water, limit factory processed fruit juice and avoid processed sweetened and fizzy drinks

### Why should you drink plenty of safe water?

Drinking sugary drinks (sugar sweetened beverages) is associated with weight gain, obesity, type 2 diabetes, heart disease, liver disease and tooth decay in children especially. Examples of drinks that are sweetened with sugar are fizzy drinks (e.g Frozy, Fanta etc), sports drinks, energy drinks, coffee and tea with added sugar. **These drinks contribute significantly to the amount of sugar Malawians eat and play a direct role in the rise of overweight and obesity.** Drinking enough safe water every day is good for overall health, helps manage body weight and lower the risk of NCDs.



Figure 23: A minimum of 8 glasses of 250ml each of water per day

### How to drink enough water

- The amount of water you drink varies by age and many other factors. However generally adults should aim for at least **8 glasses of 250ml or more of water (2L or more)**. Most healthy people should be kept hydrated by drinking water whenever they feel thirsty.
- Your body needs more water on very hot days or when you are physically active, have a fever, have diarrhoea or are vomiting.
- If you struggle to drink plain water, you may add fresh fruit pieces like lemons, strawberries, oranges and watermelon to give water a bit of flavour.
- Carry a water bottle with you when you go out of the house and drink frequently.

## How to limit sweetened drinks, fruit juice and fizzy drinks

- Try and reduce the amounts of fizzy drinks and other sweetened drinks you drink gradually by setting yourself weekly targets.
- Eating whole fruit is better than drinking factory processed fruit juice which is more concentrated in sugar. Even 100% fruit juice is naturally high in sugar.
- Sugars that add calories to a beverage have different names and are not always obvious to people looking at the ingredients list. Some examples of common sugars that may appear in drinks includes high fructose corn syrup, fructose, fruit juice concentrates, sugar, syrup, honey, sucrose and dextrose.
- Sugar free drinks also known as diet or light drinks are sweet but do not have as much sugar as standard drinks. They contain low energy artificial sweeteners like aspartame, sucralose, and stevia. Most sweeteners on the market are generally recommended as safe. However, it is unclear whether these drinks protect against overweight/obesity and NCDs. Hence, for people who regularly drink sugary drinks, diet or light alternatives may be a useful temporary replacement strategy to reduce intake of sugary drinks.

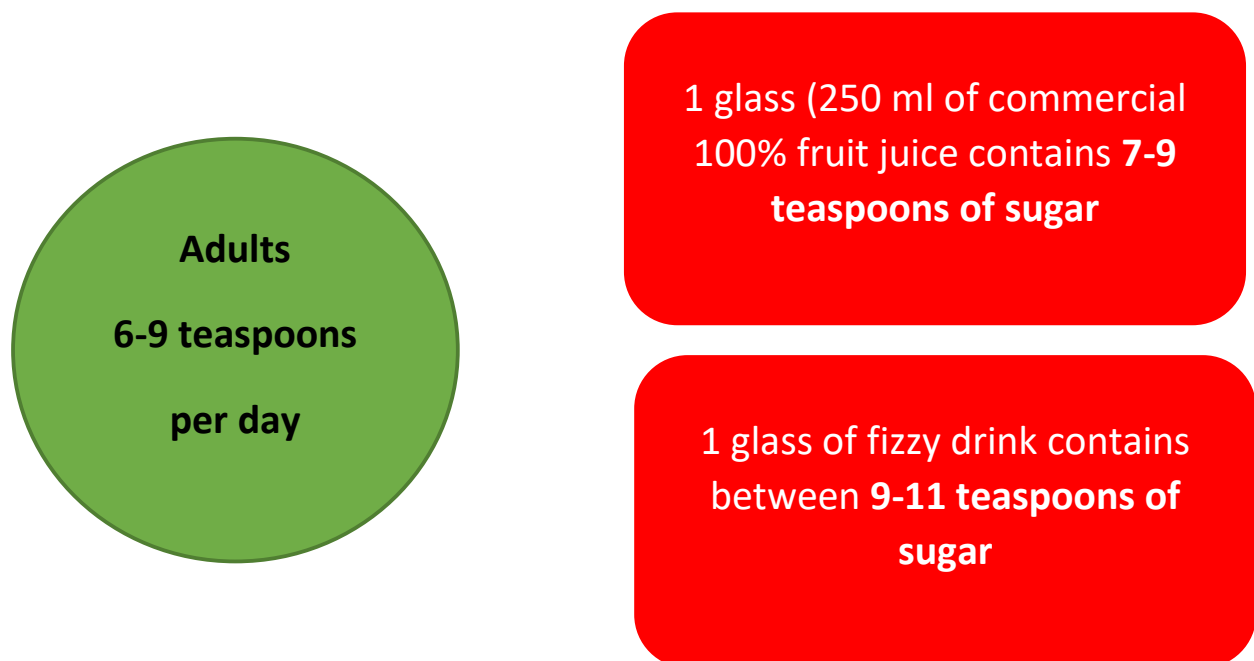


Figure 24: Recommended maximum sugar intake

## Tips for children

- Offer water to babies over six months to drink after breastfeeding or meals.
- Offer more water to children above six months on very hot days, when they are physically active, have a fever, have diarrhoea or are vomiting.
- You may give children 2 years and above a maximum of 1-2 glasses of milk or milk product per day. This is good for their growing bones.
- To reduce the amount of juice that your child drinks, start gradually by setting weekly targets till you reach a maximum of not more than half a glass of juice per day. Give them juice only after meals and avoid giving juice before bed.
- For children, the long-term effects of diet and light beverages are unknown, so it is best for kids to limit their intake.

**Table 6: Beverages to choose, choose carefully and limit**

Choose	Choose carefully	Limit
Water	Sports drinks *preferably used before/ during or after exercising	Commercial fruit juice
Black tea with no sugar or milk	Tea with low fat milk and 1 teaspoon of sugar	All fizzy drinks or soft drinks e.g. cocacola, sprite, fanta, freezes and sobo
Black coffee with no sugar or milk	Coffee with low fat milk and 1 teaspoon of sugar	Sweetened milk drinks
Low fat or skim milk	Juice concentrates for dilution *only If you follow 1-part juice to 4 parts water concentration	Energy drinks
Thobwa	Freshly squeezed home-made fruit juice	Coffee with more than one teaspoon of sugar and milk
	Full cream milk	Tea with more than one teaspoon of sugar and milk
	*No sugar or Light fizzy drinks e.g. coke 0 or sprite 0	

## 7. Use salt sparingly during cooking and avoid adding salt to cooked food

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### Why should you eat less salt?

Eating too much salt is responsible for millions of deaths worldwide. **A component of salt called sodium is responsible for raising blood pressure and increasing the risk of heart disease and stroke.** It is estimated that if everyone reduced **salt intake to less 1 teaspoon a day (5 g)** as recommended by world experts, 2.5 million lives could be saved from high blood pressure, heart attacks and strokes related deaths.

### Sources of salt

**Most salt in the diets of Malawians come from added salt during cooking and added to cooked foods.**

Salted/dried fish and meat are also a major source of salt. Increasingly, salt is also coming from processed foods and fast foods. Almost any food that is not processed and fresh like fruits, vegetables, whole grains, nuts, fresh meat and milk are naturally low in salt.

### How much salt is enough?

- Aged 11 years and older

5g of salt which is equal to 2400 mg of sodium (about 1 teaspoon of salt)

- Children younger than 11 years old salt needs depend on their age, although they generally need less

**Table 7: Quantities of salt in selected foods**

<b>High salt or sodium content foods LIMIT</b>	<b>Estimated sodium per 100g (mg)</b>	<b>Estimated salt per 100g (g)</b>	<b>Teaspoons of salt</b>
Canned fish e.g. Pilchards	908-1215	2.27- 3	½ tsp
Any processed meats (bacon, sausages, canned beef)	570-1540	1.42- 3.85	1 level tsp
Hard margarine and salted butter	407-826	1-2	¼ tsp
Savoury snacks e.g. chips/crisps	655-1440	1.6- 3.6	1 level tsp
Stock cubes, powders, granules and emulsions	13000-22631	32.5- 56. 6	6 ½ - 11 tsp
Dry soup powders	7435-8469	18.5- 21.2	4 tsp
Dry gravy powders & dry instant savoury sauces	2237-5658	5.6 – 14	1- 3tsp
Dry savoury powders with dry instant noodles	902-1969	2.3 – 4.9	1 tsp

### How to reduce salt intake?

- Avoid adding too much salt to food when cooking
- Avoid adding salt to cooked food.
- Use locally available non-salted herbs and spices, garlic, pepper, onions, lemon and vinegar to add flavour to foods instead of salt.
- Avoid foods such as breads, cured meats (polony, ham etc), dry packaged soup powders, savoury snacks (chips, popcorns, salted nuts, crackers) as they are the highest sources of salt.
- Avoid fast food and take away.
- Eat home cooked fresh food as much as possible. This way you can control the amount of added salt.

- Soak salted fish overnight, drain the water and then boil it in fresh water. Discard the cooking water before eating the fish. This will help reduce the sodium content.
- Always check labels of processed foods and avoid those with high salt or sodium content.

### High salt –LIMIT

More than 300 mg of sodium per portion

- Re-train your taste buds. Over time, the less salt you eat, the less you'll want.

### Children and babies

- If a baby is breastfed, they will get the right amount of minerals, including salt from breast milk.
- All salt that is consumed should be iodized or “fortified” with iodine, which is essential for healthy brain development.

## 8. Be more physically active

### What is physical activity?

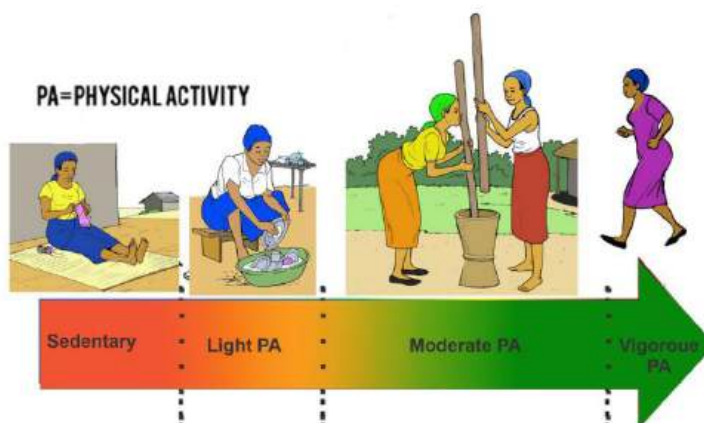
**Physical activity is anything that moves your body and burns energy.** This includes walking, playing, carrying out household chores, jogging, gardening, sports and any job that requires you to be on your feet and active like construction work and farming.

### Why is physical activity important?

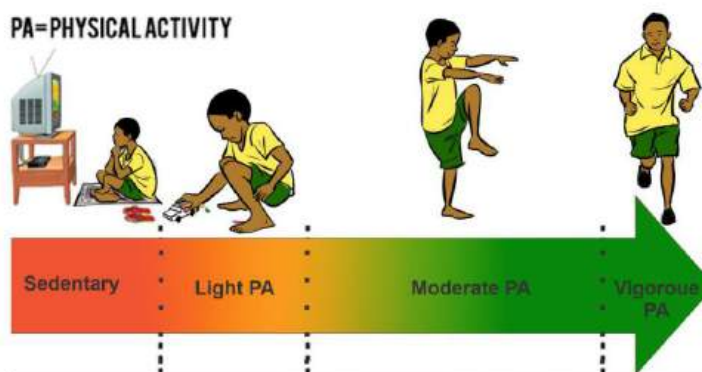
Being physically active has significant benefits for your health, wellbeing, and contributes to preventing overweight/obesity and NCDs, including depression, and arthritis. These health benefits occur for all age groups. People with NCDs also benefit enormously from being active through reducing the risk of complications, improving quality of life and reducing the risk of death from any cause. **Physical inactivity is the 4th leading risk factors for death.**



Everyone should engage in some form of physical activity frequently and aim to reach the minimum targets for their age groups. Refer to Annexe 2 which offers suggestion on physical activities and levels for each age group. Additional benefits are realized if one can exceed the minimum targets. Each person can choose which activities best suits them and their lifestyles. Some may prefer walking or incorporating physical activity during leisure time i.e. playing sports or doing household chores and farming activities that all count as physical activity.



Moderate intensity activity requires a moderate amount of effort and you must also feel your heart beating faster than when you are at rest. Vigorous intensity requires more effort and causes rapid breathing and a substantial increase in heart rate. See Appendix 2 for more descriptions of types of physical activity and level of intensity.



**Table 8: How much physical activity is enough?**

Age group	Minimum amount of activity
<b>Children and adolescents</b> <b>5-17 years</b>	60 minutes (1 hour) of moderate to vigorous-intensity physical activity daily
<b>Adults</b> <b>18+ years</b>	<ul style="list-style-type: none"> <li>- 150 minutes (2 and half hours) of moderate intensity activity throughout the week or 75 minutes (1 hour 15 minutes) of vigorous intensity</li> <li>- For additional health benefits, adults should increase their moderate-intensity physical activity to 300 minutes per week, or equivalent.</li> </ul>
<b>Older adults</b> <b>65 years +</b>	When older adults cannot do the recommended amounts of physical activity due to health conditions, they should be as physically active as their abilities and conditions allow.

### Tips for increasing physical activity for children and adults

- Be sure to warm up with stretches before you start exercising or a workout and cool down after with gentle stretches. This may help prevent soreness and injuries.
- If you are not very active, start small and build momentum by setting your own realistic goals and pacing yourself until you get to the recommended minimum of exercise per week for your age group.
- Drink plenty of water before and during exercise/workouts. Your body performs the best when it is properly hydrated.
- **If you want to lose weight, meet specific fitness goals or get even more benefits, you may need to increase up your activity to 300 minutes or more a week.**
- Check with your doctor before starting a new exercise program, especially if you have any concerns about your fitness, haven't exercised for a long time, have chronic health problems, such as heart disease, diabetes or arthritis.
- Encourage children to play outside, join sports teams or any other physical activity.
- Limit the time that your child spends watching television, on mobile phones and playing video games.



## 9. Avoid smoking and limit the amount of alcohol intake

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### Why should you limit alcohol?

Drinking alcohol has long-term health risks which include high blood pressure, heart disease, stroke and liver disease. Many cancers (for example cancer of the breast, mouth, throat, oesophagus, liver, and colon) are linked to alcohol drinking. Many people who abuse alcohol also struggle with mental health problems like depression and anxiety. Drinking in pregnancy can lead to long-term harm to the baby, with greater risk the more you drink.



**Drinking, particularly in excessive amounts increases the risk of poor health, with higher risks associated with binge drinking and habitual drunkenness.**

### How to reduce alcohol intake?

- Limit the total amount of drink to less than 14 units per week – equivalent to six pints (each pint is about 500 ml) of beer, seven glasses of wine, 1 tot (35 ml) of spirits, 7 litres of traditional corn based beer and less than 2 glasses (each glass 250 ml) of traditionally distilled spirits.

### Why should you avoid smoking?

Tobacco accounts for over 7.2 million deaths every year (including from the effects of exposure to second-hand smoke). Cigarette smoking, even a few a day, increases the risk of heart disease. It is also responsible for 90% of lung cancers.

You can avoid these risks to your health if you completely avoid smoking. Even after having smoked for many years, stopping smoking now will reduce your risks.



## 10. To reduce your risk of NCDs aim for a healthy weight by eating healthy and being active.

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### Why should you aim for a healthy weight?

Excess weight is one of the most important risk factors for nearly all NCDs. Many people who are at risk or that are diagnosed with conditions like type 2 diabetes, high blood pressure and high cholesterol are overweight or obese. Being overweight is also a major risk for any cause of death, low quality of life, mental illness, depression among many other health conditions. The good news is that overweight and obesity are not necessarily permanent conditions. **Being consistent with a healthy diet and exercise as shown in the first 9 of the ten tips to a healthier you can lead to weight loss and keeping weight off.** More good news is that NCD health risks of overweight and obesity are in some cases completely or partially reversible with the adoption of a healthy lifestyle and weight loss. As little as losing 3-5% of your current body weight and keeping it off improves many parameters like blood sugar levels, blood pressure and cholesterol among other benefits. The principle of both preventing and managing overweight and obesity have been described in detail in the first nine of **ten steps to healthier you** outlined earlier. These tips are applicable to both men and women of all age groups. Further tips to help your weight loss journey are given below.

### How to lose weight and keep it off

- **Adopt a healthy lifestyle and make a long-term commitment to it.** Recognizing that you are overweight or obese, understanding that this poses a major health risk to you, and making the decision to change your lifestyle is a big step in the right direction.
- **Start by adopting goals for behaviour change.** For example, you may choose to work on 2 or 3 of the **10 tips to healthier you**, depending on where you think you need to improve the most. For example, you may choose to reduce or cut out sugary drinks, increase your fruit and vegetable intake and reduce the amount of high energy foods like fried chips and mandazi that you eat.
- **Increase the number of healthy behaviours.** You can commit to working towards your goals for a month then add more healthy tips to your habits. This could be putting stricter controls on your portions, eating more whole grains and being more physically active.
- **Regular physical activity helps keep the weight off.** Weight loss is achieved when more calories from the food you eat are used than the amount that is eaten.

- **Set a realistic goal for weight loss.** If you are overweight or obese, the more weight you lose will have significant health benefits and lower risk of all NCDs such as lowering blood pressure, blood sugar, and cholesterol. Weight loss of between 3% and 5% of current body weight is considered to be modest. For example, a person weighing 100 kg would see some improvement in their health by losing just 3-5 kg. More health benefits are realised when a person loses more weight. Remember that often your weight gain did not happen over a few weeks or months, so expect that weight loss can also take several weeks or months. You need to be consistent with activities and behaviours that you are doing to achieve your goal.
- **Be cautious of using herbs, supplements and weight loss products that are often marketed as quick solutions to weight loss.** Many of these products are not tested for safety, which means they may cause harm. There are also expensive and often not effective in the long run.
- **Reflect about your lifestyle and the food you eat as a habit**  
Before you start your journey to weight loss make a list of the reasons why you want to lose weight, what your goals are, the things and factors that pose the greatest challenges to your weight loss journey. These factors could be anything from finding it difficult to quit alcohol because of social circles, not having enough time to do physical activity or struggling with cravings for sugar. Be pro-active and think about ways to overcome them. Reflect daily on how far you have come and whether you achieved your own targets. Some people find it helpful to keep food and physical activity diary to track progress.
- **Understand that setbacks happen**  
Setbacks happen when you get off your plan for whatever reason. Common reasons are that you get too busy or are away from home. Do not be too hard on yourself but focus on getting back on track as quickly as possible. Be consistent about adopting healthy behaviours and you should lose some weight in the long run.
- **Identify or create support structures that help you succeed**  
Making lifestyle changes is easier when you have people to support you and hold you accountable. Find family, friends, co-workers, support groups or anyone else to support your weight loss efforts. Discuss your goals with people that you trust and regularly talk to them about progress. There is power in numbers, so find people with similar goals and help each other achieve goals by sharing useful tips that have worked for you, starting an exercise club or a weight loss group. Discuss your goals with your health professional too.

- **Seek professional advice**

If you struggle with setting your own goals you may want to visit a health professional like dietitian/nutritionist who can assess your health, help set realistic goals and help monitor your progress too.

## Childhood overweight and obesity

### Facts about childhood obesity

Overweight and obesity in children is rising rapidly in Africa. In Malawi the rates of overweight and obesity in school going children ranges from 15.5% -17.5%. Children born to mothers who are overweight have much greater chance of being overweight themselves. Hence it is important that mothers maintain a healthy weight and gain healthy amounts of weight throughout the pregnancy.

**Table 9: Ideal weight gain during pregnancy based on pre-pregnancy body mass index**

Pre-pregnancy weight status	Recommended total weight gain (kg)
Underweight (<18.5 kg/m <sup>2</sup> )	12.5-18.0
Normal (18.5 -24.9 kg/m <sup>2</sup> )	11.5-16.0
Overweight (25-29.9 kg/m <sup>2</sup> )	7.0-11.5
Obese (>30 kg/m <sup>2</sup> )	5.0-9.0

Children who are overweight are also more likely to remain overweight in adulthood and have increased risk of health problems like high blood pressure, type 2 diabetes and heart disease. They are also less happy and in some cases, do not perform as well at school than non-overweight or obese children. Many factors contribute to childhood overweight and obesity like easy access to unhealthy high calorie (energy) food and snacks, lack of exercise and too much time spent sitting watching tv, playing video games and not knowing how to eat healthy. Additionally, stunted children are likely to be overweight or obese during adulthood and are at risk of NCDs.

### How do children and adolescents maintain a healthy weight?

To maintain a healthy weight for children and adolescents, caregivers are encouraged to:

- Exclusively breastfeed from 0-6 months followed by continued breastfeeding to 2 years or beyond.

- Give age specific nutritious and healthy complimentary foods with focus on home cooked foods from the Malawi six food groups.
- Maintain a healthy diet that is diverse and include correct proportions from the Malawi six food groups according to age.
- Offer children lots of fruits, vegetables, and whole grains in place of unhealthy foods. There is little need to limit the portion sizes of these foods, but avoid giving unhealthy food like chocolates, chips, sweets and sugar.
- Gradually reduce the amount of juice and fizzy drink your child drinks. If they carry food to school always pack water for them. Discourage them from buying sugar sweetened drinks at school.
- Encourage lots of physical activity by supporting your children to join sports teams or clubs in school and outside of school and doing household chores like sweeping the house and yard, washing windows and clothes.
- Not use food as a reward for good behaviour but other activities as a reward like a family day out.
- Involve the entire family in a healthy plan including having nutritious and healthy meals together.
- Reduce screen time on televisions and other devices and replace with outdoor activities.
- Be role models in encouraging good eating habits.

Seek help from a dietician who can guide you through the management of overweight or obesity in your child. There is need to focus on nutritious healthy eating to maintain body weight and not weight loss for children.

# Section 3

## Diet and Lifestyle tips for management of common nutrition related NCDs

This is additional information that may help you understand how to apply and adopt the 10 tips to a healthier you when you have been diagnosed with a cardiovascular condition or diabetes. There is also some specific guidance for disease conditions. The information in this section does not replace health professional advice and is generalized to common issues of management. Most people with NCDs will require tailored and individualized recommendations from clinicians for optimal management of their condition.



## **Eat a heart-healthy diet to prevent and manage your risk of strokes and heart attacks**

### **Why a heart-healthy diet**

Cardiovascular diseases are the number one cause of death in the world. Hence, a heart-healthy diet aims to reduce the risk of getting cardiovascular diseases and reduce the risk of complications by promoting weight control, blood pressure control, blood cholesterol control and blood sugar control. All these are major risk factors for heart disease and stroke.



### **How to eat and live heart healthy diet**

#### **1. Reach and maintain a healthy weight**

Reaching and maintaining a healthy weight is essential for the prevention and management of high blood pressure, high cholesterol, heart disease and stroke. Various strategies may be used to reach and maintain ideal body weight. However, nearly all emphasise a healthy balanced diet with portion control and regular physical activity. See weight management section for tips on weight loss (Page 35).

#### **2. Eat more fruits and vegetables**

Fruits and vegetables are a good source of vitamins and minerals, low in calories and rich in dietary fibre, which all protect against heart disease and stroke. Therefore, eat a variety of fresh fruits and vegetables. **Refer to tip 2 of the 10 tips to a healthier you for guidance in increasing intake of fruits and vegetables on page 17.**



#### **3. Select whole grains for fibre, vitamins and minerals**

Whole grains are a good source of fibre, vitamins and minerals that have an important role in weight control, blood pressure control, blood sugar and blood cholesterol control. You can increase the amount of whole grains you are eating in the diet by substituting refined grain products with whole grains. **Refer to tip 3 of the 10 tips to a healthier you for guidance in increasing intake of whole grains and fibre on page 19.**

#### **4. Limit unhealthy fats and eat more healthy fats**

Eliminate all processed sources of fat from your diet and limit the amount of animal source

fat that you eat. Focus on healthy fat options and avoid cooking methods that use lots of fat like frying, deep frying instead choose baking and grilling. **Refer to tip 5 of the 10 tips to a healthier you for guidance for reducing the amount of fat you eat and choosing healthier fat options on page 24.**

## **5. Reduce the amount of salt in your food to control blood pressure**

Eating a lot of salt is a risk factor for cardiovascular disease such as high blood pressure. Reducing the amount of salt in food is an important part of a heart-healthy diet and remember that reducing salt does not just mean reducing the amount of salt you add during cooking and eating food. Significant amounts of salt come from processed/convenience foods, soup powders and artificial seasoning. **Refer to tip 7 of the 10 tips to a healthier you for guidance on reducing salt intake on page 29.**

## **6. If you have diabetes or prediabetes, control your blood sugar**

Diabetes and pre-diabetes are a very important risk factor for heart disease. In fact, most people that die from heart attacks and strokes are also people living with diabetes. Hence blood sugar control as outlined in the diabetes management tips section (page 44) is essential for reducing your risk of heart disease and death.










## **7. Get regular medical check-ups and follow your doctors instructions for taking medication**






Regular check-ups as prescribed by your doctor are very important to monitor how well you are managing your condition. Take your medication as prescribed by the doctor.

## **8. Reduce your blood pressure with the DASH plan**

The Dietary Approach to Stop Hypertension (DASH) is a heart-healthy way of eating that is designed to help you manage blood pressure. Scientific evidence shows DASH's effectiveness in reducing the risk and managing diabetes, gout, kidney diseases among other NCDs. The diet promotes consumption of fruits, vegetables, low-fat dairy products, whole grains, legumes and nuts as the most appropriate food stuffs. When combined with physical activity and avoidance of smoking and alcohol, the diet has been shown to lower blood pressure. Medication prescribed by doctors must still be taken as recommended until otherwise advised by your doctor. The diet suggests a specific number of servings of the recommended foods. One must plan how to distribute the servings throughout the day. A trained health professional like a dietitian/nutritionist can help you get started with a DASH diet.

**Table 10: Sample DASH plan**

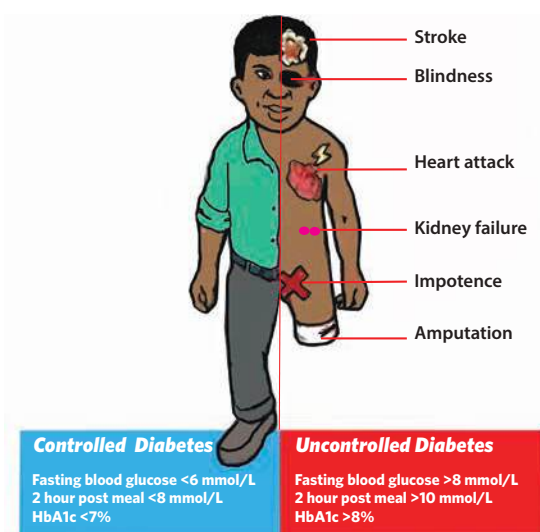
Food group	Type of food	Serving size Visual equivalence and cup and spoons sizes	Average portion per day
 <b>Vegetables</b>	Tomatoes, carrots, green leafy vegetables, cabbage, pumpkins	 <b>2 handfuls</b>	4-5
 <b>Fruits</b>	Oranges, bananas, paw paw, mangoes, lemons, melons, mulberries, masau	 <b>1 cup</b>	4-5
 <b>Legumes and Nuts</b>	groundnuts/peanuts, bambara nuts, macadamia, cashew nuts	 <b>½ cup</b>	4-5
	beans, peas, cowpeas/ black-eyed pea,	 <b>1 cup</b>	
 <b>Animal Foods</b>	Lean Meat (chicken, fish,) Beef or pork tenderloin  1 egg	 <b>Size of piece of meat</b>	2-3

	Fat free or low-fat milk and milk products	 <b>1 cup</b>	
 <b>Fats</b>	Cooking oil, peanut butter, margarine/ butter, mayonnaise (salad cream)	 <b>1 teaspoon</b>	2-3
 <b>Whole grain staples</b>	Nsima, rice, sweet potato, potato, cassava, bread  • 1 serving = 1 slice of bread, 1/2 cup rice, 1/2 cup nsima, 1/2 cup of most breakfast cereals,	 <b>1/2 cup</b>	6-8

## Diet and lifestyle tips of management of diabetes

### Why should you have good control of your blood sugars?

High blood sugars are directly linked with complications of diabetes like heart attacks and strokes, blindness, amputations and kidney failure. Hence in people with diabetes or prediabetes, blood sugar levels must be within acceptable target ranges. Your health care provider can give more details on what an acceptable blood sugar target is for you.



### How do you keep your blood sugars in control?

Adopt healthy self-care behaviours. Living a healthy and active life with diabetes is very possible when you adopt healthy behaviours that help you manage your condition. Experts agree that there are 7 behaviours everyone with diabetes should adopt for improved self-management. These include healthy eating and being active.

#### Self-care behaviours to good diabetes control and a healthier you

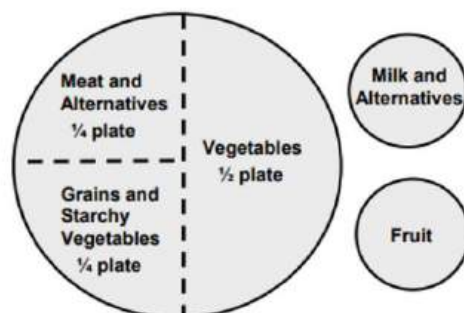
1. Healthy Eating
2. Being Physically Active
3. Monitoring
4. Taking Medications
5. Problem Solving
6. Reducing risk
7. Healthy coping

### 1. Healthy eating

Simply following healthy eating principles as discussed in the Ten tips to a healthier you, focusing on whole grains, fruits and vegetables and healthy/good fats in the right amounts is key to controlling blood sugars. **Thus, a 'diabetic diet' is not different from a healthy diet, which is the way everyone should eat irrespective of age, gender and whether they have NCDs.** A few things must be emphasized for people with diabetes

#### I. Portion control

The plate method and hand jive method for portion control are effective portion control strategies for



people with diabetes. The plate model was designed for people with diabetes and is very effective in controlling portions.

## **II. Staple foods, fruits and milk products are part of a healthy diet but also have the potential to raise blood sugar levels**

People living with diabetes should particularly be aware of the portions of fruits, staple foods and milk products that they eat. Even though some of these foods raise blood sugar the most, they are still part of a healthy diet. For staples, replace refined staples with whole grains. Keep portions to a quarter of your plate or your fist as shown in the portion guide. Avoid eating more than 2-3 fruits in a day and not all at once. All fruit have the same potential to raise your blood sugar per given portion. Hence, people with diabetes are not restricted to the type of fruit that they eat - just watch the portions.

## **III. Eat small but frequent meals**

It is also advisable for people with diabetes to eat small meals more frequently (every 3-4 hours) for better blood sugar control. Avoid skipping main meals (Breakfast, Lunch and Supper). Try and incorporate small snacks in between your meals- this is especially important if you are on insulin medication. It is important to try and keep the portion sizes of your meals the same from meal to meal.

## **2. Taking medication**

Taking medication correctly and consistently as prescribed by the doctor is extremely important for achieving good blood sugar control. Understand medication prescription by asking questions to your health care provider.

## **3. Physical activity**

In people with diabetes, being physically active is an important part of keeping good blood sugar control. Follow the tips on physical activity in the 10 steps to a healthier you to determine what kind of physical activity and how much you should be doing for your age group. People with diabetes should have a discussion with their health care providers on the best physical activities. Ensure that you have comfortable shoes that fit well (not too tight) when you do physical activity. If you own a glucometer, best practice is to check your blood sugar levels before starting physical activity, especially if you are on insulin.

- If your blood sugar levels are below 100 mg/dL, you should eat a small snack like 2 pieces of bread or a fruit. Carry the equivalent of a glass sugary drink with you during long duration physical activity. This could be a sports drink or fruit juice.



- If your blood sugar is above 240 mg/dL then it is too high, and it is not safe to exercise.

#### 4. Monitoring

People with diabetes must monitor their blood sugar levels frequently in order to see how well they are controlling the diabetes and make informed decisions on treatment plan. Weight, blood pressure and blood cholesterol levels should also be routinely monitored. These factors complicate the management of diabetes and increase the risk of complications. A health care worker can provide more details on the frequency of monitoring and interpretation of your blood sugar, weight, blood pressure and cholesterol levels. The health care worker will also be advise on frequency of medical check-ups. People living with diabetes must also inspect their feet frequently for cracks, wounds and sores.

#### 5. Problem solving

Diabetes is a complex disease that requires a person to make daily decisions on what and how to eat, level of physical activity, taking medication and monitoring of their sugar levels among other parameters. Unfortunately, no one day will be the same and it is normal to be faced with different conditions and environments that pose equally different challenges to your adherence to self-care behaviours. Try not to be overwhelmed and take one problem at a time. Ask for help from your clinician. You must ask "*what to do if....*" questions. Continue to ask for help and support if the problem is not solved. Asking such questions can help reduce the risk of poor blood sugar control and, frequent admissions in hospital.

##### **"What to do if..." questions to ask your health professional**

1. What should I do if I have low or high blood sugar?
2. What should I do if I travel?
3. What should I do if I want to eat extra food?
4. What to do if I want to do more or less physical activity than normal?
5. What should I do if I am too sick to eat?

#### 6. Reducing risks

Poor diabetes control is associated with several complications from heart disease and stroke to blindness. Therefore, it is important for people with diabetes to have routine diabetes test, exams and treatments to reduce the risk of diabetes. Regular visits to health care centre, taking medication as prescribed, following a healthy diet and lifestyle are all part of reducing risks. In, addition avoiding alcohol and smoking reduces the risk of heart disease and stroke complications.

## **7. Healthy coping**

The daily demands of managing what you eat, your activity, taking medication and self-monitoring, coupled with demands of life tasks/goals like earning a living and raising children can be very demanding for people with diabetes and their families. Healthy coping involves knowing when and who to ask for help. Health professionals will be able to give you support and teach you coping skills. However, it is also important that you get family and community support.

# Annexes

This is additional information that may help you understand how to apply and adopt the 10 tips to a healthier you

## Annexe 1

### BMI Reference Tables for adults >19 years old

Height (cm)	Adults 134–169 cm tall, table 1 of 2																												
169	9.8	10.2	10.5	10.9	11.2	11.6	11.9	12.3	12.6	13.0	13.3	13.7	14.0	14.4	14.7	15.1	15.4	15.8	16.1	16.5	16.8	17.2	17.5	17.9	18.2	18.6	18.9	19.3	19.6
168	9.9	10.3	10.6	11.0	11.3	11.7	12.0	12.4	12.8	13.1	13.5	13.8	14.2	14.5	14.9	15.2	15.6	15.9	16.3	16.7	17.0	17.4	17.7	18.1	18.4	18.8	19.1	19.5	19.8
167	10.0	10.4	10.8	11.1	11.5	11.8	12.2	12.5	12.9	13.3	13.6	14.0	14.3	14.7	15.1	15.4	15.8	16.1	16.5	16.9	17.2	17.6	17.9	18.3	18.6	19.0	19.4	19.7	20.1
166	10.2	10.5	10.9	11.2	11.6	12.0	12.3	12.7	13.1	13.4	13.8	14.2	14.5	14.9	15.2	15.6	16.0	16.3	16.7	17.1	17.4	17.8	18.1	18.5	18.9	19.2	19.6	20.0	20.3
165	10.3	10.7	11.0	11.4	11.8	12.1	12.5	12.9	13.2	13.6	14.0	14.3	14.7	15.1	15.4	15.8	16.2	16.5	16.9	17.3	17.6	18.0	18.4	18.7	19.1	19.5	19.8	20.2	20.6
164	10.4	10.8	11.2	11.5	11.9	12.3	12.6	13.0	13.4	13.8	14.1	14.5	14.9	15.2	15.6	16.0	16.4	16.7	17.1	17.5	17.8	18.2	18.6	19.0	19.3	19.7	20.1	20.4	20.8
163	10.5	10.9	11.3	11.7	12.0	12.4	12.8	13.2	13.5	13.9	14.3	14.7	15.1	15.4	15.8	16.2	16.6	16.9	17.3	17.7	18.1	18.4	18.8	19.2	19.6	19.9	20.3	20.7	21.1
162	10.7	11.1	11.4	11.8	12.2	12.6	13.0	13.3	13.7	14.1	14.5	14.9	15.2	15.6	16.0	16.4	16.8	17.1	17.5	17.9	18.3	18.7	19.1	19.4	19.8	20.2	20.6	21.0	21.3
161	10.8	11.2	11.6	12.0	12.3	12.7	13.1	13.5	13.9	14.3	14.7	15.0	15.4	15.8	16.2	16.6	17.0	17.4	17.7	18.1	18.5	18.9	19.3	19.7	20.1	20.4	20.8	21.2	21.6
160	10.9	11.3	11.7	12.1	12.5	12.9	13.3	13.7	14.1	14.5	14.8	15.2	15.6	16.0	16.4	16.8	17.2	17.6	18.0	18.4	18.8	19.1	19.5	19.9	20.3	20.7	21.1	21.5	21.9
159	11.1	11.5	11.9	12.3	12.7	13.1	13.4	13.8	14.2	14.6	15.0	15.4	15.8	16.2	16.6	17.0	17.4	17.8	18.2	18.6	19.0	19.4	19.8	20.2	20.6	21.0	21.4	21.8	22.2
158	11.2	11.6	12.0	12.4	12.8	13.2	13.6	14.0	14.4	14.8	15.2	15.6	16.0	16.4	16.8	17.2	17.6	18.0	18.4	18.8	19.2	19.6	20.0	20.4	20.8	21.2	21.6	22.0	22.4
157	11.4	11.8	12.2	12.6	13.0	13.4	13.8	14.2	14.6	15.0	15.4	15.8	16.2	16.6	17.0	17.4	17.9	18.3	18.7	19.1	19.5	19.9	20.3	20.7	21.1	21.5	21.9	22.3	22.7
156	11.5	11.9	12.3	12.7	13.1	13.6	14.0	14.4	14.8	15.2	15.6	16.0	16.4	16.8	17.3	17.7	18.1	18.5	18.9	19.3	19.7	20.1	20.5	21.0	21.4	21.8	22.2	22.6	23.0
155	11.7	12.1	12.5	12.9	13.3	13.7	14.2	14.6	15.0	15.4	15.8	16.2	16.6	17.1	17.5	17.9	18.3	18.7	19.1	19.6	20.0	20.4	20.8	21.2	21.6	22.1	22.5	22.9	23.3
154	11.8	12.2	12.6	13.1	13.5	13.9	14.3	14.8	15.2	15.6	16.0	16.4	16.9	17.3	17.7	18.1	18.6	19.0	19.4	19.8	20.2	20.7	21.1	21.5	21.9	22.3	22.8	23.2	23.6
153	12.0	12.4	12.8	13.2	13.7	14.1	14.5	15.0	15.4	15.8	16.2	16.7	17.1	17.5	17.9	18.4	18.8	19.2	19.7	20.1	20.5	20.9	21.4	21.8	22.2	22.6	23.1	23.5	23.9
152	12.1	12.6	13.0	13.4	13.9	14.3	14.7	15.1	15.6	16.0	16.4	16.9	17.3	17.7	18.2	18.6	19.0	19.5	19.9	20.3	20.8	21.2	21.6	22.1	22.5	22.9	23.4	23.8	24.2
151	12.3	12.7	13.2	13.6	14.0	14.5	14.9	15.4	15.8	16.2	16.7	17.1	17.5	18.0	18.4	18.9	19.3	19.7	20.2	20.6	21.1	21.5	21.9	22.4	22.8	23.2	23.7	24.1	24.6
150	12.4	12.9	13.3	13.8	14.2	14.7	15.1	15.6	16.0	16.4	16.9	17.3	17.8	18.2	18.7	19.1	19.6	20.0	20.4	20.9	21.3	21.8	22.2	22.7	23.1	23.6	24.0	24.4	24.9
149	12.6	13.1	13.5	14.0	14.4	14.9	15.3	15.8	16.2	16.7	17.1	17.6	18.0	18.5	18.9	19.4	19.8	20.3	20.7	21.2	21.6	22.1	22.5	23.0	23.4	23.9	24.3	24.8	25.2
148	12.8	13.2	13.7	14.2	14.6	15.1	15.5	16.0	16.4	16.9	17.3	17.8	18.3	18.7	19.2	19.6	20.1	20.5	21.0	21.5	21.9	22.4	22.8	23.3	23.7	24.2	24.7	25.1	25.6
147	13.0	13.4	13.9	14.3	14.8	15.3	15.7	16.2	16.7	17.1	17.6	18.0	18.5	19.0	19.4	19.9	20.4	20.8	21.3	21.8	22.2	22.7	23.1	23.6	24.1	24.5	25.0	25.5	25.9
146	13.1	13.6	14.1	14.5	15.0	15.5	16.0	16.4	16.9	17.4	17.8	18.3	18.8	19.2	19.7	20.2	20.6	21.1	21.6	22.0	22.5	23.0	23.5	23.9	24.4	24.9	25.3	25.8	26.3
145	13.3	13.8	14.3	14.7	15.2	15.7	16.2	16.6	17.1	17.6	18.1	18.5	19.0	19.5	20.0	20.5	20.9	21.4	21.9	22.4	22.8	23.3	23.8	24.3	24.7	25.2	25.7	26.2	26.6
144	13.5	14.0	14.5	14.9	15.4	15.9	16.4	16.9	17.4	17.8	18.3	18.8	19.3	19.8	20.3	20.7	21.2	21.7	22.2	22.7	23.1	23.6	24.1	24.6	25.1	25.6	26.0	26.5	27.0
143	13.7	14.2	14.7	15.2	15.6	16.1	16.6	17.1	17.6	18.1	18.6	19.1	19.6	20.0	20.5	21.0	21.5	22.0	22.5	23.0	23.5	24.0	24.5	24.9	25.4	25.9	26.4	26.9	27.4
142	13.9	14.4	14.9	15.4	15.9	16.4	16.9	17.4	17.9	18.3	18.8	19.3	19.8	20.3	20.8	21.3	21.8	22.3	22.8	23.3	23.8	24.3	24.8	25.3	25.8	26.3	26.8	27.3	27.8
141	14.1	14.6	15.1	15.6	16.1	16.6	17.1	17.6	18.1	18.6	19.1	19.6	20.1	20.6	21.1	21.6	22.1	22.6	23.1	23.6	24.1	24.6	25.1	25.7	26.2	26.7	27.2	27.7	28.2
140	14.3	14.8	15.3	15.8	16.3	16.8	17.3	17.9	18.4	18.9	19.4	19.9	20.4	20.9	21.4	21.9	22.4	23.0	23.5	24.0	24.5	25.0	25.5	26.0	26.5	27.0	27.6	28.1	28.6
139	14.5	15.0	15.5	16.0	16.6	17.1	17.6	18.1	18.6	19.2	19.7	20.2	20.7	21.2	21.7	22.3	22.8	23.3	23.8	24.3	24.8	25.4	25.9	26.4	26.9	27.4	27.9	28.5	29.0
138	14.7	15.2	15.8	16.3	16.8	17.3	17.9	18.4	18.9	19.4	20.0	20.5	21.0	21.5	22.1	22.6	23.1	23.6	24.2	24.7	25.2	25.7	26.3	26.8	27.3	27.8	28.4	28.9	29.4
137	14.9	15.5	16.0	16.5	17.0	17.6	18.1	18.6	19.2	19.7	20.2	20.8	21.3	21.8	22.4	22.9	23.4	24.0	24.5	25.0	25.6	26.1	26.6	27.2	27.7	28.2	28.8	29.3	29.8
136	15.1	15.7	16.2	16.8	17.3	17.8	18.4	18.9	19.5	20.0	20.5	21.1	21.6	22.2	22.7	23.2	23.8	24.3	24.9	25.4	26.0	26.5	27.0	27.6	28.1	28.7	29.2	29.7	30.3
135	15.4	15.9	16.5	17.0	17.6	18.1	18.7	19.2	19.8	20.3	20.9	21.4	21.9	22.5	23.0	23.6	24.1	24.7	25.2	25.8	26.3	26.9	27.4	28.0	28.5	29.1	29.6	30.2	30.7
134	15.6	16.2	16.7	17.3	17.8	18.4	18.9	19.5	20.0	20.6	21.2	21.7	22.3	22.8	23.4	23.9	24.5	25.1	25.6	26.2	26.7	27.3	27.8	28.4	29.0	29.5	30.1	30.6	31.2
Weight (kg)	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56

Height (cm)	Adults 134–169 cm tall, table 2 of 2																													
169	20.0	20.3	20.7	21.0	21.4	21.7	22.1	22.4	22.8	23.1	23.5	23.8	24.2	24.5	24.9	25.2	25.6	25.9	26.3	26.6	27.0	27.3	27.7	28.0	28.4	28.7	29.1	29.4	29.8	30.1
168	20.2	20.5	20.9	21.3	21.6	22.0	22.3	22.7	23.0	23.4	23.7	24.1	24.4	24.8	25.2	25.5	25.9	26.2	26.6	26.9	27.3	27.6	28.0	28.3	28.7	29.1	29.4	29.8	30.1	30.5
167	20.4	20.8	21.2	21.5	21.9	22.2	22.6	22.9	23.3	23.7	24.0	24.4	24.7	25.1	25.5	25.8	26.2	26.5	26.9	27.3	27.6	28.0	28.3	28.7	29.0	29.4	29.8	30.1	30.5	30.8
166	20.7	21.0	21.4	21.8	22.1	22.5	22.9	23.2	23.6	24.0	24.3	24.7	25.0	25.4	25.8	26.1	26.5	26.9	27.2	27.6	27.9	28.3	28.7	29.0	29.4	29.8	30.1	30.5	30.8	31.2
165	20.9	21.3	21.7	22.0	22.4	22.8	23.1	23.5	23.9	24.2	24.6	25.0	25.3	25.7	26.1	26.4	26.8	27.2	27.5	27.9	28.3	28.7	29.0	29.4	29.8	30.1	30.5	30.9	31.2	31.6
164	21.2	21.6	21.9	22.3	22.7	23.1	23.4	23.8	24.2	24.5	24.9	25.3	25.7	26.0	26.4	26.8	27.1	27.5	27.9	28.3	28.6	29.0	29.4	29.7	30.1	30.5	30.9	31.2	31.6	32.0
163	21.5	21.8	22.2	22.6	23.0	23.3	23.7	24.1	24.5	24.8	25.2	25.6	26.0	26.3	26.7	27.1	27.5	27.9	28.2	28.6	29.0	29.4	29.7	30.1	30.5	30.9	31.2	31.6	32.0	32.4
162	21.7	22.1	22.5	22.9	23.2	23.6	24.0	24.4	24.8	25.1	25.5	25.9	26.3	26.7	27.1	27.4	27.8	28.2	28.6	29.0	29.3	29.7	30.1	30.5	30.9	31.2	31.6	32.0	32.4	32.8
161	22.0	22.4	22.8	23.1	23.5	23.9	24.3	24.7	25.1	25.5	25.8	26.2	26.6	27.0	27.4	27.8	28.2	28.5	28.9	29.3	29.7	30.1	30.5	30.9	31.2	31.6	32.0	32.4	32.8	33.2
160	22.3	22.7	23.0	23.4	23.8	24.2	24.6	25.0	25.4	25.8	26.2	26.6	27.0	27.3	27.7	28.1	28.5	28.9	29.3	29.7	30.1	30.5	30.9	31.3	31.6	32.0	32.4	32.8	33.2	33.6
159	22.5	22.9	23.3	23.7	24.1	24.5	24.9	25.3	25.7	26.1	26.5	26.9	27.3	27.7	28.1	28.5	28.9	29.3	29.7	30.1	30.5	30.9	31.2	31.6	32.0	32.4	32.8	33.2	33.6	34.0
158	22.8	23.2	23.6	24.0	24.4	24.8	25.2	25.6	26.0	26.4	26.8	27.2	27.6	28.0	28.4	28.8	29.2	29.6	30.0	30.4	30.8	31.2	31.6	32.0	32.4	32.8	33.2	33.6	34.0	34.4
157	23.1	23.5	23.9	24.3	24.7	25.2	25.6	26.0	26.4	26.8	27.2	27.6	28.0	28.4	28.8	29.2	29.6	30.0	30.4	30.8	31.2	31.6	32.0	32.5	32.9	33.3	33.7	34.1	34.5	34.9
156	23.4	23.8	24.2	24.7	25.1	25.5	25.9	26.3	26.7	27.1	27.5	27.9	28.4	28.8	29.2	29.6	30.0	30.4	30.8	31.2	31.6	32.1	32.5	32.9	33.3	33.7	34.1	34.5	34.9	35.3
155	23.7	24.1	24.6	25.0	25.4	25.8	26.2	26.6	27.1	27.5	27.9	28.3	28.7	29.1	29.6	30.0	30.4	30.8	31.2	31.6	32.0	32.5	32.9	33.3	33.7	34.1	34.5	35.0	35.4	35.8
154	24.0	24.5	24.9	25.3	25.7	26.1	26.6	27.0	27.4	27.8	28.3	28.7	29.1	29.5	29.9	30.4	30.8	31.2	31.6	32.0	32.5	32.9	33.3	33.7	34.2	34.6	35.0	35.4	35.8	36.3
153	24.3	24.8	25.2	25.6	26.1	26.5	26.9	27.3	27.8	28.2	28.6	29.0	29.5	29.9	30.3	30.8	31.2	31.6	32.0	32.5	32.9	33.3	33.7	34.2	34.6	35.0	35.5	35.9	36.3	36.7
152	24.7	25.1	25.5	26.0	26.4	26.8	27.3	27.7	28.1	28.6	29.0	29.4	29.9	30.3	30.7	31.2	31.6	32.0	32.5	32.9	33.3	33.8	34.2	34.6	35.1	35.5	35.9	36.4	36.8	37.2
151	25.0	25.4	25.9	26.3	26.8	27.2	27.6	28.1	28.5	28.9	29.4	29.8	30.3	30.7	31.1	31.6	32.0	32.5	32.9	33.3	33.8	34.2	34.6	35.1	35.5	36.0	36.4	36.8	37.3	37.7
150	25.3	25.8	26.2	26.7	27.1	27.6	28.0	28.4	28.9	29.3	29.8	30.2	30.7	31.1	31.6	32.0	32.4	32.9	33.3	33.8	34.2	34.7	35.1	35.6	36.0	36.4	36.9	37.3	37.8	38.2
149	25.7	26.1	26.6	27.0	27.5	27.9	28.4	28.8	29.3	29.7	30.2	30.6	31.1	31.5	32.0	32.4	32.9	33.3	33.8	34.2	34.7	35.1	35.6	36.0	36.5	36.9	37.4	37.8	38.3	38.7
148	26.0	26.5	26.9	27.4	27.8	28.3	28.8	29.2	29.7	30.1	30.6	31.0	31.5	32.0	32.4	32.9	33.3	33.8	34.2	34.7	35.2	35.6	36.1	36.5	37.0	37.4	37.9	38.3	38.8	39.3
147	26.4	26.8	27.3	27.8	28.2	28.7	29.2	29.6	30.1	30.5	31.0	31.5	31.9	32.4	32.9	33.3	33.8	34.2	34.7	35.2	35.6	36.1	36.6	37.0	37.5	37.9	38.4	38.9	39.3	39.8
146	26.7	27.2	27.7	28.1	28.6	29.1	29.6	30.0	30.5	31.0	31.4	31.9	32.4	32.8	33.3	33.8	34.2	34.7	35.2	35.7	36.1	36.6	37.1	37.5	38.0	38.5	38.9	39.4	39.9	40.3
145	27.1	27.6	28.1	28.5	29.0	29.5	30.0	30.4	30.9	31.4	31.9	32.3	32.8	33.3	33.8	34.2	34.7	35.2	35.7	36.1	36.6	37.1	37.6	38.0	38.5	39.0	39.5	40.0	40.4	40.9
144	27.5	28.0	28.5	28.9	29.4	29.9	30.4	30.9	31.3	31.8	32.3	32.8	33.3	33.8	34.2	34.7	35.2	35.7	36.2	36.7	37.1	37.6	38.1	38.6	39.1	39.5	40.0	40.5	41.0	41.5
143	27.9	28.4	28.9	29.3	29.8	30.3	30.8	31.3	31.8	32.3	32.8	33.3	33.7	34.2	34.7	35.2	35.7	36.2	36.7	37.2	37.7	38.1	38.6	39.1	39.6	40.1	40.6	41.1	41.6	42.1
142	28.3	28.8	29.3	29.8	30.3	30.7	31.2	31.7	32.2	32.7	33.2	33.7	34.2	34.7	35.2	35.7	36.2	36.7	37.2	37.7	38.2	38.7	39.2	39.7	40.2	40.7	41.2	41.7	42.2	42.7
141	28.7	29.2	29.7	30.2	30.7	31.2	31.7	32.2	32.7	33.2	33.7	34.2	34.7	35.2	35.7	36.2	36.7	37.2	37.7	38.2	38.7	39.2	39.7	40.2	40.7	41.2	41.7	42.3	42.8	43.3
140	29.1	29.6	30.1	30.6	31.1	31.6	32.1	32.7	33.2	33.7	34.2	34.7	35.2	35.7	36.2	36.7	37.2	37.8	38.3	38.8	39.3	39.8	40.3	40.8	41.3	41.8	42.3	42.9	43.4	43.9
139	29.5	30.0	30.5	31.1	31.6	32.1	32.6	33.1	33.6	34.2	34.7	35.2	35.7	36.2	36.7	37.3	37.8	38.3	38.8	39.3	39.9	40.4	40.9	41.4	41.9	42.4	43.0	43.5	44.0	44.5
138	29.9	30.5	31.0	31.5	32.0	32.6	33.1	33.6	34.1	34.7	35.2	35.7	36.2	36.8	37.3	37.8	38.3	38.9	39.4	39.9	40.4	41.0	41.5	42.0	42.5	43.1	43.6	44.1	44.6	45.2
137	30.4	30.9	31.4	32.0	32.5	33.0	33.6	34.1	34.6	35.2	35.7	36.2	36.8	37.3	37.8	38.4	38.9	39.4	40.0	40.5	41.0	41.6	42.1	42.6	43.2	43.7	44.2	44.8	45.3	45.8
136	30.8	31.4	31.9	32.4	33.0	33.5	34.1	34.6	35.1	35.7	36.2	36.8	37.3	37.8	38.4	38.9	39.5	40.0	40.5	41.1	41.6	42.2	42.7	43.3	43.8	44.3	44.9	45.4	46.0	46.5
135	31.3	31.8	32.4	32.9	33.5	34.0	34.6	35.1	35.7	36.2	36.8	37.3	37.9	38.4	39.0	39.5	40.1	40.6	41.2	41.7	42.2	42.8	43.3	43.9	44.4	45.0	45.5	46.1	46.6	47.2
134	31.7	32.3	32.9	33.4	34.0	34.5	35.1	35.6	36.2	36.8	37.3	37.9	38.4	39.0	39.5	40.1	40.7	41.2	41.8	42.3	42.9	43.4	44.0	44.6	45.1	45.7	46.2	46.8	47.3	47.9
Weight (kg)	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86

KEY

Severe undernutrition  
(BMI < 16.0)

Moderate undernutrition  
(BMI ≥ 16.0 to 18.4)

Normal  
(BMI ≥ 18.5 to 24.9)

Overweight  
(BMI ≥ 25.0 to 29.9)

Obese  
(BMI ≥ 30.0)

Height (cm)	Adults 170–200 cm tall, table 1 of 2																												
200	11.5	11.8	12.0	12.3	12.5	12.8	13.0	13.3	13.5	13.8	14.0	14.3	14.5	14.8	15.0	15.3	15.5	15.8	16.0	16.3	16.5	16.8	17.0	17.3	17.5	17.8	18.0	18.3	18.5
199	11.6	11.9	12.1	12.4	12.6	12.9	13.1	13.4	13.6	13.9	14.1	14.4	14.6	14.9	15.2	15.4	15.7	15.9	16.2	16.4	16.7	16.9	17.2	17.4	17.7	17.9	18.2	18.4	18.7
198	11.7	12.0	12.2	12.5	12.8	13.0	13.3	13.5	13.8	14.0	14.3	14.5	14.8	15.0	15.3	15.6	15.8	16.1	16.3	16.6	16.8	17.1	17.3	17.6	17.9	18.1	18.4	18.6	18.9
197	11.9	12.1	12.4	12.6	12.9	13.1	13.4	13.7	13.9	14.2	14.4	14.7	14.9	15.2	15.5	15.7	16.0	16.2	16.5	16.7	17.0	17.3	17.5	17.8	18.0	18.3	18.6	18.8	19.1
196	12.0	12.2	12.5	12.8	13.0	13.3	13.5	13.8	14.1	14.3	14.6	14.8	15.1	15.4	15.6	15.9	16.1	16.4	16.7	16.9	17.2	17.4	17.7	18.0	18.2	18.5	18.7	19.0	19.3
195	12.1	12.4	12.6	12.9	13.1	13.4	13.7	13.9	14.2	14.5	14.7	15.0	15.3	15.5	15.8	16.0	16.3	16.6	16.8	17.1	17.4	17.6	17.9	18.1	18.4	18.7	18.9	19.2	19.5
194	12.2	12.5	12.8	13.0	13.3	13.6	13.8	14.1	14.3	14.6	14.9	15.1	15.4	15.7	15.9	16.2	16.5	16.7	17.0	17.3	17.5	17.8	18.1	18.3	18.6	18.9	19.1	19.4	19.7
193	12.3	12.6	12.9	13.2	13.4	13.7	14.0	14.2	14.5	14.8	15.0	15.3	15.6	15.8	16.1	16.4	16.6	16.9	17.2	17.5	17.7	18.0	18.3	18.5	18.8	19.1	19.3	19.6	19.9
192	12.5	12.7	13.0	13.3	13.6	13.8	14.1	14.4	14.6	14.9	15.2	15.5	15.7	16.0	16.3	16.5	16.8	17.1	17.4	17.6	17.9	18.2	18.4	18.7	19.0	19.3	19.5	19.8	20.1
191	12.6	12.9	13.2	13.4	13.7	14.0	14.3	14.5	14.8	15.1	15.4	15.6	15.9	16.2	16.4	16.7	17.0	17.3	17.5	17.8	18.1	18.4	18.6	18.9	19.2	19.5	19.7	20.0	20.3
190	12.7	13.0	13.3	13.6	13.9	14.1	14.4	14.7	15.0	15.2	15.5	15.8	16.1	16.3	16.6	16.9	17.2	17.5	17.7	18.0	18.3	18.6	18.8	19.1	19.4	19.7	19.9	20.2	20.5
189	12.9	13.2	13.4	13.7	14.0	14.3	14.6	14.8	15.1	15.4	15.7	16.0	16.2	16.5	16.8	17.1	17.4	17.6	17.9	18.2	18.5	18.8	19.0	19.3	19.6	19.9	20.2	20.4	20.7
188	13.0	13.3	13.6	13.9	14.1	14.4	14.7	15.0	15.3	15.6	15.8	16.1	16.4	16.7	17.0	17.3	17.5	17.8	18.1	18.4	18.7	19.0	19.2	19.5	19.8	20.1	20.4	20.7	20.9
187	13.2	13.4	13.7	14.0	14.3	14.6	14.9	15.2	15.4	15.7	16.0	16.3	16.6	16.9	17.2	17.4	17.7	18.0	18.3	18.6	18.9	19.2	19.4	19.7	20.0	20.3	20.6	20.9	21.2
186	13.3	13.6	13.9	14.2	14.5	14.7	15.0	15.3	15.6	15.9	16.2	16.5	16.8	17.1	17.3	17.6	17.9	18.2	18.5	18.8	19.1	19.4	19.7	19.9	20.2	20.5	20.8	21.1	21.4
185	13.4	13.7	14.0	14.3	14.6	14.9	15.2	15.5	15.8	16.1	16.4	16.7	16.9	17.2	17.5	17.8	18.1	18.4	18.7	19.0	19.3	19.6	19.9	20.2	20.5	20.7	21.0	21.3	21.6
184	13.6	13.9	14.2	14.5	14.8	15.1	15.4	15.7	15.9	16.2	16.5	16.8	17.1	17.4	17.7	18.0	18.3	18.6	18.9	19.2	19.5	19.8	20.1	20.4	20.7	21.0	21.3	21.6	21.9
183	13.7	14.0	14.3	14.6	14.9	15.2	15.5	15.8	16.1	16.4	16.7	17.0	17.3	17.6	17.9	18.2	18.5	18.8	19.1	19.4	19.7	20.0	20.3	20.6	20.9	21.2	21.5	21.8	22.1
182	13.9	14.2	14.5	14.8	15.1	15.4	15.7	16.0	16.3	16.6	16.9	17.2	17.5	17.8	18.1	18.4	18.7	19.0	19.3	19.6	19.9	20.2	20.5	20.8	21.1	21.4	21.7	22.0	22.3
181	14.0	14.3	14.7	15.0	15.3	15.6	15.9	16.2	16.5	16.8	17.1	17.4	17.7	18.0	18.3	18.6	18.9	19.2	19.5	19.8	20.1	20.5	20.8	21.1	21.4	21.7	22.0	22.3	22.6
180	14.2	14.5	14.8	15.1	15.4	15.7	16.0	16.4	16.7	17.0	17.3	17.6	17.9	18.2	18.5	18.8	19.1	19.4	19.8	20.1	20.4	20.7	21.0	21.3	21.6	21.9	22.2	22.5	22.8
179	14.4	14.7	15.0	15.3	15.6	15.9	16.2	16.5	16.9	17.2	17.5	17.8	18.1	18.4	18.7	19.0	19.4	19.7	20.0	20.3	20.6	20.9	21.2	21.5	21.8	22.2	22.5	22.8	23.1
178	14.5	14.8	15.1	15.5	15.8	16.1	16.4	16.7	17.0	17.4	17.7	18.0	18.3	18.6	18.9	19.3	19.6	19.9	20.2	20.5	20.8	21.1	21.5	21.8	22.1	22.4	22.7	23.0	23.4
177	14.7	15.0	15.3	15.6	16.0	16.3	16.6	16.9	17.2	17.6	17.9	18.2	18.5	18.8	19.2	19.5	19.8	20.1	20.4	20.7	21.1	21.4	21.7	22.0	22.3	22.7	23.0	23.3	23.6
176	14.9	15.2	15.5	15.8	16.1	16.5	16.8	17.1	17.4	17.8	18.1	18.4	18.7	19.0	19.4	19.7	20.0	20.3	20.7	21.0	21.3	21.6	22.0	22.3	22.6	22.9	23.2	23.6	23.9
175	15.0	15.3	15.7	16.0	16.3	16.7	17.0	17.3	17.6	18.0	18.3	18.6	18.9	19.3	19.6	19.9	20.2	20.6	20.9	21.2	21.6	21.9	22.2	22.5	22.9	23.2	23.5	23.8	24.2
174	15.2	15.5	15.9	16.2	16.5	16.8	17.2	17.5	17.8	18.2	18.5	18.8	19.2	19.5	19.8	20.1	20.5	20.8	21.1	21.5	21.8	22.1	22.5	22.8	23.1	23.5	23.8	24.1	24.4
173	15.4	15.7	16.0	16.4	16.7	17.0	17.4	17.7	18.0	18.4	18.7	19.0	19.4	19.7	20.0	20.4	20.7	21.0	21.4	21.7	22.1	22.4	22.7	23.1	23.4	23.7	24.1	24.4	24.7
172	15.5	15.9	16.2	16.6	16.9	17.2	17.6	17.9	18.3	18.6	18.9	19.3	19.6	19.9	20.3	20.6	21.0	21.3	21.6	22.0	22.3	22.6	23.0	23.3	23.7	24.0	24.3	24.7	25.0
171	15.7	16.1	16.4	16.8	17.1	17.4	17.8	18.1	18.5	18.8	19.2	19.5	19.8	20.2	20.5	20.9	21.2	21.5	21.9	22.2	22.6	22.9	23.3	23.6	23.9	24.3	24.6	25.0	25.3
170	15.9	16.3	16.6	17.0	17.3	17.6	18.0	18.3	18.7	19.0	19.4	19.7	20.1	20.4	20.8	21.1	21.5	21.8	22.1	22.5	22.8	23.2	23.5	23.9	24.2	24.6	24.9	25.3	25.6
Weight (kg)	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74



Height (cm)	Adults 170–200 cm tall, table 2 of 2																													
200	18.8	19.0	19.3	19.5	19.8	20.0	20.3	20.5	20.8	21.0	21.3	21.5	21.8	22.0	22.3	22.5	22.8	23.0	23.3	23.5	23.8	24.0	24.3	24.5	24.8	25.0	25.3	25.5	25.8	26.0
199	18.9	19.2	19.4	19.7	19.9	20.2	20.5	20.7	21.0	21.2	21.5	21.7	22.0	22.2	22.5	22.7	23.0	23.2	23.5	23.7	24.0	24.2	24.5	24.7	25.0	25.3	25.5	25.8	26.0	26.3
198	19.1	19.4	19.6	19.9	20.2	20.4	20.7	20.9	21.2	21.4	21.7	21.9	22.2	22.4	22.7	23.0	23.2	23.5	23.7	24.0	24.2	24.5	24.7	25.0	25.3	25.5	25.8	26.0	26.3	26.5
197	19.3	19.6	19.8	20.1	20.4	20.6	20.9	21.1	21.4	21.6	21.9	22.2	22.4	22.7	22.9	23.2	23.4	23.7	24.0	24.2	24.5	24.7	25.0	25.3	25.5	25.8	26.0	26.3	26.5	26.8
196	19.5	19.8	20.0	20.3	20.6	20.8	21.1	21.3	21.6	21.9	22.1	22.4	22.6	22.9	23.2	23.4	23.7	23.9	24.2	24.5	24.7	25.0	25.2	25.5	25.8	26.0	26.3	26.6	26.8	27.1
195	19.7	20.0	20.2	20.5	20.8	21.0	21.3	21.6	21.8	22.1	22.4	22.6	22.9	23.1	23.4	23.7	23.9	24.2	24.5	24.7	25.0	25.2	25.5	25.8	26.0	26.3	26.6	26.8	27.1	27.4
194	19.9	20.2	20.5	20.7	21.0	21.3	21.5	21.8	22.1	22.3	22.6	22.9	23.1	23.4	23.6	23.9	24.2	24.4	24.7	25.0	25.2	25.5	25.8	26.0	26.3	26.6	26.8	27.1	27.4	27.7
193	20.1	20.4	20.7	20.9	21.2	21.5	21.7	22.0	22.3	22.6	22.8	23.1	23.4	23.6	23.9	24.2	24.4	24.7	25.0	25.2	25.5	25.8	26.0	26.3	26.6	26.8	27.1	27.4	27.7	27.9
192	20.3	20.6	20.9	21.2	21.4	21.7	22.0	22.2	22.5	22.8	23.1	23.3	23.6	23.9	24.1	24.4	24.7	25.0	25.2	25.5	25.8	26.0	26.3	26.6	26.9	27.1	27.4	27.7	27.9	28.2
191	20.6	20.8	21.1	21.4	21.7	21.9	22.2	22.5	22.8	23.0	23.3	23.6	23.8	24.1	24.4	24.7	24.9	25.2	25.5	25.8	26.0	26.3	26.6	26.9	27.1	27.4	27.7	28.0	28.2	28.5
190	20.8	21.1	21.3	21.6	21.9	22.2	22.4	22.7	23.0	23.3	23.5	23.8	24.1	24.4	24.7	24.9	25.2	25.5	25.8	26.0	26.3	26.6	26.9	27.1	27.4	27.7	28.0	28.3	28.5	28.8
189	21.0	21.3	21.6	21.8	22.1	22.4	22.7	23.0	23.2	23.5	23.8	24.1	24.4	24.6	24.9	25.2	25.5	25.8	26.0	26.3	26.6	26.9	27.2	27.4	27.7	28.0	28.3	28.6	28.8	29.1
188	21.2	21.5	21.8	22.1	22.4	22.6	22.9	23.2	23.5	23.8	24.0	24.3	24.6	24.9	25.2	25.5	25.7	26.0	26.3	26.6	26.9	27.2	27.4	27.7	28.0	28.3	28.6	28.9	29.1	29.4
187	21.4	21.7	22.0	22.3	22.6	22.9	23.2	23.4	23.7	24.0	24.3	24.6	24.9	25.2	25.5	25.7	26.0	26.3	26.6	26.9	27.2	27.5	27.7	28.0	28.3	28.6	28.9	29.2	29.5	29.7
186	21.7	22.0	22.3	22.5	22.8	23.1	23.4	23.7	24.0	24.3	24.6	24.9	25.1	25.4	25.7	26.0	26.3	26.6	26.9	27.2	27.5	27.7	28.0	28.3	28.6	28.9	29.2	29.5	29.8	30.1
185	21.9	22.2	22.5	22.8	23.1	23.4	23.7	24.0	24.3	24.5	24.8	25.1	25.4	25.7	26.0	26.3	26.6	26.9	27.2	27.5	27.8	28.0	28.3	28.6	28.9	29.2	29.5	29.8	30.1	30.4
184	22.2	22.4	22.7	23.0	23.3	23.6	23.9	24.2	24.5	24.8	25.1	25.4	25.7	26.0	26.3	26.6	26.9	27.2	27.5	27.8	28.1	28.4	28.7	28.9	29.2	29.5	29.8	30.1	30.4	30.7
183	22.4	22.7	23.0	23.3	23.6	23.9	24.2	24.5	24.8	25.1	25.4	25.7	26.0	26.3	26.6	26.9	27.2	27.5	27.8	28.1	28.4	28.7	29.0	29.3	29.6	29.9	30.2	30.5	30.8	31.1
182	22.6	22.9	23.2	23.5	23.8	24.2	24.5	24.8	25.1	25.4	25.7	26.0	26.3	26.6	26.9	27.2	27.5	27.8	28.1	28.4	28.7	29.0	29.3	29.6	29.9	30.2	30.5	30.8	31.1	31.4
181	22.9	23.2	23.5	23.8	24.1	24.4	24.7	25.0	25.3	25.6	25.9	26.3	26.6	26.9	27.2	27.5	27.8	28.1	28.4	28.7	29.0	29.3	29.6	29.9	30.2	30.5	30.8	31.1	31.4	31.7
180	23.1	23.5	23.8	24.1	24.4	24.7	25.0	25.3	25.6	25.9	26.2	26.5	26.9	27.2	27.5	27.8	28.1	28.4	28.7	29.0	29.3	29.6	29.9	30.2	30.6	30.9	31.2	31.5	31.8	32.1
179	23.4	23.7	24.0	24.3	24.7	25.0	25.3	25.6	25.9	26.2	26.5	26.8	27.2	27.5	27.8	28.1	28.4	28.7	29.0	29.3	29.6	30.0	30.3	30.6	30.9	31.2	31.5	31.8	32.1	32.5
178	23.7	24.0	24.3	24.6	24.9	25.2	25.6	25.9	26.2	26.5	26.8	27.1	27.5	27.8	28.1	28.4	28.7	29.0	29.4	29.7	30.0	30.3	30.6	30.9	31.2	31.6	31.9	32.2	32.5	32.8
177	23.9	24.3	24.6	24.9	25.2	25.5	25.9	26.2	26.5	26.8	27.1	27.5	27.8	28.1	28.4	28.7	29.0	29.4	29.7	30.0	30.3	30.6	31.0	31.3	31.6	31.9	32.2	32.6	32.9	33.2
176	24.2	24.5	24.9	25.2	25.5	25.8	26.1	26.5	26.8	27.1	27.4	27.8	28.1	28.4	28.7	29.1	29.4	29.7	30.0	30.4	30.7	31.0	31.3	31.6	32.0	32.3	32.6	32.9	33.3	33.6
175	24.5	24.8	25.1	25.5	25.8	26.1	26.4	26.8	27.1	27.4	27.8	28.1	28.4	28.7	29.1	29.4	29.7	30.0	30.4	30.7	31.0	31.3	31.7	32.0	32.3	32.7	33.0	33.3	33.6	34.0
174	24.8	25.1	25.4	25.8	26.1	26.4	26.8	27.1	27.4	27.7	28.1	28.4	28.7	29.1	29.4	29.7	30.1	30.4	30.7	31.0	31.4	31.7	32.0	32.4	32.7	33.0	33.4	33.7	34.0	34.4
173	25.1	25.4	25.7	26.1	26.4	26.7	27.1	27.4	27.7	28.1	28.4	28.7	29.1	29.4	29.7	30.1	30.4	30.7	31.1	31.4	31.7	32.1	32.4	32.7	33.1	33.4	33.7	34.1	34.4	34.7
172	25.4	25.7	26.0	26.4	26.7	27.0	27.4	27.7	28.1	28.4	28.7	29.1	29.4	29.7	30.1	30.4	30.8	31.1	31.4	31.8	32.1	32.4	32.8	33.1	33.5	33.8	34.1	34.5	34.8	35.2
171	25.6	26.0	26.3	26.7	27.0	27.4	27.7	28.0	28.4	28.7	29.1	29.4	29.8	30.1	30.4	30.8	31.1	31.5	31.8	32.1	32.5	32.8	33.2	33.5	33.9	34.2	34.5	34.9	35.2	35.6
170	26.0	26.3	26.6	27.0	27.3	27.7	28.0	28.4	28.7	29.1	29.4	29.8	30.1	30.4	30.8	31.1	31.5	31.8	32.2	32.5	32.9	33.2	33.6	33.9	34.3	34.6	34.9	35.3	35.6	36.0
Weight (kg)	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102	103	104

**KEY**

Severe undernutrition  
(BMI < 16.0)

Moderate undernutrition  
(BMI ≥ 16.0 to 18.4)

Normal  
(BMI ≥ 18.5 to 24.9)

Overweight  
(BMI ≥ 25.0 to 29.9)

Obese  
(BMI ≥ 30.0)

## Annexe 2

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### BMI and BMI for age Reference Tables for Children 5-19 years

- Step 1. Record the age, weight and height of the child.
- Step 2. Calculate BMI using the formula on page 5.
- Step 3. Using the BMI Look-Up Table for Adolescents 5–19 Years of Age find the age of the child in the vertical column on the left (x axis) presented in years and months. Note that the tables are different for boys and girls.
- Step 4. Look along the row to the right of the age of the child and look for the BMI calculated above.
- Step 5. Move your finger up to the top row along the same column to find the child's nutritional status.
- Step 4. Interpret BMI as follows:
- Overweight:  $> +1SD$  (equivalent to BMI 25 kg/m<sup>2</sup> at 19 years)
- Obesity:  $> +2SD$  (equivalent to BMI 30 kg/m<sup>2</sup> at 19 years)
- Thinness:  $< -2SD$
- Severe thinness:  $< -1 SD$

### Example


Mary is 7 years 11 months old. Her weight is 26.0 kg and height is 121.1 cm

Mary's BMI is therefore:  $\frac{26 \text{ kg}}{(1.21)^2} = 17.7$

According to the BMI look up tables for girls, Mary is Overweight.

## BMI-FOR-AGE-GIRLS

### Simplified field tables


BMI-for-age GIRLS 5 to 19 years (z-scores)		 <b>World Health Organization</b>						
Year: Month	Months	-3 SD	-2 SD	-1 SD	Median	1 SD	2 SD	3 SD
5: 1	61	11.8	12.7	13.9	15.2	16.9	18.9	21.3
5: 2	62	11.8	12.7	13.9	15.2	16.9	18.9	21.4
5: 3	63	11.8	12.7	13.9	15.2	16.9	18.9	21.5
5: 4	64	11.8	12.7	13.9	15.2	16.9	18.9	21.5
5: 5	65	11.7	12.7	13.9	15.2	16.9	19.0	21.6
5: 6	66	11.7	12.7	13.9	15.2	16.9	19.0	21.7
5: 7	67	11.7	12.7	13.9	15.2	16.9	19.0	21.7
5: 8	68	11.7	12.7	13.9	15.3	17.0	19.1	21.8
5: 9	69	11.7	12.7	13.9	15.3	17.0	19.1	21.9
5: 10	70	11.7	12.7	13.9	15.3	17.0	19.1	22.0
5: 11	71	11.7	12.7	13.9	15.3	17.0	19.2	22.1
6: 0	72	11.7	12.7	13.9	15.3	17.0	19.2	22.1
6: 1	73	11.7	12.7	13.9	15.3	17.0	19.3	22.2
6: 2	74	11.7	12.7	13.9	15.3	17.0	19.3	22.3
6: 3	75	11.7	12.7	13.9	15.3	17.1	19.3	22.4
6: 4	76	11.7	12.7	13.9	15.3	17.1	19.4	22.5
6: 5	77	11.7	12.7	13.9	15.3	17.1	19.4	22.6
6: 6	78	11.7	12.7	13.9	15.3	17.1	19.5	22.7
6: 7	79	11.7	12.7	13.9	15.3	17.2	19.5	22.8
6: 8	80	11.7	12.7	13.9	15.3	17.2	19.6	22.9
6: 9	81	11.7	12.7	13.9	15.4	17.2	19.6	23.0
6: 10	82	11.7	12.7	13.9	15.4	17.2	19.7	23.1
6: 11	83	11.7	12.7	13.9	15.4	17.3	19.7	23.2
7: 0	84	11.8	12.7	13.9	15.4	17.3	19.8	23.3
7: 1	85	11.8	12.7	13.9	15.4	17.3	19.8	23.4
7: 2	86	11.8	12.8	14.0	15.4	17.4	19.9	23.5
7: 3	87	11.8	12.8	14.0	15.5	17.4	20.0	23.6
7: 4	88	11.8	12.8	14.0	15.5	17.4	20.0	23.7
7: 5	89	11.8	12.8	14.0	15.5	17.5	20.1	23.9
7: 6	90	11.8	12.8	14.0	15.5	17.5	20.1	24.0

# BMI-for-age GIRLS 5 to 19 years (z-scores)



World Health  
Organization

Year: Month	Months	-3 SD	-2 SD	-1 SD	Median	1 SD	2 SD	3 SD
7: 7	91	11.8	12.8	14.0	15.5	17.5	20.2	24.1
7: 8	92	11.8	12.8	14.0	15.6	17.6	20.3	24.2
7: 9	93	11.8	12.8	14.1	15.6	17.6	20.3	24.4
7: 10	94	11.9	12.9	14.1	15.6	17.6	20.4	24.5
7: 11	95	11.9	12.9	14.1	15.7	17.7	20.5	24.6
8: 0	96	11.9	12.9	14.1	15.7	17.7	20.6	24.8
8: 1	97	11.9	12.9	14.1	15.7	17.8	20.6	24.9
8: 2	98	11.9	12.9	14.2	15.7	17.8	20.7	25.1
8: 3	99	11.9	12.9	14.2	15.8	17.9	20.8	25.2
8: 4	100	11.9	13.0	14.2	15.8	17.9	20.9	25.3
8: 5	101	12.0	13.0	14.2	15.8	18.0	20.9	25.5
8: 6	102	12.0	13.0	14.3	15.9	18.0	21.0	25.6
8: 7	103	12.0	13.0	14.3	15.9	18.1	21.1	25.8
8: 8	104	12.0	13.0	14.3	15.9	18.1	21.2	25.9
8: 9	105	12.0	13.1	14.3	16.0	18.2	21.3	26.1
8: 10	106	12.1	13.1	14.4	16.0	18.2	21.3	26.2
8: 11	107	12.1	13.1	14.4	16.1	18.3	21.4	26.4
9: 0	108	12.1	13.1	14.4	16.1	18.3	21.5	26.5
9: 1	109	12.1	13.2	14.5	16.1	18.4	21.6	26.7
9: 2	110	12.1	13.2	14.5	16.2	18.4	21.7	26.8
9: 3	111	12.2	13.2	14.5	16.2	18.5	21.8	27.0
9: 4	112	12.2	13.2	14.6	16.3	18.6	21.9	27.2
9: 5	113	12.2	13.3	14.6	16.3	18.6	21.9	27.3
9: 6	114	12.2	13.3	14.6	16.3	18.7	22.0	27.5
9: 7	115	12.3	13.3	14.7	16.4	18.7	22.1	27.6
9: 8	116	12.3	13.4	14.7	16.4	18.8	22.2	27.8
9: 9	117	12.3	13.4	14.7	16.5	18.8	22.3	27.9
9: 10	118	12.3	13.4	14.8	16.5	18.9	22.4	28.1
9: 11	119	12.4	13.4	14.8	16.6	19.0	22.5	28.2
10: 0	120	12.4	13.5	14.8	16.6	19.0	22.6	28.4


<div> <div> <b>BMI-for-age GIRLS</b>  <b>5 to 19 years (z-scores)</b> </div> <div>  <b>World Health Organization</b> </div> </div>								
Year: Month	Months	-3 SD	-2 SD	-1 SD	Median	1 SD	2 SD	3 SD
10: 1	121	12.4	13.5	14.9	16.7	19.1	22.7	28.5
10: 2	122	12.4	13.5	14.9	16.7	19.2	22.8	28.7
10: 3	123	12.5	13.6	15.0	16.8	19.2	22.8	28.8
10: 4	124	12.5	13.6	15.0	16.8	19.3	22.9	29.0
10: 5	125	12.5	13.6	15.0	16.9	19.4	23.0	29.1
10: 6	126	12.5	13.7	15.1	16.9	19.4	23.1	29.3
10: 7	127	12.6	13.7	15.1	17.0	19.5	23.2	29.4
10: 8	128	12.6	13.7	15.2	17.0	19.6	23.3	29.6
10: 9	129	12.6	13.8	15.2	17.1	19.6	23.4	29.7
10: 10	130	12.7	13.8	15.3	17.1	19.7	23.5	29.9
10: 11	131	12.7	13.8	15.3	17.2	19.8	23.6	30.0
11: 0	132	12.7	13.9	15.3	17.2	19.9	23.7	30.2
11: 1	133	12.8	13.9	15.4	17.3	19.9	23.8	30.3
11: 2	134	12.8	14.0	15.4	17.4	20.0	23.9	30.5
11: 3	135	12.8	14.0	15.5	17.4	20.1	24.0	30.6
11: 4	136	12.9	14.0	15.5	17.5	20.2	24.1	30.8
11: 5	137	12.9	14.1	15.6	17.5	20.2	24.2	30.9
11: 6	138	12.9	14.1	15.6	17.6	20.3	24.3	31.1
11: 7	139	13.0	14.2	15.7	17.7	20.4	24.4	31.2
11: 8	140	13.0	14.2	15.7	17.7	20.5	24.5	31.4
11: 9	141	13.0	14.3	15.8	17.8	20.6	24.7	31.5
11: 10	142	13.1	14.3	15.8	17.9	20.6	24.8	31.6
11: 11	143	13.1	14.3	15.9	17.9	20.7	24.9	31.8
12: 0	144	13.2	14.4	16.0	18.0	20.8	25.0	31.9
12: 1	145	13.2	14.4	16.0	18.1	20.9	25.1	32.0
12: 2	146	13.2	14.5	16.1	18.1	21.0	25.2	32.2
12: 3	147	13.3	14.5	16.1	18.2	21.1	25.3	32.3
12: 4	148	13.3	14.6	16.2	18.3	21.1	25.4	32.4
12: 5	149	13.3	14.6	16.2	18.3	21.2	25.5	32.6
12: 6	150	13.4	14.7	16.3	18.4	21.3	25.6	32.7

## BMI-for-age GIRLS 5 to 19 years (z-scores)



**World Health  
Organization**

Year: Month	Months	-3 SD	-2 SD	-1 SD	Median	1 SD	2 SD	3 SD
12: 7	151	13.4	14.7	16.3	18.5	21.4	25.7	32.8
12: 8	152	13.5	14.8	16.4	18.5	21.5	25.8	33.0
12: 9	153	13.5	14.8	16.4	18.6	21.6	25.9	33.1
12: 10	154	13.5	14.8	16.5	18.7	21.6	26.0	33.2
12: 11	155	13.6	14.9	16.6	18.7	21.7	26.1	33.3
13: 0	156	13.6	14.9	16.6	18.8	21.8	26.2	33.4
13: 1	157	13.6	15.0	16.7	18.9	21.9	26.3	33.6
13: 2	158	13.7	15.0	16.7	18.9	22.0	26.4	33.7
13: 3	159	13.7	15.1	16.8	19.0	22.0	26.5	33.8
13: 4	160	13.8	15.1	16.8	19.1	22.1	26.6	33.9
13: 5	161	13.8	15.2	16.9	19.1	22.2	26.7	34.0
13: 6	162	13.8	15.2	16.9	19.2	22.3	26.8	34.1
13: 7	163	13.9	15.2	17.0	19.3	22.4	26.9	34.2
13: 8	164	13.9	15.3	17.0	19.3	22.4	27.0	34.3
13: 9	165	13.9	15.3	17.1	19.4	22.5	27.1	34.4
13: 10	166	14.0	15.4	17.1	19.4	22.6	27.1	34.5
13: 11	167	14.0	15.4	17.2	19.5	22.7	27.2	34.6
14: 0	168	14.0	15.4	17.2	19.6	22.7	27.3	34.7
14: 1	169	14.1	15.5	17.3	19.6	22.8	27.4	34.7
14: 2	170	14.1	15.5	17.3	19.7	22.9	27.5	34.8
14: 3	171	14.1	15.6	17.4	19.7	22.9	27.6	34.9
14: 4	172	14.1	15.6	17.4	19.8	23.0	27.7	35.0
14: 5	173	14.2	15.6	17.5	19.9	23.1	27.7	35.1
14: 6	174	14.2	15.7	17.5	19.9	23.1	27.8	35.1
14: 7	175	14.2	15.7	17.6	20.0	23.2	27.9	35.2
14: 8	176	14.3	15.7	17.6	20.0	23.3	28.0	35.3
14: 9	177	14.3	15.8	17.6	20.1	23.3	28.0	35.4
14: 10	178	14.3	15.8	17.7	20.1	23.4	28.1	35.4
14: 11	179	14.3	15.8	17.7	20.2	23.5	28.2	35.5
15: 0	180	14.4	15.9	17.8	20.2	23.5	28.2	35.5

<div> <div> <b>BMI-for-age GIRLS</b>  <b>5 to 19 years (z-scores)</b> </div> <div>  <b>World Health Organization</b> </div> </div>								
Year: Month	Months	-3 SD	-2 SD	-1 SD	Median	1 SD	2 SD	3 SD
15: 1	181	14.4	15.9	17.8	20.3	23.6	28.3	35.6
15: 2	182	14.4	15.9	17.8	20.3	23.6	28.4	35.7
15: 3	183	14.4	16.0	17.9	20.4	23.7	28.4	35.7
15: 4	184	14.5	16.0	17.9	20.4	23.7	28.5	35.8
15: 5	185	14.5	16.0	17.9	20.4	23.8	28.5	35.8
15: 6	186	14.5	16.0	18.0	20.5	23.8	28.6	35.8
15: 7	187	14.5	16.1	18.0	20.5	23.9	28.6	35.9
15: 8	188	14.5	16.1	18.0	20.6	23.9	28.7	35.9
15: 9	189	14.5	16.1	18.1	20.6	24.0	28.7	36.0
15: 10	190	14.6	16.1	18.1	20.6	24.0	28.8	36.0
15: 11	191	14.6	16.2	18.1	20.7	24.1	28.8	36.0
16: 0	192	14.6	16.2	18.2	20.7	24.1	28.9	36.1
16: 1	193	14.6	16.2	18.2	20.7	24.1	28.9	36.1
16: 2	194	14.6	16.2	18.2	20.8	24.2	29.0	36.1
16: 3	195	14.6	16.2	18.2	20.8	24.2	29.0	36.1
16: 4	196	14.6	16.2	18.3	20.8	24.3	29.0	36.2
16: 5	197	14.6	16.3	18.3	20.9	24.3	29.1	36.2
16: 6	198	14.7	16.3	18.3	20.9	24.3	29.1	36.2
16: 7	199	14.7	16.3	18.3	20.9	24.4	29.1	36.2
16: 8	200	14.7	16.3	18.3	20.9	24.4	29.2	36.2
16: 9	201	14.7	16.3	18.4	21.0	24.4	29.2	36.3
16: 10	202	14.7	16.3	18.4	21.0	24.4	29.2	36.3
16: 11	203	14.7	16.3	18.4	21.0	24.5	29.3	36.3
17: 0	204	14.7	16.4	18.4	21.0	24.5	29.3	36.3
17: 1	205	14.7	16.4	18.4	21.1	24.5	29.3	36.3
17: 2	206	14.7	16.4	18.4	21.1	24.6	29.3	36.3
17: 3	207	14.7	16.4	18.5	21.1	24.6	29.4	36.3
17: 4	208	14.7	16.4	18.5	21.1	24.6	29.4	36.3
17: 5	209	14.7	16.4	18.5	21.1	24.6	29.4	36.3
17: 6	210	14.7	16.4	18.5	21.2	24.6	29.4	36.3



# **BMI-for-age GIRLS** **5 to 19 years (z-scores)**




**World Health  
Organization**

Year: Month	Months	-3 SD	-2 SD	-1 SD	Median	1 SD	2 SD	3 SD
17: 7	211	14.7	16.4	18.5	21.2	24.7	29.4	36.3
17: 8	212	14.7	16.4	18.5	21.2	24.7	29.5	36.3
17: 9	213	14.7	16.4	18.5	21.2	24.7	29.5	36.3
17: 10	214	14.7	16.4	18.5	21.2	24.7	29.5	36.3
17: 11	215	14.7	16.4	18.6	21.2	24.8	29.5	36.3
18: 0	216	14.7	16.4	18.6	21.3	24.8	29.5	36.3
18: 1	217	14.7	16.5	18.6	21.3	24.8	29.5	36.3
18: 2	218	14.7	16.5	18.6	21.3	24.8	29.6	36.3
18: 3	219	14.7	16.5	18.6	21.3	24.8	29.6	36.3
18: 4	220	14.7	16.5	18.6	21.3	24.8	29.6	36.3
18: 5	221	14.7	16.5	18.6	21.3	24.9	29.6	36.2
18: 6	222	14.7	16.5	18.6	21.3	24.9	29.6	36.2
18: 7	223	14.7	16.5	18.6	21.4	24.9	29.6	36.2
18: 8	224	14.7	16.5	18.6	21.4	24.9	29.6	36.2
18: 9	225	14.7	16.5	18.7	21.4	24.9	29.6	36.2
18: 10	226	14.7	16.5	18.7	21.4	24.9	29.6	36.2
18: 11	227	14.7	16.5	18.7	21.4	25.0	29.7	36.2
19: 0	228	14.7	16.5	18.7	21.4	25.0	29.7	36.2
<b>2007 WHO Reference</b>								

## BMI-FOR-AGE-BOYS

### Simplified field tables


BMI-for-age BOYS 5 to 19 years (z-scores)		 World Health Organization						
Year: Month	Months	-3 SD	-2 SD	-1 SD	Median	1 SD	2 SD	3 SD
5: 1	61	12.1	13.0	14.1	15.3	16.6	18.3	20.2
5: 2	62	12.1	13.0	14.1	15.3	16.6	18.3	20.2
5: 3	63	12.1	13.0	14.1	15.3	16.7	18.3	20.2
5: 4	64	12.1	13.0	14.1	15.3	16.7	18.3	20.3
5: 5	65	12.1	13.0	14.1	15.3	16.7	18.3	20.3
5: 6	66	12.1	13.0	14.1	15.3	16.7	18.4	20.4
5: 7	67	12.1	13.0	14.1	15.3	16.7	18.4	20.4
5: 8	68	12.1	13.0	14.1	15.3	16.7	18.4	20.5
5: 9	69	12.1	13.0	14.1	15.3	16.7	18.4	20.5
5: 10	70	12.1	13.0	14.1	15.3	16.7	18.5	20.6
5: 11	71	12.1	13.0	14.1	15.3	16.7	18.5	20.6
6: 0	72	12.1	13.0	14.1	15.3	16.8	18.5	20.7
6: 1	73	12.1	13.0	14.1	15.3	16.8	18.6	20.8
6: 2	74	12.2	13.1	14.1	15.3	16.8	18.6	20.8
6: 3	75	12.2	13.1	14.1	15.3	16.8	18.6	20.9
6: 4	76	12.2	13.1	14.1	15.4	16.8	18.7	21.0
6: 5	77	12.2	13.1	14.1	15.4	16.9	18.7	21.0
6: 6	78	12.2	13.1	14.1	15.4	16.9	18.7	21.1
6: 7	79	12.2	13.1	14.1	15.4	16.9	18.8	21.2
6: 8	80	12.2	13.1	14.2	15.4	16.9	18.8	21.3
6: 9	81	12.2	13.1	14.2	15.4	17.0	18.9	21.3
6: 10	82	12.2	13.1	14.2	15.4	17.0	18.9	21.4
6: 11	83	12.2	13.1	14.2	15.5	17.0	19.0	21.5
7: 0	84	12.3	13.1	14.2	15.5	17.0	19.0	21.6
7: 1	85	12.3	13.2	14.2	15.5	17.1	19.1	21.7
7: 2	86	12.3	13.2	14.2	15.5	17.1	19.1	21.8
7: 3	87	12.3	13.2	14.3	15.5	17.1	19.2	21.9
7: 4	88	12.3	13.2	14.3	15.6	17.2	19.2	22.0
7: 5	89	12.3	13.2	14.3	15.6	17.2	19.3	22.0
7: 6	90	12.3	13.2	14.3	15.6	17.2	19.3	22.1


# **BMI-for-age BOYS** **5 to 19 years (z-scores)**



**World Health  
Organization**

Year: Month	Months	-3 SD	-2 SD	-1 SD	Median	1 SD	2 SD	3 SD
7: 7	91	12.3	13.2	14.3	15.6	17.3	19.4	22.2
7: 8	92	12.3	13.2	14.3	15.6	17.3	19.4	22.4
7: 9	93	12.4	13.3	14.3	15.7	17.3	19.5	22.5
7: 10	94	12.4	13.3	14.4	15.7	17.4	19.6	22.6
7: 11	95	12.4	13.3	14.4	15.7	17.4	19.6	22.7
8: 0	96	12.4	13.3	14.4	15.7	17.4	19.7	22.8
8: 1	97	12.4	13.3	14.4	15.8	17.5	19.7	22.9
8: 2	98	12.4	13.3	14.4	15.8	17.5	19.8	23.0
8: 3	99	12.4	13.3	14.4	15.8	17.5	19.9	23.1
8: 4	100	12.4	13.4	14.5	15.8	17.6	19.9	23.3
8: 5	101	12.5	13.4	14.5	15.9	17.6	20.0	23.4
8: 6	102	12.5	13.4	14.5	15.9	17.7	20.1	23.5
8: 7	103	12.5	13.4	14.5	15.9	17.7	20.1	23.6
8: 8	104	12.5	13.4	14.5	15.9	17.7	20.2	23.8
8: 9	105	12.5	13.4	14.6	16.0	17.8	20.3	23.9
8: 10	106	12.5	13.5	14.6	16.0	17.8	20.3	24.0
8: 11	107	12.5	13.5	14.6	16.0	17.9	20.4	24.2
9: 0	108	12.6	13.5	14.6	16.0	17.9	20.5	24.3
9: 1	109	12.6	13.5	14.6	16.1	18.0	20.5	24.4
9: 2	110	12.6	13.5	14.7	16.1	18.0	20.6	24.6
9: 3	111	12.6	13.5	14.7	16.1	18.0	20.7	24.7
9: 4	112	12.6	13.6	14.7	16.2	18.1	20.8	24.9
9: 5	113	12.6	13.6	14.7	16.2	18.1	20.8	25.0
9: 6	114	12.7	13.6	14.8	16.2	18.2	20.9	25.1
9: 7	115	12.7	13.6	14.8	16.3	18.2	21.0	25.3
9: 8	116	12.7	13.6	14.8	16.3	18.3	21.1	25.5
9: 9	117	12.7	13.7	14.8	16.3	18.3	21.2	25.6
9: 10	118	12.7	13.7	14.9	16.4	18.4	21.2	25.8
9: 11	119	12.8	13.7	14.9	16.4	18.4	21.3	25.9
10: 0	120	12.8	13.7	14.9	16.4	18.5	21.4	26.1

<div> <div>BMI-for-age BOYS</div> <div>5 to 19 years (z-scores)</div> </div> <div>  <div>World Health Organization</div> </div>								
Year: Month	Months	-3 SD	-2 SD	-1 SD	Median	1 SD	2 SD	3 SD
10: 1	121	12.8	13.8	15.0	16.5	18.5	21.5	26.2
10: 2	122	12.8	13.8	15.0	16.5	18.6	21.6	26.4
10: 3	123	12.8	13.8	15.0	16.6	18.6	21.7	26.6
10: 4	124	12.9	13.8	15.0	16.6	18.7	21.7	26.7
10: 5	125	12.9	13.9	15.1	16.6	18.8	21.8	26.9
10: 6	126	12.9	13.9	15.1	16.7	18.8	21.9	27.0
10: 7	127	12.9	13.9	15.1	16.7	18.9	22.0	27.2
10: 8	128	13.0	13.9	15.2	16.8	18.9	22.1	27.4
10: 9	129	13.0	14.0	15.2	16.8	19.0	22.2	27.5
10: 10	130	13.0	14.0	15.2	16.9	19.0	22.3	27.7
10: 11	131	13.0	14.0	15.3	16.9	19.1	22.4	27.9
11: 0	132	13.1	14.1	15.3	16.9	19.2	22.5	28.0
11: 1	133	13.1	14.1	15.3	17.0	19.2	22.5	28.2
11: 2	134	13.1	14.1	15.4	17.0	19.3	22.6	28.4
11: 3	135	13.1	14.1	15.4	17.1	19.3	22.7	28.5
11: 4	136	13.2	14.2	15.5	17.1	19.4	22.8	28.7
11: 5	137	13.2	14.2	15.5	17.2	19.5	22.9	28.8
11: 6	138	13.2	14.2	15.5	17.2	19.5	23.0	29.0
11: 7	139	13.2	14.3	15.6	17.3	19.6	23.1	29.2
11: 8	140	13.3	14.3	15.6	17.3	19.7	23.2	29.3
11: 9	141	13.3	14.3	15.7	17.4	19.7	23.3	29.5
11: 10	142	13.3	14.4	15.7	17.4	19.8	23.4	29.6
11: 11	143	13.4	14.4	15.7	17.5	19.9	23.5	29.8
12: 0	144	13.4	14.5	15.8	17.5	19.9	23.6	30.0
12: 1	145	13.4	14.5	15.8	17.6	20.0	23.7	30.1
12: 2	146	13.5	14.5	15.9	17.6	20.1	23.8	30.3
12: 3	147	13.5	14.6	15.9	17.7	20.2	23.9	30.4
12: 4	148	13.5	14.6	16.0	17.8	20.2	24.0	30.6
12: 5	149	13.6	14.6	16.0	17.8	20.3	24.1	30.7
12: 6	150	13.6	14.7	16.1	17.9	20.4	24.2	30.9


<div> <div>BMI-for-age BOYS</div> <div>5 to 19 years (z-scores)</div> </div> <div>  <div>World Health Organization</div> </div>								
Year: Month	Months	-3 SD	-2 SD	-1 SD	Median	1 SD	2 SD	3 SD
12: 7	151	13.6	14.7	16.1	17.9	20.4	24.3	31.0
12: 8	152	13.7	14.8	16.2	18.0	20.5	24.4	31.1
12: 9	153	13.7	14.8	16.2	18.0	20.6	24.5	31.3
12: 10	154	13.7	14.8	16.3	18.1	20.7	24.6	31.4
12: 11	155	13.8	14.9	16.3	18.2	20.8	24.7	31.6
13: 0	156	13.8	14.9	16.4	18.2	20.8	24.8	31.7
13: 1	157	13.8	15.0	16.4	18.3	20.9	24.9	31.8
13: 2	158	13.9	15.0	16.5	18.4	21.0	25.0	31.9
13: 3	159	13.9	15.1	16.5	18.4	21.1	25.1	32.1
13: 4	160	14.0	15.1	16.6	18.5	21.1	25.2	32.2
13: 5	161	14.0	15.2	16.6	18.6	21.2	25.2	32.3
13: 6	162	14.0	15.2	16.7	18.6	21.3	25.3	32.4
13: 7	163	14.1	15.2	16.7	18.7	21.4	25.4	32.6
13: 8	164	14.1	15.3	16.8	18.7	21.5	25.5	32.7
13: 9	165	14.1	15.3	16.8	18.8	21.5	25.6	32.8
13: 10	166	14.2	15.4	16.9	18.9	21.6	25.7	32.9
13: 11	167	14.2	15.4	17.0	18.9	21.7	25.8	33.0
14: 0	168	14.3	15.5	17.0	19.0	21.8	25.9	33.1
14: 1	169	14.3	15.5	17.1	19.1	21.8	26.0	33.2
14: 2	170	14.3	15.6	17.1	19.1	21.9	26.1	33.3
14: 3	171	14.4	15.6	17.2	19.2	22.0	26.2	33.4
14: 4	172	14.4	15.7	17.2	19.3	22.1	26.3	33.5
14: 5	173	14.5	15.7	17.3	19.3	22.2	26.4	33.5
14: 6	174	14.5	15.7	17.3	19.4	22.2	26.5	33.6
14: 7	175	14.5	15.8	17.4	19.5	22.3	26.5	33.7
14: 8	176	14.6	15.8	17.4	19.5	22.4	26.6	33.8
14: 9	177	14.6	15.9	17.5	19.6	22.5	26.7	33.9
14: 10	178	14.6	15.9	17.5	19.6	22.5	26.8	33.9
14: 11	179	14.7	16.0	17.6	19.7	22.6	26.9	34.0
15: 0	180	14.7	16.0	17.6	19.8	22.7	27.0	34.1

# BMI-for-age BOYS 5 to 19 years (z-scores)



World Health  
Organization

Year: Month	Months	-3 SD	-2 SD	-1 SD	Median	1 SD	2 SD	3 SD
15: 1	181	14.7	16.1	17.7	19.8	22.8	27.1	34.1
15: 2	182	14.8	16.1	17.8	19.9	22.8	27.1	34.2
15: 3	183	14.8	16.1	17.8	20.0	22.9	27.2	34.3
15: 4	184	14.8	16.2	17.9	20.0	23.0	27.3	34.3
15: 5	185	14.9	16.2	17.9	20.1	23.0	27.4	34.4
15: 6	186	14.9	16.3	18.0	20.1	23.1	27.4	34.5
15: 7	187	15.0	16.3	18.0	20.2	23.2	27.5	34.5
15: 8	188	15.0	16.3	18.1	20.3	23.3	27.6	34.6
15: 9	189	15.0	16.4	18.1	20.3	23.3	27.7	34.6
15: 10	190	15.0	16.4	18.2	20.4	23.4	27.7	34.7
15: 11	191	15.1	16.5	18.2	20.4	23.5	27.8	34.7
16: 0	192	15.1	16.5	18.2	20.5	23.5	27.9	34.8
16: 1	193	15.1	16.5	18.3	20.6	23.6	27.9	34.8
16: 2	194	15.2	16.6	18.3	20.6	23.7	28.0	34.8
16: 3	195	15.2	16.6	18.4	20.7	23.7	28.1	34.9
16: 4	196	15.2	16.7	18.4	20.7	23.8	28.1	34.9
16: 5	197	15.3	16.7	18.5	20.8	23.8	28.2	35.0
16: 6	198	15.3	16.7	18.5	20.8	23.9	28.3	35.0
16: 7	199	15.3	16.8	18.6	20.9	24.0	28.3	35.0
16: 8	200	15.3	16.8	18.6	20.9	24.0	28.4	35.1
16: 9	201	15.4	16.8	18.7	21.0	24.1	28.5	35.1
16: 10	202	15.4	16.9	18.7	21.0	24.2	28.5	35.1
16: 11	203	15.4	16.9	18.7	21.1	24.2	28.6	35.2
17: 0	204	15.4	16.9	18.8	21.1	24.3	28.6	35.2
17: 1	205	15.5	17.0	18.8	21.2	24.3	28.7	35.2
17: 2	206	15.5	17.0	18.9	21.2	24.4	28.7	35.2
17: 3	207	15.5	17.0	18.9	21.3	24.4	28.8	35.3
17: 4	208	15.5	17.1	18.9	21.3	24.5	28.9	35.3
17: 5	209	15.6	17.1	19.0	21.4	24.5	28.9	35.3
17: 6	210	15.6	17.1	19.0	21.4	24.6	29.0	35.3

<div> <div> <b>BMI-for-age BOYS</b>  <b>5 to 19 years (z-scores)</b> </div> <div>  <b>World Health Organization</b> </div> </div>								
Year: Month	Months	-3 SD	-2 SD	-1 SD	Median	1 SD	2 SD	3 SD
17: 7	211	15.6	17.1	19.1	21.5	24.7	29.0	35.4
17: 8	212	15.6	17.2	19.1	21.5	24.7	29.1	35.4
17: 9	213	15.6	17.2	19.1	21.6	24.8	29.1	35.4
17: 10	214	15.7	17.2	19.2	21.6	24.8	29.2	35.4
17: 11	215	15.7	17.3	19.2	21.7	24.9	29.2	35.4
18: 0	216	15.7	17.3	19.2	21.7	24.9	29.2	35.4
18: 1	217	15.7	17.3	19.3	21.8	25.0	29.3	35.4
18: 2	218	15.7	17.3	19.3	21.8	25.0	29.3	35.5
18: 3	219	15.7	17.4	19.3	21.8	25.1	29.4	35.5
18: 4	220	15.8	17.4	19.4	21.9	25.1	29.4	35.5
18: 5	221	15.8	17.4	19.4	21.9	25.1	29.5	35.5
18: 6	222	15.8	17.4	19.4	22.0	25.2	29.5	35.5
18: 7	223	15.8	17.5	19.5	22.0	25.2	29.5	35.5
18: 8	224	15.8	17.5	19.5	22.0	25.3	29.6	35.5
18: 9	225	15.8	17.5	19.5	22.1	25.3	29.6	35.5
18: 10	226	15.8	17.5	19.6	22.1	25.4	29.6	35.5
18: 11	227	15.8	17.5	19.6	22.2	25.4	29.7	35.5
19: 0	228	15.9	17.6	19.6	22.2	25.4	29.7	35.5
2007 WHO Reference								



## Annexe 3

### Mphatso Banda's journey to weight loss and a healthy lifestyle



Mphatso Banda is a 45-year-old market vendor from a rural area in Malawi. Mr Banda has a wife and four children. The market is about 15-minute walk from his house, but since his business took off he often prefers to catch a bicycle taxi than walking. He buys breakfast and lunch from a fast food outlet close to the market. He often also buys snacks from there too. He eats dinner at home but his wife knows that he doesn't like eating vegetables and fruits.

Mr Banda enjoys socializing with other men at the local tavern on weekends. He drinks alcohol at least three times a week, usually about 5-6 bottles of beer with mang'ina. This has been his habit for many years, and he has noticed that he has gained weight and his clothes do not fit anymore. He now wears large sizes. He is not worried about his weight because in his community this is linked to being wealthy.

#### Usual Diet

##### Breakfast

07:30- 4 big Mandazi hot, milky tea with 4 teaspoons of sugar and fried eggs

##### Lunch

12pm – Large portion of nsima with usipa

Or fried chips with fried eggs or chicken (He adds extra salt before testing the food) when he has money

He also drinks sweet drinks such as fizzy drinks, sweetened thobwa, sweetened malanbe juice and Coke

##### Snack

3pm – 1 packet of Marie biscuits with Orange squash drink or hot chips

##### Dinner

7 pm – Large portion of nsima with pumpkin leaves and 2 pieces of chicken or chambo

One day Mphatso feels dizzy and collapses whilst working at the market. He is rushed to the hospital where he is told that his blood pressure is very high. His condition is very serious, he cannot walk, talk or eat and is admitted in hospital.

Eventually, after several days in hospital he is feeling better and is discharged.

The dietitian spends lots of time educating him on food choices he is supposed to make in order to improve his health. He is told that it is a very serious disease that can lead to loss of eyesight, kidney failure and even death. However, if he follows guidance on how to manage it, he can live a healthy life. He is told that he must start to exercise more, eat healthy, and take medication as prescribed by the doctors.

Mphatso takes this very seriously because he realizes that he nearly died and would have left his wife and four young children with no income. He is determined to follow the advice of the doctor. His new routine is waking up early in the morning to walk about 5 km before he walks to the market. He also eats breakfast at home now. He stopped drinking alcohol and now carries a big bottle of drinking water from home to drink throughout the day. He also decided that since home is quite close, he can walk home for lunch too.

On the weekends he has taken up gardening and has joined a local football team instead of going to the tavern.

#### Usual Diet

##### Breakfast

07:30- 4 big Mandazi hot, milky tea with 4 teaspoons of sugar and fried eggs

##### Lunch

12pm – Large portion of nsima with usipa

Or fried chips with fried eggs or chicken (He adds extra salt before testing the food) when he has money

He also drinks sweet drinks such as fizzy drinks, sweetened thobwa, sweetened malanbe juice and Coke

##### Snack

3pm – 1 packet of Marie biscuits with Orange squash drink or hot chips

##### Dinner

7 pm – Large portion of nsima with pumpkin leaves and 2 pieces of chicken or chambo

After just six months of eating healthy, exercising and taking his medication as prescribed, Mphatso has lost lots of weight and he has noticed that some clothes that he has not worn in several years now fit properly. At his last review with the doctor his blood pressure was very well controlled. He says he feels he has much more energy than he used to and has not been sick in very long.

### Mphatso's risk factors for high blood pressure and NCDs

#### He is overweight

- His weight has doubled in 5 years
- His old clothes are too small for him

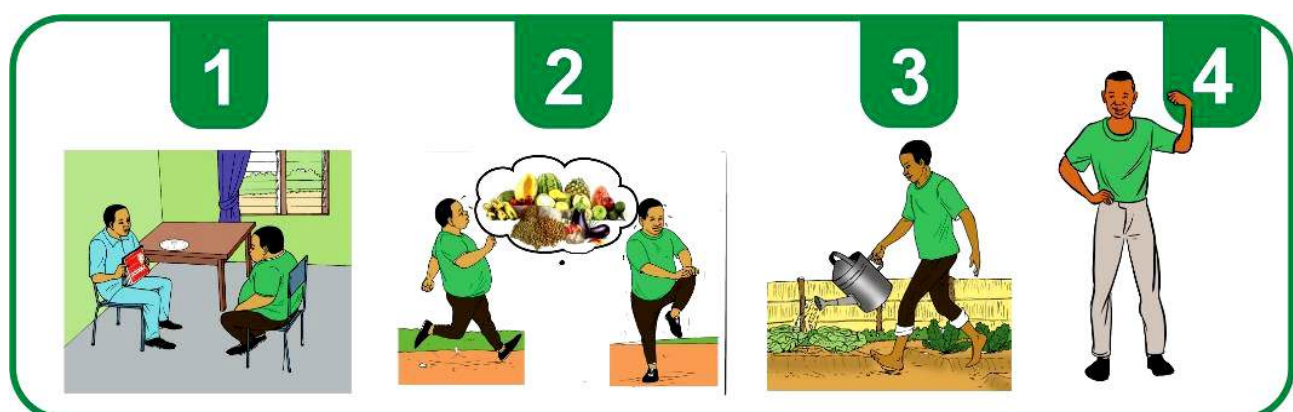
#### He drinks alcohol

#### He eats an unhealthy diet

- High in sugars shown by lots of sugar sweetened drinks and biscuits
- High fat meals (fried chips and mandazi)
- No fruits
- Too few vegetables
- No whole grains

#### He does not exercise enough

- He walks only a very short distance to his house
- He sits most of the day



Mphatso's steps to reduce blood pressure and risk of other NCDs

### **Weight loss**

- Has lost a lot of weight. Some of his old clothes fit again

### **He stopped drinking alcohol**

### **He eats a healthy diet**

- Reduced the amount of fat he is eating
- Lots of fruits
- More whole grains
- Lots of vegetables

### **He exercises frequently**

- He walks 5 km everyday
- He plays football on the weekends
- He does gardening

### **New diet**

#### **Breakfast**

07:00 – 1 banana, 2 slices of watermelon and mgaiwa porridge with groundnut flour

#### **Lunch**

12pm – 1 small portion Nsima ya mgaiwa with vegetables (usually cabbage and pumpkin leaves) and usipa

#### **Snack**

1 orange and 1 slice of brown bread with peanut butter

#### **Dinner**

7 pm – 1 small portion nsima ya mgaiwa with vegetables (cassava leaves) with beans and carrots

## Annexe 4

### Physical activity suggestions of moderate and vigorous intensity for all age groups

Type of physical activity	Moderate intensity aerobics	Vigorous intensity
Pre-school children	<b>Walking</b>	<b>Walking, jogging and running</b>
	Walking slowly around the home	Walking at a fast pace
		Jogging and running
	<b>Leisure time and sports</b>	<b>Leisure time and sports</b>
	Playing outside	Running, jumping and skipping
	Dancing	Playing games involving catching, throwing and kicking (Depending on effort)
	Playing games involving catching, throwing and kicking	Any other sports involving lots of movement e.g. swimming, soccer, basketball, netball
	Climbing on playground equipment	
School going children and adolescents	<b>Walking</b>	<b>Walking, jogging and running</b>
	Walking slowly around the house or walking less than 5 km per day	Walking at a fast pace for more than 5 km or walking with heavy loads or up hill
		Jogging and running
	<b>Leisure time and sports</b>	<b>Leisure time and sports</b>












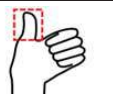


	Playing games that require catching and throwing like fulaye, phada, netball,	Playing sports with lots of running and chasing like roundasi, bula, soccer, netball, basketball (Depending on effort)
	Low – medium intensity bicycle riding e.g. with no uphill and less than 10km	Fast bicycle riding
		Skipping
		Going to the gym (e.g. weightlifting, aerobics classes, boxing)
	<b>Household chores</b>	<b>Household chores</b>
	Sweeping floors and yard, mopping	Carrying heavy loads such as bricks
	Washing windows, car or clothes	Heavy farming such as shovelling and digging
	Carrying and stacking wood	Bicycle riding uphill or fast with heart rate increase
<b>Adults</b>	<b>Walking</b>	<b>Walking, jogging and running</b>
	Walking slowly around the house or walking less than 5 km per day	Walking at a fast pace for more than 5 km or walking with heavy loads or up hill
	<b>Leisure time and sports</b>	<b>Leisure time and sports</b>
	Playing sport like tennis and dancing	Fast bicycle riding
	Low – medium intensity bicycle riding e.g. with no uphill and less than 10km	Swimming

		Gym exercise classes like aerobics and kickboxing
		Playing sports with lots of running and chasing like football, netball
	<b>Household chores and occupation</b>	<b>Household chores and occupation</b>
	Heavy cleaning- washing windows, car, sweeping home and yard	Carrying heavy loads such as bricks
	Carrying and staking wood	Heavy garden or farm work (digging or shovelling, with heart rate increase)
	General house and garden work and home repair work	Cycling with heavy loads such as firewood
	Carpentry	



## Annexe 5

Average amount of food adequate for a typical adult based on recommended daily allowances (RDA)

Food group	Type of food	Serving size Visual equivalence and cup and spoons sizes	Average number of portion per day
<b>Vegetables</b> 	Tomatoes, carrots, green leafy vegetables, pumpkins	 <b>2 handfuls</b>	3-5
<b>Fruits</b> 	Oranges, bananas, pawpaw, mangoes lemons, melons, mulberries, masau, masuku, nthudza, guavas, tangerines	 <b>1 cup</b>	2-3
<b>Legumes and Nuts</b> 	groundnuts/peanuts, bambara, cashew, macadamia other nuts	 <b>½ cup</b>	2
	beans, peas, cowpeas/black-eyed pea	 <b>1 cup</b>	2-4
<b>Animal Foods</b> 	Meat (chicken, fish, beef, goat, pork, field mice and insects)	 <b>Size of piece of meat</b>	2-4
	Milk and milk products	 <b>1 cup</b>	1-2
<b>Fats</b> 	Cooking oil, peanut butter, margarine/butter, avocados, coconut	 <b>1 teaspoon</b>	4-5
<b>Staples</b> 	Maize, rice, cassava, grains, potatoes, plantains	 <b>1 cup</b>	6-9

**1 cup is the equivalent of 250 ml or a standard teacup**

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