World Vision

Nutrition Toolkit

# MEASURING AND PROMOTING CHILD GROWTH

## Participant's Workbook

**Version 2, August 2011**

World Vision

# Measuring and Promoting Child Growth Tool

*A Module of the Nutrition Toolkit*

MPCG

## Participant's Workbook

Version 2, August 2011

Nutrition Centre of Expertise

World Vision International, Global Health and WASH


World Vision is a Christian relief, development and advocacy organisation dedicated to working with children, families and their communities worldwide to reach their full potential by addressing the causes of poverty and injustice. World Vision serves all people, regardless of religion, race, ethnicity or gender.

## Terms of Use



Published by Nutrition Centre of Expertise, Global Health and WASH on behalf of World Vision International.

For further information about this or other nutrition tools and publications contact the Nutrition Centre of Expertise: nutrition_coe@wvi.org. For information about World Vision International publications contact wvi_publishing@wvi.org.

# Acknowledgements

The Measuring and Promoting Child Growth Tool, one tool within the Nutrition Toolkit, contains all the essential information needed for a trainer who is building the skills and competencies of those who measure child growth (anthropometry).

Many people contributed to the final version of the Measuring and Promoting Child Growth Tool. We want to thank all those who helped make this tool a reality, by developing the concept, writing and reorganising the text, providing technical feedback on the accuracy and flow, editing, illustrating, and testing the tool in project sites.

**Miriam Yiannakis** of World Vision's Nutrition Centre of Expertise (NCOE), provided overall leadership to this project. **Naomi Klaas** (consultant) was the lead author.

The following individuals provided technical comments and review on various drafts:

World Vision International Nutrition Centre of Expertise:

**Alison Mildon, Miriam Yiannakis, Carolyn MacDonald, Colleen Emary, Carmen Tse, Aimee Webb**

Technical Experts:

**Emily Levitt (FANTA), Mark Myatt**

World Vision Canada

**Miriam Chang, Melani Fellows, Marion Roche, Abena Thomas, Jeannette Ulate, Barbara Main**

The following individuals were involved in field-testing an earlier draft of the tool in Indonesia:

**Esther Indriani** (World Vision Asia Pacific Regional Office)

**Sigit Sulistyo, Markus Puthut Harmiko, Candra Wijaya, and the entire team in Alor Area Development Programme,** (World Vision Indonesia)

**Republic of Indonesia Ministry of Health Staff**

**Melani Fellows** (World Vision Canada)

**Beth Fellows** (consultant) illustrated the Measuring and Promoting Child Growth Tool, while **Perry D'Elia** (consultant) provided graphic design and layout expertise. Numerous drafts of the toolkit were edited by **Loria Kulathungam** (NCOE) and **Kila Reimer** (Consultant).

We are grateful to **Felicity Savage King** and **Ann Burgess** for generously allowing us to use excerpts from their book, *Nutrition for Developing Countries* (2nd ed, 1993), in Lessons 2, 4 and 11.

We hope that the Measuring and Promoting Child Growth Tool will enhance your efforts to build capacity in field staff so they will be able to respond quickly and appropriately to cases of malnutrition among children in the communities in which they live and work. Ultimately, we want to see children grow and develop as they should so they can reach their full potential as children, and later on in life, as adults.

Sincerely,

Miriam Yiannakis
Technical Specialist, Capacity Building
Nutrition Centre of Expertise
World Vision International

Carolyn MacDonald
Nutrition Director and NCOE Lead
Nutrition Centre of Expertise,
World Vision International

# *Welcome to the Training on How to Measure Children*

*Proper measurement of children is an important part of helping mothers and health workers know what they can do to help children grow better.*

## Measuring Child Growth (Anthropometrics)

**Proper measurement of child growth** is an important part of assessment and evaluation surveys (including World Vision Child Well-Being Outcomes and Transformational Development Indicators), sponsorship programmes, sector-specific projects in nutrition, health, food security or other areas, and emergency programmes. By measuring child growth, we get information that helps us determine the levels of malnutrition within our communities and informs our programming decisions. Of course we also obtain and use this information to do routine monitoring of children in order to support the healthy growth of the individual child. The Measuring and Promoting Child Growth module of the Nutrition Toolkit is designed to increase factual knowledge, understanding and practical skills of people responsible for measuring child growth.

**There are several different tasks involved in monitoring child growth.** These include taking accurate measurements of height, weight and size of the upper arm. Other tasks are collecting accurate information about the age and sex of children; recording this information; calculating the results of the data; and interpreting the data. The process of growth monitoring is not complete without counselling for mothers about the growth of their children. It is also important to group the data into a 'big picture' that helps us to see if there is widespread malnutrition within a community.

***Anthropometrics*** is a long word that means 'measurement of human beings'. We measure the rate that children grow to understand a child's nutritional status. If a child is growing at a normal rate, he or she is almost certainly well nourished. A child who is not growing at the normal rate is probably not well nourished. Parents may not know if a child is growing at the normal rate, and they need help to find out. The only way for parents and nutrition workers to be certain about how a child is growing is to measure a child regularly (i.e. anthropometry).

This section of the Nutrition Toolkit will help you to understand how to collect and how to use anthropometric information to monitor the growth of young children in your development projects. Lessons will show the practical steps for correctly measuring height, weight, upper-arm size and age of children.

# Welcome and Introduction



## Workshop Purpose

**Purpose 1**

To train participants to weigh and measure children accurately; and to calculate and record growth accurately.

**Purpose 2**

To train participants to interpret child nutritional status and community nutritional status accurately.

**Purpose 3**

To increase participants' understanding of the purpose and importance of counselling mothers and caregivers and to build skills for appropriate counselling.

## Skills To Learn

**Skill 1.** We will learn the technique for weighing and measuring children under 5.

**Skill 2.** We will learn the technique for finding out a child's exact age.

**Skill 3.** We will learn how to record information clearly on appropriate forms.

**Skill 4.** We will learn to interpret the meaning of the data gathered in order to determine a child's nutritional status accurately.

**Skill 5.** We will learn how to counsel mothers about nutrition.

**Skill 6.** We will learn to use the information to help us make decisions about when interventions are needed to improve child growth.

| | Day 1 | Day 2 | Day 3 |
|---|---|---|---|
| **Morning** | Lesson 1 – Welcome and Introduction (60 min)<br>Lesson 2 – What Is Anthropometry? (60 min) | Lesson 6 – Measuring Length and Height (2 hours) | Lesson 9 – Improving Individual Child Growth (2 hours) |
| **Break** (15 minutes) | | | |
| **Morning** | Lesson 3 – Information About Sex and Age of Children Under 5 (90 min) | Lesson 7 – Mid-Upper Arm Circumference (60 min)<br>Lesson 8 – Preparation for the Standardisation Exercise (60 min) | Lesson 10 – Counselling (2 hours) |
| **Lunch** | | | |
| **Afternoon** | Lesson 4 – Hanging Scales (2 hours) | Lesson 8 – Standardisation Exercise (2 hours) | Lesson 11 – Population Nutritional Status (60 min) |
| **Break** (15 minutes) | | | |
| **Afternoon** | Lesson 5 – Standing Scales (2 hours) | Lesson 8 – Standardisation Exercise cont'd (2 hours) | Closing |

# What Is Anthropometry?



## Defining Anthropometrics

*Why do we weigh and measure children under 5 years of age?*

### The three main reasons for focusing on this age range are:

- Children under 5 grow very rapidly; this is especially true for the period from birth to two years old. This growth includes physical growth as well mental development.
- How well children grow in their first five years will influence how healthy they are for the rest of their lives, and how well they will be able to fight infections and illness.
- Growth during this early period of a child's life will also affect how well a child learns in school in later years and how much strength he or she will have as an adult.

We can summarise by saying: we measure how well a child is growing from birth to five years because this is a critical period of growth with long-term consequences for a child's mental and physical health. We measure children's growth by gathering their height, weight, age and sex information.

The process of weighing and measuring is called anthropometrics.

### Reasons relating to the individual child:

a) We compare a child's weight and height and age to healthy children's growth patterns to tell us how well that child is growing. When a child does not gain weight or height at the same rate as healthy children, he or she is considered malnourished.

b) The measurement information lets us know if the child is well nourished or malnourished.

c) We want to find out if the child is not growing well so that we can take action to correct it because:
   - Children who don't grow normally do not develop to their full potential.
   - Poor nutrition affects a child's ability to think and grow.
   - Poor nutrition also makes a child weak and can cause a child to get sick ofen.

### Reasons relating to the community:

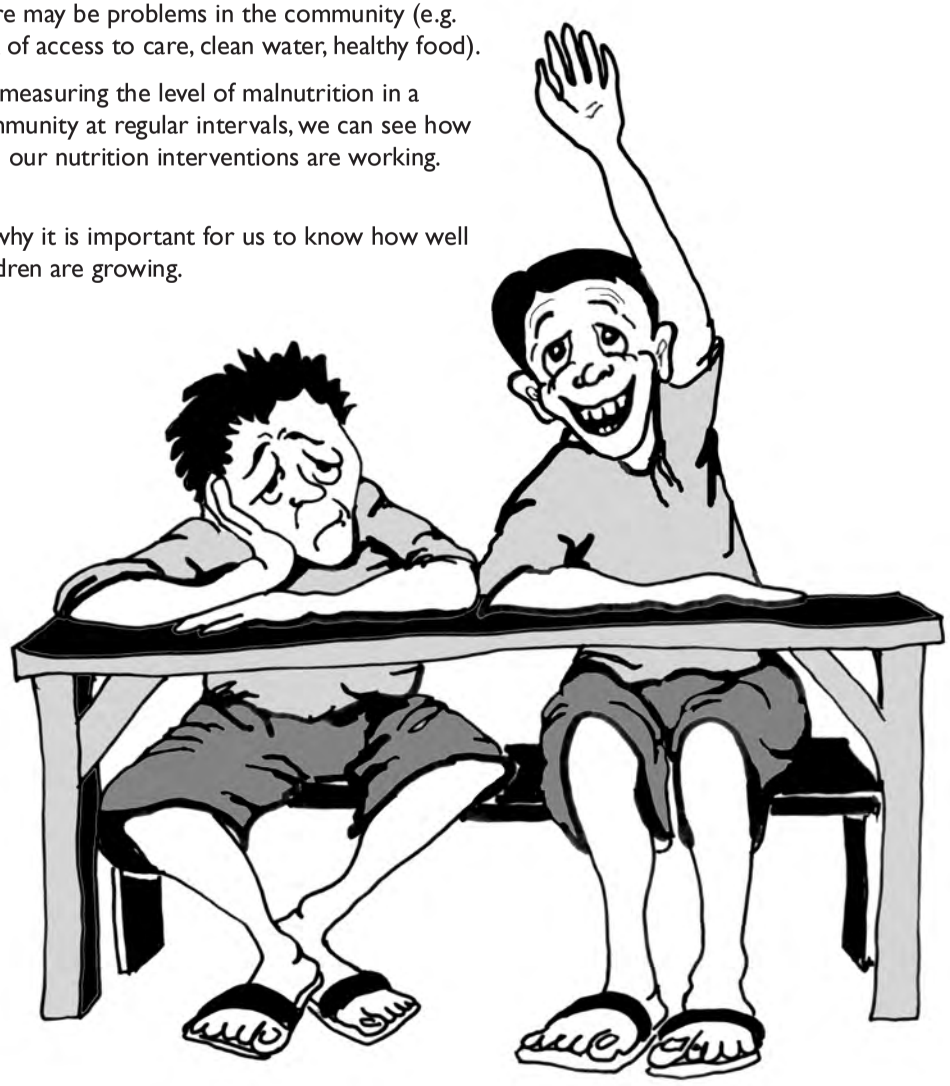
a) We can combine the growth information from all the children to see whether the rate of malnutrition in a community is low, medium or high.

b) A high level of malnutrition means we need to start or strengthen nutrition interventions.

c) Medium or high levels of malnutrition indicate that there may be problems in the community (e.g. lack of access to care, clean water, healthy food).

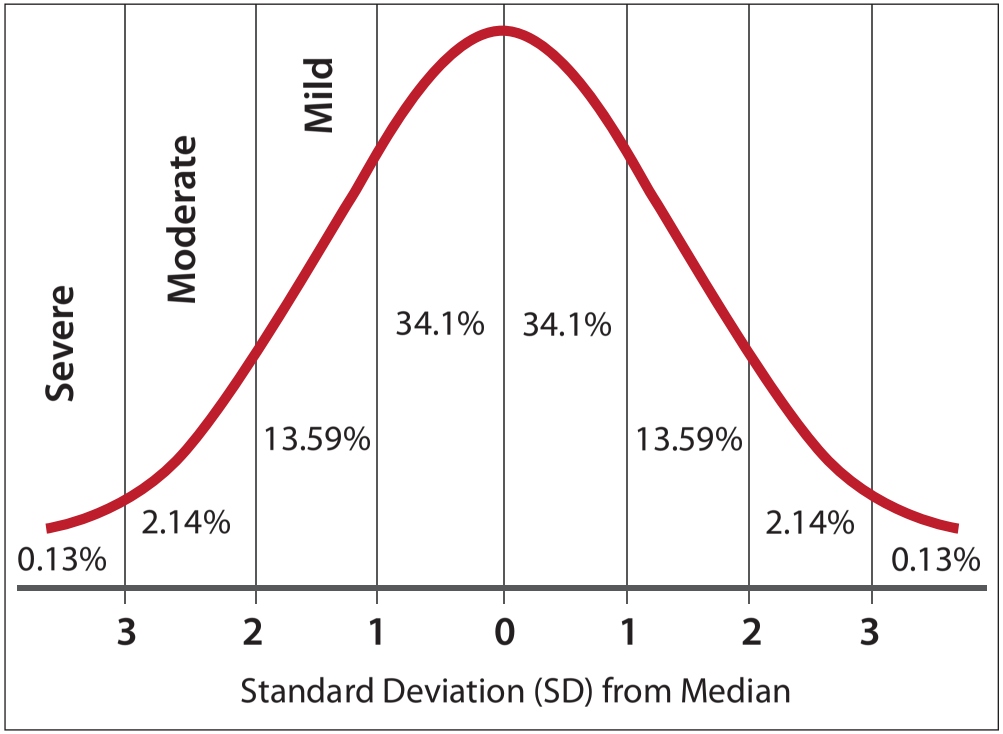
d) By measuring the level of malnutrition in a community at regular intervals, we can see how well our nutrition interventions are working.

That is why it is important for us to know how well our children are growing.



## What Are Z-Scores?

- a Z-score is a standard deviation (SD)
- it refers to how far and in what direction the measurement is from a reference or median
- cut-offs for the categories (mild, moderate or severe) of undernutrition are based on negative Z-scores




## Wasting (weight-for-height/length (WHZ) less than -2 SD)

- identifies children who are 'wasted' or thinner than a healthy child of the same height/length.
- describes children who have stopped growing and may be losing weight
- reflects recent, short-term (acute) malnutrition
- is useful for individual assessment, as well as community assessment, especially in an emergency situation.
- may be influenced by annual seasons and times of food insecurity

## Stunting (height/length-for-age (HAZ) less than -2 SD)

- identifies children who are 'stunted' or shorter than expected for a healthy child of the same age
- growth in height slows when a child is undernourished
- a child who is stunted has been undernourished for a long time, so we call that chronic undernutrition
- measuring changes in a child's height is difficult to do accurately, and changes take a long time to happen
- measuring stunting is best for assessing the nutrition situation in a community

## Underweight (weight-for-age (WAZ) less than -2 SD)

- identifies children who are 'underweight' or weigh less than expected for a healthy child of the same age.
- describes a child who may weigh less because the child has lost weight, has not grown normally in height, or both.
- measuring increases in weight is a good way to monitor individual children because it is easy and weight changes quickly so that action can be taken to prevent worsening undernutrition.
- measuring underweight is less useful than stunting or wasting for understanding nutrition in a community because one cannot know if the undernutrition is acute or chronic.

Excerpts were taken from: Savage King F, Burgess A. *Nutrition for Developing Countries*, 2nd ed. Oxford: Oxford University Press, 1993.

## How Can We Use Anthropometric Information?

**Assessment:**

a) To know whether there is current or potential risk of malnutrition in an individual child;

b) To identify the presence and severity of a nutrition problem in a community.

**Targeting:**

a) To identify need;

b) To prioritise resources.

c) To screen individuals for programme services.

**Monitoring:**

a) To track individual growth patterns;

b) To show programme performance.

**Evaluation:**

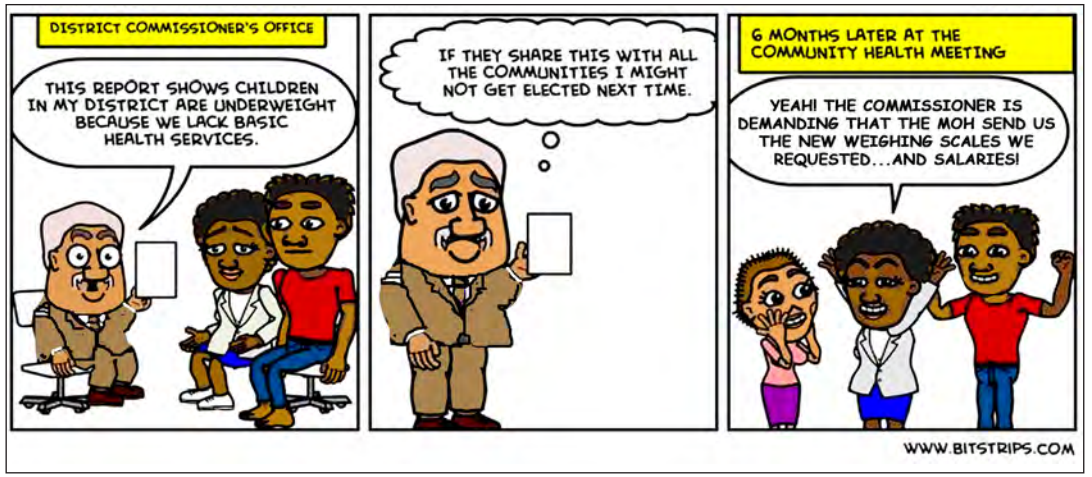
a) To evaluate and measure changes in nutrition over time;

b) To demonstrate programme impact on individuals and on the community.

**Advocacy:**

a) To advocate for increased programmes and services to address child malnutrition (such as increased funding for salaries, supplies and primary health services).

## Statistics Work for Everyone



# What Is Anthropometry?



## When Do We Take Anthropometric Measurements?

Baseline assessment:

During project implementation:

Midterm evaluation:

End of project evaluation:

## What Information Do We Need to Gather?

We need several different pieces of information in order to calculate whether or not a child is growing well.

- Age (using date of birth to calculate age in months)
- Sex (male or female)
- Weight
- Height/length
- MUAC (Mid-Upper Arm Circumference)

## There are five things to remember about gathering this kind of information from children.

**Be respectful!** It is important to be respectful and gentle with mothers and their children during the whole process of weighing and measuring.

**Be consistent and accurate** and precise in taking measurements.

**Be careful!** Be sure to record the information neatly on the correct forms.

**Be patient!** Getting precise data requires willingness, patience and great care in measuring.

**Be appropriate!** Always use good quality measuring equipment.

# Information about Sex and Age of Children Under 5

World Vision

**Children 0–59 months**

**Data Collection Form**

**Remember to:**

1. Record the date of birth (year/month/day) and the sex (M or F) of the child.
2. Record the child's height/length to nearest 0.1 cm, weight to 0.1 kg and MUAC to 0.1 cm or colour.
3. Record the date of measurement.

ADP/Program: Date of Measurement (yy/mm/dd):

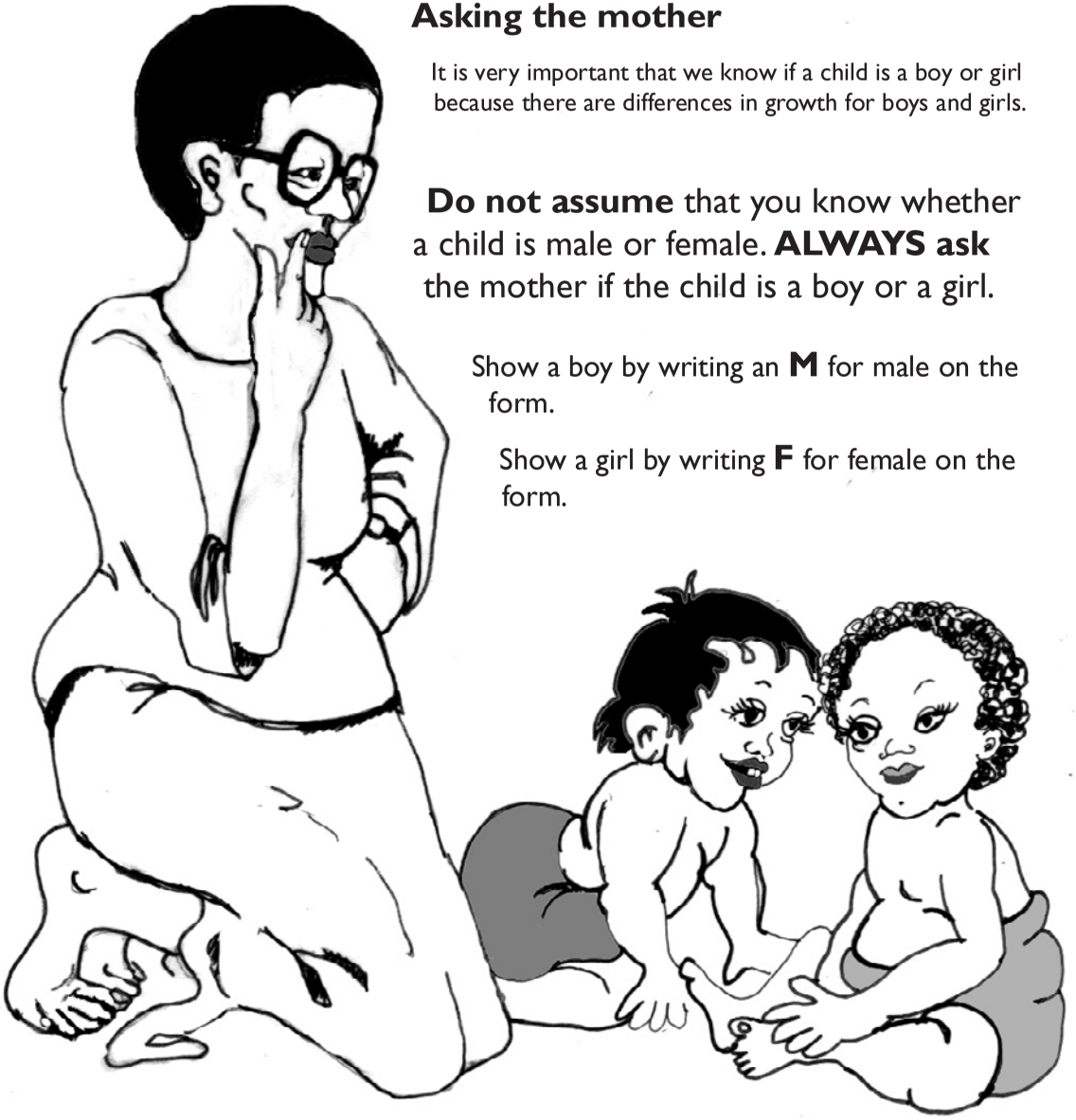
Community: Name of Data Collector:

| No. | Name of Mother | Name of Child | Date of Birth yy/mm/dd | Age in Months* | Sex M/F | Child's Length/ Height (cm) | Child's Weight (kg) | MUAC (cm or colour) only for 6-59 months | STANDING SCALE ONLY Use these two columns with young children who cannot stand. | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Mother's Weight (kg) | Mother+Child's Weight (kg) |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |



* Not necessary when collecting data for surveys.

## Is the Child a Boy or a Girl?



### Asking the mother

It is very important that we know if a child is a boy or girl because there are differences in growth for boys and girls.

**Do not assume** that you know whether a child is male or female. **ALWAYS ask** the mother if the child is a boy or a girl.

Show a boy by writing an **M** for male on the form.

Show a girl by writing **F** for female on the form.

## Determine the Child's Age

**Birth record**

Ask the mother to show you the record of the child's date of birth. If the date of birth is not recorded on the child's growth monitoring or immunisation card, or if the child does not have a card, ask the mother to tell you the child's date of birth.

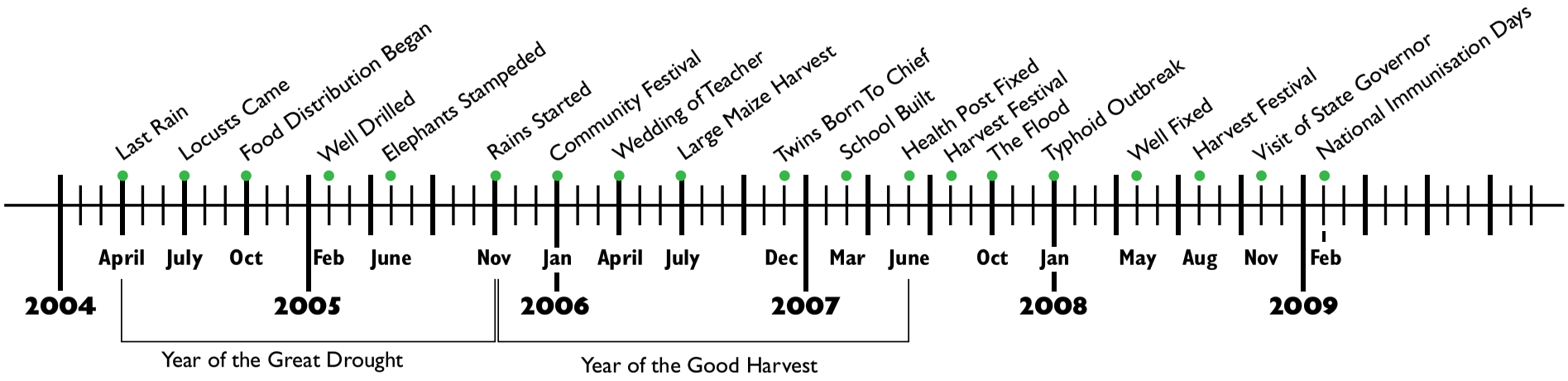
Always record the date of birth as well as the child's current age on the Data Collection Form. Date of birth is sometimes written DOB.

In the DOB column, write the correct year, month and day according to the format used, e.g. dd/mm/yy.

When the exact DOB is unknown, estimate the DOB using a community timeline.

# Information about Sex and Age of Children Under 5






*If the mother does not know the child's precise year and month of birth, use a community timeline.*

## Estimating Date of Birth

| | | | | | |
|---|---|---|---|---|---|
| May 04 | Jun 04 | Jul 04 | Aug 04 | Sep 04 | Oct 04 |
| Nov 04 | Dec 04 | Jan 05 | Feb 05 | Mar 05 | Apr 05 |
| May 05 | Jun 05 | Jul 05 | Aug 05 | Sep 05 | Oct 05 |
| Nov 05 | Dec 05 | Jan 06 | Feb 06 | Mar 06 | Apr 06 |
| May 06 | Jun 06 | Jul 06 | Aug 06 | Sep 06 | Oct 06 |
| Nov 06 | Dec 06 | Jan 07 | Feb 07 | Mar 07 | Apr 07 |
| May 07 | Jun 07 | Jul 07 | Aug 07 | Sep 07 | Oct 07 |
| Nov 07 | Dec 07 | Jan 08 | Feb 08 | Mar 08 | Apr 08 |
| May 08 | Jun 08 | Jul 08 | Aug 08 | Sep 08 | Oct 08 |
| Nov 08 | Dec 08 | Jan 09 | Feb 09 | Mar 09 | Apr 09 |

## Calculate a Child's Age in Months From Date of Birth

*To help you calculate the age of a child in months, use the table:*

*Put a small tick (√) in the birth month.*

*Put a small x in the current month.*

*Count the number of full months starting with the month after the tick (√).*

### Exercises:

1. A boy was born May 3, 2005. His mother brought him to be weighed on December 15, 2008. What is the boy's age in months?

2. A grandmother brings a young girl into the health clinic on March 28, 2008. There is no record of the child's birth date, but the grandmother says she will be one year old next week. What is the child's age in months?

3. A small girl is brought to the health post for immunisation on May 29, 2008. Her birth date is recorded as July 15, 2007. What is the child's age in months?

# Information about Sex and Age of Children Under 5

World Vision

## Recording Numbers Clearly

| CORRECT | INCORRECT |
|---|---|
| 1 | 1 |
| 2 | 2 |
| 3 | 3 |
| 4 | 4 |
| 5 | 5 |
| 6 | 6 |
| 7 | 7 |
| 8 | 8 |
| 9 | 4 |
| 0 | 6 |

1 – Draw the number 1 as a single vertical line.

2,3 – Write the numbers 2 and 3 without extra loops.

4 – Leave the number 4 open. A closed 4 can look like a 9.

5 – Don't close the 5. A closed 5 can look like a 6.

6 – Be careful that the circle on the 6 does not look like a 0.

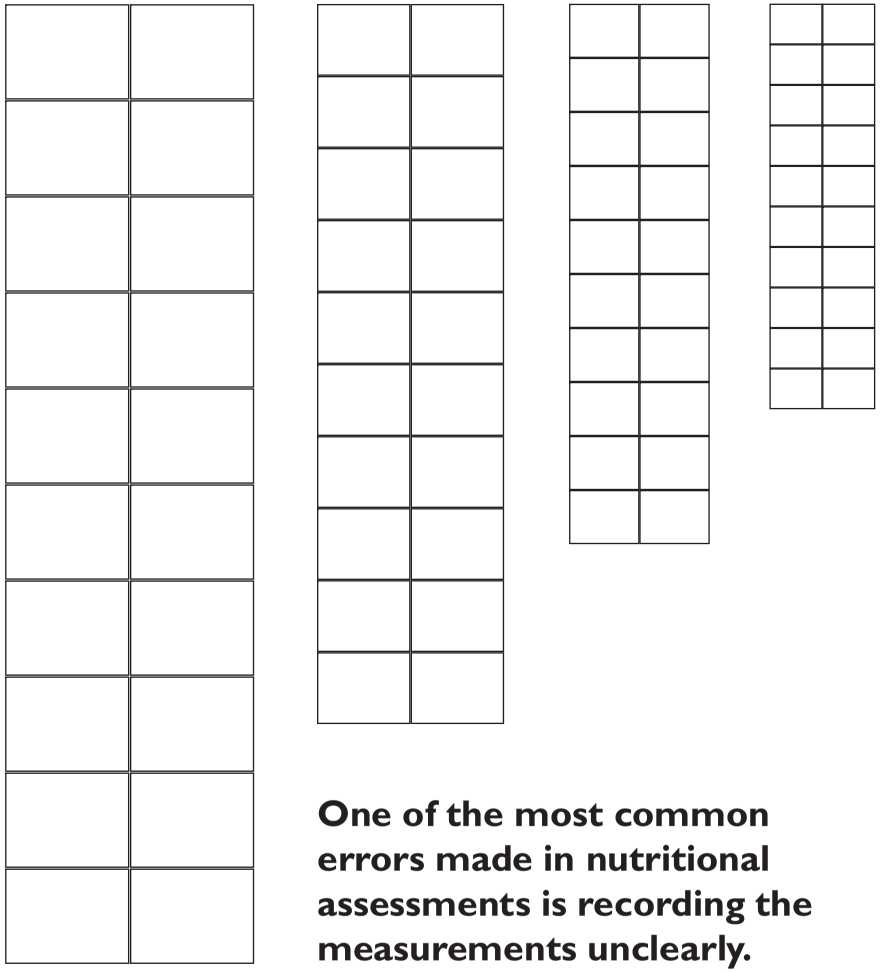
7 – Make a small horizontal line to cross the 7. This will distinguish it from a 1.

8 – Make two circles to draw the number 8 so that it does not look like a 0. Don't separate the two circles.

9 – Close the circle on the number 9 so that it does not look like a 4.

0 – Put a diagonal line through the 0 so that it is easy to identify and does not look like a 6.

## Practise the Numbers in Different Sized Boxes



**One of the most common errors made in nutritional assessments is recording the measurements unclearly.**

# Information about Sex and Age of Children Under 5



## Record Numbers Clearly on Sample Recording Form

Circle the errors you find on this form.

**Children 0 - 59 months**

**Remember to:**

1. Record the Date of Birth (year/month/day) and the sex (M or F) of the child.
2. Record the child's height/length to 0.1cm.
3. Record the date of measurement.

ADP: Shining Hope Date of Measurement: 2009/03/15

Community: Rising Sun Facilitator: Julia Feliciano

| No. | Name of Mother | Name of Child | Date of Birth yy/mm/dd | Age in Months | Sex M/F | Weight (kg) | Child's Height/Length (cm) | MUAC (cm or colour) | Weight Mother+Child | Weight Mother |
|---|---|---|---|---|---|---|---|---|---|---|
| | Diaz Jema | Diaz, Cristy | 2/03/08 | 9 | Girl | 6.9 | | | | |
| | Gamgam, Gizel | Gamgam, Ryan | 2007/3/16 | 24 | M | 12.8 | | | | |
| | Bensurto, Maria | Bensurto, Julia | 08/14/29 | | F | 11.6 | | | | |
| | Teados, Sabina | Teados, Renz | 26/12/05 | 39 | | 9.7 | | | | |
| | Pangani, Ann | Pangani, Jemer | 06/10/19 | 28 | M | 10.2 | | | | |
| | Bylos, Kiera | Bylos, L. | 07/06/16 | 33 | F | 14.2 | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |

# Hanging Scales



Weight is the measurement most commonly used by the Ministry of Health to evaluate nutritional status of children.

The actual weight of a child can vary for different reasons. For example, weight can be affected by:

1. The clothes a child is wearing
2. Food/drink the child has recently consumed.
3. Incorrect calibration of the scales.
4. Incorrect placement of the scales.
5. Use of poor quality equipment.
6. Improper weighing technique.


Measuring children is not for the faint hearted!

**Excerpts were taken from F. Savage King and A. Burgess, Nutrition for Developing Countries, 2nd ed. (Oxford: Oxford University Press, 1993).**

## Calibration

***To 'calibrate' means to use known weights to see if the scales are reading correctly.***

At the beginning of each day's weighing session, you should weigh two or three known weights on the scales to make sure the scales are still accurate.

For example, you can weight a five kilogram bag of grain or sack of rice that has been purchased from a store and make sure the scales read five kilograms. Make sure you do this with two or three known weights to ensure the scales are accurate.

## Zeroing

To make sure that the weighing you do is accurate, you must check the scales before you weigh each child and ensure that the needle on the scales points to zero (this is called 'zeroing' the scales).

To repeat, before you weigh a child, you must check that the needle on the scales points to 'zero' with the weighing basket or sling, but no child.

If you don't include the weighing basket or sling when zeroing the scales, then this extra weight will be added to the weight of the child and the weight recorded will be incorrect.

If the needle does not point to zero, adjust the scales using the dial or screw on the scales so the needle points to zero.

## Procedure for Measuring Weight With Hanging Scales


### PREPARE THE SCALES

1. Hang scales from a strong support, such as a tree.
2. Set scales at eye level.
3. With weighing basket or sling attached, adjust the scales to zero.


### PREPARE THE CHILD

4. Mother assists measurer to remove the child's outer clothing.
5. Place the child in basket or sling.



### MEASURE CHILD'S WEIGHT

6. Support the child while attaching basket or sling to the scales.
7. Hold the scales steady and read the numbers aloud.
8. Record the weight.

## Introduction to Standing Scales

Use hanging scales whenever possible to weigh children under 5, but if they are not available, use standing scales.

Using standing scales requires an extra calculation.

1. Weigh the mother and child together.
2. Weigh the mother alone.
3. Find the weight of the child by subtracting the weight of the mother alone from the weight of the mother and child together.

# Standing Scales



## How to Weigh Children Two to Five Years (who can stand well alone)

1. Set scales on smooth hard surface in good light.
2. Zero the scales.
3. Ask the mother to remove the child's shoes and outer clothing.
4. Child stands with feet at centre of the scales.
5. Reader kneels by the scales and reads aloud the weight of the child.
6. Recorder stands behind the reader and records the weight on the form. Reader checks information for accuracy.

## How to Weigh Children Under Two Years Old or Children Who Cannot Stand Well Alone

1. Set scales on smooth hard surface in good light.
2. Zero the scales.
3. Mother removes child's outer clothes.
4. Mother holds child and stands on centre of the scales.
5. Reader reads aloud the weight of mother and child.
6. Recorder puts the information on the official form.




7. Mother stands on scales alone.
8. Reader reads the weight of the mother alone.
9. Recorder records weight of mother and calculates weight of child on form (weight of child = weight of mother+child minus weight of mother alone). Reader checks information for accuracy.

## Length or Height?

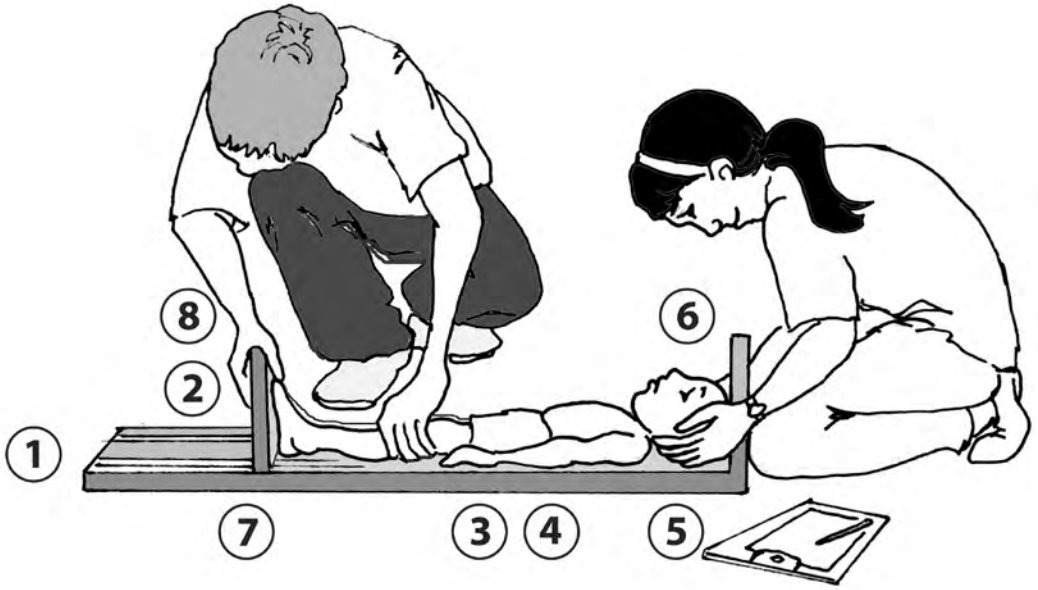
• Length = measurement of a child lying down.

• We use the length measurement for children under 2, any child who appears to be less than 80 centimetres tall, or any child who cannot stand well on their own.

• Height = measurement of a child standing up.

• We use the height measurement for children older than 24 months who can stand well alone.

• The same board is used for both measurements. It is called a length board when measuring length and a height board when measuring height.

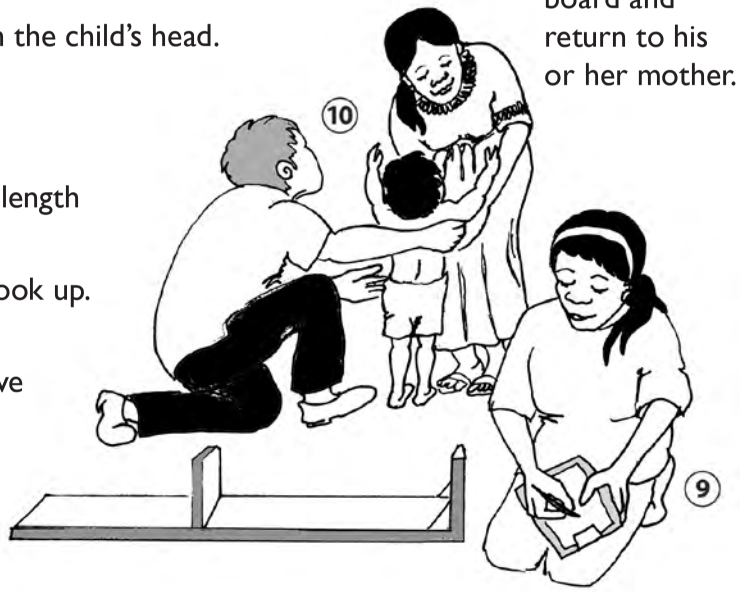



## Measuring Length

1. Place the length board on flat ground or a low, flat surface. Don't let the child fall off!
2. Ask the mother to remove the child's shoes and anything on the child's head.
3. Lay the child down on its back on the length board.
4. The child's body should be completely flat on the board.
5. The top of the child's head should be against the end of the length board that does not move.
6. The assistant holds the child's head so that the child's eyes look up. The assistant should look directly into the child's eyes.
7. Press gently on the child's knees to straighten them and move the footpiece so the child's feet are flat against it.
8. Quickly read aloud the length measurement, before the child moves.

## Record the Measurement

9. The assistant records the information.
10. Gently help the child to get up off the board and return to his or her mother.



## How to Measure Height

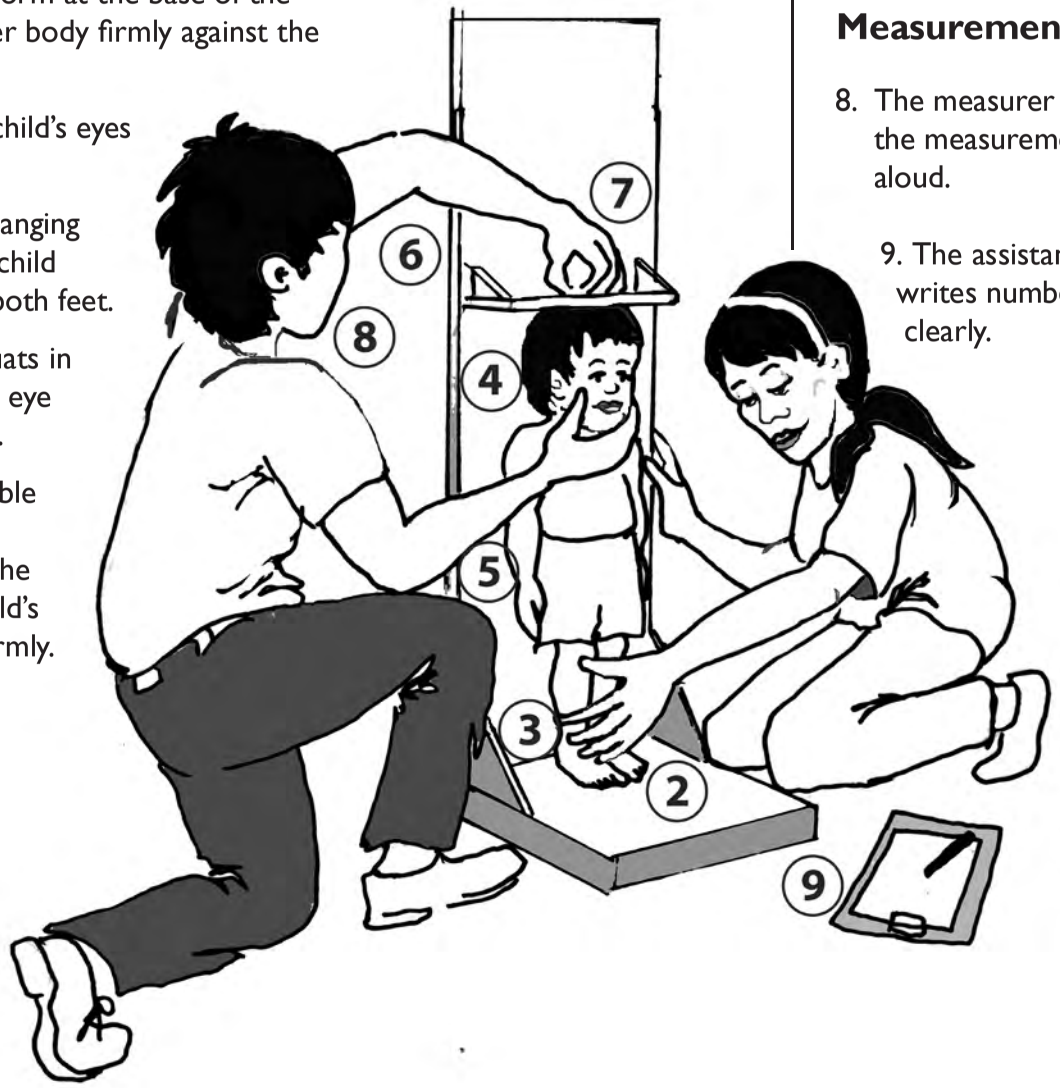
This is the proper positioning of the height board, the measurer and the assistant.

1. Place the height board on flat ground and against a wall or tree. The board cannot move.

## Measuring Height of Children Over Two Years of Age


## How to Place the Child Against the Height Board

2. The child must be barefoot with nothing on his or her head.
3. Stand the child on the platform at the base of the height board with his or her body firmly against the back of the board.
4. Lift the child's chin so the child's eyes are looking straight ahead.
5. The arms should be hanging at the child's sides. The child should be standing on both feet.
6. The measurer squats in front of the child at eye level with the child.
7. Slide the moveable headpiece down until it touches the crown of the child's head and hold firmly.



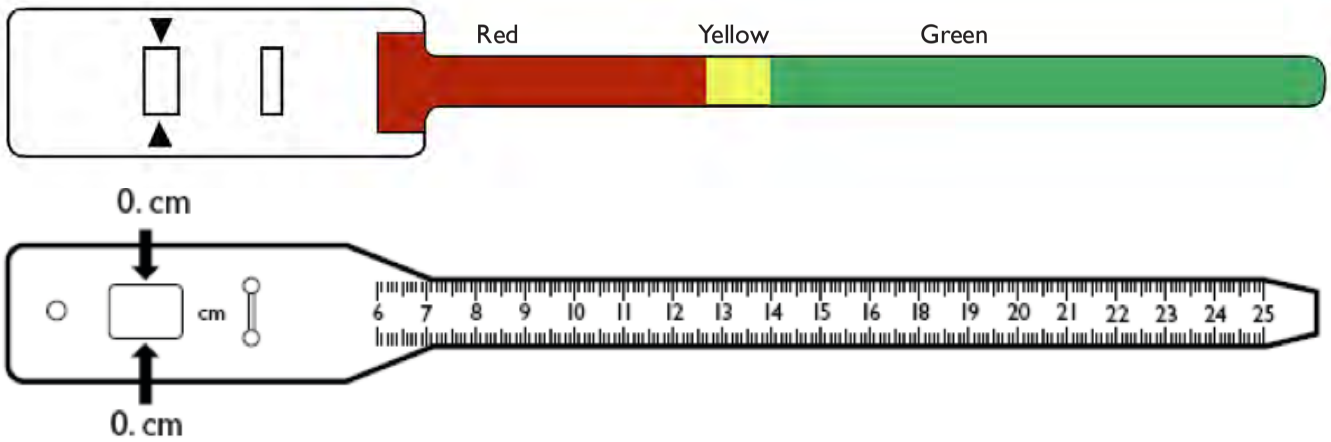

## Record the Measurement

8. The measurer reads the measurement aloud.
9. The assistant writes numbers clearly.

# What is correct? Incorrect?

# Mid-Upper Arm Circumference (MUAC)






MUAC is a simple and easy body measurement that is often used for screening in emergency situations and is also used in nutrition surveys in development contexts.

MUAC helps us to determine the level of malnutrition in large groups of people quickly.

MUAC is based on the fact that a small or decreasing arm circumference signals the loss of muscle mass. (*Circumference* means 'outside edge of a circle'). Muscle mass is known to be important in maintaining body functions and in fighting infections.

MUAC is a good predictor of immediate risk of death. This is why we usually use MUAC in emergency situations, for a quick assessment of nutritional status.

MUAC is not used to measure malnutrition in children under six months because we don't have established cut-off levels for this age group.

MUAC can be used with children and adults to find the recent undernutrition rates in a population.

You should measure MUAC to identify acute malnutrition and in nutrition surveys to estimate beneficiary umbers for emergency nutrition programmes.stunting we use height and age. Wasting is sometimes measured using weight and height. You should measure MUAC to identify acute malnutrition and in nutrition surveys to estimate beneficiary numbers for emergency nutrition programmes.

## MUAC Cut-off Points

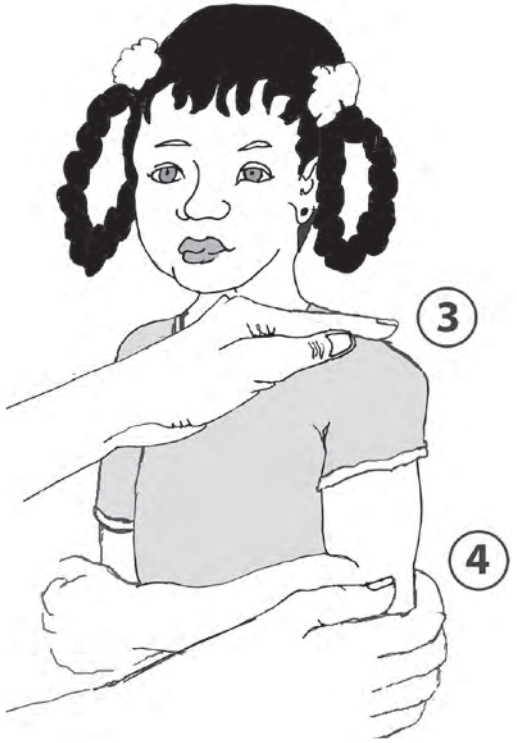
- Below 11.5 (red) for severe malnutrition; needs immediate medical attention
- 11.5 - 12.4 cm (yellow) for moderate malnutrition
- A measurement of 12.5 cm or greater (green) is considered a normal mid-upper arm circumference.

*The cut-off point of 11.5 cm is still used in CMAM programmes because this was the WHO recommendation in 2007 and there are high caseloads even with this lower cut-off. In 2009, WHO recommended increasing the cut-off point to 11.5 cm because evidence shows that children with smaller mid-upper arm circumference than 11.5 cm are at greater risk of death than those above this cut-off.*

1. Work at eye level.
2. Ask mother to remove clothing covering the child's arm.

# Mid-Upper Arm Circumference (MUAC)






**3.** Locate the tip of the child's shoulder with your fingertips.

**4.** Bend the child's elbow so the arm makes a right angle.

**5.** Place a mark on the child's arm half way between the shoulder tip and the elbow. This is the mid-point.

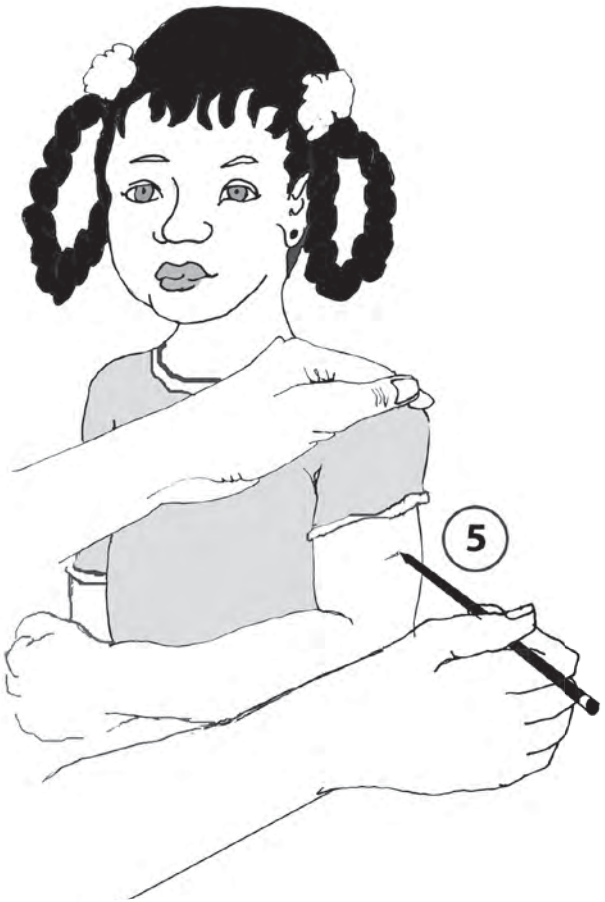
**6.** Straighten the child's arm.

**7.** Wrap the MUAC band around the child's arm at the mid-point mark you have just made. Insert the end of the band through the thin opening at the other end of the band.

a) Keep the colours or numbers on the band right side up so that you can see them, and be sure that the band is flat against the skin.

b) Make sure the band is not too tight (if the band is too tight, this bunches up the skin and we do not get an accurate reading).

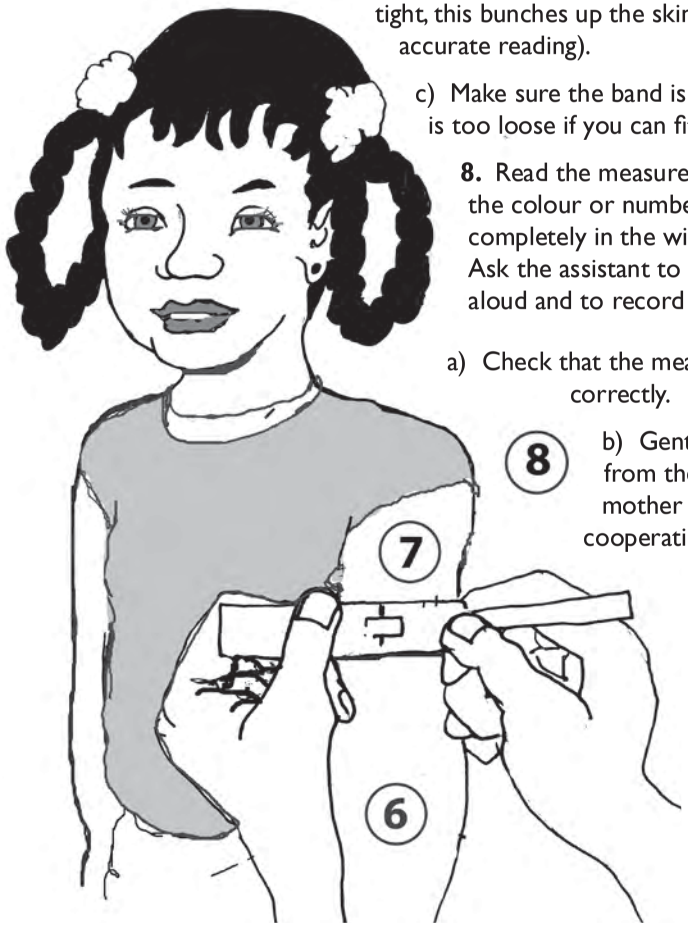
c) Make sure the band is not too loose (the band is too loose if you can fit a pencil under it)




**8.** Read the measurement aloud (either the colour or number which shows most completely in the wide window on the band). Ask the assistant to repeat the measurement aloud and to record it on the form.

a) Check that the measurement is recorded correctly.

b) Gently remove the band from the child's arm. Thank the mother and the child for their cooperation.



# Standardisation Exercise



| Common Errors | Solution |
|---|---|
| **1. All Measurements** | |
| Restless child | Postpone measurement. Involve parent in procedure. |
| Inaccurate reading | Training and retraining stressing accuracy. |
| Recording | Record results immediately after taking measurements and confirm record. |
| **2. Length/Height** | |
| Incorrect method for age | Use length only when child is <2 years old [or unable to stand properly]. |
| Foot wear/headgear | Remove. |
| Head not in correct plane, child not straight, knees bent, or feet not flat on floor | Correct technique with practise and regular retraining. Provide adequate assistance. Calm the child. |
| Child not straight along board and foot not parallel with movable board | Parent or assistant should be present. [Move head board to compress hair.] |
| Sliding board not firmly against heels/head | Correct pressure should be practised. [Move head board to compress hair.] |
| **3. Weight** | |
| Scale not calibrated to zero | Recalibrate after every measurement. [Zero after every measurement, recalibrate at the start of each weighing session with a known weight.] |
| Child wearing heavy clothing | Remove or make allowances for clothing. |
| Child moving or anxious | Wait until child is calm or remove cause of anxiety. |
| **4. MUAC** | |
| Child not standing in the correct position | Position subject correctly. |
| Mid arm point incorrectly marked | Measure mid-point carefully. |
| Examiner not level with subject, tape around the arm not at mid point, tape too tight/too loose | Correct techniques with training, supervision and retraining. Take into account cultural practices for example, wearing of arm bands. |

This chart is adapted from Appendix 2, page 39, 'Sources of error in taking anthropometrical measurements' in: Food Security Analysis Unit for Somalia (FSAU). Nutrition: A Guide to Data Collection, Analysis, Interpretation and Use. (Nairobi; FSAU, 2005).

## These common errors are controlled by:

- Learning and applying correct measuring techniques.
- Taking care to read the measurements correctly.
- Recording the measurements correctly and clearly so that someone else can easily read the numbers.
- Being patient with the measurement process, and being willing to do the job correctly.
- If a long time has passed since you measured children, review the technique with someone who has experience and who can guide you.

## Things to Remember

**BE FRIENDLY:** Remember that each child is a special individual, not a project number. Be kind and friendly when you relate to the child and the mother.

**BE CLEAR:** Explain in simple terms what you are doing. Ask the mother if she has any questions.

**BE SAFE:** Never leave the child alone with the equipment. Make sure the child does not slip or fall.

**BE PARTNERS:** Two people work together to take the measurements. This helps ensure that the child is placed correctly on the height board or the scales. If there is no other trained person available to assist, then explain the procedure to the child's mother and ask her to help you.

**BE BETTER:** Work hard to do better quality work every day.

## Form 1 Weight Standardisation

Name of Participant: _____

Date of Measurement: _____ /_____ /_____ (yy/mm/dd)

| Name of Child | Age in Months | No. | My Measure | Standard Measure | Difference Sign (+, -) | Size of Difference (L, M, S) |
|---|---|---|---|---|---|---|
| | | 1 | | | | |
| | | 2 | | | | |
| | | 3 | | | | |
| | | 4 | | | | |
| | | 5 | | | | |
| | | 6 | | | | |
| | | 7 | | | | |
| | | 8 | | | | |
| | | 9 | | | | |
| | | 10 | | | | |

**Size of Differences:**

| | | | |
|---|---|---|---|
| Number of Large Differences | (0.3 kg or more) | Box 1 | |
| Number of Medium Differences | (0.2 kg) | Box 2 | |
| Number of Small Differences | (0.0 - 0.1 kg) | Box 3 | |

**Differences:**

Number of positive signs (+) _____ Number of negative signs (-) _____

## Form 2 Height/Length Standardisation

Name of Participant: _____

Date of Measurement: _____ /_____ /_____ (yy/mm/dd)

| Name of Child | Age in Months | No. | My Measure | Standard Measure | Difference Sign (+, -) | Size of Difference (L, M, S) |
|---|---|---|---|---|---|---|
| | | 1 | | | | |
| | | 2 | | | | |
| | | 3 | | | | |
| | | 4 | | | | |
| | | 5 | | | | |
| | | 6 | | | | |
| | | 7 | | | | |
| | | 8 | | | | |
| | | 9 | | | | |
| | | 10 | | | | |

**Size of Differences:**

| | | |
|---|---|---|
| Number of Large Differences | (1.0 cm or more) | Box 1 |
| Number of Medium Differences | (0.6 - 0.9 cm) | Box 2 |
| Number of Small Differences | (0.0 - 0.5 cm) | Box 3 |

**Differences:**

Number of positive signs (+) _____ Number of negative signs (-) _____

## Form 3 MUAC Standardisation

Name of Participant: _____

Date of Measurement: _____ /_____ /_____ (yy/mm/dd)

| Name of Child | Age in Months | No. | My Measure | Standard Measure | Difference Sign (+, -) | Size of Difference (L, M, S) |
|---|---|---|---|---|---|---|
| | | 1 | | | | |
| | | 2 | | | | |
| | | 3 | | | | |
| | | 4 | | | | |
| | | 5 | | | | |
| | | 6 | | | | |
| | | 7 | | | | |
| | | 8 | | | | |
| | | 9 | | | | |
| | | 10 | | | | |

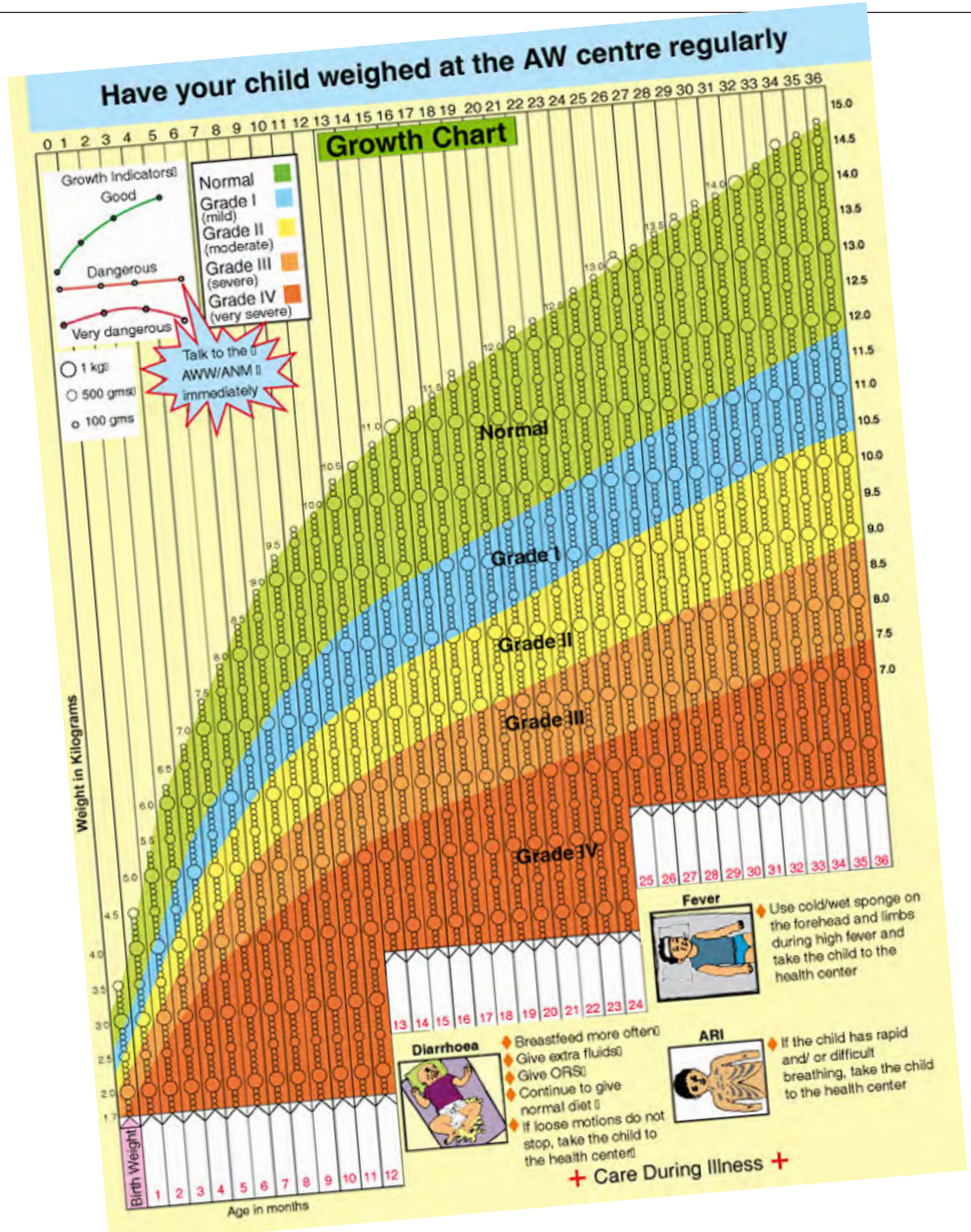
**Size of Differences:**

| | | | |
|---|---|---|---|
| Number of Large Differences | (0.5 cm or more) | Box 1 | |
| Number of Medium Differences | N/A | Box 2 | N/A |
| Number of Small Differences | (0.0 - 0.5 cm) | Box 3 | |

**Differences:**

Number of positive signs (+) _____ Number of negative signs (-) _____

# Your Country's Road to Health Card



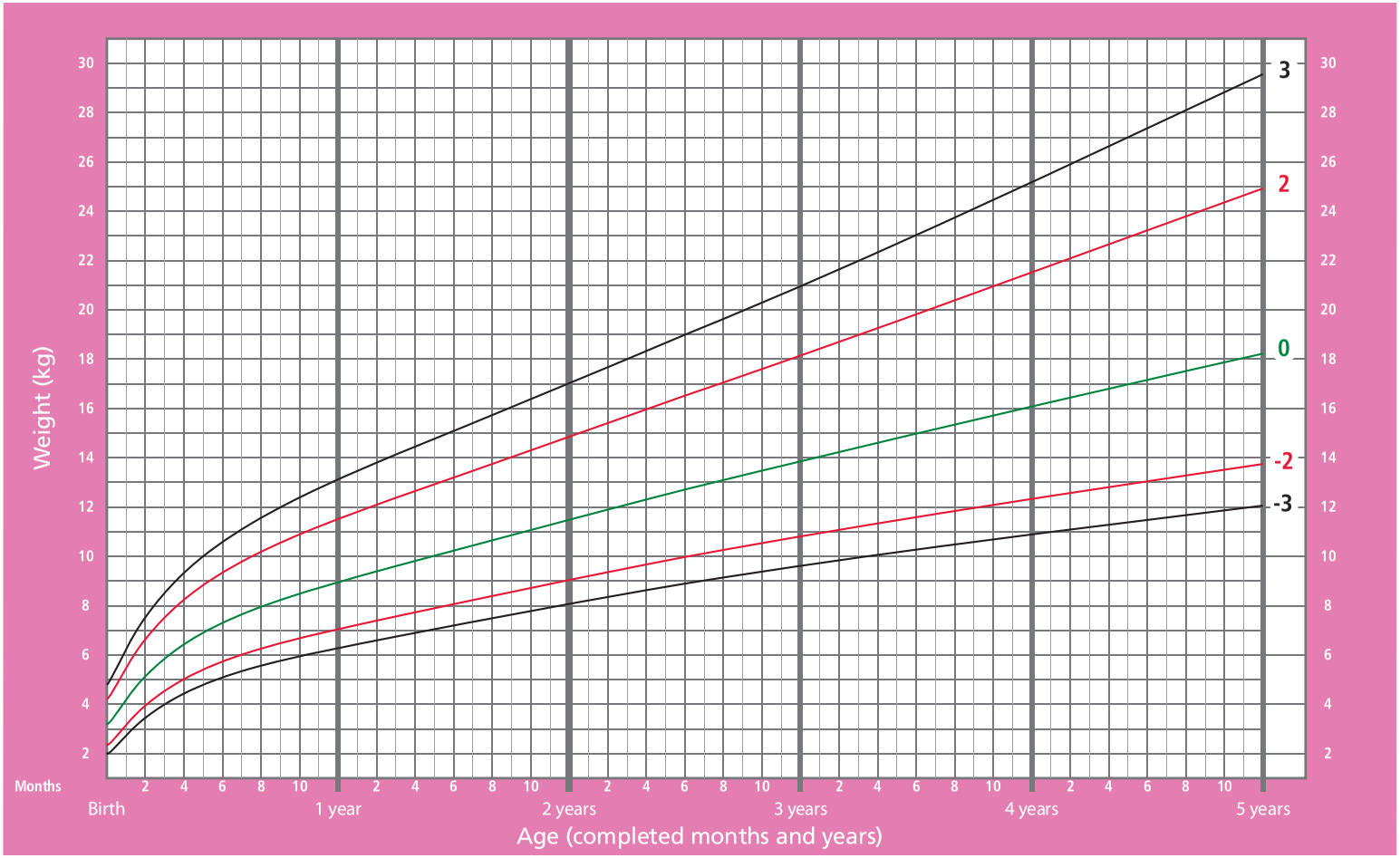
**Rose (Female)**
**DOB: March 2007**
**Birth Weight: 3.2 kg**

| Growth Monitoring Results | |
|---|---|
| April 2007 | 3.2 kg |
| May 2007 | 3.8 kg |
| June 2007 | 3.9 kg |
| July 2007 | 4.0 kg |
| August 2007 | 4.2 kg |
| September 2007 | 4.3 kg |
| October 2007 | 4.4 kg |
| November 2007 | 5.3 kg |
| December 2007 | 6.1 kg |
| January 2008 | 6.4 kg |
| April 2008 | 6.8 kg |
| June 2008 | 7.2 kg |
| September 2008 | 7.8 kg |

## Weight-for-age GIRLS

Birth to 5 years (z-scores)

World Health Organization




WHO Child Growth Standards

## Exercise: Graphing a Child's Growth

### Nandi: (female)

| Date | Weight (kg) |
|---|---|
| March 2007 (DOB) | 3.7 |
| April 2007 | 3.7 |
| May 2007 | 4.3 |
| June 2007 | 4.4 |
| July 2007 | 4.5 |
| August 2007 | 4.7 |
| September 2007 | 4.8 |
| October 2007 | 4.9 |
| November 2007 | 5.8 |
| December 2007 | 6.6 |
| January 2008 | 6.9 |
| April 2008 | 7.3 |
| June 2008 | 7.7 |
| September 2008 | 8.3 |

### Sinto: (male)

| Date | Weight (kg) |
|---|---|
| July 2007 (DOB) | 3.5 |
| August 2007 | 4.4 |
| October 2007 | 5.2 |
| November 2007 | 7.3 |
| December 2007 | 8.0 |
| February 2008 | 8.8 |
| April 2008 | 10.2 |
| June 2008 | 10.5 |

### Tinu: (male)

| Date | Weight (kg) |
|---|---|
| Nov 2007 (DOB) | 2.3 |
| December 2007 | 2.9 |
| February 2008 | 3.8 |
| March 2008 | 4.3 |
| April 2008 | 4.7 |
| June 2008 | 5.6 |
| July 2008 | 6.3 |
| August 2008 | 6.7 |
| October 2008 | 7.2 |
| | |

### Harjinder: (female)

| Date | Weight (kg) |
|---|---|
| June 2007 (DOB) | 3.6 |
| August 2007 | 4.5 |
| October 2007 | 5.7 |
| November 2007 | 5.8 |
| January 2008 | 6.2 |
| February 2008 | 6.4 |
| March 2008 | 6.4 |
| May 2008 | 6.5 |
| July 2008 | 6.8 |
| September 2008 | 7.0 |
| October 2008 | 7.1 |
| December 2008 | 7.5 |

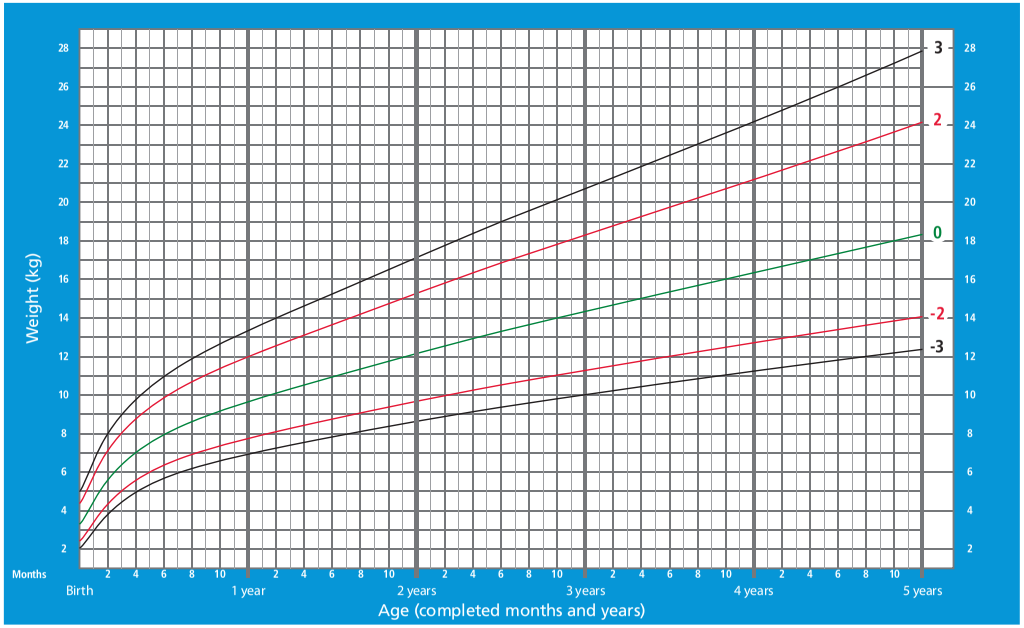
### Sarah: (female)

| Date | Weight (kg) |
|---|---|
| Feb 2008 (DOB) | 2.0 |
| March 2008 | 2.5 |
| April 2008 | 3.1 |
| May 2008 | 3.5 |
| June 2008 | 4.0 |
| July 2008 | 4.6 |
| August 2008 | 5.0 |
| September 2008 | 5.4 |
| October 2008 | 5.9 |
| November 2008 | 6.2 |
| January 2009 | 6.9 |

## Weight-for-age BOYS

Birth to 5 years (z-scores)

World Health Organization

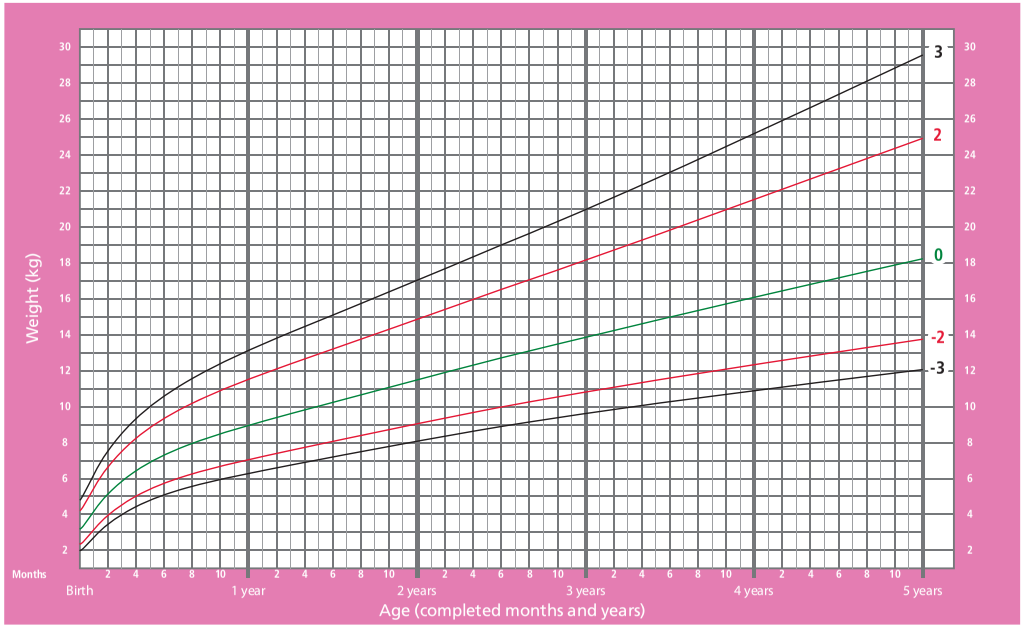



WHO Child Growth Standards

## Weight-for-age GIRLS

Birth to 5 years (z-scores)

World Health Organization




WHO Child Growth Standards

## Five Growth Curves

1. **Channel below -3 SD (below the lowest growth curve): Very low weight-for-age – the most dangerous.**
   - Most children are severely malnourished
   - These children need help immediately
2. **Channel between -2 SD and -3 SD: Low weight-for-age – a sign of danger.**
   - Most children are moderately malnourished
   - These children are at risk for becoming severely malnourished
3. **Channel between 2 SD and -2 SD: Normal weight-for-age – healthy.**
   - A healthy child's weight should be in this channel
4. **Channel between 2 SD and 3 SD: Normal to high weight-for-age – healthy.**
   - Most children are still healthy in this channel
5. **Channel above 3 SD: High weight-for-age – overweight.**
   - Most children in this channel are overweight

**REMEMBER**: Always check this direction of the growth curve to see if the child's weight is increasing or not. Even a child in Channel 1 (below -3 SD) can be healthy as long as he or she is growing.

## Shape of Growth Curves

- Healthy growth – growth lines are rising at the same rate as the reference curve. This shows the child is well-nourished.
- Growth faltering – growth lines are rising more slowly than the reference curve. This is a warning sign that the child may be undernourished.
- Failing growth – growth lines are not increasing over a certain period of time (flat lines). This means the child has stopped growing and is undernourished.
- Weight loss – growth lines are decreasing, meaning that the child has stopped growing and is losing weight. The child is undernourished, and usually also ill with an infection. This is particularly serious.
- Fast weight gain – when a child's growth line rises faster than the reference weight-for-age curve. Fast weight gain often occurs when a child is recovering from undernutrition or an illness, and is a good sign of recovery. It is also called 'catch-up growth.'

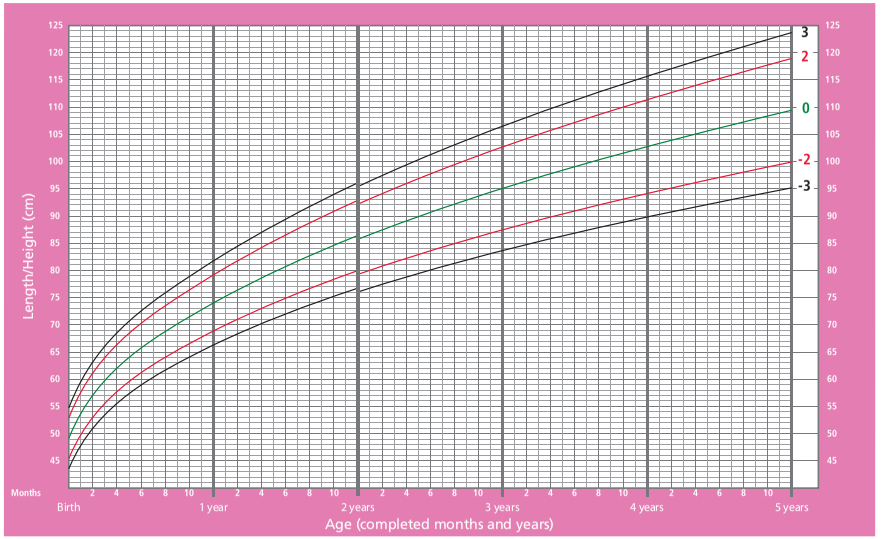
# Improving Individual Child Growth

World Vision

## Length/height-for-age GIRLS

World Health Organization

Birth to 5 years (z-scores)

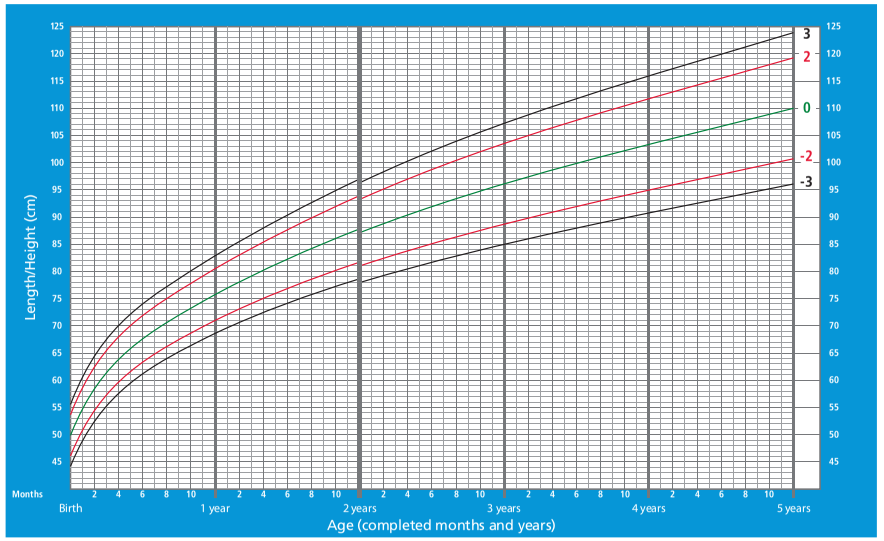



WHO Child Growth Standards

## Length/height-for-age BOYS

World Health Organization

Birth to 5 years (z-scores)

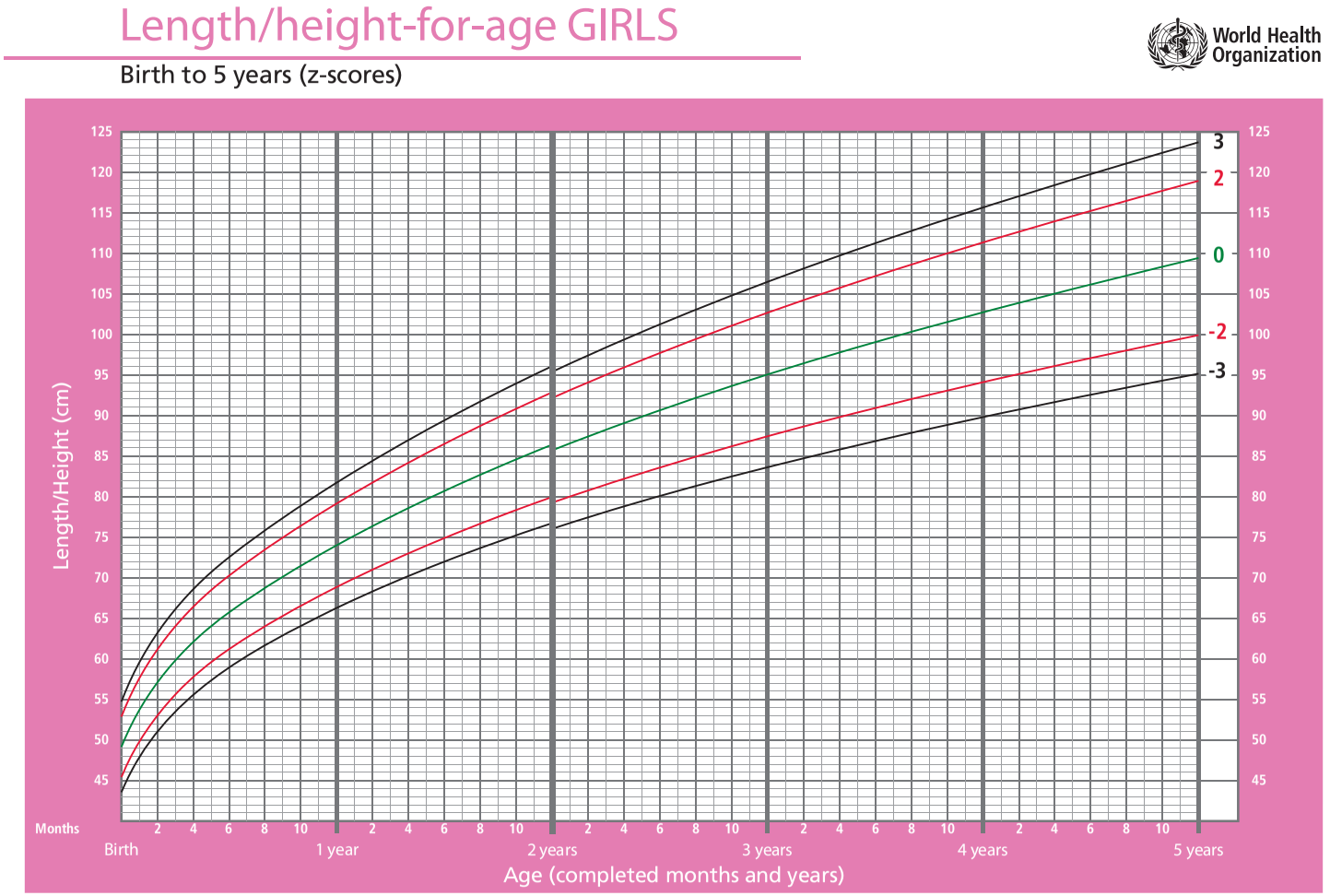



WHO Child Growth Standards

# Length Measurements (Nandi)

**Nandi: (female)**

| Date | Length (cm) |
|---|---|
| March 2007 (DOB) | 53 |
| April 2007 | 57 |
| May 2007 | 60 |
| June 2007 | 63 |
| July 2007 | 64 |
| August 2007 | 65 |
| September 2007 | 65 |
| October 2007 | 66 |
| November 2007 | 66 |
| December 2007 | 66 |
| January 2008 | 67 |
| April 2008 | 70 |
| June 2008 | 71 |
| September 2008 | 73 |



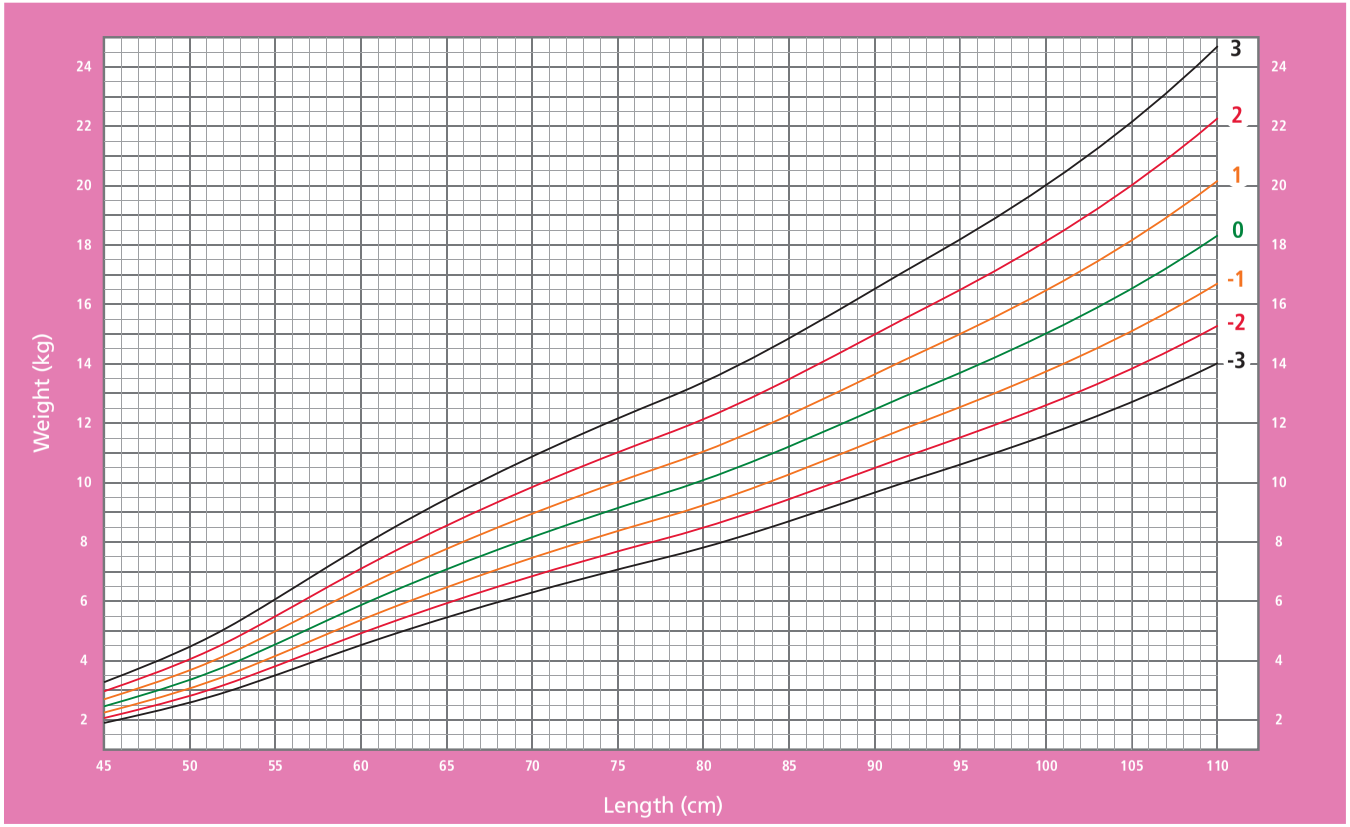
# Weight and Length Measurements (Nandi)

| Date | Weight (kg) | Length (cm) |
|---|---|---|
| March 2007 (DOB) | 3.7 | 53 |
| April 2007 | 3.7 | 57 |
| May 2007 | 4.3 | 60 |
| June 2007 | 4.4 | 63 |
| July 2007 | 4.5 | 64 |
| August 2007 | 4.7 | 65 |
| September 2007 | 4.8 | 65 |
| October 2007 | 4.9 | 66 |
| November 2007 | 5.8 | 66 |
| December 2007 | 6.6 | 66 |
| January 2008 | 6.9 | 67 |
| April 2008 | 7.3 | 70 |
| June 2008 | 7.7 | 71 |
| September 2008 | 8.3 | 73 |

## Weight-for-length GIRLS

World Health Organization

Birth to 2 years (z-scores)



# Growth Counselling Reminders

- Have a conversation with the mother or caregiver.
- Ask questions that will help you understand what practices she has at home that might contribute to the child's lack of growth.
- Listen carefully to the answers and make some recommendations to the caregiver.
- Reach an agreement about some steps the caregiver could take at home.
- Ask the caregiver to state what agreements you reached during the conversation to ensure she understands and remembers what she agreed to try to promote her child's growth.

The Malawi Infant and Young Child Feeding National Counselling Cards have been included in these materials as an example of good counselling aids. Your country may have developed its own counselling cards that are appropriate for your work.

**Incorrect**

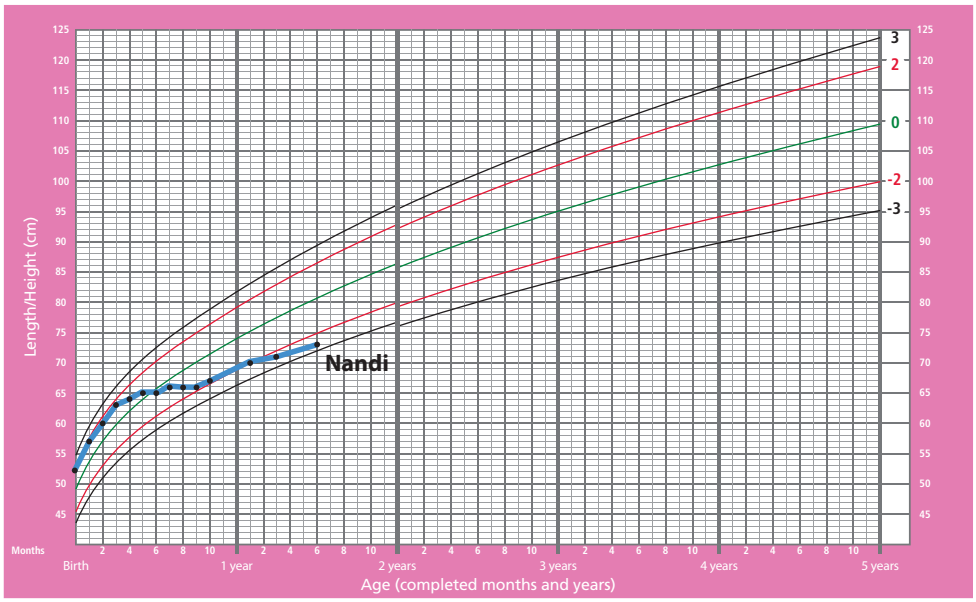

**Correct**

# Charts (Nandi)

## Length/height-for-age GIRLS

Birth to 5 years (z-scores)

World Health Organization

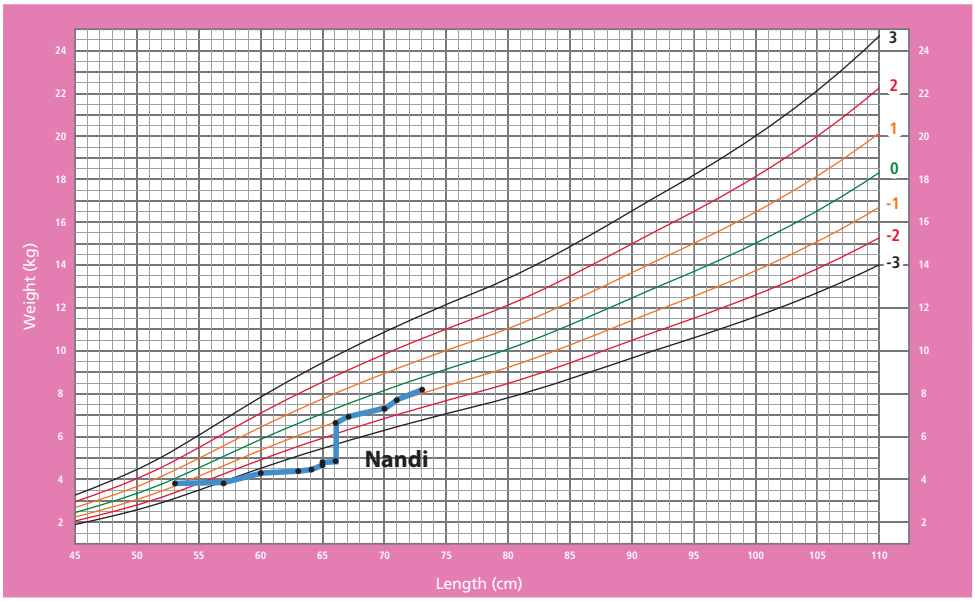



WHO Child Growth Standards

## Weight-for-length GIRLS

Birth to 2 years (z-scores)

World Health Organization

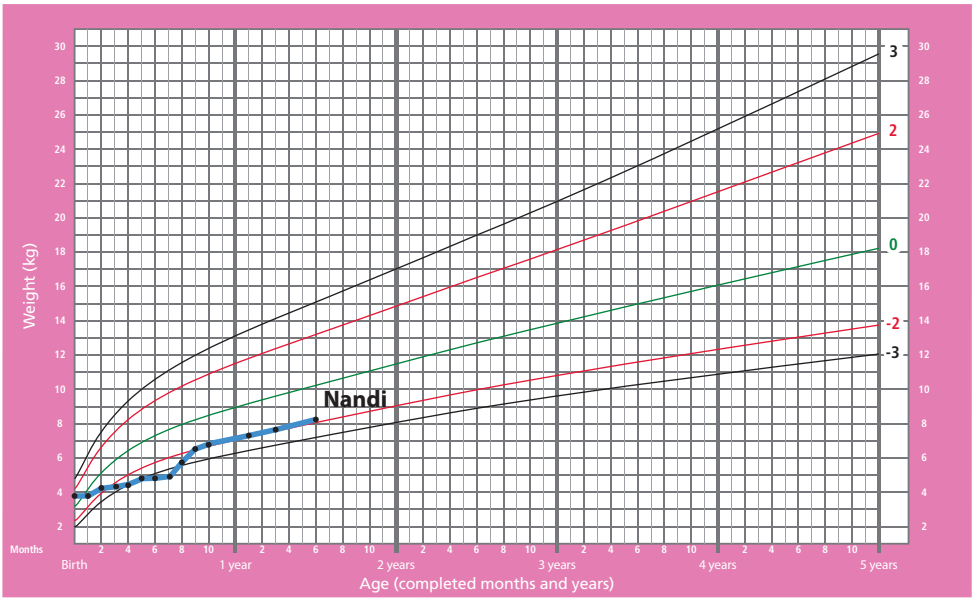



WHO Child Growth Standards

## Weight-for-age GIRLS

Birth to 5 years (z-scores)

World Health Organization




WHO Child Growth Standards

# Community Weighing Summary

## Number of Children Weighed in Each Category

| | Normal | Mildly Malnourished | Moderately Malnourished | Severely Malnourished | Total Children |
|---|---|---|---|---|---|
| | 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 | 𝍸 𝍸 𝍸 𝍸 𝍸 | 𝍸 III | 𝍸 I | |
| Totals (#) | 30 | 28 | 8 | 6 | 72 |
| Totals (%) | | | | | 100 |

To calculate percentages: = $\frac{\text{the number of children in the category}}{\text{the total number of children}} \times 100$

Example: $\frac{30 \text{ normal children}}{72 \text{ total children}} \times 100$

= .417 X 100

= 41.7%, we can round this up to 42%.

42% of children have normal nutrition and are growing well.

How many children in Shining Hope Community were weighed?

How many were malnourished and to what extent?

Calculate percentages of children in each category of malnutrition.

# Triggers for Action – Underweight

**Percentage of Children 0-59 Months Moderately and Severely Malnourished**

| | Acceptable | Attention Required | Critical |
|---|---|---|---|
| **Underweight** Moderately/Severely Malnourished | <10% | 10-19% | ≥20% |

# Level of Stunting in This Community

**Height/Length-for-Age – Number of Children**

| | Normal | Mildly Malnourished | Moderately Malnourished | Severely Malnourished | Total Children |
|---|---|---|---|---|---|
| | 𝍸 𝍸 𝍸 I | 𝍸 𝍸 𝍸 𝍸 𝍸 II | 𝍸 𝍸 𝍸 𝍸 I | III | |
| Totals | 16 | 32 | 21 | 3 | 72 |

To calculate percentages: = the number of children in the category X 100
the total number of children

Example: 16 normal children X 100
72 total children
= .22 X 100
= 22 %

22% of children have normal nutrition according to their height-for-age and are growing well.

How many children were measured?

How many were malnourished and to what extent?

Calculate percentages of children in each category of malnutrition.

# Triggers for Action – Stunting

**Percentage of Children 0-59 Months Moderately and Severely Malnourished**

| | Acceptable | Attention Required | Critical |
|---|---|---|---|
| **Stunting** (height-for-age) | <20% | 20 – 29% | ≥30% |

# Trigger for Action – Wasting

**Percentage of Children 0-59 Months Moderately and Severely Malnourished**

| | Acceptable | Attention Required | Critical |
|---|---|---|---|
| **Wasting** (weight-for-height) | <5% | 5 – 9% | ≥10% |

Table 13.7 Nutritional status of children

Percentage of children under five years classified as malnourished according to three anthropometric indices of nutritional status: height-for-age, weight-for-height, and weight-for-age, by background characteristics, and percentage of children of noninterviewed mothers, and all children classified as malnourished, Cambodia 2000

| Background characteristic | Height-for-age | | | Weight-for-height | | | Weight-for-age | | | Number of children |
|---|---|---|---|---|---|---|---|---|---|---|
| | Percentage below -3 SD | Percentage below -2 SD[1] | Mean Z-score (SD) | Percentage below -3 SD | Percentage below -2 SD[1] | Mean Z-score (SD) | Percentage below -3 SD | Percentage below -2 SD[1] | Mean Z-score (SD) | |
| **Child's age in months** | | | | | | | | | | |
| <6 | 5.1 | 14.5 | -0.4 | 1.9 | 9.0 | -0.1 | 1.1 | 7.7 | -0.4 | 351 |
| 6-9 | 4.4 | 23.5 | -1.1 | 1.4 | 9.3 | -0.4 | 6.1 | 20.2 | -1.1 | 229 |
| 10-11 | 6.1 | 26.5 | -1.1 | 2.5 | 20.0 | -1.0 | 14.0 | 44.6 | -1.7 | 104 |
| 12-15 | 14.0 | 36.6 | -1.4 | 7.1 | 24.9 | -1.2 | 10.8 | 49.4 | -1.9 | 228 |
| 16-23 | 23.2 | 49.3 | -2.0 | 5.1 | 21.5 | -1.2 | 17.0 | 51.2 | -2.0 | 340 |
| 24-35 | 22.3 | 50.4 | -1.9 | 3.9 | 16.7 | -1.1 | 17.1 | 55.0 | -2.0 | 640 |
| 36-47 | 27.2 | 53.2 | -2.1 | 4.2 | 14.8 | -1.0 | 14.9 | 51.9 | -2.0 | 734 |
| 48-59 | 27.6 | 54.5 | -2.2 | 4.0 | 11.7 | -0.9 | 12.3 | 51.8 | -2.0 | 746 |
| **Child's sex** | | | | | | | | | | |
| Male | 19.0 | 43.3 | -1.7 | 3.9 | 15.4 | -0.9 | 11.9 | 44.3 | -1.8 | 1,735 |
| Female | 22.1 | 45.9 | -1.8 | 3.9 | 14.6 | -0.9 | 13.4 | 46.3 | -1.8 | 1,637 |
| **Birth order[2]** | | | | | | | | | | |
| 1 | 18.0 | 40.9 | -1.7 | 3.8 | 15.6 | -1.0 | 12.3 | 43.6 | -1.8 | 611 |
| 2-3 | 20.1 | 44.2 | -1.7 | 2.8 | 13.7 | -0.8 | 11.5 | 42.8 | -1.7 | 1,160 |
| 4-5 | 19.8 | 42.7 | -1.7 | 4.2 | 14.3 | -0.9 | 11.8 | 44.5 | -1.8 | 744 |
| 6+ | 22.5 | 48.7 | -1.8 | 4.9 | 17.1 | -1.0 | 14.9 | 49.5 | -1.9 | 773 |
| **Birth interval in months[2]** | | | | | | | | | | |
| First birth | 18.0 | 40.8 | -1.7 | 3.8 | 15.6 | -1.0 | 12.3 | 43.6 | -1.8 | 612 |
| <24 months | 31.3 | 55.3 | -2.2 | 3.5 | 11.7 | -0.9 | 17.0 | 52.2 | -2.0 | 529 |
| 24-47 months | 19.6 | 46.0 | -1.8 | 3.6 | 15.4 | -0.9 | 11.6 | 45.2 | -1.8 | 1,488 |
| 48+ months | 14.7 | 34.9 | -1.4 | 4.4 | 16.1 | -0.9 | 11.2 | 39.6 | -1.6 | 660 |
| **Residence** | | | | | | | | | | |
| Urban | 19.4 | 38.1 | -1.6 | 3.3 | 12.6 | -0.8 | 9.1 | 37.9 | -1.6 | 484 |
| Rural | 20.7 | 45.7 | -1.8 | 4.0 | 15.4 | -0.9 | 13.2 | 46.5 | -1.8 | 2,888 |
| **Region** | | | | | | | | | | |
| Banteay Mean Chey | 11.7 | 28.9 | -1.3 | 5.0 | 19.5 | -1.1 | 10.5 | 39.5 | -1.7 | 162 |
| Kampong Cham | 19.3 | 48.2 | -1.8 | 5.2 | 15.6 | -1.0 | 13.6 | 47.8 | -1.9 | 464 |
| Kampong Chhnang | 19.4 | 45.9 | -1.9 | 0.7 | 9.5 | -0.9 | 9.9 | 46.1 | -1.8 | 161 |
| Kampong Speu | 17.4 | 44.5 | -1.7 | 3.6 | 16.9 | -1.0 | 13.7 | 44.0 | -1.9 | 232 |
| Kampong Thum | 26.1 | 47.2 | -1.7 | 10.2 | 24.5 | -1.0 | 12.5 | 49.4 | -1.9 | 150 |
| Kandal | 17.6 | 46.2 | -1.9 | 1.1 | 11.8 | -0.9 | 10.6 | 48.2 | -1.9 | 301 |
| Kaoh Kong | 30.8 | 55.0 | -2.2 | 3.9 | 14.7 | -0.6 | 15.4 | 42.7 | -1.8 | 40 |
| Phnom Penh | 17.0 | 25.6 | -1.2 | 3.1 | 18.3 | -0.9 | 8.0 | 35.0 | -1.4 | 197 |
| Prey Veaeng | 27.4 | 51.2 | -2.1 | 6.5 | 15.1 | -1.0 | 17.5 | 56.8 | -2.0 | 244 |
| Pousat | 20.0 | 46.3 | -1.7 | 1.3 | 13.4 | -1.0 | 12.4 | 46.3 | -1.8 | 126 |
| Svay Rieng | 22.9 | 51.3 | -1.8 | 4.9 | 13.0 | -0.8 | 13.5 | 45.9 | -1.7 | 125 |
| Takaev | 21.1 | 42.1 | -1.6 | 4.8 | 17.2 | -0.8 | 14.5 | 39.9 | -1.6 | 218 |
| Bat Dambang/ Krong Pailin | 15.9 | 36.3 | -1.4 | 5.7 | 21.1 | -1.0 | 12.0 | 36.4 | -1.6 | 240 |
| Kampot/Krong Kaeb/ Krong Preah Sihanouk | 26.0 | 43.4 | -1.8 | 2.6 | 9.6 | -0.5 | 12.6 | 39.8 | -1.5 | 230 |
| Preah Vihear/Stueng Traeng/Kracheh | 22.9 | 51.0 | -2.0 | 2.8 | 10.9 | -0.9 | 13.2 | 47.0 | -1.9 | 164 |
| Mondol Kiri/Rotanak Kiri | 33.4 | 55.0 | -2.2 | 6.2 | 15.2 | -0.9 | 19.0 | 54.0 | -2.0 | 51 |
| Siem Reab/Otdar Mean Chey | 21.0 | 50.7 | -2.0 | 0.8 | 10.6 | -0.8 | 10.9 | 49.9 | -1.8 | 266 |
| **Mother's education[2]** | | | | | | | | | | |
| No education | 24.4 | 51.0 | -1.9 | 4.7 | 15.7 | -0.9 | 15.1 | 51.2 | -1.9 | 1,067 |
| Primary | 19.4 | 42.6 | -1.7 | 3.6 | 15.3 | -0.9 | 12.1 | 42.7 | -1.8 | 1,778 |
| Secondary and higher | 14.1 | 35.1 | -1.4 | 2.6 | 12.6 | -0.9 | 8.4 | 39.7 | -1.5 | 463 |
| **Children of interviewed mothers** | 20.2 | 44.3 | -1.7 | 3.8 | 15.0 | -0.9 | 12.5 | 44.9 | -1.8 | 3,288 |
| **Children of non-interviewed mothers** | | | | | | | | | | |
| Mother in household | * | * | * | * | * | * | * | * | * | 20 |
| Mother not in household | 35.6 | 61.5 | -2.2 | 8.2 | 15.0 | -0.8 | 15.9 | 57.6 | -1.9 | 64 |
| Total | 20.5 | 44.6 | -1.8 | 3.9 | 15.0 | -0.9 | 12.6 | 45.2 | -1.8 | 3,372 |

Note: This table refers to de facto children. An asterisk indicates that a figure is based on fewer than 25 unweighted cases and has been suppressed.
[1] Includes children who are below -3 standard deviations from the International Reference Population median
[2] Excludes children whose mothers were not interviewed

# Comparing DHS to Triggers for Action

**Percentage of Children Under 5 Who Are Moderately and Severely Malnourished**

| | DHS Total | DHS District (Kampang Cham) | Immediate Action Required (Trigger) |
|---|---|---|---|
| Underweight | 45.2% | 47.8% | ≥20% |
| Stunting | 44.6% | 48.2% | ≥30% |
| Wasting | 15.0% | 15.6% | ≥10% |

**Percentage of Children Under 5 Who Are Moderately and Severely Malnourished**

| | DHS Total | DHS _____ District | Community Information | Trigger for Action |
|---|---|---|---|---|
| Underweight | | | | ≥20% |
| Stunting | | | | ≥30% |
| Wasting | | | | ≥10% |

# CONGRATULATIONS EVERYONE!

You have now learned to weigh and measure children with proper technique. You have also learned how to do growth monitoring and promotion. You have begun to understand what different measures of malnutrition and growth mean. We hope that this tool will continue to enable you to support your community to improve the nutrition of their children and families. Good nutrition is an important part of a healthy community!