



## MODULE 4:

# Detecting Malnutrition in Women and Children

- Overview of tools used for detecting malnutrition
- Screening for anemia
- Nutritional counseling and rehabilitation
- Fortifying food in the home

Copyright 2010 MAMA Project, Inc.

Revised 2013 (slides 27-36, 46-48, 51, 59-61, 63-69)

This material is intended solely for non-commercial, not-for-profit use. Any commercial or for-profit use of this material is prohibited.

**Notice: MAMA Project does not warrant that any medical diagnosis procedure or medical treatment set forth in these materials is the most current or desirable course of treatment. Any user is encouraged to check the accuracy of any medical diagnosis procedure or medical treatment against currently accepted courses of treatment.**

Child Survival Programs for Sahel region and Haiti are in collaboration with University of Maryland Dental School.

For questions or information, please contact: MAMA Project, Inc. 2781A Geryville Pike, Pennsburg, PA, USA 18073

# **Children who get good care and nutrition grow well.**



# **Children who are hungry for food and attention fail to grow.**



# Detection & classification of malnutrition reveals:

- If a child is malnourished, and how badly
- If a community has a problem with food security, and how badly the population is suffering

# Parents, community members and government agencies need to know how the children are growing.



There are times  
that you only  
need your eyes to  
tell you that a  
child is  
malnourished.



# Chronic Malnutrition

Both moderately and severely malnourished children are at great risk of death and disease.

Stunted children, even teenagers, need extra food for catch up growth – for productive adulthood and safer motherhood.

# **It takes a long time to get stunted!**

## *Height Indicates Chronic Long Term Nutrition*

- Knowing a child's height helps us to know whether they have grown as well as expected over time.
- Have they been well-fed during their lifetime? Or is their height stunted by years of under-nutrition?
- If they are in the yellow range, they are classified as “moderately chronically malnourished”. In the red, they are “severely chronically malnourished.”

# Acute Malnutrition

- Both moderately and severely malnourished children need to recuperate or they will be at great risk of death and disease.
- Children who have become malnourished due to illness need extra food to regain lost weight and prevent growth stunting.

# It takes a short time to become wasted!

*Height* Indicates Chronic Long Term Nutrition, but  
*Weight* Indicates Short Term Nutrition

- Knowing a child's weight tells you if they are malnourished, right now, because of current level of nutrition. Are they being fed well at the present time?
- If they are in the yellow range, they are “moderately acutely malnourished”. Red indicates “severe acute malnutrition”.

# Recognizing Acute Malnutrition



## Kwashiorkor

Swollen body, feet  
 Poor appetite  
 Lethargic, sad  
 Pale fragile skin/hair

## Marasmus

Loss of fat, muscle  
 Very hungry  
 Irritable, anxious  
 Skin loose, wrinkled



Kwashiorkor	Marasmus
Age usually over 18 months	Usually under 1 yr old
Lacks protein-rich foods and other nutrients	Lacks energy-rich foods and other nutrients
Relatively more often in tropical countries	Often in dry climate/ drought/ disaster/ war
“Wet” malnutrition, but may be wasted, also	“Dry” malnutrition, but may have edema
Any edema – SEVERE malnutrition. Child is not “fat”	May be classified as moderate or severe
Swollen belly from fatty liver, edema, and/or parasites	May have swollen belly from parasites and weak muscles

These children are in grave immediate danger, and require urgent nutritional rehabilitation. However, most children who die from malnutrition will not appear obviously ill with kwashiorkor and/or marasmus. Deadly “Hidden Hunger”, or micronutrient malnutrition, is found in growth stunted infants and children. Community-wide interventions are required to improve the survival rates of those chronically malnourished children who actually represent a much higher percentage of the vulnerable population.

But to document mild and moderate malnutrition, it is necessary to measure children.



# **But how do we know what is normal?**

Are children being compared to  
children from developed countries?

No, not anymore.....



New (2005 and 2007) international standards have been established by measuring children from every race and nationality to see how they grow.

# The World Health Organization Child Growth Standards

Now apply to children from birth to 19 years of age, regardless of race or nationality.



Measurements are used to classify children as normal, moderately or severely malnourished according to growth charts.

# **But, growth charts can be confusing!**

So MAMA Project created easy to use tables based on the new growth standards.



# **MAMA Project's tables aid rapid field assessment of children.**

Reference:

WHO Child Growth Standards

MAMA Project has also created and adapted other tools to quickly and accurately assess malnutrition in women and children.



# **MAMA's Mobile Malnutrition assessment tools:**

The Health Flagpole and the  
Lap Infant-o-Meter facilitate accurate  
measurements.

# The Nutrition Ruler is a useful screening tool for malnutrition in 12-60 month old children and women of child-bearing age.



A Nutrition Ruler can be found inside the Mother's Log.

# Mid Upper Arm Circumference Tape

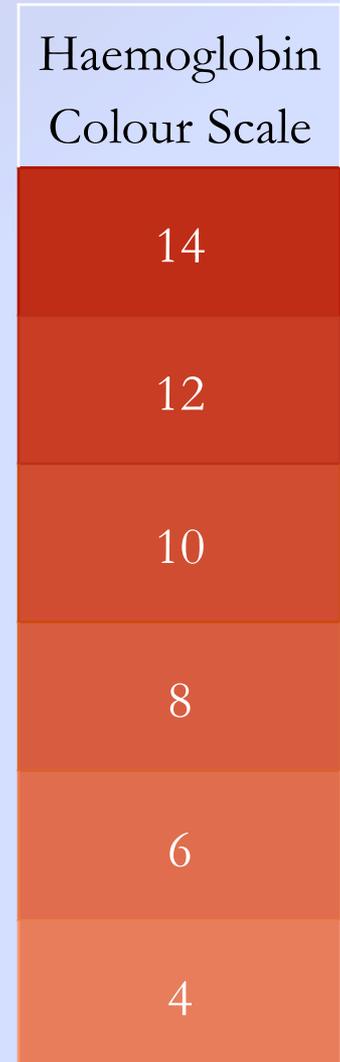
- Between 12 and 60 months, healthy children have mid upper arm circumference above 14 cm.
- Below 12.5 cm, a child of that age may be severely malnourished.
- Women of child bearing age should have a mid upper arm circumference over to 23 cm.
- The tape itself has advice and encouragement for the mother. Study it and when possible give one to the mother to monitor herself and her children.

# Haemoglobin Colour Scale

1. Clean fingertip or heel with alcohol
2. Obtain drop of blood by skin puncture
3. Apply to absorbent paper, then blot firmly
4. Wait 30 seconds, then compare to chart
5. Read in natural light, out of direct sun
6. Results may be <, between, or > block  
For example: <4, 5, 7, 9, 11, 13, or >14
7. Estimate Haemoglobin to 1 gm/dL

## Normal ranges:

Newborn & Adult: > 14 male; >12 female  
After 6 months: 8-10 usually indicates nutritional anaemia with moderate risk  
<8 indicates severe anaemia with high risk  
Mild risk if >10, but < normal for age



# Screening for Anaemia with Haemoglobin Colour Scale

- Recommended when laboratory testing is not possible
- Indicated in populations with high levels of malnutrition, malaria, intestinal parasites and high incidence of maternal mortality from blood loss

# Our Questions:

- Is this child or mother well nourished or is s/he in need of attention?
- Is his or her degree of malnutrition moderate or severe?
- Is s/he getting better?

Our tools can give us answers, starting with the tables...

# Using the Tables

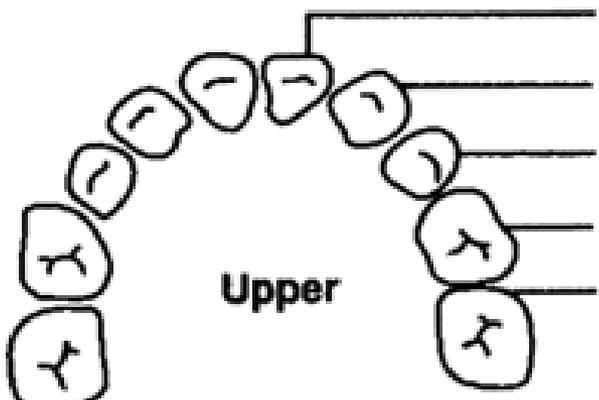
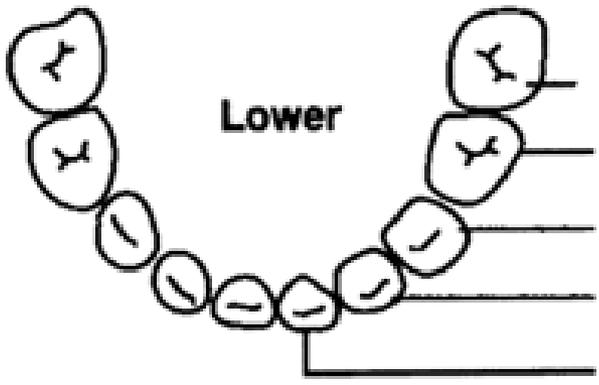
Remind yourself what you want to know.

# **If we want to know:**

- **Is this child too short?**
- **Is this child too thin?**

# First we need to know:

- Child's age in years and months
- Weight in kilograms to .1kg
- Height in centimeters to .1cm
- Presence or absence of oedema (swelling)

	<b>FIRST TEETH</b>	<b>When teeth "come in"</b>	<b>When teeth "fall out"</b>
 <p><b>Upper</b></p>	Central incisors	7-12 mos	6-8 yrs
	Lateral incisors	9-13 mos	7-8 yrs
	Canines	16-22 mos	10-12 yrs
	First molars	13-19 mos	9-11 yrs
	Second molars	25-33 mos	10-12 yrs
 <p><b>Lower</b></p>	Second molars	20-31 mos	10-12 yrs
	First molars	12-18 mos	9-11 yrs
	Canines	16-23 mos	9-12 yrs
	Lateral incisors	7-16 mos	7-8 yrs
	Central incisors	6-10 mos	6-8 yrs

When assessing nutritional status, it may be useful to judge children's ages by examining their teeth. For example, without a birth date, it will be more difficult to comment on growth stunting, but wasting will be detectable by using the weight for height chart in children up to age five. If the child has started losing baby teeth, he or she is probably over age 5. Age may also be estimated by using a local events calendar.

# Weight for Height

- From birth to Age 5
- Are they then wasted for their height?
- Especially helpful if no accurate birthdates

# BMI for Age

- An assessment of whether body weight is appropriate for their height at their age.
- BMI – you cannot measure it directly, but can use a table to estimate

# BMI

Can also be determined more precisely by

## 1. Calculation

Weight in KG

(Ht in meters x ht in meters)

## 2. Using a BMI wheel or

## 3. Using a computer

# BMI Graphing

- We need to know both the height and weight to calculate the BMI, an index of body heaviness compared to height.
- The normal BMI varies greatly with age, so exact age is important. If it is unknown, the weight for height can be helpful until approximately age 5. The timing of puberty is variable, so the body shape and composition will change at variable rates depending on onset of sexual maturity.

- One of the best indicators of the overall health of a community is how well the young children are growing.
- Adversity in the local economy, war, famine, crop failures, natural disasters, and injustice all impact the growth of the children.

# **There are five tables:**

Find the tables and take them out of your folder. Look at them as we review.

# All tables follow this pattern:

- Green is normal

Or in statistician's language: -2 to +2 Z-score or standard deviation from average

- Yellow is moderate malnutrition

Between -2 and -3

- Red is severe malnutrition

Below -3

# Height for Age 0-19

## HEIGHT FOR AGE 0-11

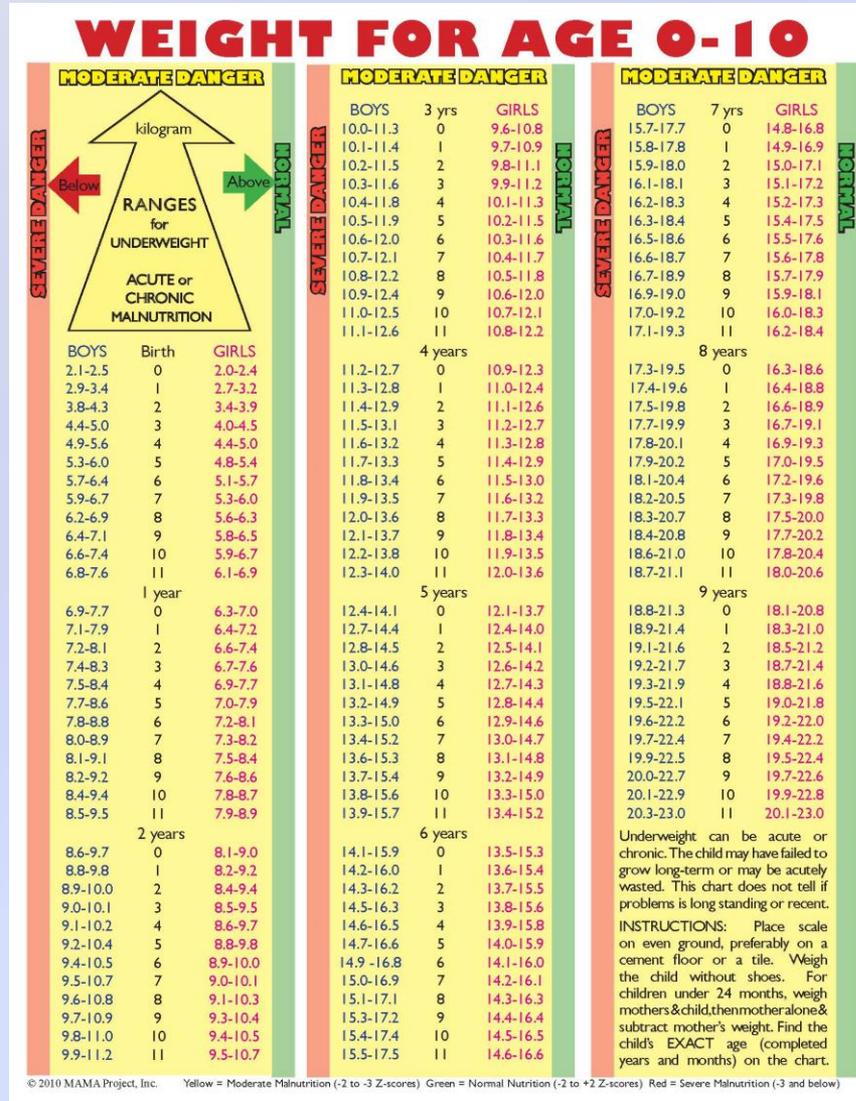
SEVERE DANGER		MODERATE DANGER		MODERATE DANGER		MODERATE DANGER		SEVERE DANGER	
		BOYS 3 yrs		GIRLS		BOYS 7 yrs		GIRLS	
		85.0-88.7	0	83.6-87.4		105.9-111.2	0	104.4-109.9	
		85.5-89.2	1	84.2-88.0		106.3-111.6	1	104.8-110.3	
		86.0-89.8	2	84.7-88.6		106.6-112.0	2	105.2-110.7	
		86.5-90.3	3	85.3-89.2		107.0-112.4	3	105.6-111.1	
		87.0-90.9	4	85.8-89.8		107.4-112.8	4	106.0-111.6	
		87.5-91.4	5	86.3-90.4		107.8-113.2	5	106.4-112.0	
		88.0-91.9	6	86.8-90.9		108.1-113.6	6	106.8-112.4	
		88.4-92.4	7	87.4-91.5		108.5-114.0	7	107.2-112.8	
		88.9-93.0	8	87.9-92.0		108.9-114.4	8	107.6-113.2	
		89.4-93.5	9	88.4-92.5		109.2-114.8	9	108.0-113.7	
		89.8-94.0	10	88.9-93.1		109.6-115.2	10	108.4-114.1	
		90.3-94.4	11	89.3-93.6		110.0-115.6	11	108.8-114.5	
		4 years		8 yrs		12 years		16 years	
		90.7-94.9	0	89.8-94.1		110.3-116.0	0	109.2-115.0	
		91.2-95.4	1	90.3-94.6		110.7-116.4	1	109.6-115.4	
		91.6-95.9	2	90.7-95.1		111.0-116.7	2	110.0-115.8	
		92.1-96.4	3	91.2-95.6		111.4-117.1	3	110.4-116.3	
		92.5-96.9	4	91.7-96.1		111.7-117.5	4	110.8-116.7	
		93.0-97.4	5	92.1-96.6		112.1-117.9	5	111.2-117.1	
		93.4-97.8	6	92.6-97.1		112.4-118.3	6	111.6-117.6	
		93.9-98.3	7	93.0-97.6		112.8-118.7	7	112.0-118.0	
		94.3-98.8	8	93.4-98.1		113.1-119.0	8	112.5-118.5	
		94.7-99.3	9	93.9-98.5		113.5-119.4	9	112.9-118.9	
		95.2-99.7	10	94.3-99.0		113.8-119.8	10	113.3-119.4	
		95.6-100.2	11	94.7-99.5		114.2-120.2	11	113.7-119.8	
		5 years		9 years		13 years		17 years	
		96.1-100.7	0	95.2-99.9		114.5-120.5	0	114.2-120.3	
		96.5-101.1	1	95.3-100.1		114.9-120.9	1	114.6-120.7	
		96.9-101.6	2	95.7-100.5		115.2-121.3	2	115.0-121.2	
		97.4-102.0	3	96.1-101.0		115.6-121.7	3	115.5-121.6	
		97.8-102.5	4	96.5-101.4		115.9-122.0	4	115.9-122.1	
		98.2-103.0	5	97.0-101.9		116.3-122.4	5	116.3-122.6	
		98.7-103.4	6	97.4-102.3		116.6-122.8	6	116.8-123.0	
		99.1-103.9	7	97.8-102.7		116.9-123.2	7	117.2-123.5	
		99.5-104.3	8	98.2-103.2		117.3-123.5	8	117.7-124.0	
		99.9-104.8	9	98.6-103.6		117.6-123.9	9	118.1-124.4	
		100.4-105.2	10	99.0-104.0		118.0-124.3	10	118.5-124.9	
		100.8-105.7	11	99.4-104.5		118.3-124.7	11	119.0-125.4	
		6 years		10 years		14 years		18 years	
		101.2-106.1	0	99.8-104.9		118.7-125.0	0	119.4-125.8	
		101.6-106.5	1	100.2-105.3		119.0-125.4	1	119.9-126.3	
		102.0-107.0	2	100.5-105.7		119.3-125.8	2	120.4-126.8	
		102.4-107.4	3	100.9-106.1		119.7-126.2	3	120.8-127.3	
		102.8-107.8	4	101.3-106.6		120.0-126.5	4	121.3-127.8	
		103.2-108.2	5	101.7-107.0		120.4-126.9	5	121.7-128.2	
		103.6-108.7	6	102.1-107.4		120.7-127.3	6	122.2-128.7	
		103.9-109.1	7	102.5-107.8		121.1-127.7	7	122.7-129.2	
		104.3-109.5	8	102.9-108.2		121.4-128.1	8	123.2-129.7	
		104.7-109.9	9	103.2-108.6		121.8-128.5	9	123.6-130.2	
		105.1-110.3	10	103.6-109.0		122.2-128.8	10	124.1-130.7	
		105.5-110.8	11	104.0-109.5		122.5-129.2	11	124.6-131.2	
		1 year		2 years		3 years		4 years	
		68.6-71.0	0	66.3-68.9		78.0-81.0	0	76.0-79.3	
		69.6-72.1	1	67.3-70.0		78.6-81.7	1	76.8-80.0	
		70.6-73.1	2	68.3-71.0		79.3-82.5	2	77.5-80.8	
		71.6-74.1	3	69.3-72.0		79.9-83.1	3	78.1-81.5	
		72.5-75.0	4	70.2-73.0		80.5-83.8	4	78.8-82.2	
		73.3-76.0	5	71.1-74.0		81.1-84.5	5	79.5-82.9	
		74.2-76.9	6	72.0-74.9		81.7-85.1	6	80.1-83.6	
		75.0-77.7	7	72.8-75.8		82.3-85.7	7	80.7-84.3	
		75.8-78.6	8	73.7-76.7		82.8-86.4	8	81.3-84.9	
		76.5-79.4	9	74.5-77.5		83.4-86.9	9	81.9-85.6	
		77.2-80.2	10	75.2-78.4		83.9-87.5	10	82.5-86.2	
		78.0-81.0	11	76.0-79.2		84.4-88.1	11	83.1-86.8	

© 2010 MAMA Project, Inc. Rev 2/2013

## HEIGHT FOR AGE 11-19

SEVERE DANGER		MODERATE DANGER		MODERATE DANGER		MODERATE DANGER		INSTRUCTIONS:	
		BOYS 11 yrs		GIRLS		BOYS 15 yrs		GIRLS	
		122.9-129.7	0	125.1-131.7		145.5-153.4	0	141.0-147.9	
		123.3-130.1	1	125.5-132.2		145.9-153.7	1	141.2-148.0	
		123.7-130.5	2	126.0-132.7		146.3-154.1	2	141.3-148.1	
		124.1-130.9	3	126.5-133.2		146.7-154.5	3	141.4-148.2	
		124.5-131.3	4	127.0-133.7		147.1-154.9	4	141.5-148.3	
		124.9-131.7	5	127.4-134.1		147.4-155.2	5	141.6-148.4	
		125.3-132.2	6	127.9-134.7		147.7-155.5	6	141.7-148.5	
		125.7-132.6	7	128.4-135.2		148.1-155.9	7	141.8-148.6	
		126.1-133.1	8	128.9-135.7		148.4-156.2	8	141.9-148.7	
		126.5-133.5	9	129.3-136.1		148.7-156.5	9	141.9-148.7	
		126.9-134.0	10	129.8-136.6		149.0-156.8	10	142.0-148.8	
		127.4-134.4	11	130.3-137.1		149.3-157.1	11	142.1-148.9	
		12 years		16 years		17 years		18 years	
		127.8-134.9	0	130.7-137.6		149.6-157.4	0	142.2-148.9	
		128.3-135.4	1	131.2-138.0		149.9-157.6	1	142.2-149.0	
		128.7-135.9	2	131.6-138.5		150.1-157.9	2	142.3-149.1	
		129.2-136.4	3	132.0-138.9		150.4-158.1	3	142.3-149.1	
		129.7-136.9	4	132.5-139.3		150.6-158.4	4	142.4-149.2	
		130.2-137.4	5	132.9-139.8		150.9-158.6	5	142.4-149.2	
		130.7-137.9	6	133.3-140.2		151.1-158.8	6	142.5-149.2	
		131.2-138.5	7	133.7-140.6		151.3-159.0	7	142.5-149.3	
		131.7-139.0	8	134.1-141.0		151.5-159.2	8	142.6-149.3	
		132.2-139.5	9	134.5-141.4		151.7-159.4	9	142.6-149.4	
		132.7-140.0	10	134.8-141.8		151.9-159.6	10	142.7-149.4	
		133.2-140.6	11	135.2-142.1		152.1-159.7	11	142.7-149.4	
		13 years		14 years		15 years		16 years	
		133.8-141.2	0	135.6-142.5		152.2-159.9	0	142.8-149.5	
		134.3-141.7	1	135.9-142.8		152.4-160.0	1	142.8-149.5	
		134.8-142.3	2	136.2-143.2		152.5-160.2	2	142.9-149.5	
		135.4-142.9	3	136.5-143.5		152.7-160.3	3	142.9-149.6	
		135.9-143.4	4	136.9-143.8		152.8-160.4	4	142.9-149.6	
		136.4-144.0	5	137.2-144.1		153.0-160.5	5	143.0-149.6	
		137.0-144.5	6	137.4-144.4		153.1-160.6	6	143.0-149.7	
		137.5-145.1	7	137.7-144.7		153.2-160.8	7	143.1-149.7	
		138.0-145.7	8	138.0-144.9		153.3-160.9	8	143.1-149.7	
		138.6-146.2	9	138.2-145.2		153.4-160.9	9	143.1-149.8	
		139.1-146.7	10	138.5-145.4		153.5-161.0	10	143.2-149.8	
		139.6-147.3	11	138.7-145.7		153.6-161.1	11	143.2-149.8	
		14 years		15 years		16 years		17 years	
		140.1-147.8	0	139.0-145.9		153.7-161.2	0	143.2-149.8	
		140.6-148.3	1	139.2-146.1		153.8-161.3	1	143.3-149.9	
		141.1-148.8	2	139.4-146.3		153.9-161.4	2	143.3-149.9	
		141.6-149.3	3	139.6-146.5		154.0-161.4	3	143.3-149.9	
		142.1-149.8	4	139.8-146.7		154.1-161.5	4	143.4-149.9	
		142.5-150.3	5	140.0-146.9		154.2-161.6	5	143.4-150.0	
		143.0-150.8	6	140.1-147.1		154.2-161.6	6	143.4-150.0	
		143.4-151.2	7	140.3-147.2		154.3-161.7	7	143.4-150.0	
		143.9-151.7	8	140.5-147.4		154.4-161.7	8	143.5-150.0	
		144.3-152.1	9	140.6-147.5		154.5-161.8	9	143.5-150.0	
		144.7-152.5	10	140.8-147.7		154.5-161.8	10	143.5-150.0	

# Weight for Age 0-10



# Weight for Height for 0-5 years



# Minimum Weight for Height for Safe Motherhood (Women 15-49)



# BMI for Age 5-19

## BMI FOR AGE 5-19

SEVERE DANGER		MODERATE DANGER		MODERATE DANGER		MODERATE DANGER		SEVERE DANGER	
<p><b>RANGES for ACUTE MALNUTRITION</b></p> <p>Body is WASTED or TOO LEAN/THIN</p> <p>Below (Left) / Above (Right)</p>									
<b>BOYS</b>		<b>GIRLS</b>		<b>BOYS</b>		<b>GIRLS</b>		<b>BOYS</b>	
<b>5 years</b>		<b>5 years</b>		<b>9 years</b>		<b>9 years</b>		<b>14 years</b>	
12.0-12.9	0	11.6-12.7	12.1-13.1	12.6-13.5	0	12.1-13.1	14.3-15.5	0	14.0-15.4
12.1-13.0	1	11.7-12.7	12.1-13.2	12.6-13.5	1	12.1-13.2	14.3-15.5	1	14.1-15.5
12.1-13.0	2	11.8-12.7	12.1-13.2	12.6-13.5	2	12.1-13.2	14.3-15.6	2	14.1-15.5
12.1-13.0	3	11.8-12.7	12.1-13.2	12.6-13.5	3	12.2-13.2	14.4-15.6	3	14.1-15.6
12.1-13.0	4	11.8-12.7	12.2-13.2	12.6-13.6	4	12.2-13.2	14.4-15.7	4	14.1-15.6
12.1-13.0	5	11.7-12.7	12.2-13.3	12.6-13.6	5	12.2-13.3	14.5-15.7	5	14.2-15.6
12.1-13.0	6	11.7-12.7	12.2-13.3	12.7-13.6	6	12.2-13.3	14.5-15.7	6	14.2-15.7
12.1-13.0	7	11.7-12.7	12.2-13.3	12.7-13.6	7	12.3-13.4	14.5-15.8	7	14.2-15.7
12.1-13.0	8	11.7-12.7	12.3-13.4	12.7-13.6	8	12.3-13.4	14.6-15.8	8	14.3-15.7
12.1-13.0	9	11.7-12.7	12.3-13.4	12.7-13.7	9	12.3-13.4	14.6-15.9	9	14.3-15.8
12.1-13.0	10	11.7-12.7	12.3-13.4	12.7-13.7	10	12.3-13.4	14.6-15.9	10	14.3-15.8
12.1-13.0	11	11.7-12.7	12.3-13.4	12.8-13.7	11	12.4-13.4	14.7-16.0	11	14.3-15.8
<b>6 years</b>		<b>11 years</b>		<b>15 years</b>		<b>15 years</b>		<b>16 years</b>	
12.1-13.0	0	11.7-12.7	13.1-14.1	0	12.7-13.9	15.1-16.5	0	14.6-16.2	
12.1-13.0	1	11.7-12.7	13.1-14.1	1	12.8-13.9	15.1-16.5	1	14.6-16.2	
12.2-13.1	2	11.7-12.7	13.1-14.1	2	12.8-14.0	15.2-16.6	2	14.6-16.2	
12.2-13.1	3	11.7-12.7	13.1-14.1	3	12.8-14.0	15.2-16.6	3	14.6-16.2	
12.2-13.1	4	11.7-12.7	13.2-14.2	4	12.8-14.0	15.2-16.7	4	14.6-16.2	
12.2-13.1	5	11.7-12.7	13.2-14.2	5	12.9-14.1	15.3-16.7	5	14.6-16.3	
12.2-13.1	6	11.7-12.7	13.2-14.2	6	12.9-14.1	15.3-16.7	6	14.7-16.3	
12.2-13.1	7	11.7-12.7	13.2-14.3	7	13.0-14.2	15.3-16.8	7	14.7-16.3	
12.2-13.1	8	11.7-12.7	13.3-14.3	8	13.0-14.2	15.3-16.8	8	14.7-16.3	
12.2-13.1	9	11.7-12.7	13.3-14.3	9	13.0-14.3	15.4-16.8	9	14.7-16.3	
12.2-13.1	10	11.7-12.7	13.3-14.4	10	13.1-14.3	15.4-16.9	10	14.7-16.3	
12.2-13.1	11	11.7-12.7	13.4-14.4	11	13.1-14.3	15.4-16.9	11	14.7-16.3	
<b>7 years</b>		<b>12 years</b>		<b>17 years</b>		<b>17 years</b>		<b>18 years</b>	
12.3-13.1	0	11.8-12.7	13.4-14.5	0	13.2-14.4	15.4-16.9	0	14.7-16.4	
12.3-13.2	1	11.8-12.7	13.4-14.5	1	13.2-14.4	15.5-17.0	1	14.7-16.4	
12.3-13.2	2	11.8-12.8	13.5-14.5	2	13.2-14.5	15.5-17.0	2	14.7-16.4	
12.3-13.2	3	11.8-12.8	13.5-14.6	3	13.2-14.5	15.5-17.1	3	14.7-16.4	
12.3-13.2	4	11.8-12.8	13.5-14.6	4	13.2-14.6	15.6-17.1	4	14.7-16.4	
12.3-13.2	5	11.8-12.8	13.6-14.6	5	13.2-14.6	15.6-17.1	5	14.7-16.4	
12.3-13.2	6	11.8-12.8	13.6-14.7	6	13.4-14.7	15.6-17.1	6	14.7-16.4	
12.3-13.2	7	11.8-12.8	13.6-14.7	7	13.4-14.7	15.6-17.2	7	14.7-16.4	
12.3-13.2	8	11.8-12.8	13.7-14.8	8	13.5-14.8	15.6-17.2	8	14.7-16.4	
12.4-13.3	9	11.8-12.8	13.7-14.8	9	13.5-14.8	15.6-17.2	9	14.7-16.4	
12.4-13.3	10	11.9-12.9	13.7-14.8	10	13.5-14.8	15.7-17.2	10	14.7-16.4	
12.4-13.3	11	11.9-12.9	13.8-14.9	11	13.6-14.9	15.7-17.3	11	14.7-16.4	
<b>8 years</b>		<b>13 years</b>		<b>18 years</b>		<b>18 years</b>		<b>19 years</b>	
12.4-13.3	0	11.9-12.9	13.8-14.9	0	13.6-14.9	15.7-17.3	0	14.7-16.5	
12.4-13.3	1	11.9-12.9	13.8-15.0	1	13.6-15.0	15.7-17.3	1	14.7-16.5	
12.4-13.3	2	11.9-12.9	13.9-15.0	2	13.7-15.0	15.7-17.3	2	14.7-16.5	
12.4-13.3	3	11.9-12.9	13.9-15.1	3	13.7-15.1	15.7-17.4	3	14.7-16.5	
12.4-13.4	4	11.9-13.0	14.0-15.1	4	13.8-15.1	15.8-17.4	4	14.7-16.5	
12.5-13.4	5	12.0-13.0	14.0-15.2	5	13.8-15.2	15.8-17.4	5	14.7-16.5	
12.5-13.4	6	12.0-13.0	14.0-15.2	6	13.8-15.2	15.8-17.4	6	14.7-16.5	
12.5-13.4	7	12.0-13.0	14.1-15.2	7	13.9-15.2	15.8-17.5	7	14.7-16.5	
12.5-13.4	8	12.0-13.0	14.1-15.3	8	13.9-15.3	15.8-17.5	8	14.7-16.5	
12.5-13.4	9	12.0-13.1	14.1-15.3	9	13.9-15.3	15.8-17.5	9	14.7-16.5	
12.5-13.5	10	12.1-13.1	14.2-15.4	10	14.0-15.4	15.8-17.5	10	14.7-16.5	
12.5-13.5	11	12.1-13.1	14.2-15.4	11	14.0-15.4	15.8-17.5	11	14.7-16.5	

Yellow = Moderate Malnutrition (-2 to -3 Z-scores) Green = Normal Nutrition (-2 to +2 Z-scores) Red = Severe Malnutrition (-3 and below)

Body Mass Index (BMI) Table																						
Instructions: To use this table, find the appropriate height in the side columns labeled Height (cm). Move across to the weight (kg). The number at the top and bottom of both the left and right side of the BMI table is a field guide for the estimation of BMI, for use as a screening guide for the severity of acute malnutrition in children under 60 months of age. To interpret BMI, use BMI FOR AGE chart to determine if acutely, severely or moderately malnourished or normal. <a href="http://www.manaproject.org">www.manaproject.org</a> BMI=WEIGHT(kg)/HEIGHT(m) x HEIGHT(m) or BMI=kg/m <sup>2</sup>																						
Height (cm)	12	12.5	13	13.5	14	14.5	15	15.5	16	16.5	17	17.5	18	18.5	19	19.5	20	20.5	21	21.5	22	Height (cm)
126	19.1	19.8	20.6	21.4	22.2	23.0	23.8	24.6	25.4	26.2	27.0	27.8	28.6	29.4	30.2	31.0	31.8	32.5	33.3	34.1	34.9	126
127	19.4	20.2	21.0	21.8	22.6	23.4	24.2	25.0	25.8	26.6	27.4	28.2	29.0	29.8	30.6	31.5	32.3	33.1	33.9	34.7	35.5	127
128	19.7	20.5	21.3	22.1	22.9	23.6	24.4	25.2	26.0	26.8	27.6	28.4	29.2	30.0	30.9	31.7	32.5	33.3	34.1	34.9	35.7	128
129	20.0	20.8	21.6	22.5	23.3	24.1	25.0	25.8	26.6	27.5	28.3	29.1	30.0	30.8	31.6	32.4	33.2	34.0	34.8	35.6	36.4	129
130	20.3	21.1	22.0	22.8	23.7	24.5	25.4	26.2	27.0	27.9	28.7	29.6	30.4	31.3	32.1	33.0	33.8	34.6	35.5	36.3	37.2	130
131	20.6	21.5	22.3	23.2	24.0	24.9	25.7	26.6	27.5	28.3	29.2	30.0	31.0	31.7	32.6	33.5	34.3	35.2	36.0	36.9	37.8	131
132	20.9	21.8	22.7	23.5	24.4	25.3	26.1	27.0	27.9	28.7	29.6	30.5	31.4	32.2	33.1	34.0	34.8	35.7	36.6	37.5	38.3	132
133	21.2	22.1	23.0	23.9	24.8	25.6	26.5	27.4	28.3	29.1	30.0	31.0	31.8	32.7	33.6	34.5	35.4	36.3	37.1	38.0	38.9	133
134	21.5	22.4	23.3	24.2	25.1	26.0	26.9	27.8	28.7	29.6	30.5	31.4	32.3	33.2	34.1	35.0	35.9	36.8	37.7	38.6	39.5	134
135	21.9	22.8	23.7	24.6	25.5	26.4	27.3	28.2	29.1	30.0	31.0	31.9	32.8	33.7	34.6	35.5	36.5	37.4	38.3	39.2	40.1	135
136	22.2	23.1	24.0	25.0	25.9	26.8	27.7	28.7	29.6	30.5	31.4	32.4	33.3	34.2	35.1	36.1	37.0	37.9	38.8	39.8	40.7	136
137	22.5	23.5	24.4	25.3	26.3	27.2	28.1	29.1	30.0	31.0	31.9	32.8	33.8	34.7	35.7	36.6	37.5	38.5	39.4	40.4	41.3	137
138	22.9	23.8	24.8	25.7	26.7	27.6	28.6	29.5	30.5	31.4	32.4	33.3	34.3	35.2	36.2	37.1	38.1	39.0	40.0	40.9	41.9	138
139	23.2	24.2	25.1	26.1	27.0	28.0	29.0	29.9	30.9	31.9	32.8	33.8	34.8	35.7	36.7	37.7	38.6	39.6	40.6	41.5	42.5	139
140	23.5	24.5	25.5	26.5	27.4	28.4	29.4	30.4	31.3	32.3	33.3	34.3	35.3	36.3	37.2	38.2	39.2	40.2	41.2	42.1	43.1	140
141	23.9	24.9	25.9	26.8	27.8	28.8	29.8	30.8	31.8	32.8	33.8	34.8	35.8	36.8	37.8	38.8	39.8	40.8	41.8	42.7	43.7	141
142	24.2	25.2	26.2	27.2	28.2	29.2	30.2	31.2	32.2	33.2	34.2	35.2	36.2	37.2	38.2	39.2	40.2	41.2	42.2	43.2	44.2	142
143	24.5	25.6	26.6	27.6	28.6	29.7	30.7	31.7	32.7	33.7	34.8	35.8	36.8	37.8	38.9	39.9	40.9	41.9	42.9	44.0	45.0	143
144	24.9	25.9	27.0	28.0	29.0	30.1	31.1	32.1	33.2	34.2	35.2	36.3	37.3	38.4	39.4	40.4	41.5	42.5	43.5	44.6	45.6	144
145	25.2	26.3	27.3	28.4	29.4	30.5	31.5	32.6	33.6	34.7	35.7	36.8	37.8	38.9	39.9	41.0	42.1	43.1	44.2	45.2	46.3	145
146	25.6	26.6	27.7	28.8	29.8	30.9	32.0	33.0	34.1	35.2	36.2	37.3	38.4	39.4	40.5	41.6	42.6	43.7	44.8	45.8	46.9	146
147	25.9	27.0	28.1	29.2	30.3	31.3	32.4	33.5	34.6	35.7	36.7	37.8	38.9	40.0	41.1	42.1	43.2	44.3	45.4	46.5	47.6	147
148	26.3	27.4	28.5	29.6	30.7	31.8	32.9	34.0	35.0	36.1	37.2	38.3	39.4	40.5	41.6	42.7	43.8	44.9	46.0	47.1	48.2	148
149	26.6	27.8	28.9	30.0	31.1	32.2	33.3	34.4	35.5	36.6	37.7	38.9	40.0	41.1	42.2	43.3	44.4	45.5	46.6	47.7	48.8	149
150	27.0	28.1	29.3	30.4	31.5	32.6	33.8	34.9	36.0	37.1	38.3	39.4	40.5	41.6	42.7	43.8	45.0	46.1	47.3	48.4	49.5	150
151	27.4	28.5	29.6	30.8	31.9	33.1	34.2	35.3	36.5	37.6	38.8	39.9	41.0	42.2	43.3	44.5	45.6	46.7	47.9	49.0	50.2	151
152	27.7	28.9	30.0	31.2	32.3	33.5	34.6	35.8	36.9	38.1	39.2	40.4	41.6	42.7	43.9	45.0	46.2	47.4	48.5	49.7	50.9	152
153																						

- First we will review how to measure children.
- Refer to the printed materials and view the video on the WHO website:

<http://www.who.int/childgrowth/training/en/>

(We won't show this video today but encourage you to look at it on your own time.)

Refer to the Job-Aid sheets.

- Weigh mom and record weight of mother.
- Now, “add” the baby, and record the weight of the mother and baby.
- Then subtract mom’s weight to get baby’s weight.

# Practice Time

1. Examine your tools – the scale, Health Flagpole (stadiometer), lap infantometer, armbands and charts.
2. Read the instruction sheets.
3. Look through the photo book.
4. This part of the seminar requires “hands on” practice.
5. Practice on healthy children, dolls and or pretend children.
6. We will then come back together and go over data from children to see how the charts allow us to classify their nutritional status.

# Practicing Using Charts

Use today's date as: 6-29-2013

Child 1: Marco (boy)

Birthdate: August 15, 2007

Weight: 15 kg

Height: 103 cm

Child 2: Edgar (boy)

Birthdate: March 28, 2012

Weight: 2.27 kg

Height: 46 cm

Child 3: Maribel (girl)

Birthdate: August 20, 2001

Weight: 26.9 kg

Height: 131.7 cm

Child 4: Jackelin (girl)

Birthdate: April 8, 2008

Weight: 13 kg

Height: 97.3 cm

# Practicing Using Charts (ANSWERS)

Use today's date as: 6-29-2013

Child 1: Marco (boy)

Birthdate: August 15, 2007 **5 years 10 months**

Weight: 15 kg **MODERATE**

Height: 103 cm **MODERATE**

Child 2: Edgar (boy)

Birthdate: March 28, 2012 **3 months**

Weight: 2.27kg **SEVERE**

Height: 46 cm **SEVERE**

# Practicing Using Charts (ANSWERS)

Use today's date as: 6-29-2013

Child 3: Maribel (girl)

Birthdate: August 20, 2001 **11 years, 10 months**

Weight: 26.9 kg **BMI=15.5 NORMAL**

Height: 131.7 cm **MODERATE**

Child 4: Jackelin (girl)

Birthdate: April 8, 2008 **4 years 2 months**

Weight: 13 kg **NORMAL**

Height: 97.3 cm **NORMAL**

# Beware of water weight!

- When a child is so sick that he or she has swollen up with water, (oedema) her or she will be heavier, making him or her look healthy on paper only.
- Always look at the child and check for oedema!
- Any child swollen with water should be considered severely malnourished.

When to NOT believe your charts but to believe your eyes: Indication of severe malnutrition –acute no matter what weight shows:

- Kwashiorkor: indicates protein deficiency. Study the pictures and learn to detect oedema in the feet.
- Marasmus: indicates total calorie deficit. Wasted arms and legs especially. Bloated bellies and protein deficiency causing swelling may falsely elevate the weight.



In an ideal world, this is very important. During a community brigade, there is not time to add this component.

## **Windows of Achievement**

- Pull out Motor Milestone chart.
- In many communities malnutrition is a common cause for physiological, social and motor delay.
- This chart shows normal motor milestones: sitting, standing, crawling, & walking-for children over 4 months.
- Delay may be caused by lack of nutrition or attention, or a neurological (brain) disorder.
- Assess all children in designated age ranges.

# Also, examine the child for signs of oral problems and eye health

See module 1 and 3



# Work logs and encounter records

- Fill out neatly and completely
- Will be fully explained in Module 6

# What does all of this do for the children?

Malnourished children need attention



# Counseling the mother

- Explain all findings.
- Listen to mother's concerns.
- Be kind, compassionate, respectful and affirming.
- Share basic nutrition and hygiene messages.
- See Module 5 Choose appropriate messages such as exclusive breast feeding for 6 months, hand washing, etc.

# Remember

- Share information with the community health leaders.
- Respond to problems discovered-  
See Modules 1 and 3

# **Begin Nutritional Rehabilitation.**

Use available resources to bring help to malnourished children and mothers in the communities.

# Principles of Rehabilitation

- Use multiple vitamins and minerals, protein, fat, carbohydrates, and appropriate fluids.
- Oral rehydration salts and/or home-made rehydration solution is lifesaving for dehydrated children.
- Avoid re-feeding a seriously malnourished child too quickly. Seek expert medical advice or assistance whenever possible.
- Try to use the most nutritionally balanced foods available to you, since quickly replenishing one nutrient while other nutrients are severely lacking can cause harm to child. e.g., Vitamin A and iodine needs to be replenished

# Principles of Rehabilitation (continued)

- Refer to Module I for recipes and formulas including MAMA's Super Drink.
- Study Chapter 7 of the *PocketBook of Hospital Care for Children* (in the Additional Materials Folder of your DVD)

## **When you discover a severely malnourished child:**

- First, be sure that the child is well hydrated.
- Treat for malaria if located in a malaria area.
- Look for and treat other serious illnesses.
- Then start multiple vitamin and mineral supplementation to prevent the precipitation of deficiency syndromes. For example, vitamin A, thiamine, phosphate, and iodine deficiency can be unmasked with serious consequences if the malnourished child is rapidly refed a poor diet.

## **When you discover a severely malnourished child (continued):**

- Instruct the mother to slowly, over several days, advance the diet to healthy amounts. Emphasize the importance of feeding a balanced diet, rich in micronutrients and appropriate sources of fat and protein to restore normal metabolism, repair damage and resume growth.
- Teach the mother that after serious illness, children need more food than normal for recovery.

# Using the multivitamin and mineral supplement:

- **Home food fortification**, using readily available highly nutritious food will prevent and treat malnutrition.
- **Nutritious food** such as eggs and red palm oil should be consumed by every woman and child daily.
- Alternatives include soy, milk, meat, mixed grains and ground nuts.
- A moderately malnourished child needs two such supplementary feedings, and a severely malnourished one needs three.

As soon as she and her children have been assessed, the mother should be given a six month supply of micronutrient powder.

- The powder is packaged in small bags with 60cc of the mixture. 60cc = 360-400+ doses.
- I bag for each family member as supplies are available.
- Every growing child needs a bag every 6 months.



Tear open Amber Bag or MNP and pour into the yellow flip-top container.

Mini-scoop will also be placed into container.

Keep container closed tightly when not in use and keep out of the reach of children.



# How to fortify foods in the home

- Refer to the directions in the Essential Micronutrient Container.
- If eggs are unavailable, substitute a similar volume of cooked porridge of mixed grains, ground nuts, or other protein rich food that is available in the community. Fortify this food, and use as a meal supplement, not a meal replacement! Fortify the first daily meal or supplementary feeding.

# Instructions inside Container (front)

**Why do I need vitamins and minerals?**

- Growth, healing, & repair
- Strong bones, muscles, & heart
- Mental alertness & energy
- Healthy blood and immune system

**MAMA PROJECT, INC.**  
A Network For Health and Wellness

My family is healthier since I started fortifying our food with Nora Lynne Micronutrients EVERY DAY!

I am feeding my baby fruits, vegetables, and mashed, boiled eggs with iodized salt and oil, fortified with micronutrients.

Ingredients shown: Micronutrient Powder, Iodized Salt, Cooking Oil

# Instructions inside Container (back)

In communities striving to improve family nutrition, mashed, boiled eggs are an ideal food to fortify:

- 2 eggs a day for growing children
- 3 eggs for women 15-49
- at least 1 egg for men over age 19 and women over 49

Sprinkle with iodized salt & add 2 teaspoons of oil per egg. If eggs are unavailable use other high protein food such as mixed grains, beans, cheese, or meat.



1. Separate a portion of cooked food for each person
2. With 0.15cc mini scoop, take a heaping serving of micronutrient mixture, and compress it against container wall.
3. Be careful not to let any blow away.
4. Turn the scoop over the food, tap until empty, mix and serve.



Use daily:

- 2 scoops for growing children over 6 months
- 3 scoops for women 15-49 years old
- 1 scoop for men over 19 and women over 49



# Facilitator's Guide for Village Demonstrations

Pull out the Facilitator's Guide from your folder and look through.

Facilitator's Guide for Village Demonstration:



Nora Lynne  
Micronutrient Powder

**Guide for Facilitators:**

*MAMA Project format for introducing Nora Lynne Micronutrients to village women's groups.*

Background Information:

- **The Importance of Micronutrients**

In good soil, with good rainfall, there are usually abundant minerals, and all of the building blocks for life. When an environment is stripped of its natural resources, the nutrients in the soil are also lost. In some parts of the world, the soil is deficient in important minerals such as iodine, zinc and iron. Communities experiencing deforestation, erosion, leaching and other environmentally harmful events are victims. It is a cycle that damages the soil causing nutritional depletion for plants, animals, and humans. The harmful effects of micronutrient depletion cause the sons and daughters of the soil hardships of many kinds. It has become increasingly evident that micronutrients are a key component to health and wellness, both of the land and the humans that live on it. Health experts have found that in-home micronutrient fortification is an effective means to survival and health, especially in children and child-bearing women.

- **What are micronutrients?**

Micronutrients are an important part of our nutrition, making our bodies healthy and strong. Though they only need to be consumed in very small amounts, these elements play a large role in overall body wellness and functioning. Nora Lynne micronutrient powder contains 21 of these essential vitamins and minerals and can help families to supplement their nutrition.

**Note:** *There are other nutrients such as fat, carbohydrates, protein, calcium, magnesium, potassium, and phosphorus that are "macro" nutrients. They are vital for life also.*

For those in charge of the village demonstration, it is VERY important that s/he says with the script and does not make claims for vitamins & minerals that cannot be substantiated.

# Pocket Guide for Village Demonstrations

Pocket Guide for Village Demonstration



*Nora Lynne*  
Micronutrient Powder

## Checklist for Presentation:

- |  |   |
|--|---|
| <input type="checkbox"/> Hard Boiled Eggs                  | <input type="checkbox"/> Soap, Water & Pitcher                                |
| <input type="checkbox"/> Iodized Salt                      | <input type="checkbox"/> Spoons & Kitchen Knife                               |
| <input type="checkbox"/> Oil                               | <input type="checkbox"/> Plates   |
| <input type="checkbox"/> Micronutrient Powder (MNP) & Bags | <input type="checkbox"/> Table  |
| <input type="checkbox"/> Mini-Scoop (0.15cc)               | <input type="checkbox"/> Projection Screen or TV                              |
| <input type="checkbox"/> Yellow Flip-Top Bottle            | <input type="checkbox"/> "A Micronutrient Story" DVD, DVD Player or Projector |



## Micronutrient Powder Dosing:

Age	Eggs	Oil (tsp)	Iodized Salt	MNP 0.15cc mini-scoop
Growing Child: Older than 6 mos.	2	4	Sprinkle	2
Women: 15-49 years	3	6	Sprinkle	3
Men over 19 years; Women over 50 years	1 or more	2	Sprinkle	1

\*There should be 2 tsp/10 cc of oil for each egg.

## MNP - Tips for Teaching:

- Helpful in 1st food of the day.**
- Pour water when washing:** Do not wash from basin.
- Exclusive breastfeeding:** BEST nutrition for babies under 6 months.
- Do not cook MNP:** Cooking "kills" some vitamins.
- Do not mix in water, milk, or any liquids:** Sinks to bottom.
- Keep out of reach of children:** Avoid accidental ingestion.

## MNP - Instructions for Teaching for Teaching:

### GREETINGS & INTRODUCTIONS:

Invite women older than 15yrs or child caregivers.

### STEP BY STEP DEMONSTRATION:

Discuss and demonstrate the "What and Why" of MNP.

#### What:

#### Why:

1. Wash hands, wash child's hands/face	Good hygiene will prevent infection.
2. Demo: Cutting bag open vs. tearing. Each person opens bag and pours into bottle.	Powder must be kept dry and clean; otherwise it will become hard and difficult to use.
3. Crack hardboiled eggs and mash with spoon.	Eggs are a super food containing protein and Omega 3s (good fats).
4. Measure oil with spoon and add to egg mixture; add small sprinkle of salt.	If eggs are unavailable, use protein rich foods: mixed grains, beans, cheese, or meat.
5. Measure MNP with 0.15 cc mini-scoop: fill heaping scoop of MNP and press/pack against side of container, turn scoop over food and tap empty.	MNP is rich in nutrients; use only small volumes. Protect this fine powder from blowing away in the wind.
6. Mix egg compound with MNP.	Use dosing chart to determine each person's nutritional needs.
7. Hold child on lap and spoon feed. Lovingly talk to baby.	Engage child in experience. Never leave alone to eat.
8. Eat and enjoy.	Discuss comments and questions.

# Ending child hunger is everyone's business.





# **You may continue to review optional material in this annex:**

- Interpreting the tables
- Understanding malnutrition classification
- Grasping the concept of graphs and Z-scores

## What do you learn from tables?

- Weight for age
- Height for age
- Weight for height
- BMI for age

If young child stunted – low length or height

If young child is underweight – low weight

If a child is wasted-low weight for height

If adolescent is stunted – low height

If adolescent is underweight – low BMI

# Information on children's growth guides care for each child.

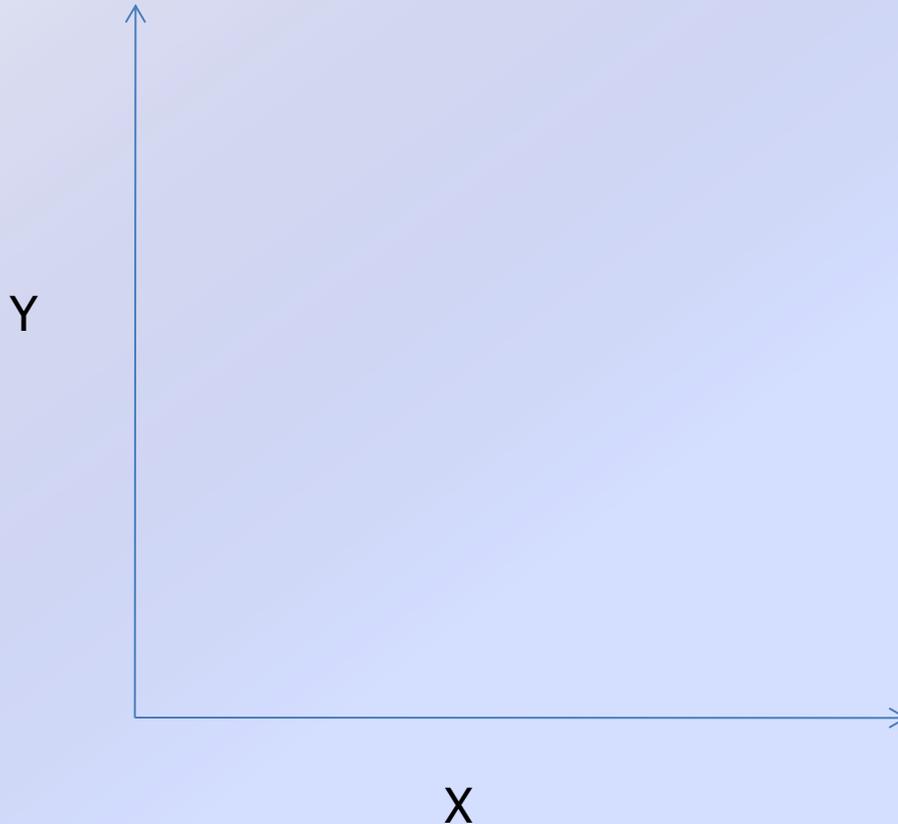
**Computer programs can analyze data for statistics on children's growth in populations.**

Health workers and village volunteers care for the individual child and community, using the same data



**For those who want to understand growth charts and Z-scores continue this module.**

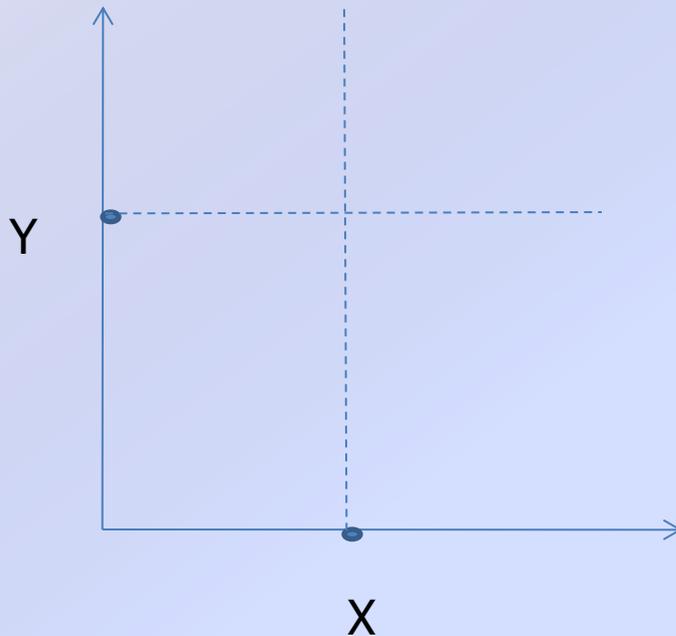
When using a graph, we name the line on the left the “Y axis” and the bottom the “X axis.”



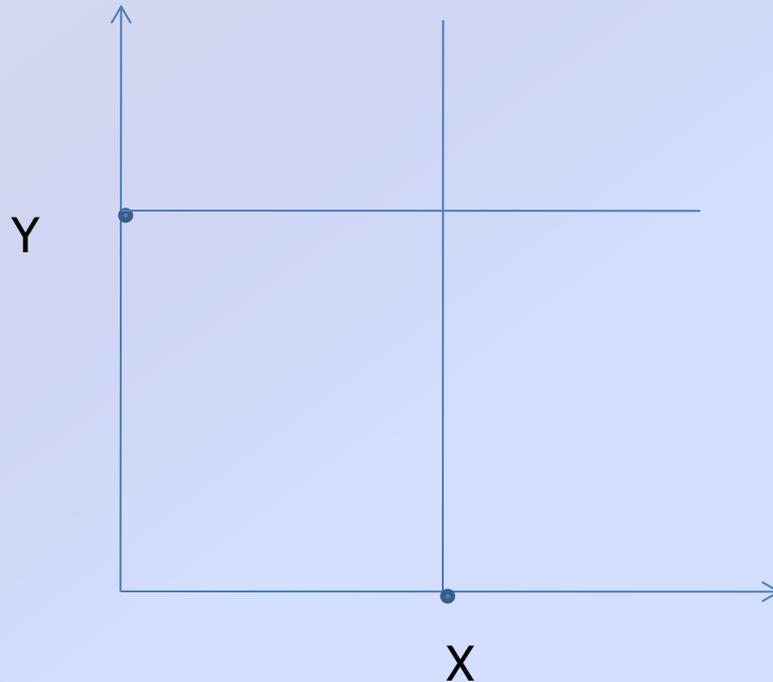
- X and Y are always labeled

Example: “Height”, “Age”, or “Weight”

After we find our 2 values (example: age and weight), draw 2 straight lines perpendicular to the Y and X axis starting from those points.



- These lines will cross on the graph.



The point where the lines from  
**X** and **Y** cross is called

**“Z”**

We are now going to look at some graphs to see how they are used to determine whether or not a child is malnourished.

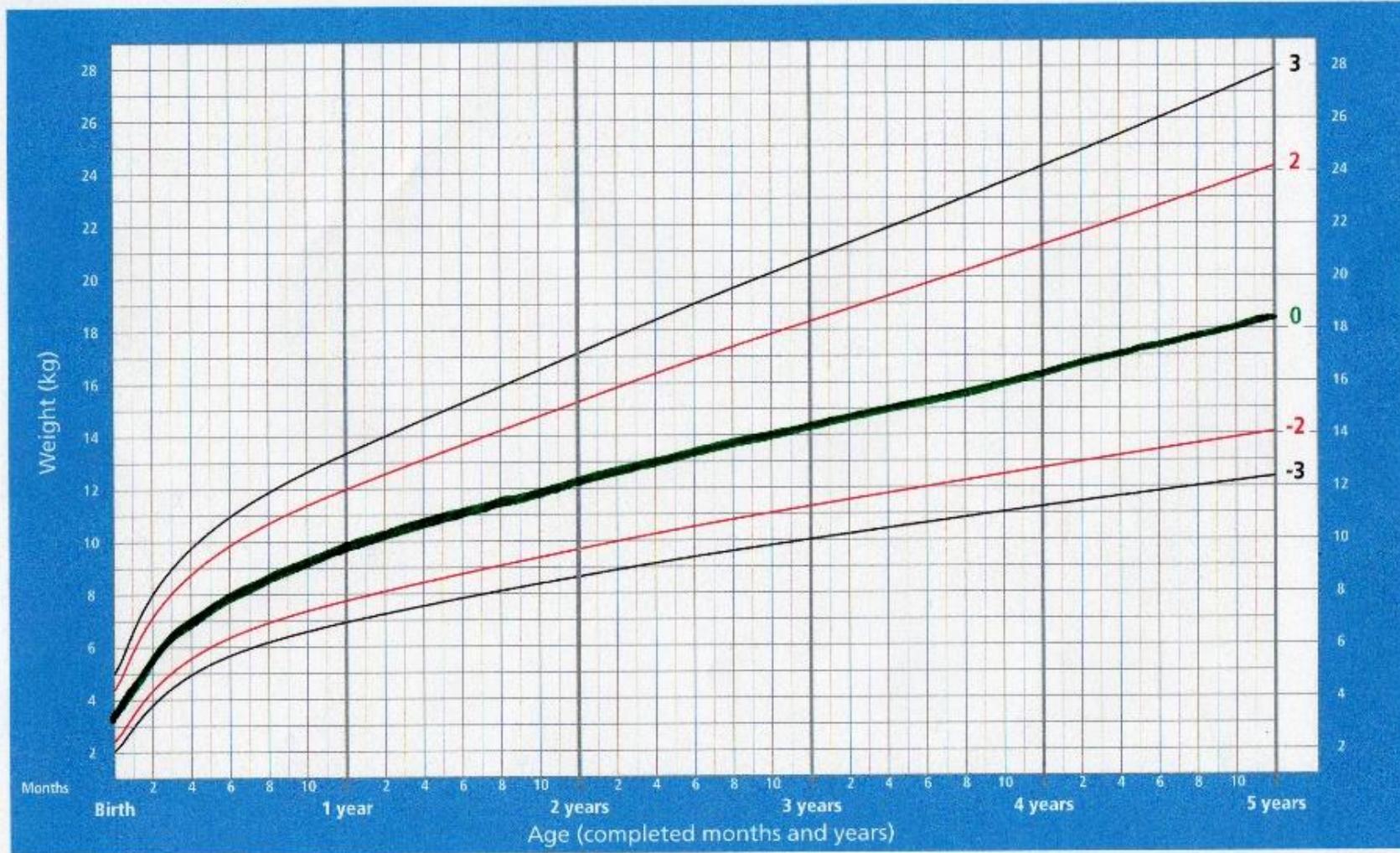
We will use the boys age 0-5 years weight graph as an illustration. The same principles apply to all of the graphs.

- When children are weighed, they usually gain weight as time passes. When researchers graph the weight compared to their age, the most common weight is represented by the line marked “O”.
- A child whose weight for his age falls in that line gets a score of “O”. They are “O” distance from the middle of normal, the most frequent weight for the age.
- In the next slide, the “0” line will be darkened.

# Weight-for-age BOYS



Birth to 5 years (z-scores)

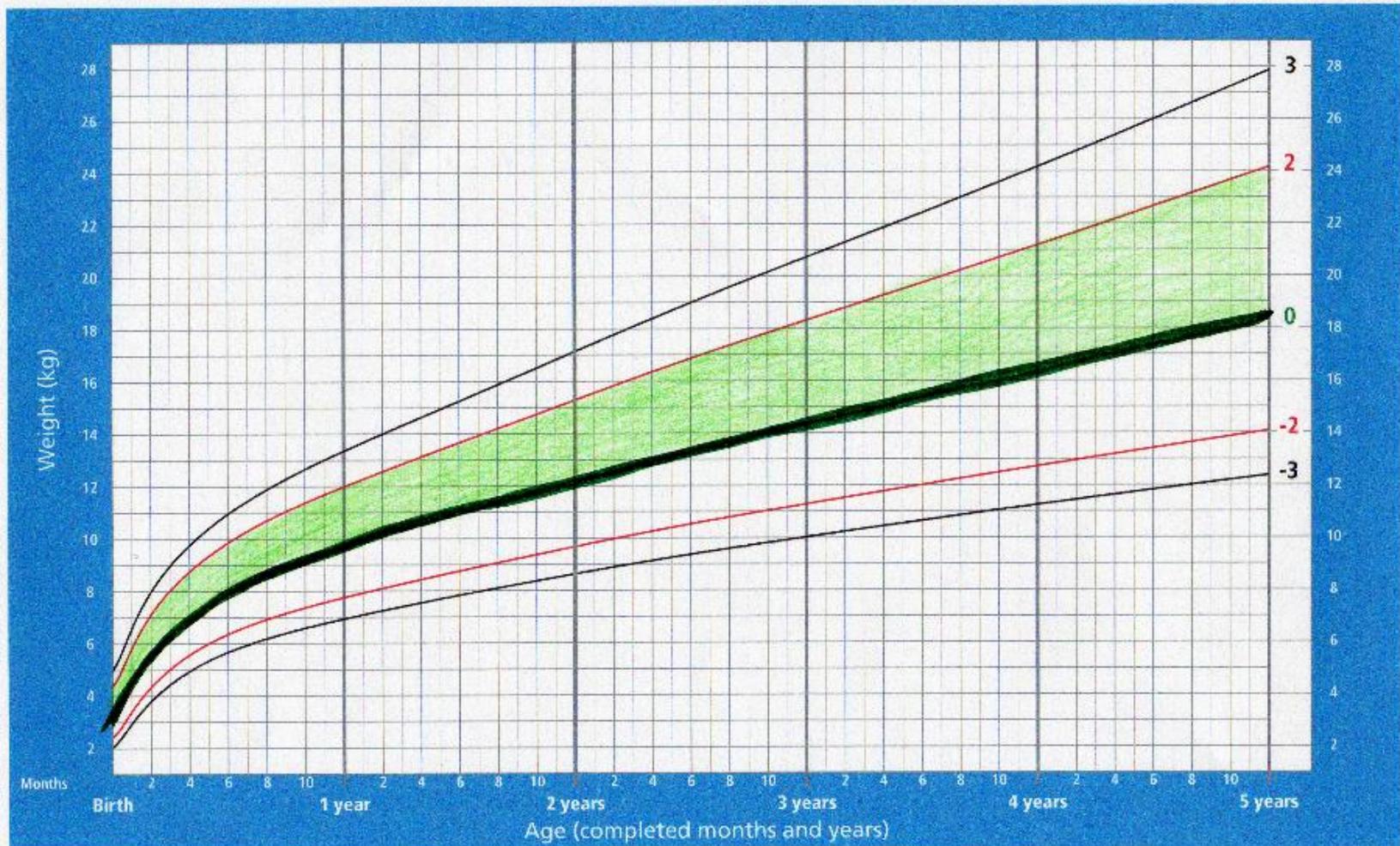
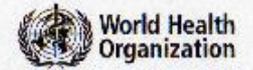


WHO Child Growth Standards

Boys whose weight for their age falls between the “0” (also called 0 Z-score) line and the 2 line (2 Z-score) are higher weight than the most common, but still normal. That is illustrated by green shading.

# Weight-for-age BOYS

Birth to 5 years (z-scores)

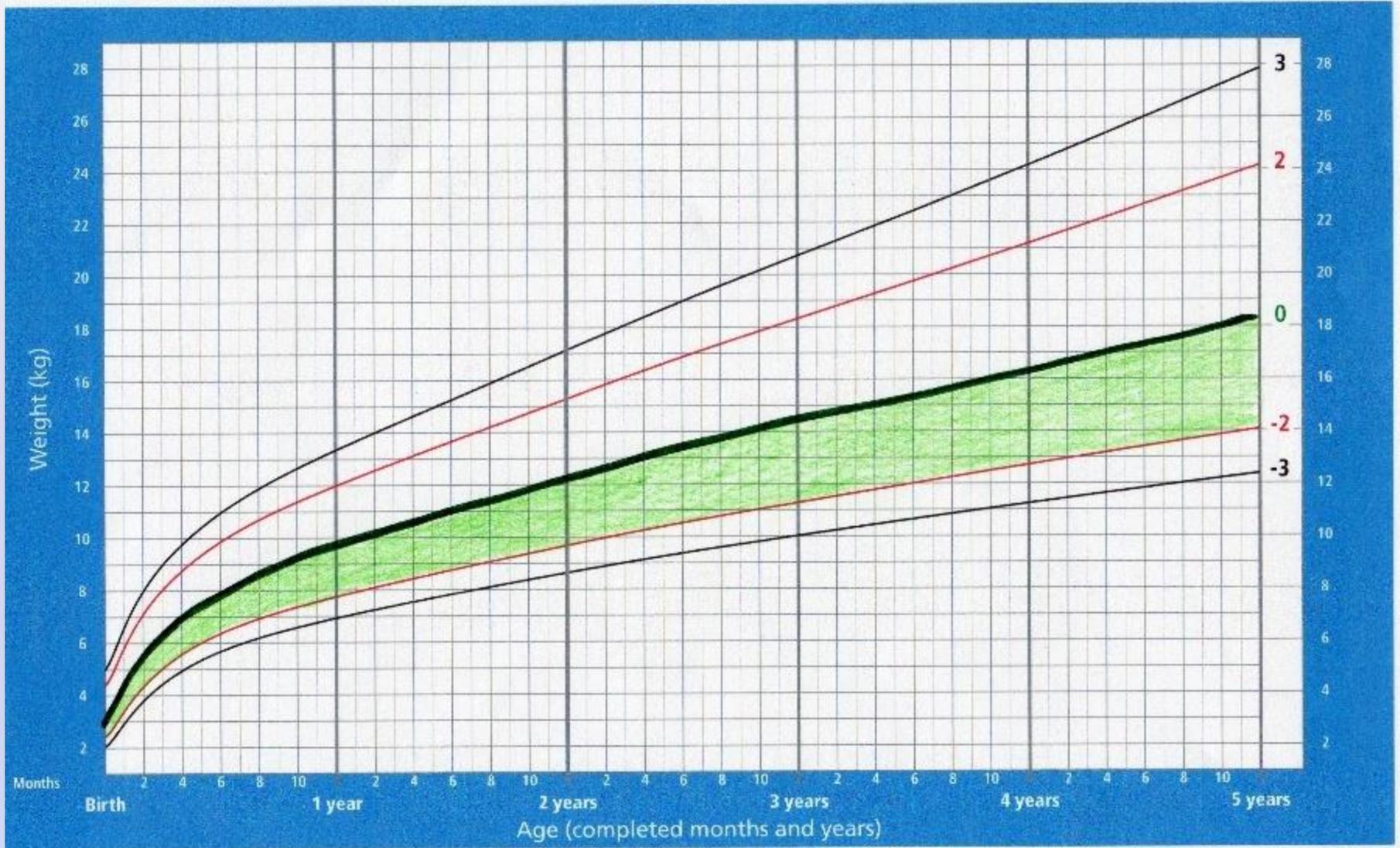
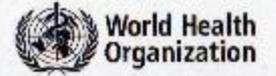


WHO Child Growth Standards

Those boys whose weight is below the middle of their age group (0 Z-score) but above the -2 line (-2 Z-score) are also normal, but below the most common. That is illustrated by the green shading below the 0 Z-score line.

# Weight-for-age BOYS

Birth to 5 years (z-scores)

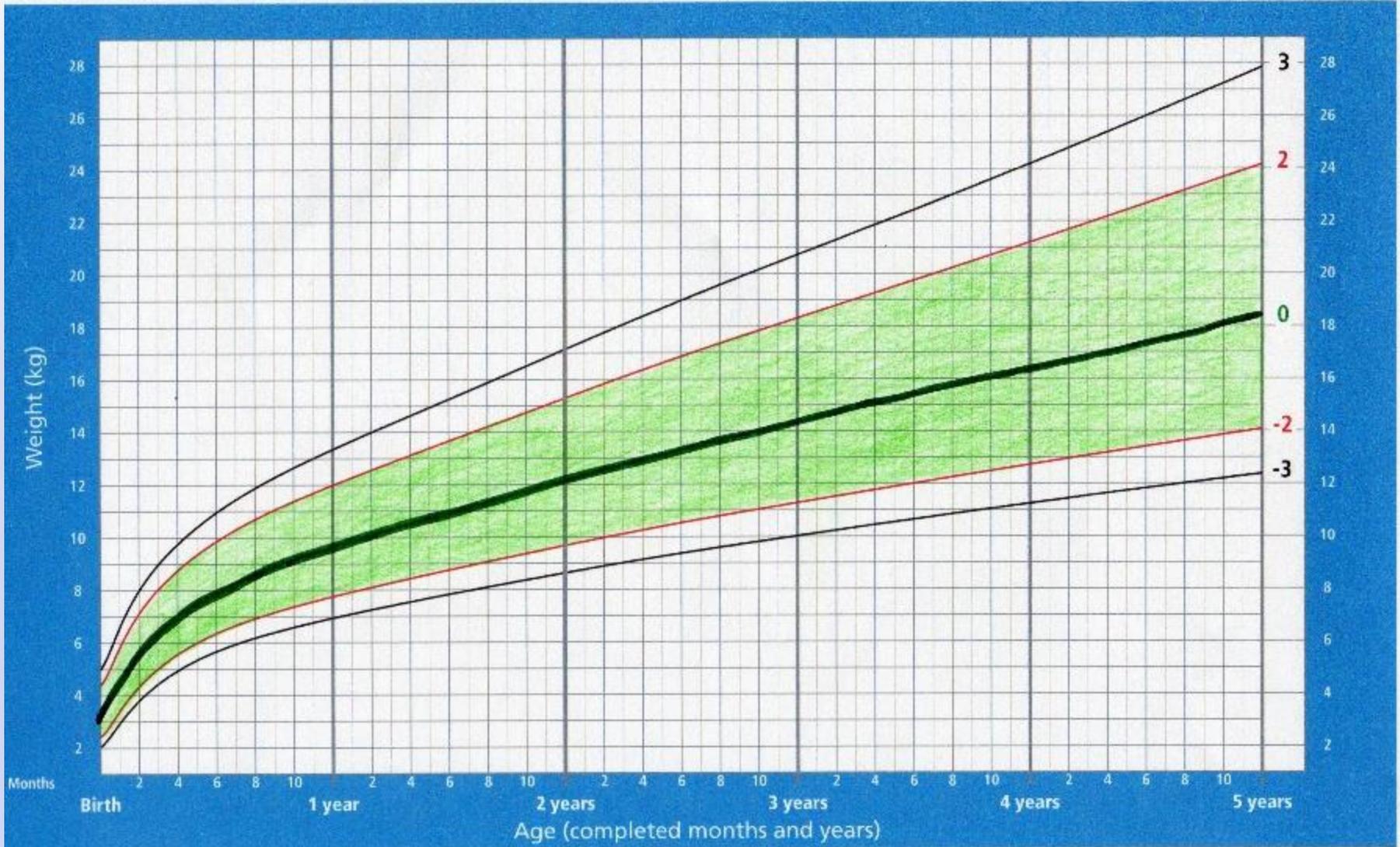


WHO Child Growth Standards

If a boy's weight for his age falls in the area between the 2 Z-score line and the -2 Z-score line, he is considered normal. That is the shaded green area above and below the 0 Z-score line.

# Weight-for-age BOYS

Birth to 5 years (z-scores)



WHO Child Growth Standards

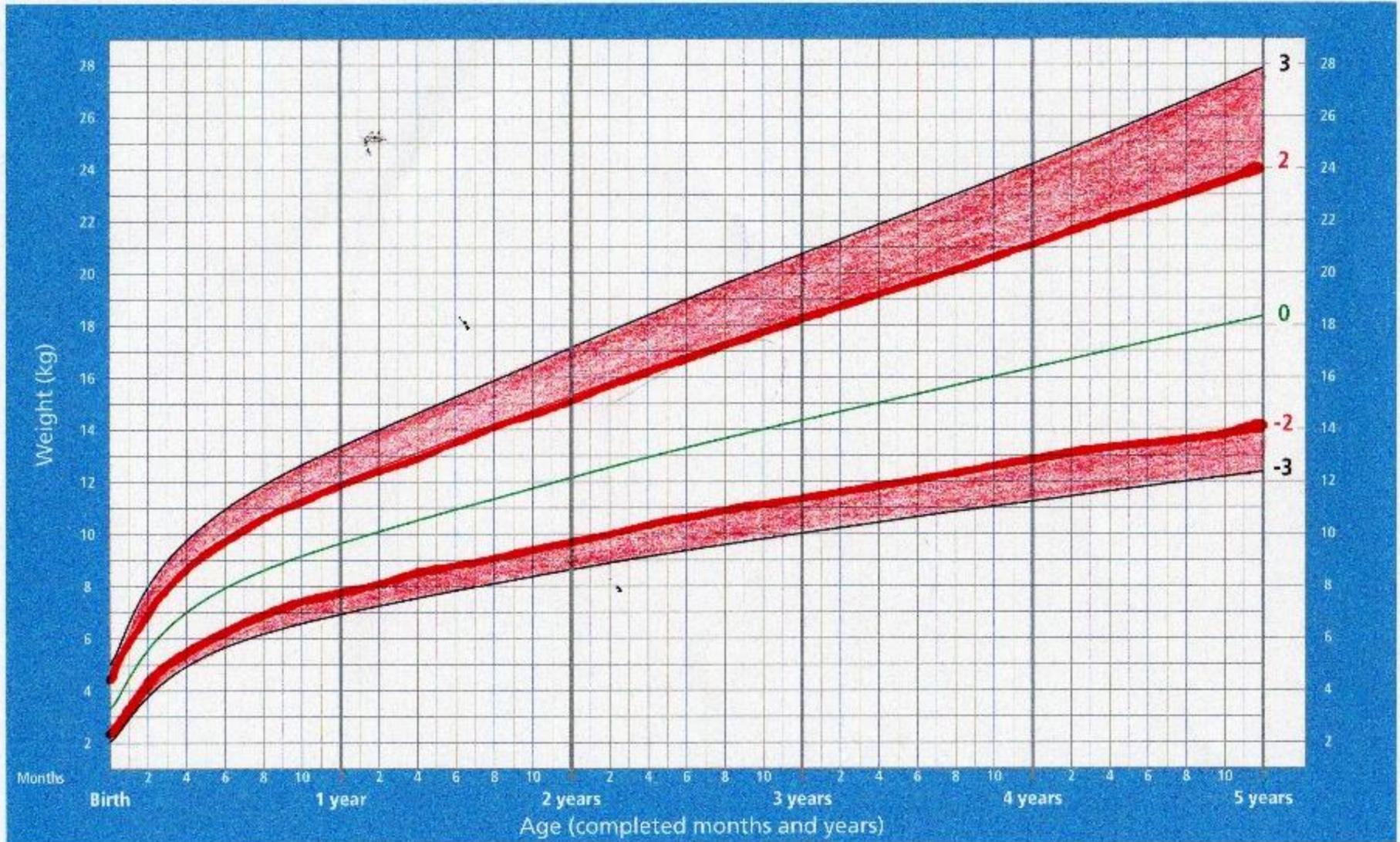
The 2 Z-score line and the -2 Z-score line are the boundary between normal weight for age and either overweight or underweight.

Note: Children who are mildly malnourished may fall in the area between 0 and -2 because they have fallen below the weight they **could** have achieved if they had been well fed.

The red area between 2 Z-score and 3 Z-score represents overweight. Between -2 Z-score and -3 Z-score represents a moderate degree of underweight (malnutrition).

# Weight-for-age BOYS

Birth to 5 years (z-scores)



WHO Child Growth Standards

If a child's weight for age is above the 3 Z-score line he is obese and if lower than the -3 Z-score line he is severely underweight.

**THIS IS AN EMERGENCY!**

Use rulers or a different straight edge to line up the two values carefully that your conclusions are accurate.

(Make certain that all lines are perpendicular lines)

- There is a time when the weight graph can lead you to think that a very malnourished child is normal.
- That happens when a child is so sick that he or she has swollen up with water. (Oedema) That child's weight makes them heavy, making him or her look healthy on paper only.
- Always look at the child and check for oedema!

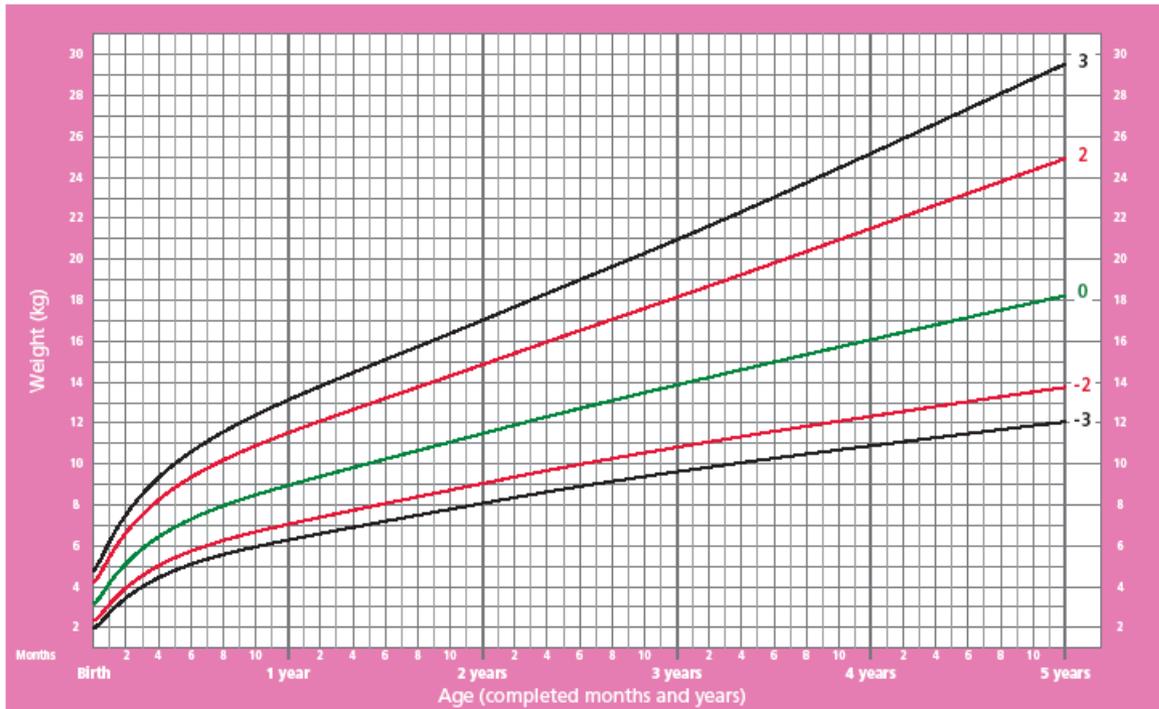
To illustrate what graphs reveal, we will study 4 representations – Girl's graphs –

- WAZ (Weight for Age Z-score)
- HAZ (Height for Age Z-score)
- BAZ (BMI for Age Z-score)
- WHZ (Weight for Height Z-score)

# WAZ- Weight for Age Z-score Detects underweight from all causes present or past malnutrition

## Weight-for-age GIRLS

Birth to 5 years (z-scores)



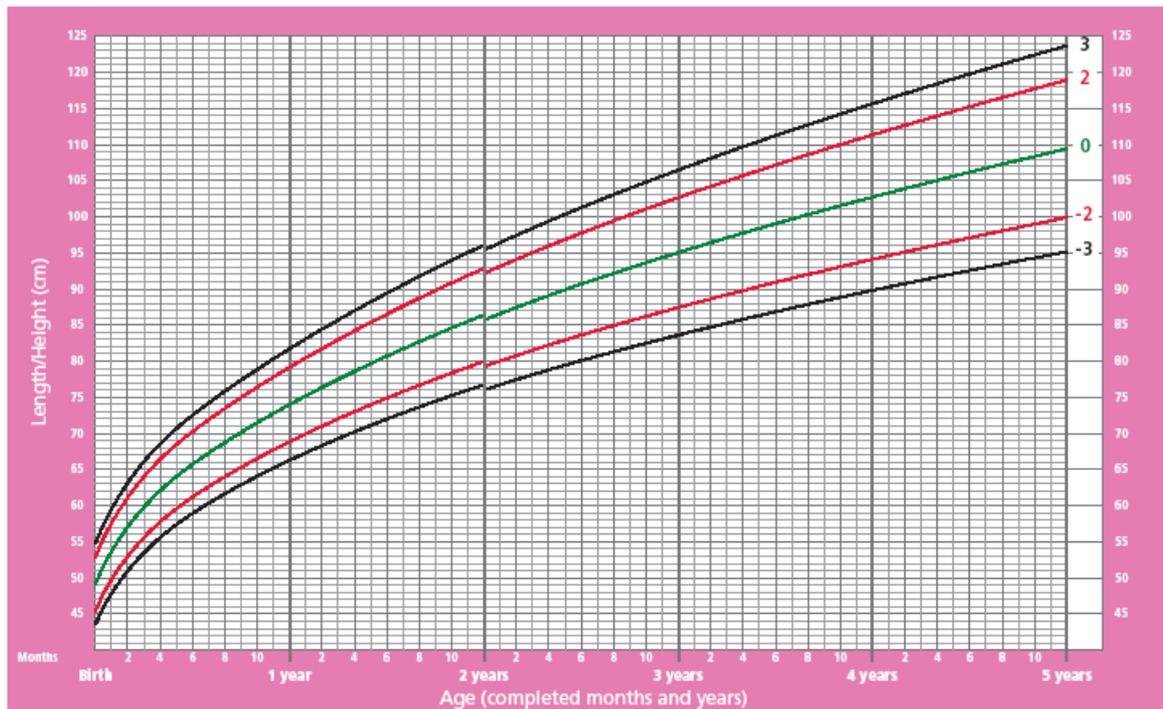
WHO Child Growth Standards

- Birth to Age 10
- 2 to -2 is normal
- -2 to -3 is moderately malnourished now
- Below -3 is severely malnourished now

# HAZ- Height for Age Z-score Detects Chronic Long-Term growth stunting

## Length/height-for-age GIRLS

Birth to 5 years (z-scores)



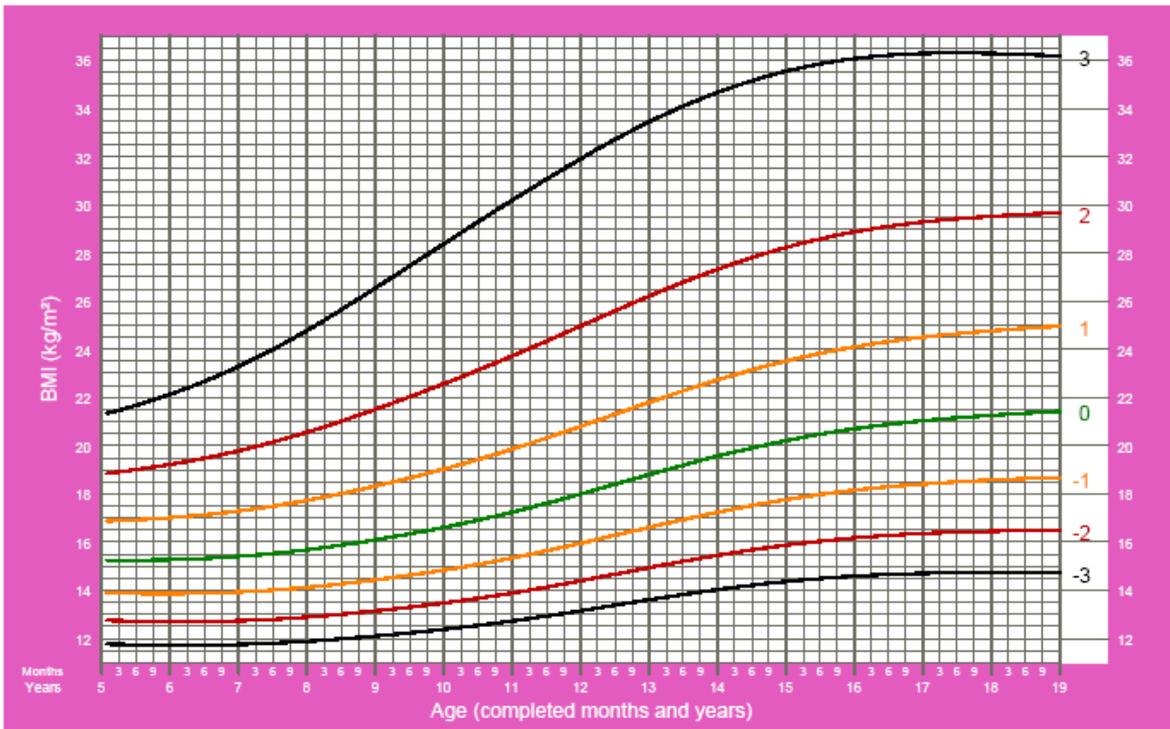
WHO Child Growth Standards

- Ages 5-19
- Watch growth in height of girls until Age 19 for safe motherhood
- -2 to -3 moderate chronic stunting
- Below -3 severe chronic stunting

# BAZ-BMI for Age Z-score Detects current, acute body wasting

## BMI-for-age GIRLS

5 to 19 years (z-scores)



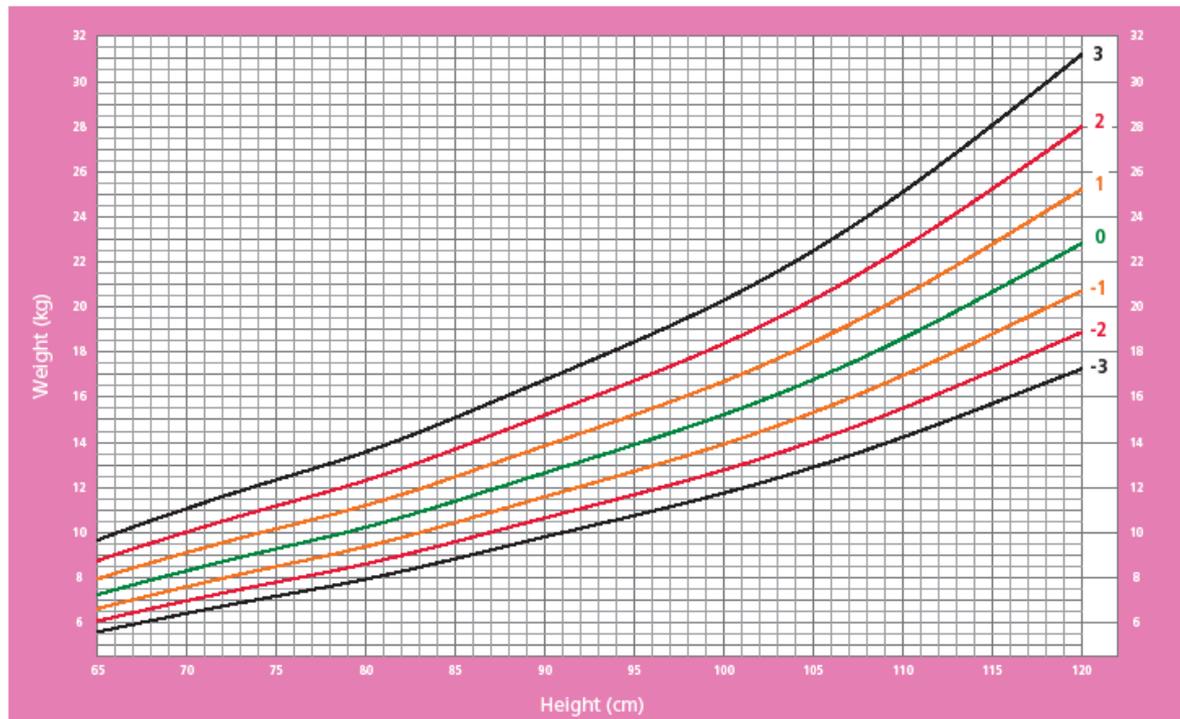
2007 WHO Reference

- Acute! Serious for children of all ages
- Pay attention to adolescents. It is important for safe motherhood.
- -2 to -3 moderate acute malnutrition wasting
- Below -3, severe acute malnutrition wasting

# WHZ- Weight for Height Z-score Detects current acute body wasting

## Weight-for-Height GIRLS

2 to 5 years (z-scores)



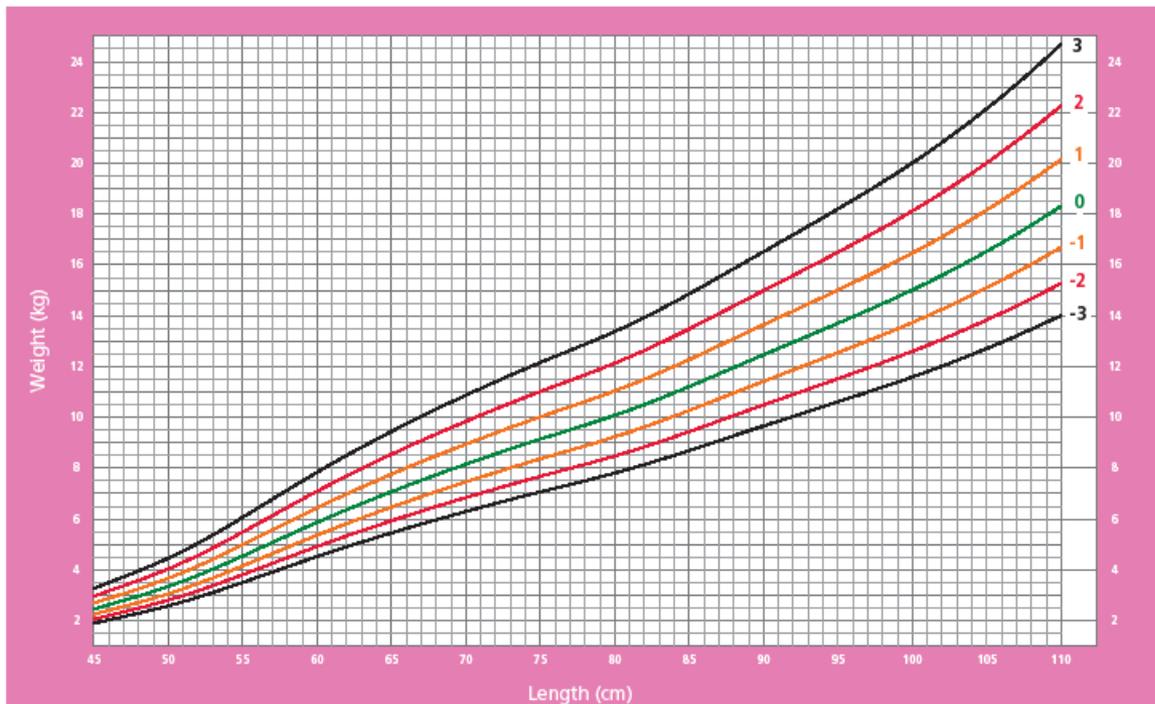
WHO Child Growth Standards

- Ages 5-10
- Reveals Wasting
- -2 to -3 is moderately acute wasting
- Below -3 is severe acute wasting

# WLZ-Weight for Length Z-score Detects current, acute body wasting

## Weight-for-length GIRLS

Birth to 2 years (z-scores)



WHO Child Growth Standards

- Ages 0-2
- Reveals Wasting
- -2 to -3 is moderately acute wasting
- Below -3 is severe acute wasting

When to NOT believe your graphs but your eyes.

Severe malnutrition –acute no matter what weight shows:

- Kwashiorkor: Indicates protein deficiency. Study the pictures, learn to detect oedema in the feet.
- Maramus: indicates total calorie deficit. Wasted arms and legs especially. Bloated bellies and protein deficiency causing swelling may falsely elevate the weight.

## Growth Problems

Compare the points plotted on the child's growth charts with the z-score lines to determine whether they indicate a growth problem. Measurements in the shaded boxes are in the normal range.

Z-score	Growth Indicators			
	Length/height -for-age	Weight-for-age	Weight-for-length/height	BMI-for-age
<b>Above 3</b>	<i>See note 1</i>	<i>See note 2</i>	<i>Obese</i>	<i>Obese</i>
<b>Above 2</b>			<i>Overweight</i>	<i>Overweight</i>
<b>Above 1</b>			<i>Possible risk of overweight (see note 3)</i>	<i>Possible risk of overweight (see note 3)</i>
<b>0 (median)</b>				
<b>Below -1</b>				
<b>Below -2</b>	<i>Stunted (See note 4)</i>	<i>Underweight</i>	<i>Wasted</i>	<i>Wasted</i>
<b>Below -3</b>	<i>Severely Stunted (see note 4)</i>	<i>Severely Underweight</i>	<i>Severely Wasted</i>	<i>Severely wasted</i>

# Growth Problems (cont.)

## Notes:

- *1. A child in this range is very tall. Tallness is rarely a problem, unless it is so excessive that it may indicate an endocrine disorder such as a growth-hormone-producing tumor. Refer a child in this range for assessment if you suspect an endocrine disorder (e.g. if parents of normal height have a child who is excessively tall for his or her age)*
- *2. A child whose weight-for-age falls in this range may have a growth problem, but this is better*
- *assessed from weight-for-length/height or BMI-for-age.*
- *3. A plotted point above 1 shows possible risk. A trend towards the 2 z-score line shows definite risk.*
- *4. It is possible for a stunted or severely stunted child to become overweight.*

There are times when measurement is not necessary to diagnose malnutrition.

When you encounter a severely wasted or a severely swollen child, you can generally assume that they are severely malnourished, but take the measurement anyway, for documentation and for tracking progress in recovery.

**Thank you!**