

Contribution to
Ecopoor Research Framework Workshops
Dar es Salaam (3rd March 2014) and Dhaka (6th March 2014)

**Nutrition and food insecurity amongst poor urban people in
Bangladesh (with some reference to Tanzania)**

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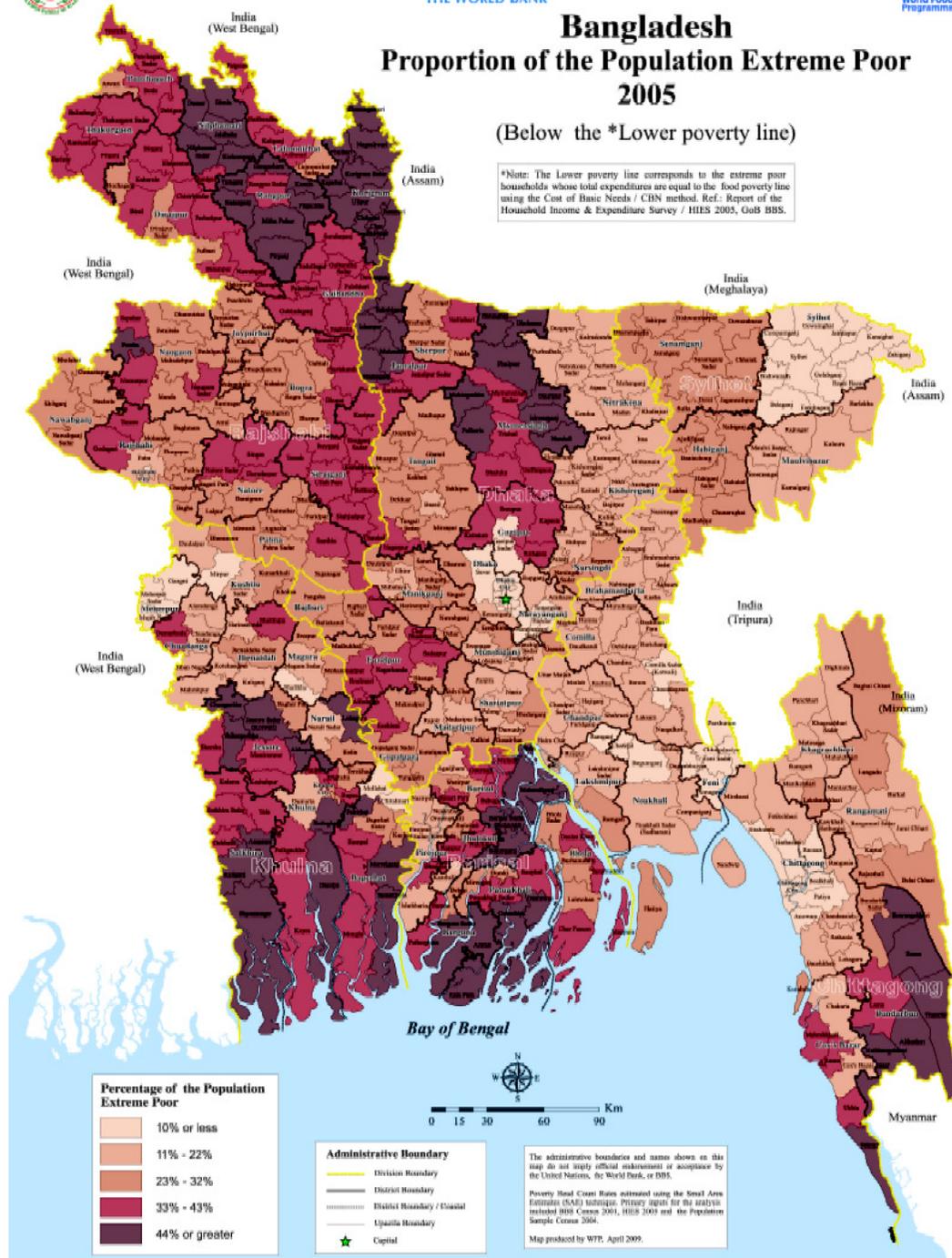


Bangladesh

Proportion of the Population Extreme Poor 2005

(Below the *Lower poverty line)

*Note: The Lower poverty line corresponds to the extreme poor households whose total expenditures are equal to the food poverty line using the Cost of Basic Needs / CBN method. Ref.: Report of the Household Income & Expenditure Survey / HIES 2005, GHS BBS.



- High population density
- Poverty
- Food insecurity
- Poor maternal nutrition
- Low birth weight
- Low rates of exclusive breast feeding
- Lack of proper complementary feeding
- Poor sanitation and hygiene
- Frequent illnesses
- Environmental enteropathy

GLIMPSE OF BANGLADESH

- The country's food insecure population is now estimated to be 65.3 million people
- 45 percent of the country's 145 million population is now food insecure (< 2122 kcals/person/day)
- 23.9 percent of the population is understood as severely food insecure (consuming less than 1 805 kcals/person/day)
- Severe insecurity of food was found most commonly in slums (17.2%), compared to 12.3% at the national level, 12% in rural areas and 12.4% in urban areas of the country.



Fig: Urban Slum

Feature	Bauniabadh slum	Dhaka/National
Population density	38,760 /sq km	8,229 /sq km
Population in catchment area	111,811	12 million (Dhaka)
% female	48%	46%
Average family size	4.5	4.2
Life expectancy	No site specific data	M: 68, F: 69
Major employment	Day laborer garments worker transport worker small business	Agriculture, small business, transport & unskilled worker

Our Study Findings:

- At the age of 15 months, 41% of the children were short for their age or stunted, while 15% were severely stunted (Z-score $<-3SD$ of WHO growth standard).
- Nutritional status is worst among the slum people and they suffer mostly from the key micronutrient deficiencies.
- 40% of the complementary food given to the children was contaminated with fecal coliforms and *E. coli*, which was mainly attributable to faulty food preparation practices.



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Malnutrition-Enteric Disease (Mal-ED) Study at Bauniabadh, Mirpur, Dhaka city and in a rural community of Mirzapur in the Tangail district.

Specific Objectives:

- To assess the nutritional status of under five children in the selected four slum settlements of Dhaka city.
- To assess food security access in the selected four slum settlements of Dhaka city.
- To look at the extent of microbial contamination in complementary food in the selected four slum settlements of Dhaka city

Methodology

Study design:

An observational study

Study site:

Four slums will be selected based on a predefined criterion where low-income neighbourhoods are connected to the broader ecosystem networks in Dhaka city

Study period:

Four months for data collection and analysis

Sample size: 370

Nutritional Status

- ❖ Under nutrition, fetal growth restriction, stunting, wasting and deficiencies of vitamin A and zinc cause 3.1 million child deaths annually equivalent to 45% of all child deaths in 2011.
- ❖ FGR causes 20% of stunting worldwide.
- ❖ There are several factors that contribute to these high rates of undernutrition, particularly among children.

Anthropometry:

- Nutritional status will be assessed through anthropometry
- Weight will be measured by Seca weighing scale (Seca 354 Dual Purpose Baby Scale)
- Mid upper arm circumference will be measured by MUAC tape and height/length will be measured by height/length board.

Building blocks of Anthropometry

1) SEX

2) AGE

3) WEIGHT

4) LENGTH or HEIGHT

Three standard indices of physical growth that describe the nutritional status of children will be determined:

- ❖ Height-for-age/Stunted
- ❖ Weight-for-height/Wasted
- ❖ Weight-for-age/Underweight



When used together called an index,

- Commonly used indices: WA, HA & WH
- Others: *MUAC, BMI, SFT etc.*

We will use the WHO 2006 child growth reference standards.

Height-for-age is a measure of linear growth.

Z score= (-2 SD) \longrightarrow moderate stunting

Z score= (-3 SD) \longrightarrow severe stunting

Chronic / long term undernutrition

Weight-for-height

- Acute / recent undernutrition
- Useful when exact age is difficult to determine
- WL for < 2 yrs & WH for ≥ 2 yrs

Length is ~ 0.7 cm more than corresponding height

Height is ~ 0.7 cm less than corresponding length

- Appropriate for examining short-term effects.

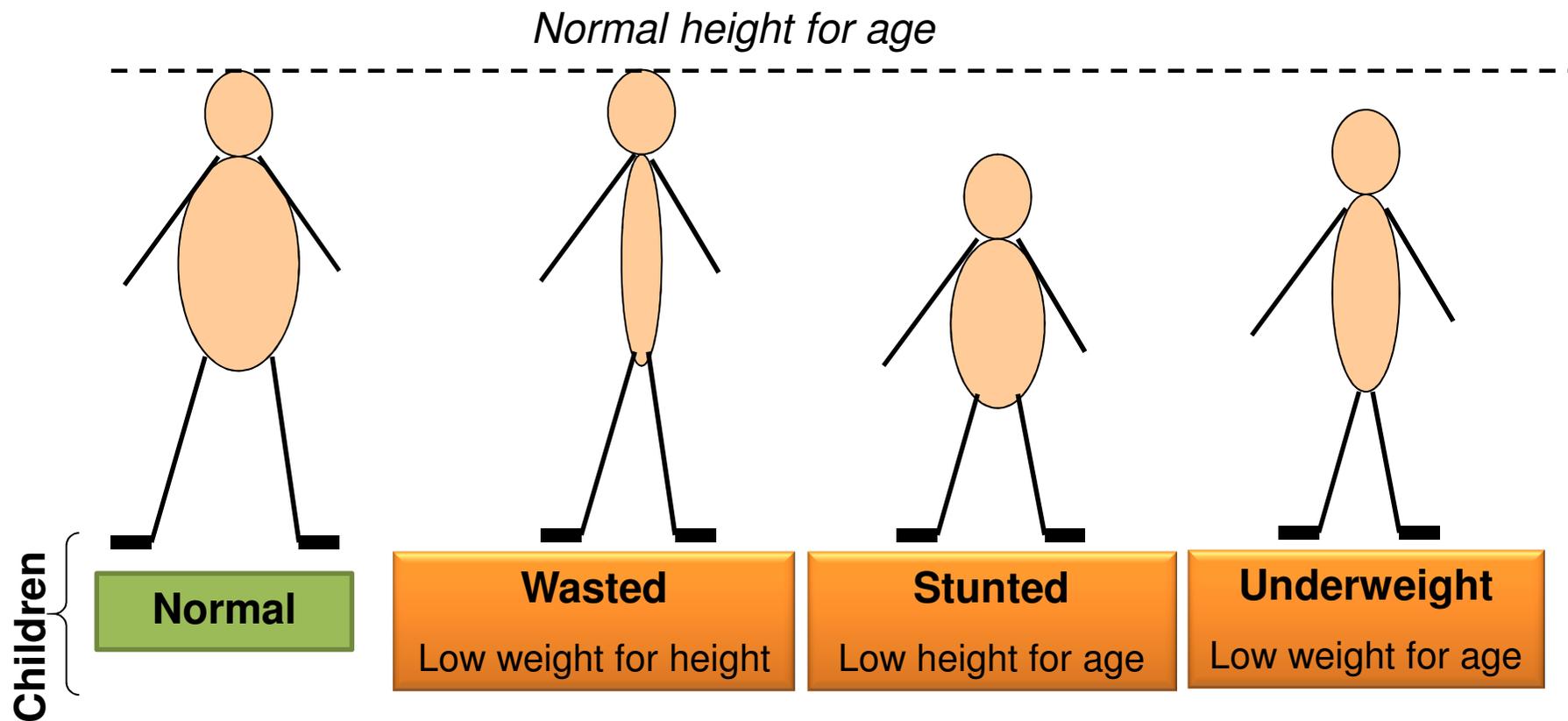
Weight-for-age does not distinguish between acute malnutrition (wasting) and chronic malnutrition (stunting).

< -2 Z score = *Underweight*

< -2 to -3 Z score = *Moderate underweight*

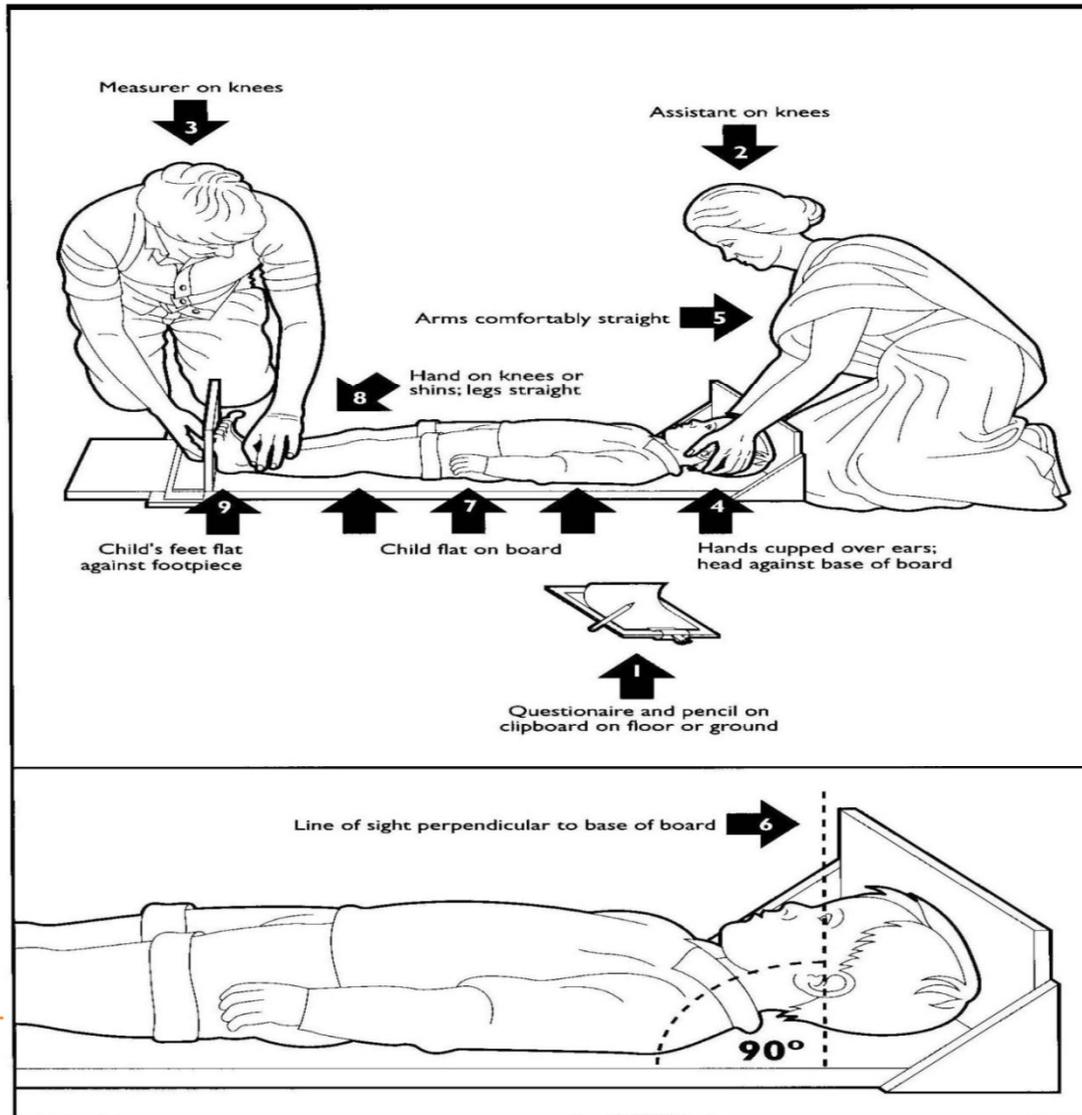
< -3 Z score = *Severe underweight*

Different types of childhood malnutrition



Measuring Length for infants and children 0-23 months by using length board:

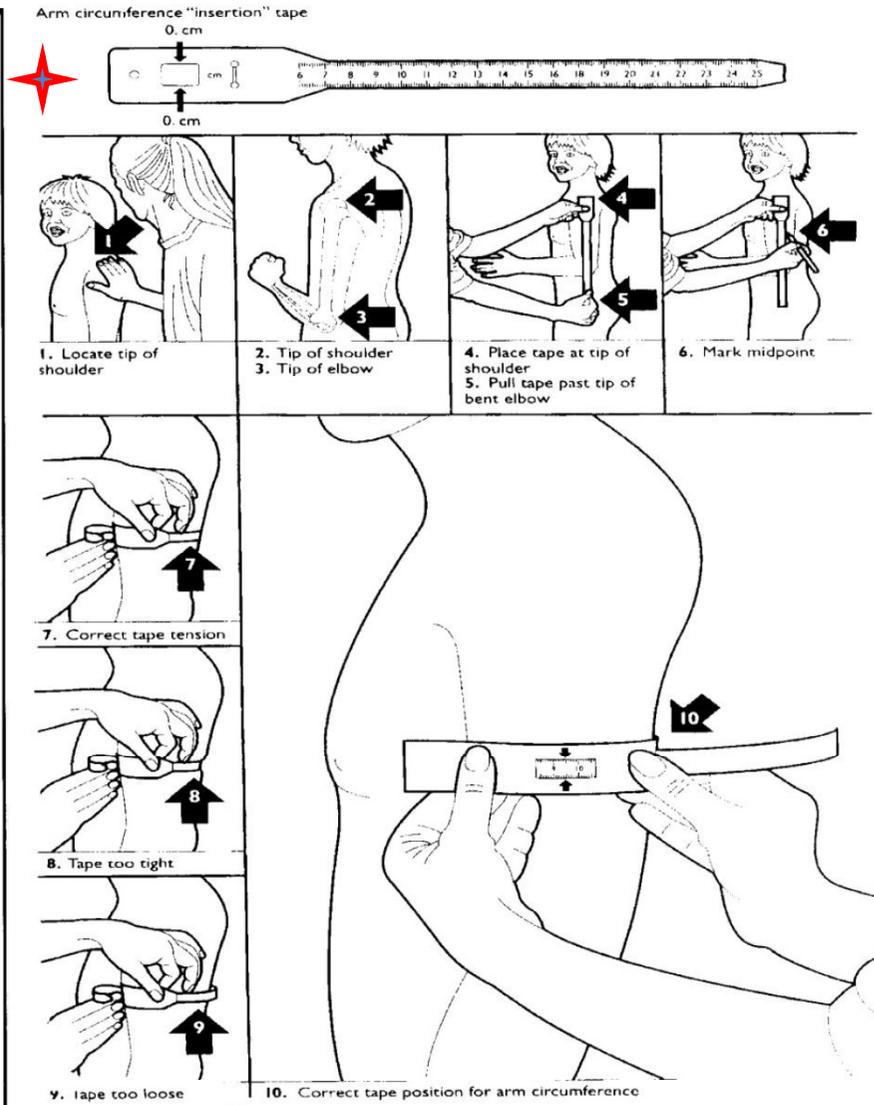
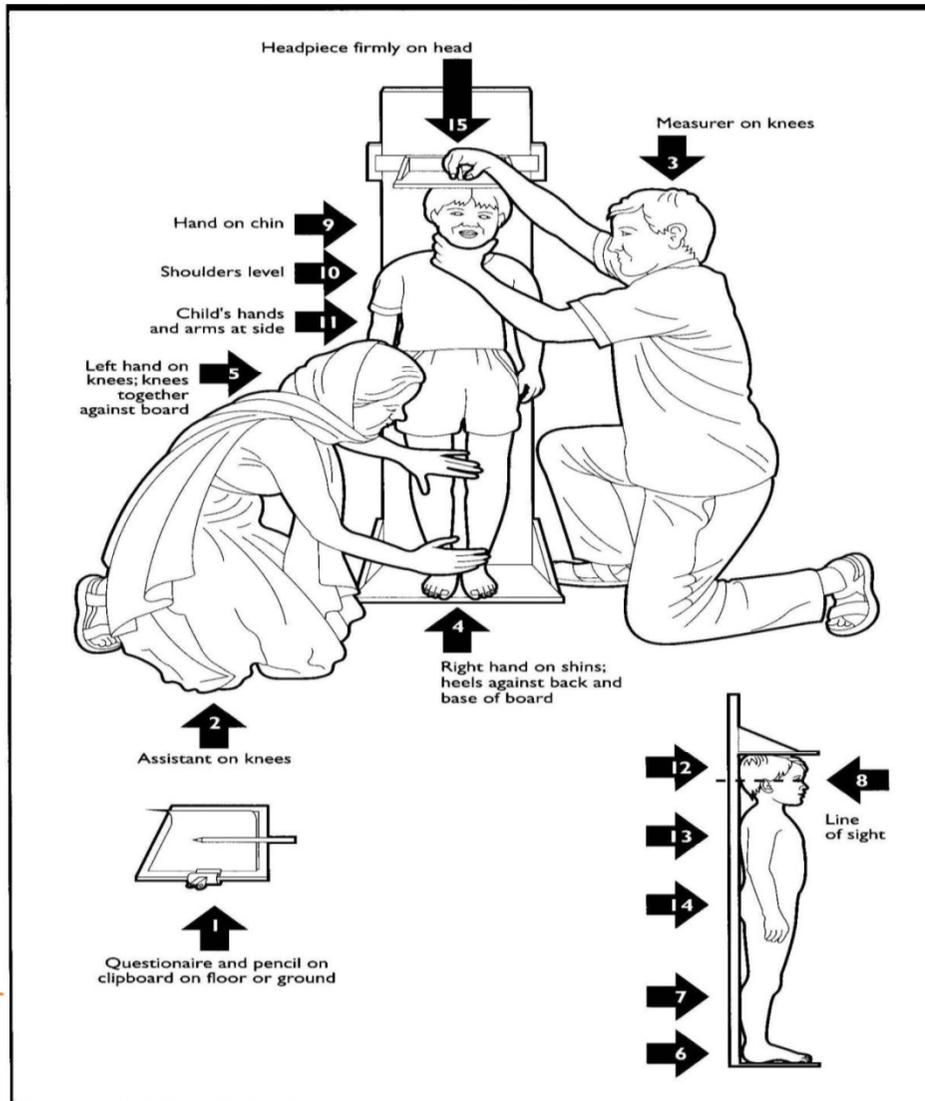
The anthropometry protocol requires a stature measurement in the form of recumbent length for all children less than 2 years of age (birth to 23 months).



Source: How to Weigh and Measure Children: Assessing the Nutritional Status of Young Children, United Nations, 1986.



✦ In 6 mo – 5 yrs < 11.5 cm is severe acute malnutrition (SAM)
 11.5 to <12.5 is moderate acute malnutrition (MAM)



Source: How to Weigh and Measure Children: Assessing the Nutritional Status of Young Children, United Nations, 1986.

Anthropometric indicators measurement guide FANTA, 2003

We can calculate the Z score of the indices by WHO's "ANTHRO" software (Version: 3.2.2), 2011

The screenshot shows the 'Anthropometric calculator' software interface. The input fields are as follows:

- Help
- Date of visit: 10/ 7/2011
- Sex: Female Male
- Weight (kg): 9.00
- Length/height (cm): 73.00
- BMI: 16.9
- Head circumference (cm): 45.00
- MUAC (cm): 15.00
- Triceps skinfold (mm): 8.00
- Subscapular skinfold (mm): 7.00
- Date of birth: 10/ 7/2010
- Approximate date:
- Unknown date:
- Age: 11mo
- Measured: Recumbent Standing
- Oedema: No Yes

The Results section displays percentile and z-score charts for the following indices:

Index	Percentile	z-score
Weight-for-length	61.4	0.29
Weight-for-age	51.9	0.05
Length-for-age	34.8	-0.39
BMI-for-age	64.1	0.36
HC-for-age	53.1	0.08
MUAC-for-age	74.3	0.65
TSF-for-age	49.9	0.00
SSF-for-age	65.0	0.38

Comparison between Bangladesh and Tanzania:

	Country	1 Months	6 Months	12 Months	18 Months	24 Months
Stunting	Bangladesh	19.1 %	18.9 %	33 %	46.7 %	54.5 %
	Tanzania	17.1 %	25 %	50.7 %	70.4 %	70.6 %
Wasting	Bangladesh	3.6 %	4 %	5.8 %	10 %	10 %
	Tanzania	0 %	2.1 %	2.6 %	.5 %	1.9 %
Malnourished (Mean range):	Bangladesh	-1	-0.9	-1.2	-1.5	-1.6
	Tanzania	-0.2	-0.6	-0.9	-1.2	-1.3
Head circumference (Mean range):	Bangladesh	-0.8	-1	-1.5	-1.7	-1.9
	Tanzania	0	-0.3	-0.6	-0.6	-0.8

Comparison between Bangladesh and Tanzania:

Diarrhea experience	% of kids with no Diarrhea (0-5 months):	% of kids with no Diarrhea (6-11months):	% of kids with no Diarrhea (12-17months):	% of kids with no Diarrhea (18-23 months):
Bangladesh	34 %	16 %	22 %	26 %
Tanzania	56 %	43 %	65 %	76 %

Breast feeding at 6 months of age:	Optimal Breast Feeding	Exclusive breast Feeding
Bangladesh	9 %	17 %
Tanzania	0 %	0 %

*MAL-ED Cohort Study, Feb 2014.

Food Security:

According to the World Food Summit (1996), “Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food which meet their dietary needs and food preferences for an active and healthy life”.

Data will be collected by interview using pre-tested food security questionnaire.

Food security Domain:

Food Availability

Access to food

Food utilization

Stability

FANTA (Food and Nutrition Technical Assistance) and its partners have identified a set of questions (Household Food Insecurity Access Scale Generic Questions), it consists of nine questions.

These questions represent apparently universal domains of the household food insecurity (access)

The questionnaire is widely used in Bangladesh including our ongoing studies (the MAL-ED study).

1 = Food Secure  2=Mildly Food Insecure Access 
 3=Moderately Food Insecure Access 
 4=Severely Food Insecure Access 

Question	Food Secure All answer=0	Frequency		
		Rarely (1)	Sometimes (2)	Often (3)
1				
2				
3				
4				
5				
6				
7				
8				
9				

Prevalence of undernourishment and progress towards the world food summit and the millennium development goal targets in developing regions:

Country	Number of people undernourished					Change so far (%)	Progress towards WFO Targets
	1990-1992	2000-2002	2005-2007 (in millions)	2008-2010	2011-2013		
Bangladesh	36.5	22.7	21.6	22.8	24.8	32.2	▼
Tanzania	7.6	14.4	14.2	15.9	15.7	107.1	▲

Country	Proportion of undernourished in total population					Change so far (%)	Progress towards WFO Targets
	1990-1992	2000-2002	2005-2007 (in millions)	2008-2010	2011-2013		
Bangladesh	33.9	17.2	15.1	15.5	16.3	-52.1	■
Tanzania	28.8	41.3	35.6	36.5	33.0	14.5	■

Food Contamination

- ❖ CF will be collected through house hold visit for laboratory test to see the food microbiology. Samples will be collected by using a calibrated sterile spoon maintaining aseptic conditions.
- ❖ A minimum of 60 g of sample will be collected directly from the feeding pot, placed into a sterile plastic bag, and transported to the laboratory within 3–4 hours maintaining a cool chain (+ 4 to + 8 °C).



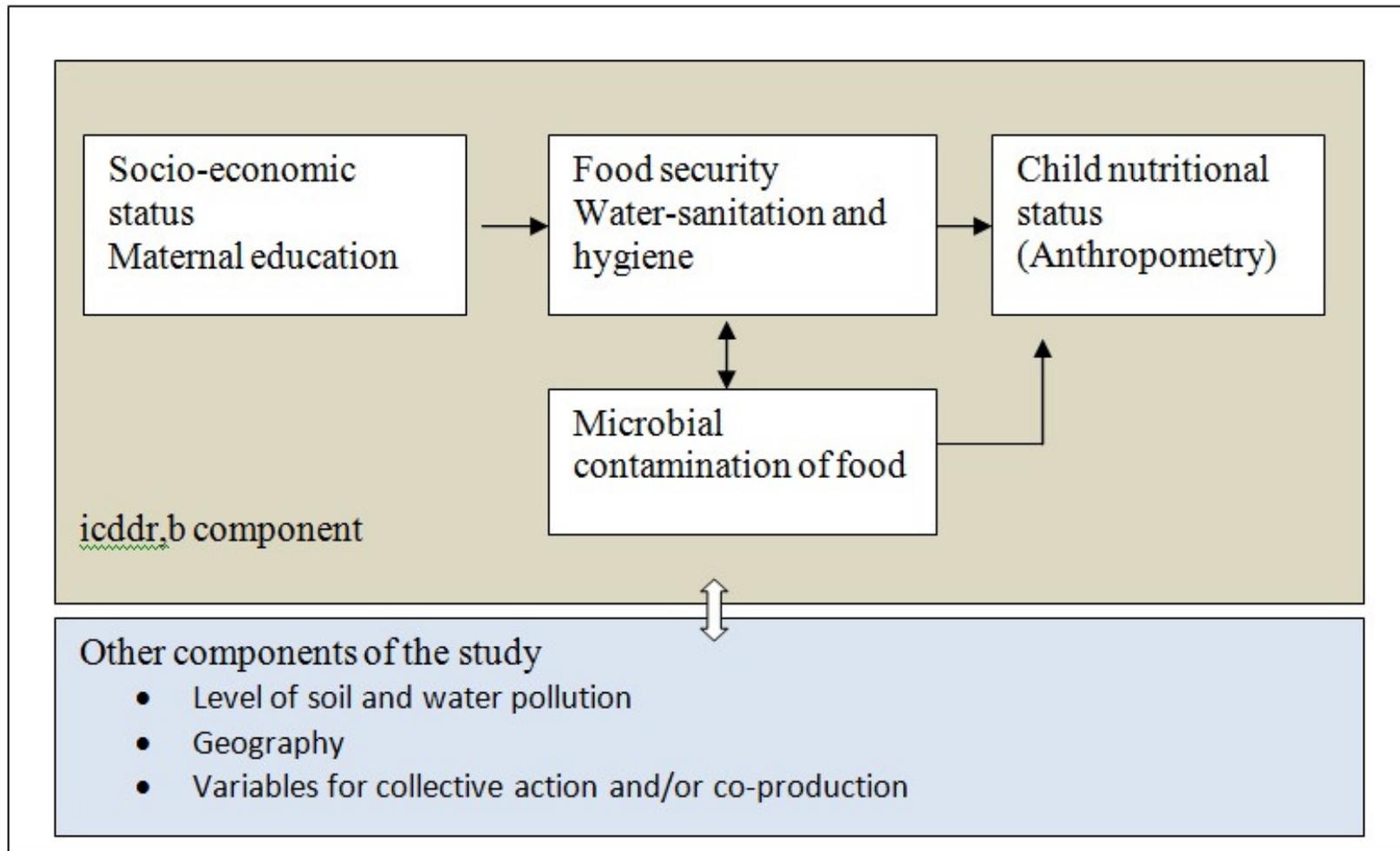
PARAMETERS FOR ANALYSIS:

Issues of Interest	Key Indicators
Microbiological Assessment	<p><i>Fecal coliform</i> <i>Bacillus Cereus</i> <i>Staphylococcus aureus</i> <i>Yeast and mould count</i> <i>Salmonella</i> <i>Shigella</i> <i>Vibrio Cholerae</i> <i>E.coli</i></p>
Dietary Assessment (Food Sample)	<ul style="list-style-type: none"> ▪ Powdered infant formula ▪ Liquid milk from animal ▪ Plain water ▪ Suji (a traditional recipe containing rice/ wheat powder, milk, sugar/ /molasses) ▪ Rice or kichuri ▪ Fruit juice (fresh or commercial) ▪ Cooked rice ▪ Cooked dal (lentil soup) ▪ Bread ▪ Cooked vegetables ▪ Cooked spinach or dark leafy ▪ Ripe fruits ▪ Cooked meat ▪ Cooked fish ▪ Cooked/boil egg ▪ Other dairy products (yogurt, butter and so on) ▪ Bakery items (biscuit, cake, pastry)





Analytical Framework



THANK YOU

