

FOOD AND
NUTRITION
TECHNICAL
ASSISTANCE

2003 Revised Edition

Anthropometric Indicators Measurement Guide

Bruce Cogill



This publication was made possible through support provided by the Office of Health, Infectious Disease and Nutrition of the Bureau for Global Health, US Agency for International Development, under the terms of Cooperative Agreement HRN-A-00-98-00046-00 of the Food and Nutrition Technical Assistance Project (FANTA). Additional support was provided by the Office of Food for Peace of the Bureau for Democracy, Conflict and Humanitarian Assistance. Earlier drafts of the guide were developed with funding from the Food and Nutrition Monitoring Project (IMPACT) (Contract No. DAN-5110-Q-00-0014-00, Delivery Order 16), managed by the International Science and Technology Institute, Inc. and the Food Security Unit of the LINKAGES Project (Cooperative Agreement: HRN-A-00-97-00007-00), managed by the Academy for Educational Development. The opinions expressed herein are those of the author and do not necessarily reflect the views of the US Agency for International Development. It may be reproduced, if credit is given to the FANTA Project.

Recommended citation: Cogill, Bruce.
Anthropometric Indicators Measurement Guide. Food and Nutrition Technical Assistance Project, Academy for Educational Development, Washington, D.C., 2003.

Revised March 2003

Copies of the Guide can be obtained from:

Food and Nutrition Technical Assistance Project
Academy for Educational Development
1825 Connecticut Ave., NW
Washington D.C., 20009-5721
Tel: 202-884-8000
Fax: 202-884-8432
E-mail: fanta@aed.org
Website: www.fantaproject.org

Contents

	Page	
1	8	Part 1. Introduction
2	10	Part 2. Anthropometric and annual monitoring indicators
	10	2.1. Anthropometric Indicators
	10	2.1.1. Building blocks of anthropometry: Indices
	11	2.1.2. What the indices reflect about the nutritional status of infants and children
	12	2.2. Annual monitoring indicators
3	14	Part 3. Collecting anthropometric data through surveys
	14	3.1. Steps for conducting a survey
4	17	Part 4. Weighing and measuring equipment
	17	4.1. Scales
	20	4.2. Length/height boards
	22	4.3. Mid-upper arm circumference measure

5

	Part 5.
23	Taking measurements
23	5.1. Interviewer field materials
24	5.2. Procedures before measuring
25	5.3. How to measure age, height, length, weight and MUAC
25	5.3.1. Age
26	5.3.2. Height
28	5.3.3. Length
30	5.3.4. Weight
34	5.3.5. MUAC
36	5.4. Assessing the accuracy of measurements
36	5.5. Entering the data
37	5.6. Training field staff
37	5.6.1. Planning the training
38	5.6.2. Field exercises and standardization
38	5.6.3. Survey training manual

6

	Part 6.
39	Comparison of anthropometric data to reference standards
39	6.1. NCHS/WHO reference standards
39	6.2. Comparisons to the reference standard
40	6.3. Standard deviation units or Z-scores
40	6.4. Percentage of the median and percentiles
41	6.5. Cut-offs
41	6.5.1. Cut-off points for MUAC for the 6-59 month age group
42	6.5.2. Malnutrition classification systems

7

	Part 7.
43	Data analysis
44	7.1. Sources of Epi Info software
44	7.2. Recommendation for analysis and presentation of height data
45	7.3. Examples of data analysis
46	7.3.1. Calculation of nutrition levels
47	7.3.2. Comparison of mean Z scores
48	7.4. Additional data analysis information

Contents - *continued*

8

	Part 8.
49	Annual monitoring indicators
49	8.1. Introduction
49	8.2. Routine data collection
50	8.3. Data on growth monitoring and promotion (GMP)

9

	Part 9.
51	References
53	Useful Websites
54	Glossary
59	Acronyms
60	Appendix 1. Calculating Z-scores
63	Appendix 2. Uses of anthropometric data
65	Appendix 3. Selecting a sample
70	Appendix 4. Measuring adults
75	Appendix 5. Adolescent anthropometric indicators
78	Appendix 6. Standardization of anthropometric measurements
89	Appendix 7. Guidelines for supervising surveys
91	Appendix 8. Title II generic indicators

Figures

	Figures
27	5.1. Child height measurement - Height for children 24 months and older
29	5.2. Child length measurement - For infants and children 0-24 months
31	5.3. Child weight measurement using Salter-like hanging scale
33	5.4. Child weight measurement using electronic scale
35	5.5. Child mid-upper arm circumference measurement
37	5.6. Child anthropometry questionnaire (partial)

Acknowledgements

This guide draws extensively on materials from the Anthropometry Resource Center, funded by the Food and Agriculture Organization's Southern African Development Community (SADC) project GCP/RAF/284/NET, Development of a Regional Food Security and Nutrition Information System. The Center was developed by Bill Bender and Sandra Remancus. Two publications were especially important to the development of the guide: United Nation's *How to Weigh and Measure Children: Assessing the Nutritional Status of Young Children in Household Surveys* and the World Health Organization's *Physical Status: The Use and Interpretation of Anthropometry*.

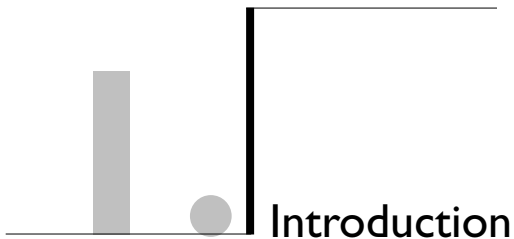
We thank the reviewers for their thoughtful comments. The Cooperating Sponsors provided invaluable assistance and this guide is dedicated to them. Eunyong Chung of the Global Health Bureau's Office of Health, Infectious Disease and Nutrition provided insight and guidance and her efforts are appreciated. USAID's Office of Food for Peace encouraged and supported the development of the guide. Phil Harvey and Matthew Saaks revised sections of the guide and their work is greatly appreciated. Sumathi Subramaniam and Laura Caulfield of Johns Hopkins University also contributed sections to the guide. Irwin Shorr, Penny Nestel, Anne Swindale, Patrick Diskin and Anne Ralte provided extensive comments and support.

This series

This series of Title II Generic Indicator Guides has been developed by the Food and Nutrition Technical Assistance (FANTA) Project, and its predecessor projects (LINKAGES and IMPACT), as part of USAID's support to develop monitoring and evaluation systems for use in Title II programs. These guides are intended to provide the technical basis for the indicators and the recommended method for collecting, analyzing and reporting on the indicators. A list of Title II Generic Indicators that were developed in consultation with the Cooperating Sponsors in 1995/1996 is included in Appendix 8. The guides are available on the project website www.fantaproject.org.

Below is the list of available indicator guides:

- Agricultural Productivity Indicators Measurement Guide
- Food for Education Indicator Guide
- Food Security Indicators and Framework for Use in the Monitoring and Evaluation of Food Aid Programs
- Infant and Child Feeding Indicators Measurement Guide
- Measuring Household Food Consumption: A Technical Guide
- Sampling Guide
- Water and Sanitation Indicators Measurement Guide



Introduction

This guide provides information on the Anthropometric Impact Indicators and the Annual Monitoring Indicators for Maternal and Child Health/Child Survival (MCH/CS) and income-related Title II activities, a subset of the P.L. 480 Title II Generic Performance Indicators for Development Activities. The impact indicators are:

- **decreased percent of stunted children** (presented for ages 24-60 months and by gender), where stunting is defined as percent of children falling below -2 standard deviations for height-for-age;
- **decreased percent of underweight children** (in specified age groupings such as 12-24 months 36-59 months and by gender) where underweight is defined as percent of children falling below -2 standard deviations for weight-for-age.

These indicators are required for the reports of projects with specific nutrition components and are collected at baseline, mid-term and final-year evaluations. Stunting, reflected by deficits in height-for-age, would not be expected to change in a short time period. It is recommended, therefore, not to report stunting figures annually. Underweight (or weight for age), reported for specific age groupings, would change more quickly as it is influenced by short-term effects such as a recent outbreak of diarrheal diseases.

Some programs report stunting for children under 24 months of age rather than the recommended 24-60 months age grouping. Restricting the age grouping to children under 24 months has the disadvantage of not capturing the lagged effects of the program and reducing the numbers of potential participants in a survey. The advantage of using children under 24 months is that the data are more useful to determine the factors related to stunting for program design or redesign.

The monitoring indicators are:

- **increased percent of eligible children in growth monitoring/promotion** (usually presented for children under 24 months or over 36 months of age, depending on the target group of the program);
- **increased percent of children in growth promotion program gaining weight in past 3 months** (by gender and age group, will depend upon the target group of the program).

The choice of indicators for annual monitoring and reporting should be based upon a review of available sources of data and the information needs of the Cooperating Sponsor and USAID. Reporting the annual monitoring indicators is recommended rather than required as in the case for reporting on impact. The primary purpose of collecting and reporting the monitoring indicators is to improve program management but these indicators can also provide valuable insights into the interpretation of the anthropometric indicators of program impact. In addition, reporting the annual indicators may provide Cooperating Sponsors a further opportunity to demonstrate progress towards the achievement of results.

While the focus of this guide is on the consistent collection and reporting of **nutritional anthropometry indicators** and **annual monitoring indicators**, suggestions are provided for additional information related to monitoring and evaluation. This information will help Cooperating Sponsors to track and improve child nutrition activities and performance. The focus is on anthropometric assessment of infants and young children. The guide is a programming tool and is not meant to substitute for adequate technical and academic training needed to conduct problem analysis, design programs and for implementation. Cooperating Sponsors are encouraged to seek technical expertise in nutritional assessment and related topics needed to ensure appropriate use of anthropometric indicators.

An inter-agency global initiative to improve the assessment, monitoring, reporting and evaluation of **humanitarian assistance** interventions has begun and is called **SMART** (Standardized Monitoring and Assessment of Relief and Transitions). The initiative is promoting an approach to routinely collect, analyze and disseminate nutrition and mortality data. Mortality and nutrition indicators are used to assess the severity of a crisis, identify needs, and prioritize resources. They are also used to monitor the extent to which the relief system is meeting the needs of affected populations and to gauge the overall impact and performance of humanitarian assistance in a given situation. The SMART initiative emphasizes the importance of interpreting data in context to provide a comprehensive picture of a given situation to facilitate effective decision-making. In addition to the basic nutrition and mortality indicators commonly used in the acute phase of an emergency, other important indicators will be reviewed and added as part of the collaborative effort.

The main indicators are Crude Mortality Rate (CMR) and the standard nutritional status indices of **wasting** (thinness or marasmus) and edema (kwashiokor) in children. Wasting is measured using **weight-for-height**. Wasting is defined as the percent of children (6-59 months) falling below -2 standard deviations for weight-for-height plus all children with edema.

The assessment of children over 5 years of age, adolescents, adults and the elderly is not the primary focus of the guide. Appendices 4 and 5, however, provide information on the nutritional assessments of adults and adolescents.