

**MEASURE DHS**

---

## **Anthropometry Field Manual**

Kenya Demographic and Health Survey

---

**Kenya National Bureau of Statistics  
Nairobi, Kenya**

**ICF International / Demographic and Health Surveys  
Calverton, Maryland  
USA**

**November, 2013**

MEASURE DHS is a five-year project to assist institutions in collecting and analyzing data needed to plan, monitor, and evaluate population, health, and nutrition programs. MEASURE DHS is funded by the U.S. Agency for International Development (USAID). The project is implemented by ICF Macro in Calverton, Maryland, in partnership with the Johns Hopkins Bloomberg School of Public Health/Center for Communication Programs, the Program for Appropriate Technology in Health (PATH), Futures Institute, Camris International, and Blue Raster.

The main objectives of the MEASURE DHS program are to: 1) provide improved information through appropriate data collection, analysis, and evaluation; 2) improve coordination and partnerships in data collection at the international and country levels; 3) increase host-country institutionalization of data collection capacity; 4) improve data collection and analysis tools and methodologies; and 5) improve the dissemination and utilization of data.

For information about the Demographic and Health Surveys (DHS) program, write to DHS, ICF International, 11785 Beltsville Drive, Suite 300, Calverton, MD 20705, U.S.A. (Telephone: 301-572-0200; fax: 301-572-0999; e-mail: [info@measuredhs.com](mailto:info@measuredhs.com); Internet: <http://www.measuredhs.com>).

## PREFACE

In combination with classroom instruction and practical experience, this manual will be used to teach you how to collect anthropometry for the 2014 Kenya Demographic and Health Survey (KDHS). Before each training session, you should carefully study this manual and the biomarker section of the household questionnaire. You are encouraged to ask questions during training and to discuss problems encountered in order to avoid making mistakes during fieldwork. The stages of training are described below:

- During the first phase, we will review with you the chapters of this manual. You will learn how to identify eligible respondents, record information relating to anthropometry collection in the household questionnaire, handle the technical procedures involved in height/length and weight measurement, and other related instructions.
- In the second phase, you will practice the procedures you've been taught by role playing with other trainees.
- In the final phase, known as field practice, you will be assigned to a Kenya DHS trainee team. During field practice, you will collect anthropometry data from eligible children and adults exactly as you will during the survey. Households that you visit will be in clusters that are not part of the Kenya DHS sample.

Throughout the training, you may be given homework assignments and tests. At the end of the training, your overall performance will be assessed and those who have performed the best will be selected to work in the survey.

Your training does not end at the start of fieldwork. Rather, it is a continuous process. Your team supervisor and the Kenya DHS survey coordinators will play important roles in continuing your training and in ensuring the quality of data you collect throughout the survey. They will:

- Periodically observe your fieldwork activities to ensure that you are conducting yourself professionally, obtaining informed consent from respondents, and following the anthropometry collection protocol correctly;
- Spot check that you collected anthropometry from the correct households and only from eligible respondents;
- Regularly meet with you to discuss your performance and give out future work assignments.

Any field staff member who is not performing at the level necessary to produce the high quality data required to make the Kenya DHS a success may be released from service.

## TABLE OF CONTENTS

<b>CHAPTER 1: GENERAL INFORMATION .....</b>	<b>5</b>
<b>OVERVIEW OF ANTHROPOMETRY COLLECTION .....</b>	<b>5</b>
<b>ELIGIBILITY .....</b>	<b>6</b>
<b>CHAPTER 2: HOW TO TAKE ANTHROPOMETRY MEASUREMENTS.....</b>	<b>10</b>
<b>MATERIALS AND EQUIPMENT FOR ANTHROPOMETRY .....</b>	<b>10</b>
<b>PROCEDURES AND PRECAUTIONS BEFORE MEASURING .....</b>	<b>10</b>
<b>STEPS FOR MEASURING WEIGHT AND HEIGHT/LENGTH .....</b>	<b>12</b>
<b>MEASURING WEIGHT.....</b>	<b>12</b>

## CHAPTER 1: GENERAL INFORMATION

### OVERVIEW OF BIOMARKER COLLECTION

A biomarker may be thought of as a characteristic that can be independently measured and evaluated as an indicator of normal biologic processes, pathogenic processes, or pharmacologic response to a therapeutic intervention<sup>1</sup>. Biomarker measurements can serve as diagnostic tools to identify health problems in their early stages and can be used as surveillance tools to track changes in health patterns or to evaluate intervention programs. In population-based surveys, biomarkers help assess the prevalence or occurrence of diseases or conditions and can also be used at a macro level to measure the long-term effect of policies and programs. In the DHS, biomarkers are collected in order to report levels of specific health conditions on a population level. In the 2014 KDHS, the anthropometry measures will be collected. This training manual will discuss the proper data collection techniques and the appropriate recording of the measures.

Anthropometry collection should take place after the completion of the household and individual questionnaires. However, prior to collection, certain tasks must be completed. This chapter reviews the tasks that need to be completed prior to collecting anthropometry:

- Determining eligibility
- Obtaining informed consent.

---

<sup>1</sup> Biomarker Definitions Working Group, National Institutes of Health, 2001

## ELIGIBILITY

Not all household members are eligible for anthropometry collection. Members of the household who are eligible for anthropometry collection are: women age 15-49 (in half the households) and children under age 6 years old (in all households) who are usual household residents or are visitors that have stayed in the house the night before the household interview took place. **It is the responsibility of the interviewer** to identify all of the household members eligible for anthropometry collection and to enter their names and line numbers into the weight/height pages at the end of the Household Questionnaire. Individuals eligible for anthropometry collection will be identified by reviewing these columns from the Household Schedule:

- Column (1) Line number
- Column (2) Name
- Column (4) Sex of household member
- Column (7) Age of household member
- Column (9) Identification of eligible women, (women age 15-49)
- Column (11) Identification of eligible children, (children under age 6)

HOUSEHOLD SCHEDULE

LINE NO.	USUAL RESIDENTS AND VISITORS	RELATIONSHIP TO HEAD OF HOUSEHOLD	SEX	RESIDENCE		AGE	IF AGE 15 OR OLDER	ELIGIBILITY		
				5	6		MARITAL STATUS	9	10	11
1	2	3	4	5	6	7	8	9	10	11
	<p>Please give me the names of the persons who usually live in your household and guests of the household who stayed here last night, starting with the head of the household.</p> <p>AFTER LISTING THE NAMES AND RECORDING THE RELATIONSHIP AND SEX FOR EACH PERSON, ASK QUESTIONS 2A-2C TO BE SURE THAT THE LISTING IS COMPLETE.</p> <p>THEN ASK APPROPRIATE QUESTIONS IN COLUMNS 5-20A FOR EACH PERSON.</p>	<p>What is the relationship of (NAME) to the head of the household?</p> <p>SEE CODES BELOW.</p>	<p>Is (NAME) male or female?</p>	<p>Does (NAME) usually live here?</p>	<p>Did (NAME) stay here last night?</p>	<p>How old is (NAME)?</p> <p>IF 95 OR MORE, RECORD '95'.</p>	<p>What is (NAME)'s current marital status?</p> <p>1 = MARRIED OR LIVING TOGETHER 2 = DIVORCED/ SEPARATED 3 = WIDOWED 4 = NEVER-MARRIED AND NEVER LIVED TOGETHER</p>	<p>CIRCLE LINE NUMBER OF ALL WOMEN AGE 15-49</p>	<p>CIRCLE LINE NUMBER OF ALL MEN AGE 15-54</p>	<p>CIRCLE LINE NUMBER OF ALL CHILDREN AGE 0-5</p>
01		<input type="text"/>	M F 1 2	Y N 1 2	Y N 1 2	IN YEARS <input type="text"/>	<input type="text"/>	01	01	01
02		<input type="text"/>	1 2	1 2	1 2	<input type="text"/>	<input type="text"/>	02	02	02
03		<input type="text"/>	1 2	1 2	1 2	<input type="text"/>	<input type="text"/>	03	03	03
04		<input type="text"/>	1 2	1 2	1 2	<input type="text"/>	<input type="text"/>	04	04	04

After referencing the Household Schedule, the interviewer will record the names and line numbers of people eligible for anthropometry collection in the weight/height pages at the end of the Household Questionnaire. The interviewer will also record the dates of birth of children in Question 203. For a child whose mother was interviewed, the month and year of the child's birth should be taken from the mother's birth history (recorded in the Woman's Questionnaire), while the day of birth must be obtained directly from the mother. For a child whose mother has not been interviewed or is unavailable, the full date of birth must be obtained from a responsible adult.

WEIGHT AND HEIGHT MEASUREMENT FOR CHILDREN AGE 0-5

201	CHECK COLUMN 11 IN HOUSEHOLD SCHEDULE. RECORD THE LINE NUMBER AND NAME FOR ALL ELIGIBLE CHILDREN 0-5 YEARS IN QUESTION 202. IF MORE THAN SIX CHILDREN, USE ADDITIONAL QUESTIONNAIRE(S).			
		CHILD 1	CHILD 2	CHILD 3
202	LINE NUMBER FROM COLUMN 11  NAME FROM COLUMN 2	LINE NUMBER ..... <input type="text"/> <input type="text"/> NAME _____	LINE NUMBER ..... <input type="text"/> <input type="text"/> NAME _____	LINE NUMBER ..... <input type="text"/> <input type="text"/> NAME _____
203	IF MOTHER INTERVIEWED, COPY MONTH AND YEAR OF BIRTH FROM BIRTH HISTORY AND ASK DAY; IF MOTHER NOT INTERVIEWED, ASK: What is (NAME)'s birth date?	DAY ..... <input type="text"/> <input type="text"/> MONTH ..... <input type="text"/> <input type="text"/> YEAR <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	DAY ..... <input type="text"/> <input type="text"/> MONTH ..... <input type="text"/> <input type="text"/> YEAR <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	DAY ..... <input type="text"/> <input type="text"/> MONTH ..... <input type="text"/> <input type="text"/> YEAR <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>
204	CHECK 203: CHILD BORN IN JANUARY 2009	YES ..... 1 NO ..... 2 (GO TO 203 FOR NEXT CHILD OR, IF NO MORE CHILDREN, GO TO 214)	YES ..... 1 NO ..... 2 (GO TO 203 FOR NEXT CHILD OR, IF NO MORE CHILDREN, GO TO 214)	YES ..... 1 NO ..... 2 (GO TO 203 FOR NEXT CHILD OR, IF NO MORE CHILDREN, GO TO 214)
205	WEIGHT IN KILOGRAMS	KG. <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> NOT PRESENT ... 9994 REFUSED ..... 9995 OTHER ..... 9996	KG. <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> NOT PRESENT ... 9994 REFUSED ..... 9995 OTHER ..... 9996	KG. <input type="text"/> <input type="text"/> . <input type="text"/> <input type="text"/> NOT PRESENT ... 9994 REFUSED ..... 9995 OTHER ..... 9996
206	HEIGHT IN CENTIMETERS	CM. <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> NOT PRESENT ... 9994 REFUSED ..... 9995 OTHER ..... 9996	CM. <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> NOT PRESENT ... 9994 REFUSED ..... 9995 OTHER ..... 9996	CM. <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> NOT PRESENT ... 9994 REFUSED ..... 9995 OTHER ..... 9996

For children under 6 years, verify the child's name and line number is written in Question 202. Verify that an exact date of birth (day/month/year) is written in Question 203. Proceed with Question 204.

For women, verify the line number and name of all women age 15 - 49 in Question 215.

<u>WEIGHT AND HEIGHT MEASUREMENT FOR WOMEN AGE 15-49</u>				
214	CHECK COLUMN 9 IN HOUSEHOLD SCHEDULE. RECORD THE LINE NUMBER AND NAME FOR ALL ELIGIBLE WOMEN IN 215. IF THERE ARE MORE THAN THREE WOMEN, USE ADDITIONAL QUESTIONNAIRE(S).			
		WOMAN 1	WOMAN 2	WOMAN 3
215	LINE NUMBER FROM COLUMN 9  NAME FROM COLUMN 2	LINE NUMBER ..... <input type="text"/> <input type="text"/> NAME _____	LINE NUMBER ..... <input type="text"/> <input type="text"/> NAME _____	LINE NUMBER ..... <input type="text"/> <input type="text"/> NAME _____

The table below summarizes which household members are eligible for measurements and tests.

<b>Groups eligible for biomarker collection*</b>	<b>Weight</b>	<b>Height/length</b>
Children age 0-5 months	X	X
Women age 15-49 years	X	X

\*Must be usual residents or have slept in the household the night before the household interview took place.

**The following are important points to keep in mind when completing the Biomarker Data Form:**

**1) Anthropometry data should be collected from eligible consenting adults *after* their individual interview has been completed.**

**2) Collect anthropometry from one individual at a time.** All anthropometry information collected for the KDHS should be collected on one individual before moving on to the collection of anthropometry from the next eligible, consenting person. For example, if there is more than one eligible woman in a household, weigh and measure one woman first *before* proceeding to the next woman. Likewise, complete the collection of all weight/height measurements from one child before proceeding to the next. Failure to do so may lead to results being recorded in the wrong columns of the questionnaire.

**3) Never alter any responses on the Household Questionnaire without consulting the interviewer (if you were not the interviewer for the Household Questionnaire).** Even in cases where there are concerns about an individual's eligibility for anthropometry, proceed with data collection. Record in the comments section of the Household Questionnaire a description of the problem. Provide as many details as possible. The field organization/central office will decide later what will be done about the anthropometry results for the respondent in question.

## **Summary of Steps in Identifying Eligible Respondents and Seeking Informed Consent for Blood Collection**

- Complete the household and individual questionnaires
- Look at the Household Listing Schedule to confirm individuals who are eligible for anthropometry collection:
  - Women, age 15-49, who are usual residents or who stayed in the household the night before the interview are eligible for anthropometry collection
  - Children, under age 6, who are usual residents or who stayed in the household the night before the interview, are eligible for anthropometry collection

## CHAPTER 2: HOW TO TAKE ANTHROPOMETRY MEASUREMENTS

Anthropometry refers to the measurement of humans. In the KDHS, anthropometry refers solely to the measurement of a person's height (length) and weight. This information can be used to assess the nutritional status of a population. For children, standard indices of physical growth related to nutritional status are height-for-age, weight-for-height, and weight-for-age. A child who is below two standard deviations (-2 SD) from the median of a reference population in terms of height-for-age is considered short for his/her age or stunted. Stunting reflects the cumulative effect of chronic malnutrition. A child who is below two standard deviations (-2 SD) from the median of a reference population in terms of weight-for-height is considered too thin for his/her height, or wasted. Wasting is a condition reflecting acute or recent nutritional deficit. Weight-for-age is a composite index of stunting and wasting and is a good indicator to monitor nutritional status over time.

Among adults, height and weight measurement are used to calculate a person's body mass index (BMI) and to assess a woman's risk of having difficulty during childbirth due to her short stature (height <145 cm). BMI is calculated by dividing the weight in kilograms by the height in meters squared ( $\text{kg}/\text{m}^2$ ). BMI values are used to determine the percentage of the adult population that is normal, thin, overweight and obese.

### MATERIALS AND EQUIPMENT FOR ANTHROPOMETRY

- **SECA 874 digital scale<sup>2</sup>:** for weighing children and adults. The scale has a 200 kg capacity and weighs in 0.01 kg increments. The scale is powered by six AA batteries and has an "ON-OFF" switch located at the side of the scale.
- **Shorr height board:** for measuring the height (length) of children and adults.
- **Household Questionnaire**

### PROCEDURES AND PRECAUTIONS BEFORE MEASURING

1. **Layout of the Procedures:** Each step of the measurement procedure is directed at specific participants, who are named in bold letters at the beginning of each step: "**Measurer**" and "**Assistant**".
2. **Two Trained People Required:** Two trained people are required to measure a child's height or length. The measurer holds the child and takes the measurements. The assistant helps hold the child and records the measurements on the questionnaire. If there is an untrained assistant such as the mother, then the trained measurer should also record the measurements on the questionnaire. One person alone can take the weight of a child and record the results if an assistant is not available.
3. **Measuring Board and Scale Placement:** Be selective about where you place the measuring board and scale. It is best to measure outdoors during daylight hours. If it is cold, raining or if too many people congregate and interfere with the measurements, it may be more comfortable to weigh and measure indoors. Make sure there is adequate light.

---

<sup>2</sup>The Seca 874 digital floor scale is manufactured by Seca gmbh & co. kg. Hammer Steindamm 9 – 25. 22089 Hamburg, Germany. The scale can be procured directly from Seca. These instructions were adapted from instructions that accompany the scale and revised by Irwin J. Shorr, MPH, MPS.

4. **Age Assessment:** Before you measure, determine the child's age. If the child is less than two years, measure length (the child lying down). If the child is two years of age or older, measure height (the child is standing). If accurate age is not possible to obtain, measure length if the child is less than 85 cm. Measure height if the child is equal to or greater than 85 cm.
5. **Weigh and Measure One Child at a Time:** If there is more than one eligible child in a household, complete the weighing and measuring of one child at a time. Then proceed with the next eligible child. DO NOT weigh and measure all the children together. If there is more than one eligible woman in a household, weigh and measure her and all her eligible children before proceeding with the next woman. Otherwise measurements may get recorded in the wrong columns of the questionnaire. Return measuring equipment to the storage bags after you complete the measurements for each household.
6. **Control the Child:** When you weigh and measure, you must control the child. The strength and mobility of even very young children should not be underestimated. Be firm yet gentle with children. Your own sense of calm and self confidence will be felt by the parent and the child.

When a child has contact with a measuring board, you must hold and control the child so the child will not trip or fall. Never leave a child alone with a piece of equipment.

7. **Coping with stress:** Since weighing and measuring requires touching and handling children, normal stress levels for this type of survey work are higher than for surveys where only verbal information is collected.

Explain the weighing and measuring procedures to the mother, father, or other responsible adult and to a limited extent, the child, to help minimize possible resistance, fears or discomfort they may feel. You must determine if the child or the parent is under so much stress that the weighing and measuring must stop. Remember, young children are often uncooperative; they tend to cry, scream, kick and sometimes bite. If a child is under severe stress and is crying excessively, try to calm the child or return the child to the parent before proceeding with the measuring.

Do not weigh or measure a child if:

- The parent/responsible adult refuses.
  - The child is too sick or distressed.
  - The child is physically deformed which will interfere with or give an incorrect measurement. To be kind, you may want to measure such a child and make a note of the deformity on the questionnaire.
8. **Recording Measurements and Being Careful:** Keep objects out of your hands and pens out of your mouth, hair or breast pocket when you weigh and measure so that neither the child nor you will get hurt due to carelessness. When you are not using a pen, place it in your equipment pack or on the questionnaire. Make sure you do not have long fingernails. Remove interfering rings and watches before you weigh and measure.
  9. **Strive for Improvement:** You can be an expert measurer if you strive for improvement and follow every step of every procedure the same way every time. The

quality and speed of your measurements will improve with practice. Do not take these procedures for granted even though they may seem simple and repetitious. It is easy to make errors when you are not careful. Do not omit any steps. Concentrate on what you are doing.

## STEPS FOR MEASURING WEIGHT AND HEIGHT/LENGTH

1. Check column 11 of the household schedule to identify all children in the household who are eligible for weight and height/length measurement. Children born in 2009 or later who are usual residents of the household or who are visitors who spent the previous night in the household are eligible for anthropometry. Each eligible child should be recorded in a separate column of the weight/height form.
2. Referring to the household schedule, check the **Line Number** and **Name** of all eligible children in **Question 202**. In **Question 203**, verify the month and year of birth of the child from the mother's birth history (Woman's Questionnaire Section 2), and ask for the day of birth. For children not included in a birth history, determine the date of birth from the parent/responsible adult and record in **Question 203**.
3. In **Question 204** confirm that the child was born in **MONTH** 2009 or later. If the child was born before **MONTH** 2009 go to **Question 203** for the next child.
4. Perform the child weight and height/length measurements according to instructions below.
5. Next, by checking columns 9 and 10 of the household schedule, identify all women from the household schedule who are eligible for weight and height measurement. Women age 15-49 years who are usual members of the household or who slept in the household the night before are eligible.
6. Check that the **Line Number** and **Name** of all eligible women has been recorded in **Question 215** of the weight/height form.
7. Perform the adult weight and height measurements according to instructions below.

## MEASURING WEIGHT

### Preparing Adult and Child to Take Their Weight

Show the scale to the adult and explain that you will weigh her/him and their children on the scale. Tell her/him that infants and any other children who will not stand on the scale alone can be held by the adult to obtain the child's weight. Ask the adult to wear light clothing while being weighed and to remove shoes/sandals and any heavy clothing, etc. Ask the adult to undress the child just before taking his/her weight. Leave underpants on the child.

### Preparing the Scale

Take the scale out of the storage bag and place the scale on a hard, level surface. Uneven surfaces or vibration may cause the scale to malfunction. Turn on the power by pushing the switch located at the side to the "ON" position.

The scale will not function correctly if it is bumped, knocked or moved during the weighing. It is best to use the scale in the shade or indoors. Handle the scale carefully:

- Do not drop or bump the scale.
- Do not weigh a total weight of more than 200 kg.
- Do not store the scale in direct sunlight or other hot places.
- Protect the scale against excess humidity or moisture.
- Do not use the scale at temperatures below +10°C or above +40°C.
- To clean the scale, wipe surfaces with a damp cloth and dry immediately
- Never put the scale in water.
- After using the scale, turn off the scale by switching the “ON-OFF” switch to the “OFF” position.

### Weighing Women and Children Who Can Stand on the Scale by Themselves

1. Activate the power supply by pushing the switch in position “ON”. Press the “START” key with no load on the scale. The display should show “SECA, 8.8.8.8.8 and “0.00” consecutively. The scale automatically sets to zero “0.00” and is now ready for use.
2. Ask the women or child to step onto the center of the scale and stand quietly. Wait until the numbers on the display no longer change and stay fixed in the display.
3. The weight will appear in the digital display. Record the weight to 0.01 kg on the questionnaire.
  - For children, record the child’s **weight** measurement in **Questions 205**. If the child’s weight was not measured, record the appropriate code in **Question 205**.
  - Record women’s **weight** measurements in **Question 216**. If the women’s weight was not measured, record the appropriate code in **Question 216**.
4. If you have just weighed a woman and you are about to weigh an infant or child that must be held to take its weight, then ask the woman to remain on the scale since the woman will hold the child.

Weighing Infants or Children Who Must be Held by an Adult While on the Scale *(NOTE: If it is cold and the adult wants the child to be covered during the weighing, give her/him a blanket or cloth for covering the child **after** you have recorded the adult’s weight on the **Biomarker Data Form**. If you do not give the adult a blanket or cloth to cover the child, follow the instructions given under “**If You Do NOT Give the Adult a Blanket or Cloth to Cover the Child**”. If you give the adult a blanket or cloth to cover the child, follow the instructions given under “**If You Give the Adult a Blanket or Cloth to Cover the Child**”).*

### **If You Do NOT Give the Adult a Blanket or Cloth to Cover the Child:**

#### **2 in 1 Function**

The 2 in 1 function enables the weight of babies and small children to be determined. The child is held in the arms of an adult. Proceed as follows.

1. Press the “START” key with no load on the scale and wait until the display “0.00” appears.
2. Ask the adult to step onto the center of the scale without the child and stand quietly. Wait until the numbers (weight of the adult) on the display no longer change and stay fixed in the display.

3. Press the 2 in 1 key to activate the function. The scale stores the weight of the adult and the display returns to zero. "0.00" and "NET" appear in the display.
4. Give the child to the adult. The scale determines the weight of the child. Once the value is stable for about 3 seconds, the display is retained. This avoids the display jumping about as a result of the child's movements. "HOLD" and "NET" appear in the display.
5. Record the weight of the child to 0.01 kg on the questionnaire.
6. If several children are to be weighed consecutively, it is important that it is always the same adult who performs the measurement and that this person's weight does not change (e.g. due to pieces of clothing being removed).
7. The 2 in 1 function remains switched on until:
  - You press the 2 in 1 key again (total weight displayed)
  - The scale switches off automatically.

**If You Give the Adult a Blanket or Cloth to Cover the Child:**

**2 in 1 Function**

1. Press the "START" key with no load on the scale. Wait until the display "0.00" appears.
2. **Give the adult a blanket or cloth and ask her/him to step onto the center of the scale without the child and stand quietly.**
3. The weight of the adult plus blanket/cloth appears on the display. Wait until the numbers on the display no longer change and stay fixed.
4. Press the 2 in 1 key to activate the function. The scale stores the weight of the adult plus blanket/cloth and the display returns to zero. "0.00" and "NET" appear in the display.
5. Give the child to the adult. The scale determines the weight of the child. Once the value is stable for about 3 seconds, the display is retained. This avoids the display jumping about as a result of the child's movements. "HOLD" and "NET" appear in the display.
6. Record the weight of the child to 0.01 kg on the questionnaire.
7. If several children are to be weighed consecutively, it is important that it is always the same adult who performs the measurement and that this person's weight does not change (e.g. due to pieces of clothing being removed).
8. The 2 in 1 function remains switched on until:
  - You press the 2 in 1 key again (total weight displayed)
  - The scale switches off automatically.

**Additional Notes on the SECA scale:**

- The SECA scale switches off automatically. If the scale is in “Normal Mode” it will switch off 3 minutes after the last weighing. If the scale is in “2 in 1 mode”, it will switch off after two minutes.
- Do not weigh loads with a total weight of more than 200 kg.
- Possible reasons for the scale not taring (returning to zero (“0.00”) after pressing the “2 in 1 function” key when the adult stands on the scale):
  - There was no weight on the scale to tare (the adult was not on the scale).
  - The load weighs more than 200 kg; “STOP” appears in the display. Use a lighter load.

What to do if the Scale Display Shows the Following Errors:

No weight is displayed when there is a load on the scale?

- Check to see if the scale is switched on. Ask the adult to step off the scale and step gently on the weighing platform.
- Check to see if the switch is in the “ON” position
- Check the batteries

The scale keeps switching on, while being transported? The vibration switch has been activated. Turn off the scale by switching the “ON-OFF” switch to the “OFF” position.

The scale displays a weight after being transported or after new batteries have been put in? Wait until the scale switches off automatically after two minutes. The scale will work normally again.

“0.00” does not appear before weighing? Start the scale again after it switches off automatically; there should not be any load on the scale.

“----” appears instead of “0.00” before weighing? Start the scale again after it switches off automatically; there should not be any load on the scale.

One segment of the display is illuminated constantly or not at all? There is a problem with that segment of the scale. Inform your service dealer.

The display shows a battery with split shading? The battery voltage is running low. The batteries should be changed in a few days.

“..batt” appears in the display? The batteries are empty. Replace the batteries.

“Stop” appears in the display? The maximum load capacity of the scale has been exceeded.

The display flashes? Take the load off the scale and start again. Wait until 0.00 appears and weigh again.

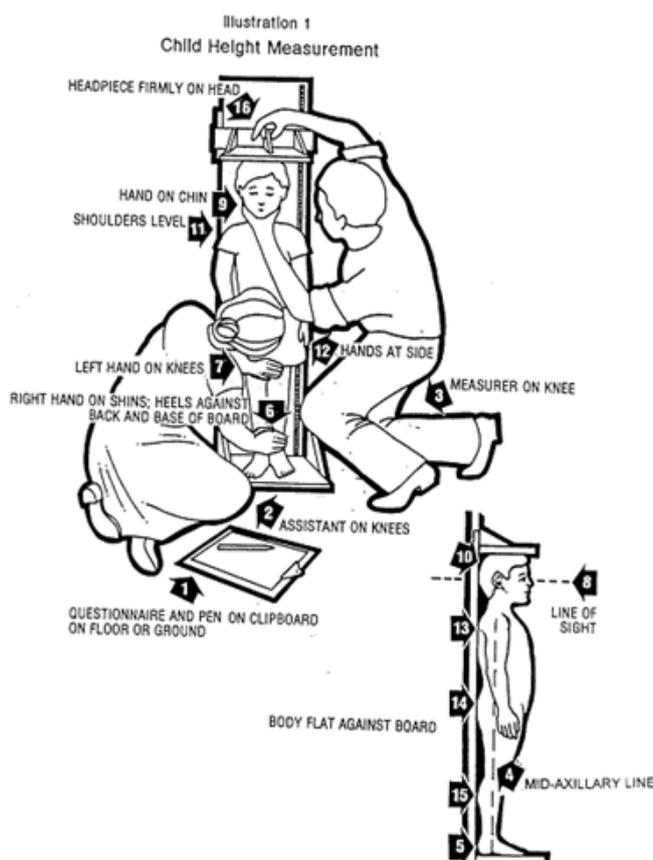
'temp' appears in the display? The ambient temperature of the scale is too high or too low. Place the scale in an ambient temperature between + 10°C and + 40°C. Wait 15 minutes for the scale to adapt to the temperature and weigh again.

E and a number appear in the display? Start the scale again after it switches off automatically. The scale will then work normally again. If this does not happen, inform the service dealer.

## MEASURING A CHILD'S HEIGHT (ILLUSTRATION 1):

1. **Measurer or Assistant:** Place the Shorr measuring board on a hard, flat surface against a wall, table, tree or staircase. Make sure the measuring board is stable. Many walls and floors are not at perfect right angles; if necessary, place small rocks underneath the height board to stabilize it during the measurement.
2. **Measurer or Assistant:** Ask the parent to take off the child's shoes and to unbraided or push aside any hair that would interfere with the height measurement. Ask the parent to bring the child to the measuring board and to kneel in front of the child so that the child will look forward at the parent.
3. **Assistant:** Place the questionnaire and pen on the ground (Arrow 1) and kneel on the right side of the child (Arrow 2).
4. **Measurer:** Kneel on the left of the child (Arrow 3).
5. **Assistant:** Place the child's knees and feet in the correct position, with knees and feet either together or apart. There are three possible positions for the knees and feet:
  - Knees together and feet together
  - Knees together and feet apart.
  - Knees apart and feet together
 Whichever touches first!

6. **Measurer:** Determine if the child's feet should be against or away from the back of the height board by observing the imaginary line drawn from the tip of the shoulder to the heel, which is called the "mid-axillary line" (Arrow 4). This line should be perpendicular (90°) to the base of the height board where the child is standing (you may have to move the child's feet away from the back of the height board to put them in the proper position). Note that with most preschool-age children who are not heavy or obese, the heels will



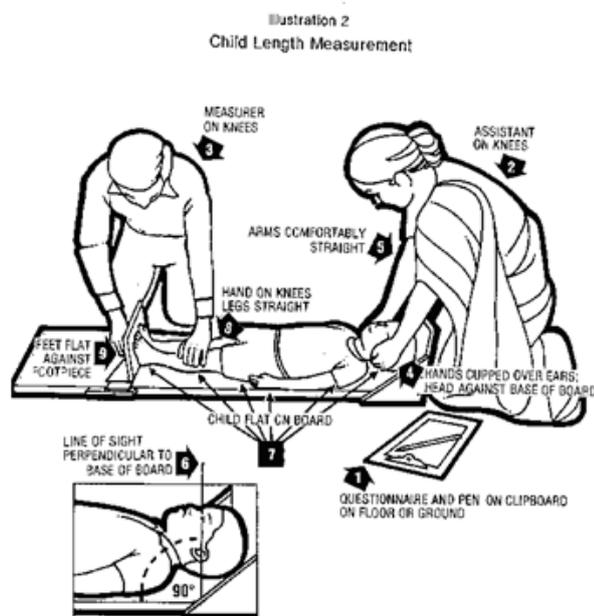
probably touch the back of the height board (Arrow 5).

7. **Assistant:** With your thumbs against the index finger of each hand, place your right hand on the child's shins (Arrow 6) and your left hand on the child's knees (Arrow 7). Do not wrap your hands around the knees or feet (ankles) or squeeze them together. Make sure the child's legs are straight.
8. **Measurer:** Ask the child to look straight ahead at the parent if she is kneeling in front of the child. Make sure the child's line of sight is parallel to the ground (Arrow 8). Place the thumb and index finger of your left hand, one finger on each side of the child's chin, and gradually close your hand (Arrow 9). Note that with most preschool-age children who are not heavy or obese, the back of the head will touch the back of the height board (Arrow 10); however, if the child is heavy or obese, there will be a space between the back of the child's head and the back of the measuring board. Make sure the child's shoulders are level (Arrow 11), the hands are at the child's side (Arrow 12), and at least the child's buttocks touch the back of the measuring board. Note that with most preschool-age children who are not heavy or obese, the back of the head, the shoulder blades, the buttocks, the calves and heels will touch the back of the measuring board (Arrows 10, 13, 14, 15 & 5).
9. **Measurer and Assistant:** Check the position of the child (Arrows 1-15). Repeat any steps as necessary.
10. **Measurer:** When the child's position is correct, lower the headpiece on top of the child's head (Arrow 16) making sure to push through the child's hair. Read and call out the measurement to the nearest 0.1 cm. Remove the headpiece from the child's head, your left hand from the child's chin, and allow the child to return to the parent.
11. **Assistant:** Immediately record the **height** measurements in **Questions 206** on the questionnaire and show it to the measurer. Record that the child was measured standing up in **Question 207**.
12. **Measurer:** Check the recorded measurement on the questionnaire for accuracy and legibility. Instruct the assistant to correct any errors.

## MEASURING A CHILD'S LENGTH (ILLUSTRATION 2)

for children less than two years old; or, when age cannot be obtained, length is measured for children less than 85 centimeters:

1. **Measurer or Assistant:** Place the measuring board on a hard, flat surface, such as the ground, floor or a solid table. Make sure the measuring board is stable.
2. **Assistant:** Place the questionnaire on the ground, floor or table (Arrow 1) and kneel behind the base of the measuring board if it is on the ground or floor (Arrow 2).



3. **Measurer:** Kneel at the right side of the child (at the child's feet) so that you can move the foot piece with your right hand (Arrow 3).
4. **Measurer and Assistant:** With the help of the parent, gently lower the child onto the measuring board, making sure the measurer supports the child at the trunk of the body while the assistant supports the child's head.
5. **Assistant:** Cup your hands over the child's ears (Arrow 4). With your arms straight (Arrow 5), place the child's head against the base of the board. The child should be looking straight up (Arrow 6) so that the line of sight is perpendicular to the board. Your head should be directly over the child's head. Watch the child's head to make sure it is in the correct position against the base of the board.
6. **Measurer:** Make sure the child is lying flat in the centre of the board (Arrow 7).

Place the child's knees and feet in the correct position, with knees and feet either together or apart. There are three possible positions for the knees and feet:

- |  |   |                          |
|--|---|--------------------------|
| <ul style="list-style-type: none"> <li>• Knees together and feet together</li> <li>• Knees together and feet apart</li> <li>• Knees apart and feet together</li> </ul> | } | Whichever touches first! |
|--|---|--------------------------|

With your thumb against your index finger, place your left hand on the child's knees (Arrow 8) and press them gently, but firmly against the board. Do not wrap your hand around the knees or squeeze them together. Make sure the child's legs are straight.

7. **Measurer:** Check the position of the child (Arrows 1-8). Repeat any steps as necessary.
8. **Measurer:** When the child's position is correct, move the foot piece with your right hand until it is firmly against the child's heels (Arrow 9). Read the measurement to the nearest 0.1 cm and call out the measurement to the assistant. Return the child to the parent.
9. **Assistant:** Record the **height** measurements in **Questions 206** and that the child was measured lying down in **Question 207**. Show it to the assistant for confirmation.
10. **Measurer:** Check the recorded measurement on the questionnaire for accuracy and legibility. Instruct the assistant to correct any errors.

### MEASURING WOMEN'S HEIGHT (ILLUSTRATION 3):

NOTE: The height of adults can be taken by one person alone, the Measurer.

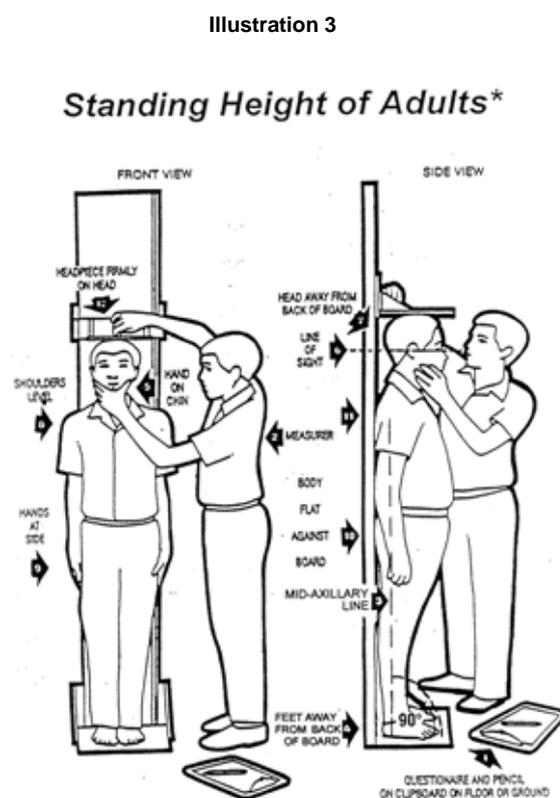
1. **Measurer:** Place the measuring board on a hard, flat surface against a wall, table, tree or staircase. Make sure the measuring board is stable. Many walls and floors are not at perfect right angles; if necessary, place small rocks underneath the height board to stabilize it during the measurement.
2. **Measurer:** Ask the woman to take off her shoes and ask her to unbraid or push aside any hair that would interfere with the height measurement. Ask the person to stand on the base of the height measuring board and to face forward.

3. **Measurer:** Place the questionnaire and pen on the ground (Arrow 1) and stand on the left side of the woman (Arrow 2).
4. **Measurer:** Determine if the woman's feet should be against or away from the back of the height board by observing the imaginary line drawn from the tip of the shoulder to the heel, which is called the "mid-axillary line" (Arrow 3). This line should be perpendicular (90°) to the base of the height board where the woman is standing. Note that with almost all women you will have to move the woman's feet away from the back of the height board to put them in the proper position; Arrow 4.
5. **Measurer:** Place the knees and feet in the correct position, with knees and feet either together or apart. There are three possible positions for the knees and feet:
  - Knees together and feet together
  - Knees together and feet apart
  - Knees apart and feet together
 } Whichever touches first!
6. **Measurer:** Ask the woman to look straight ahead. Cup the respondent's chin between the thumb and index finger of your left hand and gradually close your hand (Arrow 5). Position the woman's head so that the line of sight is parallel to the ground (Arrow 6). Note that with most women, the back of the head will not touch the back of the height board—there will be a space between the back of the woman's head and the back of the measuring board (Arrow 7). After you have placed the woman's head in the proper position, release your hand from the woman's chin and ask her to hold her head in the position you have just placed it in.

Make sure the woman's shoulders are level (Arrow 8), the hands are at the woman's side (Arrow 9), and at least the buttocks touches the back of the measuring board). Note that with most women, only the buttocks and perhaps the shoulder blades, will touch the back of the measuring board (Arrows 10 & 11).

7. **Measurer:** Check the position of the woman (Arrows 1-11). Repeat any steps as necessary.
8. **Measurer:** When the woman's position is correct, lower the headpiece on top of the head (Arrow 12) making sure to push through the woman's hair. Read and call out the measurement to the nearest 0.1 cm. Remove the headpiece from the woman's head, and escort the woman off the height board.

**Measurer:** Immediately record the measurement on the questionnaire. Record a woman's **height** measurements in **Question 217**. If the woman's height was not measured, record the



appropriate code in **Question 217**.

9. **Measurer:** Check the recorded measurement on the questionnaire for accuracy and legibility. Correct any errors.

### Summary of Steps in Measuring Anthropometry

- Children less than 2 years old or, in absence of age information, less than 85 cm
  - Verify the recorded name and line number in Question 201 and date of birth in **Question 203**.
  - Confirm child was born in January 2009 or later
  - Measure weight
  - Record weight in **Question 205**
  - Measure length with child laying down on Shorr board
  - Record length in **Question 206**
  - Record that child was measured laying down in **Question 207**
  
- Children 2 years or older or, in absence of age information, 85 cm or greater
  - Verify the recorded name and line number in **Question 201** and date of birth in **Question 203**.
  - Confirm child was born in January 2009 or later
  - Measure weight
  - Record weight in **Question 205**
  - Measure standing height
  - Record height in **Question 206**
  - Record that child was measured while standing in **Question 207**
  
- Adults
  - Verify the recorded name and line number in **Question 215**
  - Measure weight
  - Record weight in **Question 216**
  - Measure height
  - Record height in **Question 217**